Chapter 1 – An Integrated Multimodal Transportation System

The Regional Transportation Plan envisions an integrated system that supports the goals of VISION 2050, which calls for increased investment in transportation to support a growing population and economy. VISION 2050 emphasizes investing in transportation projects and programs that support local and regional growth centers and high-capacity transit station areas in particular. These policies emphasize the importance of public transit to achieving the VISION 2050 regional growth strategy.

Over the last few years, the region has made significant progress in building out its integrated multimodal transportation system. The Alaskan Way Viaduct was demolished and replaced with a tunnel under Seattle’s central waterfront. New, fast, passenger-only ferry service now connects Kitsap County with downtown Seattle, and new ferry terminals have opened, including a long-planned facility in Mukilteo. Community Transit’s Green Line provides a second bus rapid transit corridor in Snohomish County, and the Northgate extension to Sound Transit’s 1-line opened three new light rail stations. Major rail-roadway separation projects have been completed to eliminate bottlenecks and improve safety. And new bike and pedestrian connections, such as the Grand Avenue Park pedestrian bridge in Everett, provide improved access to transit stations and local amenities. WSDOT is nearing completion of a 20-year project to extend I-5 HOV lanes into Pierce County, connecting a vital network of the region’s managed highways. These investments, and many others like them, will create and sustain the integrated transportation system that will be necessary for the region to thrive.

This chapter describes different parts of the system and related operations and efficiencies, including current conditions; needs, gaps and opportunities; future conditions; and what’s ahead.
System Uses

Regular Transit

When people think of transit, most often they think of fixed-route rail or bus service that stops at specific stations or stops on a schedule. For the purposes of this section, these types of transit services are referred to as “regular transit.”

VISION 2050 calls for providing and encouraging alternatives to driving alone and ensuring the availability of reliable and competitive transit options.

Existing Conditions

The region’s regular transit system is built upon the backbone of an extensive bus transit system with an expanding high-capacity transit system.

High-capacity transit in the region is provided by a variety of rail, bus rapid transit and ferry modes, including: Sound Transit’s Link light rail, Tacoma Link, and Sounder commuter rail; Seattle’s two streetcar lines and the historic 1962 monorail; Community Transit’s Swift and King County Metro’s RapidRide bus rapid transit services; and multimodal and passenger-only ferry services provided by the Washington State Ferries, Pierce County Ferries, King County Metro and Kitsap Transit (see Ferries section below). Bus rapid transit (BRT) routes in the region are distinguished from other forms of bus transit by a combination of features that include branded buses and stations, off-board fare payment, wider stop spacing than other local bus service, and other treatments such as transit signal priority and business access and transit (BAT) lanes. Collectively, high-capacity transit modes provided approximately 25% of the region’s transit boardings in 2018. See Figure 4

Six transit agencies provide additional fixed-route bus service in the region. Each agency defines its own service thresholds and types. However, the system can be characterized by varying frequencies of bus service. The more urban and densely developed parts of the region include a network of frequent buses that operate throughout most of the day. Key roles of this type of bus service include supporting transit-oriented development (TOD) and connecting to high-capacity transit modes. Other parts of the region have more limited service. In addition, different forms of commuter and express buses operate over longer distances using the highway high-occupancy vehicle (HOV) lane system with some routes operating predominantly in the peak commuting periods only. Overall, these bus services (excluding BRT) provided approximately 75% of regular transit boardings in 2018.

Definitions

Regular Transit: Rail or bus transit that serves regional and local mobility needs by providing service at fixed stations or stops. Regular transit consists of both high-capacity transit modes (light rail, commuter rail, streetcar, monorail, and bus rapid transit) as well as bus service connecting local communities to one another and to high-capacity transit modes.
Figure 4 - 2018 High-Capacity Transit Network
More than 83% of all trips accessing transit were made by nonmotorized modes of travel (pedestrians and bicyclists) in 2018. Automobiles accounted for the remainder of access either by parking or drop-off. The central Puget Sound region has 231 park & ride lots providing 45,226 spaces for people to park to access regular transit (as well as accessing vanpools and carpools).

Figure 5 shows proximity of households to the region’s growing high-capacity transit system. The figure shows that more people of color and people with low incomes are living near high-capacity transit than the region’s population as a whole. This finding holds true whether considering ¼-mile or ½-mile distance from stations.

Figure 5 - Households Near High-Capacity Transit Stations (2018)

Trends and Data Collection

Transit agencies in the central Puget Sound region collectively provided over 221 million regular transit boardings in 2018. All fixed-route transit modes experienced robust growth between 2010 and 2018. Light rail boardings increased dramatically due to ongoing system expansion and additional station openings in 2016. In recent years prior to the COVID-19 pandemic, the region saw regular transit boardings increase faster than population - the largest increase among the top 50 urbanized areas across the nation.¹

In 2018, more than 20% of all ORCA² boardings used a reduced fare product. The largest among these were people with low incomes, using an ORCA LIFT (5.7%) at almost 8 million boardings. This was followed by people with disabilities, youth, and older adults (aged 65+). The Coordinated Mobility


² ORCA stands for One Regional Card for All. It is a contactless smart card system for public transit system riders in the central Puget Sound region. ORCA allows for fare reductions through programs such as the Regional Reduced Fare ORCA (for older adults and people with disabilities), ORCA Lift (for low income households), and ORCA Youth, among other fare products.
Plan provides more information on mobility and demographic trends for people who use reduced fare products; see Appendix B (Coordinated Mobility Plan).

In 2020, the COVID-19 pandemic disrupted this growth in regular transit boardings as the region responded to a stay-at-home order, rising unemployment, and a dramatic increase in telecommuting by employees who could work from home. By early April 2020, WSDOT’s Transit COVID-19 Transportation System Reporting dashboard indicated that the regular transit ridership in the region was down 74% on average across transit agencies compared to the previous year.\(^3\) Transit agencies in the region responded to this public health emergency in a variety of ways to maintain a safe operating environment with reduced demand and vehicle capacity. The pandemic dramatically highlighted that certain corridors and areas within the region had higher reliance on regular transit to meet daily needs, even with pandemic travel restrictions. By 2021, with the rollout of vaccines and partial reopening of the region, regular transit boardings showed a slow rebound, but remained at a fraction of the boardings in prior years.

The COVID-19 pandemic will continue to have near-term impacts on regular transit boardings. However, jurisdictions and transit agencies in the region are continuing to plan for growth in a way that will increase ridership and meet long-term projections of transit boardings. The continuing build out of the planned high-capacity transit network means that when people return to in-person employment, school, and other activities in greater numbers, they will have easier access to fast and reliable transit options. Since 2018, the region has seen the opening of one new BRT route (Swift Green line) and the extension of Link light rail (Line 1) from Husky Stadium to Northgate, opening three new stations in north Seattle.

Appendix A (Transportation System Inventory) provides information on the various routes and operational details for the region’s public transit system.

**Needs, Gaps & Opportunities**

VISION 2050 calls for attracting 65% of the region’s residential growth and 75% of its employment growth to regional geographies that are centered upon high-capacity transit station areas. Therefore, some of the plan’s greatest needs, gaps, and opportunities are linked to the planned expansion of an integrated high-capacity transit network. Integration of this network includes providing easy connections between modes of transit and providing easy multimodal access to the public transit network.

Public feedback during development of the plan indicated that among the top motivators to get people to use more regular transit are shorter trip times, easier access, and extended service. For people with special transportation needs, many of their top mobility challenges include those associated with regular transit, including lack of regular transit in locations where it is needed, long travel times, lack of service at times when it is needed, lack of accessible physical infrastructure to access regular transit, and difficulty getting to medical appointments.

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Access to Transit

As the high-capacity transit system expands, there is an opportunity to continue to improve upon the high percentages of nonmotorized access to transit that exists today. In addition, local jurisdictions and transit agencies will need to collaborate in their planning to facilitate multiple modes of transit access around future HCT station areas. This includes the following types of access:

- **Transit-Oriented Development (TOD):** VISION 2050 reinforces the importance of regular transit in the regional growth strategy. More than 65% of new housing units and 75% of new jobs are planned near transit stations. Locating most of the new growth near transit leverages the region’s investment in regular transit and provides new opportunities for nonmotorized access. Ensuring that long-term affordable housing is incorporated into transit-oriented communities will help to ensure that people with low incomes, people with disabilities and others who experience mobility challenges have easy access to the high-capacity transit system.

- **Nonmotorized Transportation (pedestrian and bicycling):** Walking and bicycling are some of the most efficient, healthy, and environmentally friendly ways to access transit. PSRC’s inventory of pedestrian and bicycle facilities shows that there are opportunities to fill gaps and create a connected network of facilities that will encourage walking and bicycling (See Bicycle and Pedestrian section). In developing the Regional Transportation Plan, sensitivity testing of PSRC’s model was conducted including an evaluation of improved walk access time and distance around HCT stations and the corresponding impact to transit boardings. The sensitivity test was intended to represent improved access from both nonmotorized and other last-mile improvements such as community shuttles and mobility on demand options. The results of this sensitivity test showed that implementation of these types of access improvements to the transit network could yield up to an estimated 40% increase in transit boardings.

- **Automobile (both parking and drop-off):** Not everyone will be able to walk or bicycle to regular transit, particularly in less urban and in rural contexts. However, constructing parking is one of the most expensive ways to access transit on a per passenger basis. Continuing to explore and implement parking management policies and programs at existing park and rides, particularly those facilities at or near capacity, can help ensure more efficient use of parking that is already in place. Parking management can include providing incentives for carpool parking as well as disincentives to driving alone. Managing demand for park and ride spaces, including through price, can also improve customer experience by providing riders with certainty that they will find a space. This can also offer more equitable access by freeing up spaces for use outside the peak periods, and potentially through leveraging programs like ORCA LIFT for low-income riders. There are opportunities for transit agencies and local governments to work together to incorporate areas for passenger drop off (private vehicle, taxi, transportation network company, and other forms) and to provide parking in scale with the community context. Agencies can consider strategic and lower cost ways to create additional parking, including:

  - **Leased lots.** Leased parking both increases the supply of transit parking and comes in at a much lower per-stall cost than building new permanent stalls.
o **Creative partnerships.** Leveraging existing private parking supply is a cost-effective strategy for transit agencies and local jurisdictions. Fee-based parking near high frequency transit service can add parking capacity and provide predictability to riders with guaranteed parking spaces near transit.

o **Restriping existing park and rides.** Restriping and reconfiguring the layout of parking stalls at existing park and ride lots can add significant new capacity at a relatively low cost.

In addition, convenient connections between regular transit modes at transit stations and stops will enable people using the growing transit system to travel farther in less time than they do today. There is an opportunity for transit agencies and jurisdictions to collaborate in designing and implementing transit facilities that make connecting between modes and services easy and seamless. One example of a seamless transfer location where multiple modes of transit come together is the Tacoma Dome Station, where Sounder commuter rail, Tacoma Link, and regional and local bus service are all within a short walk of each other. In Bremerton, ferry and bus modes come together at the Bremerton Ferry terminal. These smooth intermodal connections require advanced planning that may include multiple modes, transit agencies, local jurisdictions, and others such as WSDOT, to succeed.

**Future Conditions**

The plan includes investments in high-capacity transit to expand the system to include 116 miles of light rail with 80+ stations in three counties, 36 bus rapid transit routes, two expanded commuter rail routes (89 miles and 15 stations), three streetcar routes, and maintaining the existing historic monorail.

This integrated high-capacity transit system will connect to local transit services and other forms of public transit noted within this section. Local bus service on weekdays will increase by approximately 26% regionwide between 2018 and 2050. This bus service will continue to provide mobility in places not served by the high-capacity transit network, as well as connecting to that network. Approximately 70% of all system improvements in the plan’s financial strategy (see Appendix J, Financial Strategy) are transit investments. In addition, a significant portion of overall transit investments are for maintenance and preservation: replacing vehicles and keeping facilities in a state of good repair over the long-term. See the System Performance section for information about transit asset management and associated performance measures and targets.
Figure 6 - 2050 High-Capacity Transit Network
Plan Outcomes

Planned investments that expand and integrate the high-capacity transit system and improve multimodal access to the public transit system result in a projected tripling of transit boardings from 2018 levels (see Figure 7).

Figure 7 - Transit Boardings Comparison 2018 to 2050

The number of regular transit boardings from high-capacity transit modes will grow from 25% in 2018 to over 62% in 2050. Light rail boardings will increase by more than tenfold over 2018 levels. BRT and streetcar modes will also experience exponential growth in boardings (BRT boardings are projected to increase eightfold and streetcar boardings are projected to increase more than sixfold). Other forms of regular transit experience smaller, but still significant, ridership growth. See Figure 8 for a comparison of transit ridership by mode between 2018 and 2050.
As the regular transit system expands and more housing is built near transit investments, by 2050 around 36% of all households will live within ¼-mile of the high-capacity transit system (up from 9% in 2018) and 59% of households will live within ½-mile of high-capacity transit in the region (up from 25% in 2018). The improved access to the HCT network is projected to be even better for people of color and for people with low incomes. By 2050, 48% of people of color will live within ¼ mile of HCT and 75% will live within ½-mile of HCT. People with low incomes will have similarly high percentages (45.5% within ¼-mile and 71% within ½-mile of HCT). Nonmotorized access to regular transit will increase from 83% in 2018 to 90% of all trips accessing transit in 2050.

By 2050, the magnitude of transfer activity across the regular transit system increases dramatically. Local bus-to-local bus transfers are larger than they are in 2018 but are no longer the largest within the system in 2050. The region’s investments in an integrated high-capacity transit system that reaches all four counties means that by 2050 the largest transfer volumes will be connecting light rail to and from local bus, with the next largest transfer volumes connecting light rail to and from BRT.

What’s Ahead?

As the region continues to expand its regular transit network into one that is increasingly convenient, flexible, safe, and provides mobility options throughout the day, access to transit becomes more important than ever.

Access to Transit

As described above PSRC’s model sensitivity tests showed the importance of improving access to transit and its impact on transit ridership throughout the region in 2050. This makes it clear that improving access to transit is essential to achieving the VISION 2050 regional growth strategy. The region’s transit agencies, local jurisdictions, and other regional and state partners should continue working together, building upon principles that facilitate easy multimodal access to transit as the transit system expands. Key highlights of the work ahead include:

- **Equity and safety:** A safe and equitable transit system is fundamental to implementing VISION 2050. Equity and safety are primary lenses through which transit access improvements should be considered. The needs of transit-dependent communities to access quality transit service should be prioritized in planning and implementation. In addition, transit access improvements should be safe and comfortable for those using the transit system, with particular focus on safety for vulnerable users and people of all ages and abilities. For more in-depth analysis, please see the Equity and Safety sections of the plan.

- **Location and context matter:** There is no “one size fits all” solution to access to transit issues. When transit agencies and other stakeholders work together to improve access to transit stations, the location of the station within the transit network should be considered as well as the local community context. A station located in a growing suburban area designated as a high-capacity transit community will have different access needs and priorities than a station located at the edge of the urban growth area. Access improvements should be customized based upon location and context.

- **Importance of land use decisions and affordable housing:** VISION 2050 calls for significant development near high-capacity transit stations. It is important that convenient, safe, and
multimodal access to transit be a primary focus in redevelopment to TOD in these key locations to maximize nonmotorized access to transit and to facilitate easy transfers. Maintaining existing and creating new affordable housing near transit stations will be key to ensuring that transit-dependent populations will have easy access to the expanding transit network.

- **Identify roles and responsibilities:** Improving access to transit is a shared responsibility that includes ongoing communication and coordination among transit agencies, local jurisdictions, and other relevant stakeholders (such as WSDOT). It is important to identify and engage with potential stakeholders early in the planning process and to outline and agree to key roles and responsibilities around planning for, funding, and implementing access to transit in a community.

**Planning for transit investments to 2050**

The Regional Transportation Plan, building from and implementing VISION 2050, extends beyond the planning horizon of all transit agencies within the region. The plan provides resources for transit agencies to use and provides an opportunity for them to think longer-term beyond their existing planning horizons towards the next major transit investments needed to expand the region’s multimodal capacity.

Key issues to consider within this topic area include:

- **Equity:** As transit agencies and local jurisdictions begin planning beyond their current long-range planning horizons, it is important that they prioritize good quality transit service and consider the needs of transit-dependent populations as they do so. The Equity analysis shows that transit-dependent populations are predominantly low income and people of color. Transit-dependent populations need transit service connecting to jobs, childcare, health care and other vital services, including on days and at times other than the typical commute peak periods.

- **Envisioning the next high-capacity transit corridor planning:** This plan introduces the opportunity for transit agencies to look beyond their typical planning horizons. Looking ahead to the next set of high-capacity transit corridors will provide the framework for transit agencies to consider in updating their long-range plans, similar to how envisioning the light rail spine in the 1990’s set the regional stage for three high-capacity transit system plans that followed. See Chapter 4 of the plan for more information on this topic.

- **Maintaining and updating transit agency long range plans:** All of the region’s transit agencies have developed, and in some cases, updated long range transit plans. These plans are useful for identifying long-range planning goals, assessing transit opportunities and needs into the future, and informing shorter range implementation and funding decisions. Transit agencies should include PSRC early in their plan update processes and incorporate an assessment of how their long-range plans are consistent with and implement VISION 2050. PSRC will also continue review of transit development plans and other transit agency planning documents, as appropriate.
Specialized Transportation

People with special transportation needs are defined as those who are unable to transport themselves due to their age, income, or ability. For purposes of planning, these populations include older adults, youth, people with disabilities, and people with low incomes. While regular transit services, such as bus, rail, and ferries, are the backbone of the transit system, public transportation services tailored to people with special transportation needs are called specialized transportation.

Federal and state regulations require regions like PSRC to conduct a coordinated planning process that identifies an inventory of all transportation services available to people with special transportation needs, identifies mobility challenges through outreach to those groups, and creates prioritized strategies to address those challenges. PSRC includes this planning process as part of the Regional Transportation Plan in the development of a Coordinated Mobility Plan, see Appendix B.

Existing Conditions

As of 2019, almost half of the region’s population (47%) had special transportation needs, whether they were an older adult (aged 65 or older), youth (age 5-17), a person with low income (household income under 200% of the federal poverty level), or a person with disabilities (including physical and cognitive disabilities). Although not every person within these groups requires specialized transportation, these group tend to rely more heavily than others on public transit and specialized transportation to meet their daily needs. In many cases, people are in multiple categories, such as an older adult with a disability or a youth who lives in a household with low income.

While almost half of the population falls into at least one of the categories for people with special transportation needs, the largest component of that group consists of people with low incomes (20%) followed by people with disabilities (11%). The Coordinated Mobility Plan provides information about the distribution of these and other groups of people with special transportation needs within the region and identifies common mobility challenges associated with each group. In addition, the Coordinated Mobility Plan incorporates an equity lens by considering race and ethnicity of people with special transportation needs. For example, people of color are more likely to be low income or to have a disability when compared to the general population.

Trends and Data Collection

Long-range transportation planning relies on a thorough understanding of current conditions. As demonstrated in other sections of the RTP, data collection and analysis are critical to this understanding. This section addresses the data related to specialized transportation that is currently available and highlights challenges and gaps in that data.

Demographic Trends

This section includes trends relating to the various groups considered people with special transportation needs.

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4 According to Washington state law, RCW 81.66.010, people with special transportation needs are “those people, including their attendants, who because of physical or mental disability, income status or age, are unable to transport themselves or purchase transportation.”
Youth

The number of youth in the region is expected to grow by 21% between 2020 and 2050, a slower rate than the total population. Approximately 48% of youth in the region today are people of color, making it one of the most diverse age groups in the region. Youth also tend to be in households with low incomes at higher rates than the regional average.

Older Adults

Whereas youth will grow at a slower rate than the total population, older adults will grow at a faster rate (85%) between 2020 and 2050. This trend has been continuing for the last decade as the large Baby Boomer generation (born 1946-1964) ages and people tend to live longer. Older adults tend to be less diverse than the regional population as a whole. Although one in three adults aged 65 or older has a disability, 73% of the oldest cohort at 85 and older has a disability. The 85 and older cohort is projected to be the fastest growing demographic group in the region, increasing from 69,600 in 2020 to more than 275,900 by 2050. This oldest group, in particular, requires specialized transportation for mobility.

People with Disabilities

King County has the largest overall number of people with disabilities and Kitsap County has the highest percentage (14%) in the region. As described above, there is a high correlation between people with disabilities and older adults. In addition to that, people with disabilities are more likely to be in a household with low incomes than the general population. Twenty-seven percent of people with disabilities identify as people of color.

People with Low Incomes

The largest group of people with special transportation needs are people with low incomes, at 20% of the region’s population in 2019. Forty-nine percent of people with low incomes are people of color. Transportation costs and availability are key concerns for people with low incomes. As housing costs in urban centers increase, many people with low incomes are moving or being displaced to areas outside of the urban core. When looking at data for the Seattle-Tacoma-Bellevue Metropolitan area, the Urban Institute found that a lack of affordable housing in transit-rich areas has caused low income people to live in areas that are far from employment/services and lack frequent transit.5

Other Groups

Additional groups with high correlations to people with special transportation needs include both veterans (correlated to older adults and people with disabilities) and people who have limited English proficiency (LEP) (correlated to people with low incomes, youth, and older adults). See the Coordinated Mobility Plan for more information on these groups.

Common Origins and Destinations for People with Special Transportation Needs

The coordinated planning process calls for PSRC to identify common origins and destinations for

people with special transportation needs. The Coordinated Mobility Plan identifies where different groups of people with special transportation needs live within the region. Feedback from surveys to these groups shows that some of the most common destinations for people with special transportation needs are medical facilities and related healthcare destinations, grocery stores/food banks, and educational institutions. Medical/healthcare locations are important for all but are particularly common destinations for older adults and people with disabilities. Educational institutions are the most common destinations for youth.

**Existing Specialized Transportation Services**

People with special transportation needs rely upon all modes of public transit. Of particular importance for freedom of movement and flexibility are buses, rail, and ferries, discussed in other sections of the RTP. This section reviews the various forms of specialized transportation that are available in the region.

Most specialized transportation providers surveyed for the Coordinated Mobility Plan serve the needs of older adults, people with disabilities, and people with low incomes who either are not able to access transit or have mobility needs that cannot be met by transit.

Older adults and persons with disabilities who are very frail or have cognitive impairments require a higher level of service than can be provided by either public transit or paratransit services. Based on the latest service inventory, more than half of the specialized transportation programs in the region serve older adults or people with disabilities and most of those programs reported their service vehicles are wheelchair accessible. Table 1, below, provides a summary of specialized transportation services found in the central Puget Sound region. The Coordinated Mobility Plan includes a full inventory of existing services.

**Figure 9 - Specialized Transportation Programs by Type**

<table>
<thead>
<tr>
<th>Transportation Service</th>
<th>Key Provider(s)</th>
<th>Eligibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADA Complementary Paratransit</td>
<td>Transit agencies</td>
<td>People with disabilities</td>
</tr>
<tr>
<td>Demand Response (non-ADA paratransit)</td>
<td>Transit and other specialized transportation agencies</td>
<td>People with special transportation needs (see Coordinated Mobility Plan Attachment B for more details)</td>
</tr>
<tr>
<td>Volunteer Driver Programs</td>
<td>Other specialized transportation agencies–non-profits or faith-based organizations</td>
<td>People with special transportation needs (see Coordinated Mobility Plan Attachment B for more details)</td>
</tr>
<tr>
<td>Non-Emergency Medical Transportation (NEMT)</td>
<td>Other specialized transportation agencies—for-profit transportation contractors</td>
<td>Medicaid/Medicare Advantage eligible riders</td>
</tr>
<tr>
<td>Student Transportation (School Buses)</td>
<td>Other specialized transportation agencies—for-profit transportation contractors</td>
<td>School-aged youth</td>
</tr>
<tr>
<td>Travel Training</td>
<td>Transit and other specialized transportation agencies</td>
<td>Open to the public (see Coordinated Mobility Plan Attachment B for more details)</td>
</tr>
</tbody>
</table>
Most of the programs noted in Figure 9 are specialized transportation operating programs. However, some programs are designed to educate and inform people with special transportation needs on how to use existing operating services, whether they be regular transit or specialized transportation. These include travel training, information and referral services, and mobility management/coalitions. These three categories of specialized transportation programs provide a key transportation demand management (TDM) function for people with special transportation needs. See the Transportation Demand Management section of the RTP for more on that topic.

### Needs, Gaps & Opportunities

People with special transportation needs experience a multitude of mobility needs or challenges that are not experienced by the general population or are more difficult for these groups compared to the general population. Examples of these challenges include lack of transportation that they can use in their neighborhood; transportation that is not available at the time that they need it; and/or institutional barriers to using accessible transportation.

PSRC conducted outreach to people with special transportation needs through community-based organizations (CBOs) and online surveys during 2020-2021. Through this outreach targeted to people with lived experiences with mobility challenges, PSRC identified several key mobility needs that are highlighted in the Coordinated Mobility Plan and summarized below.

#### Shorter travel times when taking regular transit or specialized transportation

Longer travel times when taking regular transit or specialized transportation compared to other transportation options, like driving a personal vehicle, is one of the key mobility challenges. Long wait times can be due to poor on-time reliability and excessive wait time at transfer points, among other things. Also, a lack of flexibility scheduling return trips for Americans with Disabilities Act (ADA) paratransit can result in a rider waiting a long time to be picked up.

#### More transportation services at times when they are needed

With many transit agencies focusing service during peak hours, there is a need for more of the region’s transit service to be available during non-peak hours, for example in the early morning or late evening. Also, there is less transit and ADA paratransit service available on weekends compared to weekday service. Specialized transportation services most commonly provide service on weekdays with little or no service offered in early mornings, evenings, or on weekends.

#### Accessible information about available services and language services

Riders with special transportation needs are often unaware of the different transportation options available to them or unsure which to use for a particular trip. Also, a lack of translated resources or in-
language assistance services can further exacerbate this challenge.

**Better access to health and wellness destinations**

With a growing number of people with special transportation needs, getting to health and wellness destinations is a continuing mobility challenge in the region. Many people shared that a lack of transportation, either regular transit or specialized transportation, to get to their medical appointments was a barrier to accessing healthcare. Other feedback in this area was on the difficulty of reaching urban medical facilities from rural areas. There is a particular mobility challenge identified for those who have special transportation needs and are not eligible for Medicaid non-emergency medical transportation or ADA paratransit service.

**Affordable transportation for families with low incomes**

Although most transit agencies in the region offer reduced fare options for people with low incomes, those reduced fares can be too expensive for families with lower incomes who may need to pay for multiple family members for multiple rides a day. This concern was raised in many outreach meetings throughout the coordinated planning process. Concerns were also expressed about the cost of medical transportation for people with low incomes.

**Connected ADA-accessible infrastructure**

Individuals seeking to walk, bike, or roll need an accessible and connected bicycle and pedestrian network. ADA-accessible infrastructure, such as complete sidewalks and wheelchair-accessible curb ramps, can help people getting to transit or specialized transportation services to reach their desired destinations. Filling gaps in sidewalks can mean accessing public transit options that allow more independence, such as allowing use of bus transit instead of ADA paratransit service.

**Better regional coordination to meet growing mobility needs**

Transportation providers and regional stakeholders expressed concerns over funding constraints to support the mobility of people with special transportation needs in the region. In addition, there are numerous mobility programs that serve specific groups for specific purposes. These programs create potential unnecessary duplication of service to areas that are expensive to serve. There is a need to improve regional cross-program collaboration and leverage existing funding among entities with dedicated transportation programs to increase availability of specialized transportation services.

**Additional needs and challenges for specialized transportation**

PSRC also identified the following mobility needs and challenges through outreach:

- More flexible scheduling for specialized transportation services, such as ADA paratransit and other community demand response services.
- Improved driver communication and training for people with special transportation needs.
- Simplified ADA paratransit eligibility review processes.
- Issues associated with rider comfort and safety, including perceived safety.

There are also challenges in obtaining consistent data for specialized transportation programs. Specialized transportation programs cover a wide range of types, including forms of operation (volunteer driver, demand response paratransit, deviated fixed-route, among others), and types of
mobility management (travel training, information and referral services, and mobility coalitions). Specialized transportation services are also often provided by private nonprofit organizations and human service providers with limited budgets and capacity for robust data collection and reporting. There is a clear need to develop consistent performance measures and collection processes for specialized transportation providers.

**Future Conditions**

Demographic trends point to a future with a higher percentage of people with special transportation needs living in the region by 2050. The oldest adults 85 and older will be the group that grows the most and who have a very high correlation with people with disabilities. In addition, youth, people with low incomes and working-age people with disabilities will continue to have mobility challenges that must be addressed.

At the same time, as described in other sections, the central Puget Sound region will have a much more extensive high-capacity transit network that will be fed by bus, mobility on demand, and specialized transportation services to improve mobility of all people, including those who have challenges due to age, income, and ability.

**What’s Ahead?**

**Prioritized Strategies**

PSRC developed and prioritized strategies to improve identified mobility needs of the people with special transportation needs. Community and regional partners provided input on prioritization of the strategies. See Appendix B - the Coordinated Mobility Plan for a full discussion of these strategies.

**Measuring Impact and Next Steps**

PSRC will work with stakeholders to engage on the mobility needs and strategies identified in the Coordinated Mobility Plan, and to find meaningful ways to measure performance of the programs that implement the strategies.
Mobility On Demand

Mobility On Demand (MOD) refers to the ability of individuals to find and use a variety of transportation options through public or private providers at their own convenience rather than a fixed schedule. Technology plays a key role in aggregating transportation options and providing details like availability and cost so customers can make an informed decision when planning a trip. All the shared mobility options addressed in the ITS/Technology section of the plan can also be considered MOD options: ride hailing, microtransit, micromobility, car sharing, and ride sharing. (See the ITS/Technology section for definitions and general discussion of these modes.)

MOD can be a direct provider-to-user experience, like an individual booking an Uber ride instead of driving themselves or renting an electric scooter in lieu of walking. However, public transit agencies are increasingly pursuing opportunities to leverage these new transportation options rather than compete with them. Transit agencies generally use the MOD service model to provide first- and last-mile connections to regular transit services and/or to serve geographic areas not well suited to regular transit.

Utilizing MOD for First- and Last-Mile Connections

Not all residents live close enough or are able to walk, bike, drive, or get dropped off to access transit at a stop or station. One way transit agencies in the region are addressing this access issue is through MOD projects, usually as a pilot or on a trial basis. These projects use smaller vehicles (vans or cars) to provide trips within a set geography where either the destination or origin point must be a transit stop or station (usually with high-capacity transit service like rail or BRT). Transit agencies may also encourage the use of micromobility options to access regular transit services.

Ride Hailing Partnerships and Microtransit

Many of the region’s transit agencies have experimented with public-private partnerships with ride hailing or microtransit companies to improve access to transit by closing first- and last-mile gaps. Examples include King County Metro’s Via to Transit and Ride Pingo to Transit programs. Via to Transit operates in four designated zones in King County: Othello, Rainier Beach/Skyway, Renton Highlands, and Tukwila. Customers use the Via app or contact the call center to book an on-demand trip. One end of the trip (origin or destination) must be a designated Via hub, which includes transit centers, light rail stations, and key community locations (e.g., select community centers, libraries, and medical facilities). Another pilot program, Ride Pingo to Transit, operates similarly but uses the Pingo app instead of Via. Ride Pingo to Transit serves the Kent Valley area, and each trip must either end or begin at Kent Station or the Kent Valley Hub to connect to bus or Sounder commuter rail services.

Former pilots include the Ride2 Pilot Program in Eastgate and West Seattle, which was a partnership between King County Metro and Chariot, a defunct microtransit service, as well as Pierce Transit’s Limited Access Connections Program, a partnership with Lyft funded by the Federal Transit Administration’s MOD Sandbox grant program.

Micromobility

Another emerging market under the MOD umbrella is micromobility, which refers to person-powered and individually operated modes, usually for short trips. Micromobility includes shared-use bike, e-
bike, or e-scooter rental services where rental transactions are typically completed in a smartphone app. Transit agencies have partnered with bike and scooter share services to install docked systems or deploy dockless fleets at transit centers to encourage transit riders to use these modes for first- and last-mile connections to transit.

**Targeted MOD**

Transit agencies also deploy MOD services to replace a low-performing bus route or provide new service in an area that has unmet demand that may not be high enough or dense enough to warrant a regular route. Common MOD solutions in this scenario are deviated-route buses or providing on-demand point-to-point service in a designated service zone using agency-owned vans or by partnering with ride hailing or microtransit companies.

**Flexible- or Deviated-Route Bus**

Deviated-route service is a hybrid of fixed-route and demand-response service. Typically using a smaller bus or van, this service generally operates along a fixed route but can deviate within a certain proximity to pick up a rider who submits a pre-scheduled request. It may also refer to a route that consistently circulates along a busy route or corridor without scheduled timepoints that can be flagged down for pickups.

New technology has made this a more efficient mode, enabling real-time requests and making it a truly on-demand service. One local example of a deviated-route service is Kitsap Transit’s BI Ride Powered by Pingo. BI Ride has operated a deviated route serving Bainbridge Island since 2014. Beginning in July 2021, customers can also use the Ride Pingo mobile app to request rides on demand instead of scheduling in advance.

**Ride Hailing Partnerships and Microtransit**

Transit agencies have long used vans to provide community shuttle and on-demand service as an alternative to regular transit to serve people with special transportation needs (sometimes called paratransit). As ride hailing apps grew in popularity over the last decade, transit agencies began piloting partnership programs to provide a similar on-demand experience to the general public either through public-private partnerships or agency-operated programs. These pilots are typically deployed in areas where regular transit has been eliminated due to low productivity or where there is unmet demand but not enough to warrant regular transit.

King County Metro’s Community Ride is an example of the MOD application. Unlike Ride Pingo to Transit or Via to Transit, Community Ride allows on-demand trips to begin and end anywhere within the designated service area, even if it is not a transit stop, station or hub (sometimes referred to as point-to-point service). The service is being piloted in the Sammamish and Juanita areas. To access

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6 Traditional bus, rail, or ferry service that operates on a set schedule, along a fixed route alignment (including those in a shared right-of-way, like local bus), and with designated stops is considered fixed-route or “regular” transit. Alternatively, on-demand service operates dynamically based on customer demand. Routing, stops, and pick-up/drop-off times are based on requests from riders. Traditional demand-response and paratransit services require scheduling in advance, but newer technologies are allowing for true on-demand service, with customers requesting rides in real-time, as needed.
destinations outside the service areas, customers can be dropped off at one of several transit stops or park-and-rides within the service area to connect to regional transportation options.

Pierce Transit’s PT Runner service builds upon lessons learned from the pilot Runner to Joint Base Lewis-McChord. The on-demand service is designed to offer a car-free transportation solution in areas with limited regular transit options. Customers can book a door-to-door trip anywhere in a designated zone on the Goin app, by phone call, or by flagging down a vehicle. Trips are provided by Pierce Transit owned-and-operated vans.

The Future of Mobility on Demand

The scale of adoption and future impacts of Mobility on Demand are still relatively uncertain. Most programs in the region have been launched on a pilot basis, and the cost effectiveness and successfulness of MOD as a longer-term public transportation service model has yet to be seen. The impacts of the pandemic on travel behavior and the high turnover of technology and microtransit companies also contribute to this uncertainty.

Customer awareness and convenience also present challenges. With various implementers and partnerships across the region, there are several apps and programs for customers to keep track of. While traditional ride hailing services may show up as a transportation option in Google Maps, along with driving, walking, biking (with personal bike or micro-mobility options), and traditional fixed-route transit, most microtransit and flexible-route services (as well as specialized transportation services) do not show up as an option. Uniform adoption of standard data feeds (like GTFS-flex) for all MOD services in the region would improve customer awareness of these services by showing them alongside other options in Google Maps and other trip planning tools.

MOD has a lot of potential to improve access to regular transit and provide point-to-point service more efficiently in areas not well suited to regular transit. More data collection and analysis at a local and regional scale of past and current programs may help focus these emerging technologies and service models where they can be most effective long-term. Further discussion of the future of MOD is included in the ITS/Technology section of the plan.
Intercity Rail & Bus

Intercity passenger rail and bus provide transportation for trips between cities in and outside of the region, with connections to key regional and local transit services. The central Puget Sound region benefits from existing intercity passenger rail and bus lines and its location along a federally designated high-speed rail corridor.

Intercity Rail

System Description

The Pacific Northwest Rail Corridor is one of 11 high-speed rail corridors designated by the Federal Railroad Administration. The corridor runs from Eugene, Oregon through the Seattle-Tacoma-Everett urbanized area up to Vancouver, British Columbia, encompassing the primary north-south passenger rail route through the state of Washington.

Since 1994, the Amtrak Cascades line has provided intercity rail service along the length of the Pacific Northwest Rail Corridor, from Vancouver, B.C. to Eugene, OR. Since 2013, the service has been managed and funded by the Washington State Department of Transportation (WSDOT) and Oregon Department of Transportation (ODOT), contracting operations and train equipment maintenance with Amtrak and primarily using tracks owned by BNSF. The Amtrak Cascades line stops in Everett, Edmonds, Seattle, Tukwila, and Tacoma, with other stops outside the region. Prior to the COVID-19 pandemic, the service offered four daily roundtrips between Seattle and Portland, two daily roundtrips between Seattle and Vancouver, B.C., and two daily roundtrips between Portland and Eugene. Most stations provide connections to local public transit service and many have strong connections to local bicycle and pedestrian facilities.

The Amtrak Coast Starlight (from Los Angeles to Seattle) and Empire Builder (from Chicago to Seattle), which are both managed by Amtrak, serve the region with long-distance passenger rail service. The Empire Builder stops at Everett, Edmonds, and Seattle stations, with the line terminating in Seattle. The Amtrak Coast Starlight stops in Tacoma and Seattle, where the line terminates.

Existing Conditions

WSDOT developed a long-range plan for Amtrak Cascades service in 2006, identifying several

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7 Note: Sound Transit and Union Pacific also own track segments used by the Amtrak Cascades trains.
infrastructure and equipment improvements necessary to achieving the long-term vision of expanded service between Seattle and Portland (13 daily roundtrips, up from four). The federally funded infrastructure projects prioritized from the plan were completed in 2017 and included station upgrades, track and signal upgrades, new tracks, new locomotives, and landslide mitigation work. The state is monitoring the program outcomes of these investments based on travel time reductions, number of roundtrips between Seattle and Portland, and on-time performance in the corridor.

Ridership
In 2011, WSDOT reported the highest ridership on the Amtrak Cascades service to date with 848,000 trips. Unfortunately the delivery of the rail infrastructure projects between 2011 and 2017 created short-term reliability issues during construction. Ridership decreased each of the following years, reaching 745,000 in 2015. Ridership fluctuated over the next few years, but WSDOT reported improvements in ridership, revenue, and on-time performance in 2019.

The COVID-19 pandemic had a substantial impact on Amtrak Cascades service in 2020. The closure of the Canadian border led to the suspension of service between Seattle and Vancouver, B.C., and the reduction in passenger demand due to public health recommendations resulted in WSDOT reducing the number of daily roundtrips between Seattle and Portland from four to one. Furthermore, capacity restrictions to encourage social distancing limited ticket sales to 50% of capacity on all trains for most of the year. Consequently, annual ridership in 2020 dropped to 172,000 passenger trips from the 824,000 reported in 2019.

Reliability
With the completion of projects to improve the speed and reliability of intercity rail, WSDOT set a new goal in 2018 for 88% on-time performance for the trips serving Washington cities (i.e., all trips on Amtrak Cascades except the Eugene to Portland trips), up from the previous goal of 80%. On-time performance has been recovering from a low of 47% in 2017 but continues to be a challenge. In 2020, WSDOT reported that 62% of trips were on time, up from 58% in 2019 but still well below the 88% goal. Slow order delays, freight train interference, and passenger train interference accounted for almost half of all delay on this route in 2019.

Additionally, beginning in 2018, WSDOT adjusted the definition of “on time” from a train arriving at the final destination station within 10 or 15 minutes of the scheduled time (depending on route length) to arrival within 10 minutes of scheduled arrival at the endpoint station within each segment (Portland to Seattle is one segment and Seattle to Vancouver, B.C. is another).

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9 As recorded in the 2019 Washington State Rail Plan, of the 24 Amtrak delay categories, these three categories accounted for 18.7%, 15.3%, and 12.9% of total delay minutes on Washington trips of Amtrak Cascades, respectively. Freight and passenger train interference refer to delay when another train is given priority (freight, commuter rail, another Amtrak train, etc.). A slow order is issued by the host railroad as a safety measure, lowering the maximum allowable operating speed on track segments, often near maintenance areas or capital projects. Operating at a reduced speed can lead to late arrival at the destination.
Safety

The Washington Utilities and Transportation Commission (UTC) is the primary state agency responsible for regulating railroad safety in Washington, including the inventory and inspection of railroad crossings and documentation of trespassing and incident data. UTC monitors all fatalities and injuries involving trains, including those occurring at private crossings or on industrial properties along railroad rights of way. At the federal level, the Federal Railroad Administration employs safety inspectors to monitor railroad compliance with federally mandated safety standards including track maintenance, inspection standards, and operating practices. The Federal Transit Administration provides federal oversight of transit safety, in coordination with the state. As the sponsor of Amtrak Cascades, WSDOT is responsible for complying with state and federal safety regulations, along with Amtrak as the operator and the track owners.

In December 2017, an Amtrak Cascades train derailed while crossing an I-5 overpass near DuPont, Washington. The derailment killed three and injured 65 other people. It was the first revenue service trip on the Point Defiance Bypass from Tacoma to Nisqually Junction, which was built to reduce delays and improve travel time on the Seattle-to-Portland segment of the Amtrak Cascades route. Service was suspended on the bypass corridor after the crash, reverting to the previous route along the waterfront.

The National Transportation Safety Board (NTSB) investigation concluded in 2019 and identified several contributing factors to the derailment, including the lack of Positive Train Control (PTC) on the railroad segment (sensors had not yet been placed on the tracks). PTC is a technology designed to prevent overspeed derailments as well as train-to-train collisions, incursions into established work zone limits, and movements of trains through switches in the wrong position.

To reopen the bypass, Amtrak, Sound Transit, and WSDOT worked together to address the recommendations in the NTSB investigation report as well as those identified in an independent safety study commissioned by Sound Transit, which owns the tracks. PTC has now been installed and activated on all passenger rail corridors in Washington. Following extensive training and testing of crew members for qualification on the bypass, it was reopened for revenue service in November 2021.

Future of Intercity Rail

Every five years, WSDOT prepares a single, integrated plan for both passenger and freight rail, including ridership and rail volume forecasts as well as station connectivity analysis and strategies.

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11 Note: The Rail Safety Improvement Act of 2008 required PTC to be fully implemented on any main lines over which intercity or commuter rail passenger transportation is regularly provided. The initial implementation deadline was December 31, 2015, but Congress allowed extensions through December 31, 2020. The FRA reports that all required route miles had PTC in operation by the 2020 deadline. Note and Text Source: USDOT Federal Railroad Administration PTC Overview. Updated September 2021.

12 Connectivity analysis refers to an evaluation of a station area’s land use context, availability of transportation services (multimodal connections), and transportation infrastructure (e.g., bicycle lanes, sidewalks, traffic lanes) to identify strengths and weaknesses of existing station access. See Appendix C of the Washington State Rail Plan 2019-2040.
for addressing identified issues and needs. The 2019 Washington State Rail Plan identifies the next steps toward faster, more reliable, and more frequent intercity service.

Continued population growth in the region is expected to fuel demand for passenger rail service. Along with other transit services, Amtrak Cascades plays an important role in providing mobility options along the I-5 corridor. The State Rail Plan confirms the long-term vision for intercity passenger rail in Washington first identified in the Long-Range Plan for Amtrak Cascades in 2006, which is focused on increasing the number of trips and reducing travel times to keep intercity rail a competitive mode choice. The state’s long-term vision for intercity rail by 2040 is the following: 13 daily roundtrips between Portland and Seattle (with a travel time of 2 hours, 30 minutes); 4 daily roundtrips between Vancouver, B.C. and Seattle (with a travel time of 2 hours, 37 minutes); and a total travel time from Vancouver, B.C. to Portland of 5 hours, 22 minutes.

Determining the timeline for incremental steps toward this vision is contingent on future funding availability and ridership recovery from the pandemic. Now that the Point Defiance Bypass has reopened for passenger service, it is expected that two additional roundtrips between Seattle and Portland (bringing the total to six) will be added once replacement equipment for the trainset damaged in the 2017 derailment arrives and funding for expanded service is secured by WSDOT and ODOT. WSDOT is working on a service development plan for Amtrak Cascades with an implementation strategy to achieve the long-term vision for expanded service.

Reducing delays through collaboration with the railroad owners and Amtrak is also critical to achieving the travel time goals. Additionally, WSDOT is working with U.S. Customs and Border Protection, Canada Border Services Agency, and the British Columbia Ministry of Transportation and Infrastructure to implement preclearance at the international border. Preclearance allows immigration and customs to happen at a single location prior to boarding the train, eliminating the existing customs inspection stop, which could reduce travel time between Seattle and Vancouver, B.C. by up to 10 minutes.

Ultra-High-Speed Ground Transportation

The Legislature instructed WSDOT to study the feasibility of Ultra-High-Speed Ground Transportation, which is defined as transportation capable of test speeds of up to 250 miles per hour, operating on an independent corridor separate from existing freight and passenger rail systems. WSDOT completed a feasibility study in 2017 and, in cooperation with British Columbia, Oregon, and Microsoft, completed a 2019 business case analysis. Refer to Chapter 4 of the plan for more information on the future of ultra-high-speed rail.

Intercity Bus

System Description

Intercity bus service has provided critical mobility throughout the region for several decades. Perhaps the most well-known and longest-running example is Greyhound Lines, which operates a network of
intercity bus service across North America. With terminals in Everett, Seattle, and Tacoma, routes serving the region primarily operate on the I-5 and I-90 corridors, with direct service as far as Vancouver, B.C. to the north, Spokane to the east, and Los Angeles to the south as well as connections to other destinations in the national intercity bus network.

Other private operators serving the region with intercity bus service include Northwestern Trailways, Bellair Charters & Airporter, and Cantrail Coach Lines. Spokane-based Northwestern Trailways operates intercity bus throughout Washington, including one daily roundtrip from Tacoma to Spokane via I-5 and US-2, with stops in Seattle, Everett, and Skykomish. Bellair Charters & Airporter serves Sea-Tac Airport with 16 daily trips between its Central Airporter and Western Washington Airporter routes, making several stops in the region. Cantrail Coach Lines provides three southbound and four northbound daily trips between Seattle and Vancouver, B.C. Other bus services periodically enter and leave the market, like the Greyhound-owned BoltBus, which operated in the region from 2012 to 2021.

Intercity bus also encompasses the rural intercity bus program, which is designed to connect residents in rural and small urban areas to larger urban areas and more transportation options. The FTA requires each state to spend at least 15% of funds received from the FTA Rural (Section 5311) formula grant program for rural areas to develop and support rural intercity bus transportation. WSDOT developed the Travel Washington program, which uses the federal dollars to subsidize four intercity bus routes that fill gaps in the transportation network for rural and small urban areas. WSDOT contracts with private bus companies to operate the services.

The Dungeness Line, a Travel Washington route operated by Greyhound, connects the central Puget Sound region to the Olympic Peninsula. It runs from Seattle to Port Angeles and includes stops in Edmonds and Kingston. The route provides direct connections to several other modes—Amtrak Cascades (intercity passenger rail), Amtrak Coast Starlight and Empire Builder (long-distance passenger rail), Sounder (commuter passenger rail), and Greyhound (intercity bus)—at King Street Station in Seattle and terminates at Sea-Tac Airport.

Existing Conditions

WSDOT conducted a rider survey as part of the outreach for the 2019 Travel Washington Intercity Bus Plan Update. According to the survey, across all four Travel Washington routes 86% of riders indicated they were traveling alone, potentially diverting some number of single-occupancy vehicle trips off the roadways. However, 22% said they did not have a driver’s license and 57% indicated they either didn’t have a vehicle, their vehicle was not available, or was not in adequate condition to make the trip. Intercity bus ensures mobility for people who might not have other transportation options.

The Dungeness Line carried over 15,000 riders in 2018, outperforming projections by 2,200 riders and accounting for half of all Travel Washington bus riders that year. This is due, in part, to more population located along the Dungeness Line and the demand generated by Sea-Tac Airport. Ridership on this route is highly seasonal, with peak demand in the summer, whereas other routes are more consistent

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throughout the year.

**Future of Intercity Bus**

Based on a needs assessment, service data for existing routes, and public and stakeholder input, WSDOT identified 22 route expansion alternatives for the Travel Washington program. Two of these expansion alternatives provide service to/within the central Puget Sound Region: an additional Dungeness Line that deviates south through Kitsap and Pierce counties and terminates in Tacoma instead of continuing east to Seattle via Kingston, and an extended version of the existing Dungeness Line that continues west across the Olympic Peninsula, from Port Angeles to Forks (creating a Forks to Sea-Tac Airport route). Due to other needs around the state and limited funding, these expansions ranked very low in prioritization scoring and are not likely to be pursued at this time.

An on-going priority is coordinated scheduling between modes and services, especially at shared terminals like Edmonds Station and Seattle’s King Street Station. The rider and stakeholder input gathered for the 2019 Intercity Bus Plan Update indicated that more could be done to improve the passenger experience of making connections from intercity bus to other services at shared terminals.

**Other Local Transit Providers with Service to the Region**

In addition to intercity bus lines, there are also local transit providers in smaller urban areas bordering the region that operate longer-distance or commuter routes into the central Puget Sound region. Examples include Intercity Transit, Skagit Transit, and Clallam Transit routes.

Intercity Transit in Thurston County operates a limited stop service from Olympia to the SR 512 Park-and-Ride in Lakewood, where riders can connect to Pierce Transit local bus and Sound Transit ST Express bus.

Skagit Transit operates the Skagit Snohomish Connector, an express route from Burlington to Everett via Mount Vernon. Today riders can connect to Community Transit Swift Blue Line BRT and local bus, Everett Transit local bus, and Sound Transit Sounder commuter rail at Everett Station. Island Transit in Island County also provides service connecting Whidbey Island and Camano Island with local transit in Snohomish County.

Clallam Transit in Clallam County operates a commuter bus that connects Port Angeles and Sequim with Poulsbo and the Bainbridge Island Ferry Terminal. From these stops, riders can connect to local Kitsap Transit routes or the Washington State Ferries Bainbridge-to-Seattle route. Mason Transit Authority in Mason County and Jefferson Transit in Jefferson County also provide public transit service to Kitsap County from other parts of the Olympic Peninsula.

Multimodal connections to services bordering the region enhance the function and reach of the regional transit network and provide more transportation choices for people making longer trips within the region and beyond.
Ferries

The waters of Puget Sound and its nearby lakes have provided a convenient way to transport people and connect communities since pre-European contact. By the late 1800s and early 1900s, the waters of Puget Sound were bustling with a Mosquito Fleet of privately operated ferries that transported millions of people across Puget Sound, Lake Washington, and other waterways. The marine environment is still an important transportation thoroughfare for this region.

Passenger-only and multimodal ferries are an important component of the integrated high-capacity transit network envisioned in VISION 2050.

Existing Conditions

Four agencies provide ferry service within the central Puget Sound region: King County Metro and Kitsap Transit provide passenger-only ferry service as another mode of service for their customers, while the Washington State Ferries and Pierce County Ferries provide multimodal ferry service that allows automobile access as well as pedestrian and bicycle access.

As of 2018, there were 23.4 million boardings on ferries in the region. Approximately 1.5 million of these boardings occurred on the growing passenger-only ferry services, while the rest were on state and county ferries.

Washington State Ferries provides six routes that serve the region. Washington State Ferry routes within the central Puget Sound region provide the highest ridership in the state’s system. Pierce County Ferries serves two rural islands in the south part of the region. King County Metro provides two routes for its Water Taxi passenger-only ferry service, and Kitsap Transit provides four passenger-only ferry routes: two local Foot Ferry services and three cross-Sound Fast Ferry services.

Trends and Data Collection

As of 2018, all ferries within the region were experiencing passenger growth. However, passenger-only ferries were experiencing the fastest growth, as Kitsap Transit rolled out its new cross-Sound Fast Ferry service. Passenger-only ferries grew 64% from 2014 to 2018 while multimodal ferries grew only 6%. Ferry service in the region tends to include seasonal variation with higher demand for passenger service in the warmer summer months compared to the winter. This is partially the effect of tourist and recreational ferry travel demand, with many ferry service providers adding additional trips to respond to that increased seasonal demand.

As with the regular transit modes described earlier, the COVID-19 pandemic has decimated ferry
ridership in the region near-term. The combination of an aging ferry fleet and lack of qualified trained staff in the workforce has created additional reliability challenges for Washington State Ferries’ services. Similar to rail and bus transit, noted in other sections of the RTP, the region is anticipating ferry ridership will recover as people return to in-person work and activities. PSRC will continue working with ferry and other public transit partners to monitor recovery of ridership and potential changes to travel patterns.

**Needs, Gaps & Opportunities**

Washington State Ferries (WSF) completed its long-range plan update in 2019, extending its planning horizon to 2040. The WSF plan identified key needs and opportunities for the agency to address, including:

- **Stabilize its aging ferry fleet:** The WSF 2040 Long Range Plan identifies the need for 16 new ferry vessels by 2040 in order to replace aging vessels and to provide necessary relief vessels to ensure reliable ferry service. The new vessels combined with retirement of aging vessels will bring the ferry fleet from 21 vessels in 2021 to 26 vessels by 2040. Although 10 existing vessels will not have reached the end of their useful life within the timeframe of the Regional Transportation Plan, the three Jumbo Mark II vessels will be approaching the end of their useful asset life by 2050.

- **Invest in new, greener vessels through electrification:** The WSF plan identifies the need near-term to complete electric-hybrid conversions of its largest vessels and to continue reducing carbon emissions with the construction of new electric-hybrid vessels and terminal electric charging infrastructure.

- **Enhance its customer experience:** The WSF plan also calls for investing in technology that gives customers more information to support better trip planning, modernizes fare collection and provides operational efficiencies. Within this area, WSF also calls for improving accessibility and wayfinding in and around vessels and terminals to support, among other things, increased multimodal connections.

In early 2021, PSRC completed the Puget Sound Passenger-Only Ferry Study and identified potentially feasible routes within the 12 counties bordering the Puget Sound. This study described common needs and opportunities for passenger ferries that the two operators in the region (King County Metro and Kitsap Transit) have identified in the long-term planning for their systems. The Findings from the study included:

- **Importance of time-competitive travel:** Potential passenger-only ferry routes must be time competitive to be viable public transit options. Factors such as vessel speed, additional stops between destinations and the speed and reliability of land-based transportation alternatives all factor into the time competitiveness of this form of public transit.

- **Need for planning and coordination around new routes:** The study reinforced the need for early planning, collaboration, and community engagement in development of new potential passenger-only ferries. Even for theoretically time-competitive routes, specific route characteristics that include presence of confined waterways, vessel speeds, currents, wind actions, and shore-side multimodal connections are all vital considerations in creating a viable route. In addition, operation in the marine environment creates additional considerations that
are not part of standard transit planning, including consideration of Tribal treaty rights and sensitive habitat and marine mammal protection. Finally, public engagement and support for terminal location within a community is important to ensuring the success of a route.

- **Downtown Seattle terminal capacity**: The existing passenger-only ferry terminal at Pier 50 is at capacity with existing routes. The current facility limits additional trips on existing routes, and does not have capacity for new passenger-only ferry routes serving downtown Seattle. Kitsap Transit is leading a study of additional passenger-only ferry terminal capacity in this area (expected completion in late 2021).

- **Electrification**: Similar to investments in electrification identified under multimodal ferries, passenger-only ferries have an opportunity to leverage terminal electrification efforts and to use emerging technologies to provide more environmentally friendly and potentially cost-efficient travel.

### Future Conditions

As the region continues to grow, there will be growing demand for travel across Puget Sound and its nearby lakes. Ferry travel as a form of public transit will continue to have a role in providing a reliable time-competitive option for travel within the region and potentially connecting outside of the region. The plan includes growth to 10 passenger-only ferry routes and investments in multimodal ferries that provides improved reliability and customer experience, including improved multimodal access to ferries.

### Plan Outcomes

Plan investments expand the number of passenger-only ferry routes by three to 10 routes total, including the first two modern routes on Lake Washington. Although the number of multimodal ferry routes remain the same, multimodal ferry boardings (e.g., walk-ons and bike-ons) are projected to increase 75% by 2050, supported by investments in vessels and terminal upgrades that improve reliability and customer experience. Meanwhile, passenger-only ferry boardings will increase by more than seven times by 2050. By 2050, 65% of all ferry walk-on/bike-on ridership will occur on passenger-only ferries compared to only 30% in 2018. Ferries maintain around 3% of all public transit boardings in 2050, similar to 2018. This is largely because other high-capacity transit modes, such as light rail and BRT have a more significant growth in ridership over that timeframe.

### What’s Ahead?

Ferries have many of the same emergent issues as regular transit. Both access to transit and planning for transit investments to 2050 are applicable to the ferry mode of transit, with some unique aspects relevant to ferries that are highlighted below. In addition, because ferry vessels have such a long asset life and lead time for construction, planning for vessels to maintain service reliability is a particular emphasis for ferries.

### Access to Ferries

The emphasis areas of access, safety and equity noted elsewhere in the plan are also applicable to the ferry mode of transit. Ferries, as part of the marine environment, do have a unique context. As described under the Needs, Gaps & Opportunities section, planning for new ferry service in terms of
new routes or additional trips will need to take into consideration the other users of the marine environment, marine mammals and ecological factors, and features such as confined waterways. Ferries, unlike land-based transit, have more limited TOD potential, given adjacency of ferry terminals to the marine environment. Providing a seamless transfer environment between modes of transit (bus, rail, etc.) at ferry terminals is important to encouraging walk-on and bike-on ferry ridership. Ferry agencies should work closely with rail and bus agencies and local jurisdictions to make this transfer as seamless to the customer as possible.

Planning for ferry investments to 2050

Similar to regular transit, extending the planning horizon year beyond existing long-range plans provides ferry operators an opportunity to imagine what new ferry investments may be appropriate to implement the regional growth strategy in VISION 2050. This could include:

- **Envisioning the next set of passenger-only ferry routes:** The Puget Sound Passenger-Only Ferry Study assessed the feasibility of several different potential routes and service types within the region and connecting the region to other parts of western Washington. See Chapter 4 for more information on this topic.

- **Maintaining and updating transit agency long range plans:** Two of the current passenger-only ferry operators are transit agencies with long range plans. Passenger-only ferries should be incorporated into these plans as a mode of public transit, and transit agencies should include PSRC early in their plan update processes and incorporate an assessment of how their long-range plans are consistent with and implement VISION 2050. PSRC will also continue review of transit development plans and other transit agency planning documents, as appropriate.

- **Washington State Ferries Long Range Plan.** WSF adopted its most recent long-range plan in 2019 with a planning horizon year of 2040. The agency’s long-range vision includes near-term system stabilization, medium-term building infrastructure, and long-term responding to growth. The agency should continue plan implementation and extend its planning to 2050 as cities and counties complete their comprehensive plans to ensure that the agency continues to manage growth into the long term.

Long-range planning for vessels and terminal capacity

Ferries have a long asset life. Washington State Ferries maintains its ferry fleet vessels for 50+ years. In addition, it can be a long and complicated process to identify and construct ferry terminal improvements. Therefore, this long lead time calls for ferry agencies to take a proactive approach to planning for vessel replacement and terminal capacity. WSF’s long-range plan calls for increasing its ferry fleet from the current 21 vessels to 26 vessels by 2040. In the near-term, the number of vessels and shortage of skilled mariners in the workforce are affecting system reliability.

The agency’s long-range plan for vessel replacement and workforce development is intended to help the agency get ahead of these issues and provide both a reliable ferry schedule as well as to plan for system growth. A combination of vessel replacement, transportation demand management, and operational and technological efficiencies are intended to allow for ferry system growth within the constraints of newly expanded 26 vessel fleet. Terminal improvements for the agency, currently planned out to 2040, include completion of major preservation or improvement projects (including in
some cases electrification improvements) at every WSF terminal in the central Puget Sound region. For example, the Seattle Colman Dock preservation project is underway and scheduled for completion in 2023, while the Bremerton ferry terminal is scheduled to receive modifications for electric-hybrid vessel plug-in capability in the WSF medium-term planning period.
**Bicycle and Pedestrian**

VISION 2050 calls for promoting and improving pedestrian and bicycle transportation\(^{14}\) networks to support an accessible and sustainable regional transportation system. These planning efforts focus on providing safe, connected routes for walking and bicycling, and improving access to transit and neighborhood destinations to enhance communities and encourage physical activity. VISION 2050 includes a goal for 65% of the region’s population growth and 75% of the region’s employment growth to be located within walking distance of high-capacity transit by 2050.

The Regional Transportation Plan recognizes active transportation, such as walking or cycling, as an essential element of the region’s transportation system. The region’s existing sidewalks, bicycle facilities and trails provide vital connections to transit and other local and regional destinations. However, there are substantial gaps in the facility network, leaving people unable to walk and bicycle to their destinations in some areas. Potential users are less likely to see walking and biking as viable transportation options if facilities are disconnected or appear to be unsafe. Concerns about the safety of facilities are not unfounded; pedestrian serious injuries and fatalities increased considerably over the past decade in the central Puget Sound region.

Through the implementation of the plan, the region can advance many of the VISION 2050 policies for ensuring equitable access to a safe and well-connected active transportation network as the region grows.

**Existing Conditions**

To help support efforts to improve walking and biking travel, PSRC has sought to better understand the current state of active transportation in the region. This section describes work the agency has undertaken to collect data on existing conditions, as well as key findings from the information gathered.

**Regional Travel Patterns**

Walking and biking make up a relatively small but essential portion of trips in the region. In 2018, residents made an estimated 1.8 million daily walking trips and 150,000 bicycle trips, representing 14% of all trips taken in the region. Generally, walking makes up a larger share of trips than biking as not all people in the region are cyclists, but everyone will at some point be a pedestrian.

Most trips using active transportation are short compared to trips using other modes. In 2018 the average person in the region walked or biked about 11 minutes for transportation purposes each day,

\(^{14}\) For purposes of this section, “pedestrian and bicycle transportation” encompasses travel by walking, cycling, mobility device (wheelchair or power scooter), and small personal devices, such as foot scooters. This includes both traditional and electric assist devices.
with an average trip length of 0.8 miles. Around 80% of all walking trips were less than one mile, while almost all were less than three miles. For biking, about 60% all of all trips were three miles or less. See the System Performance section for more information.

Active transportation varies widely by geographic location, with people in urban areas more likely to walk or bike than people living in rural areas. Within PSRC’s designated Regional Growth Centers, over 40% of daily trips are by walking and 3% are by bicycle, which is a far higher share than the region as a whole. For example, in downtown Seattle more than 60% of daily trips are by walking, and in Seattle’s University District almost 7% of trips are by bicycle. Other notable examples of centers with high shares of active transportation trips include Bellevue, Bremerton, downtown Tacoma, and Everett, where between 40% and 50% of trips are active transportation.

In addition to location, walking and biking trends vary by demographic characteristics. Generally, households with people of color and with low incomes have fewer vehicles than the average household in the region. Accordingly, areas with high concentrations of people of color and people with low incomes have more walking and biking trips than other areas. While in 2018 the regional average for walking and biking was 11 minutes per day, residents in areas with high concentrations of low-income populations (above 50% threshold) walked or biked around 14 minutes a day and residents in areas with high concentrations of people of color (above 50% threshold) walked or biked 12 minutes per day. See the Appendix F (Regional Equity Analysis) for more information.

Pedestrian and Bicycle Facility Connections

To learn more about current active transportation travel and infrastructure, PSRC has been working to build consistent regional inventories of sidewalks and bicycle facilities on arterials, and shared use paths in separate rights-of-way. In 2019 and 2020, PSRC conducted a survey of every jurisdiction in the region to gather information on bicycle and pedestrian facility data and travel counts. The facility data collected provides comprehensive information on bicycle and sidewalk facilities on arterials and shared use paths in the region, including the existence, completeness, and type of facility. This inventory helps to provide baseline data for informing regional and local planning and to identify needs and gaps in the network. See Appendix A (Transportation System Inventory) for more information.

The data collected gives information on facility coverage for the almost 3,000 miles of arterials in the region. At the regional level, a little over half of arterials have some presence of sidewalks and about 40% have complete sidewalk coverage, meaning facilities on both sides of the street. At the regional level, 37% of arterials have some presence of bicycle facilities, while 25% have complete coverage. By county, King County has the highest degree of arterial facility coverage for both pedestrian and bicycle facilities, followed by Snohomish, Pierce, and Kitsap counties.

Bicycle facilities were further categorized by type. Overall, paved and striped shoulders are the most common bicycle facility type, representing almost half of facilities in the inventory. The next most common facility types are striped bicycle lanes, marked shared lanes (or “sharrows”) and adjacent shared use paths. Though a growing presence, protected and buffered bicycle lanes still only make up 3% of bicycle facilities in the region. Of those, about a third are located in Regional Growth Centers.

Arterials within urban areas are far more likely to have sidewalks than those outside of the urban growth area (UGA). About 75% of arterials in the UGA have some sidewalks, compared to only 5% of arterials outside the UGA. Bicycle facilities are somewhat more common outside of the UGA, at 40% of
arterials in the UGA compared to 60% outside of it. For bicycle facilities, the most common types in the UGA are striped bicycle lanes, paved and striped shoulders and marked shared lanes, while outside of the UGA the large majority (about 95%) are paved and striped shoulders.

Similarly, designated Regional Growth Centers (RGCs) have more nonmotorized facility coverage than the region as a whole. Altogether, almost all of arterials (about 95%) in RGCs have some sidewalk coverage and about a third have some bicycle facility coverage. Arterial sidewalk coverage in RGCs ranges from 70% to 100% in RGCs like Kent and Federal Way. There is significant variation in the degree of arterial bicycle coverage when looking at centers individually. About a third of RGCs have less than 10% coverage for bicycle facilities on arterials, while centers like University Place and Canyon Park in Bothell have almost full coverage.

In addition to arterial facilities, PSRC identified 417 miles of shared use paths on separate rights of way in the region. For the inventory, this included only shared use paths that both met basic design criteria and connected regional destinations, like RGCs and high-capacity transit stations. Regional shared use paths are well represented in both urban and rural areas, with 70% located within the UGA and about a third outside of it. By county, the largest share is located within King County, followed by Snohomish, Pierce, and Kitsap.

**Connectivity Near Residences**

For facility coverage near where people live, the majority of people in the region have at least some sidewalk and bicycle facility coverage in their neighborhoods. About 85% of people have sidewalk coverage on a quarter of arterials near their home, while about 65% have coverage on half of the facilities near their home. For bicycle facilities, at the regional level over half of households have striped bicycle lanes within one mile of their home, while about 15% live within a mile of protected bicycle lanes or adjacent shared use paths.

In addition to looking at general network access, PSRC reviewed the bicycle and pedestrian facility inventory to better understand the availability of facilities for historically marginalized and underserved communities. As shown in Figure 10, tracts with high proportions of people of color have significantly higher sidewalk coverage on arterials compared to the region as a whole, while bicycle coverage is fairly similar. Similarly, arterials in tracts with higher concentrations of people with low incomes have somewhat higher sidewalk coverage and similar bicycle coverage compared to the overall region.
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Figure 10 - Nonmotorized Facility Coverage on Arterials, by Census Tracts

The likely reason that these areas have more complete sidewalk coverage than other areas is because they are located in more urban areas of the region, where pedestrian facility coverage is generally higher. It is also important to note that this inventory does not include data for facilities on local roads or data on the quality of facilities available in these areas.

Connectivity in Transit Station Areas

As the region builds out its high-capacity (HCT) transit network to 2050, it will be important to ensure sufficient access for people walking and biking. The large majority of trips to access transit services are by walking or biking. As of 2018, about 85% of riders walked to access transit services and 1.4% went by bicycle. To learn more about nonmotorized access to transit, PSRC looked at bicycle and pedestrian facility coverage on arterials within a half mile of high-capacity transit and a quarter mile of non-HCT transit stations. These distances were chosen because they are the distance users are generally willing to walk to access each type of transit service.

As shown in Figure 11, most HCT and non-HCT station areas already have fairly extensive sidewalk coverage. However, a significantly smaller percentage of station areas feature widespread bicycle facility coverage, as can be seen in Figure 12. Almost all (99%) HCT stations have some (at least 25% of arterials) sidewalk coverage, but only a third have full coverage. For non-HCT stations, about 80% have some arterial sidewalk coverage while about half have full coverage. About half of HCT and non-HCT transit stations have some (at least 25%) bicycle facility coverage on arterials. However, only 0.2% of HCT station areas and 13% of non-HCT station areas have full coverage.
Another way of looking at transit access is examining how many residents live within walking or biking distance to transit stations. At the regional level, in 2018 about a quarter of residents lived within a half mile of high-capacity transit. This percentage is forecast to increase significantly to almost 60% of people in the region living near high-capacity transit by 2050.

**Bicycle and Pedestrian Safety**

In recent years pedestrian and bicyclist injuries and fatalities have increased significantly in the central Puget Sound region, particularly for pedestrians. Between 2010 and 2019, pedestrian serious injuries
and fatalities increased by 27%, while bicyclist serious
injuries and fatalities increased by 1.5%. During the
same period, serious injuries and fatalities for motorists
decreased by 3.6%. For context, population grew almost
14% between 2010 and 2019, and the number of people
who walked or biked to work grew by 34%.

Travel in intersections was the factor most often
associated with serious injuries and fatalities, which
could point to conflicts between different modes during
crossings and turnings. Looking at trends for this time
period shows that there was an almost 90% increase in
the number of serious injuries and fatalities associated
with distracted users, which includes both drivers and
active transportation users. More information on safety
trends and activities may be found in Chapter 2.

**Needs and Opportunities**

PSRC has been working with its stakeholders to
determine how the region can ensure connected and
safe options for accessing destinations by walking and
biking. This section looks at needs and opportunities for
improving active transportation conditions as the region
grows, including some highlights of work local
jurisdictions are already accomplishing in their areas.

**What Have We Heard?**

In 2021, PSRC staff engaged in a number of outreach
activities to learn about the needs and priorities of the
public for the regional transportation system, including
through a regional survey. From this survey, Kitsap
County respondents gave low quality ratings for sidewalk infrastructure and lighting near where they
live, while bicycle lane infrastructure rated low across the region. In addition to the survey, PSRC
conducted meetings and focus groups with people with special transportation needs. Participants
particularly noted that a lack of suitable physical infrastructure, such as curb ramps, makes it difficult
for them to access the services they need. See the Specialized Transportation section for more
information.

PSRC has also been increasing its understanding of the various approaches jurisdictions in the region
use to improve their active transportation infrastructure. Currently, about half of jurisdictions in the
region have adopted specific “Complete Streets” regulations. Although not every jurisdiction has
adopted a Complete Streets code, many have adopted similar policies and regulations that do not
explicitly use that terminology. On the planning side, every jurisdiction in the region includes policies
and plans for improving active transportation infrastructure in their municipal and county
comprehensive plans. About a quarter of jurisdictions also have separate stand-alone active

Some recent examples of local projects for improving nonmotorized gaps in transit station areas include:

- The City of Tacoma Links to Opportunity Project was initiated in 2016 to engage the community in designing streetscape improvements along Sound Transit’s Hilltop Tacoma Link Extension route. Based on community feedback, the city is currently making pedestrian improvements in the station area and planning to add a bicycle boulevard and a festival street.

- The City of Lynnwood has been working with Sound Transit on nonmotorized improvements at the future Lynnwood City Center Station, including a pedestrian promenade and plaza, and improved shared use path connections to the station area and Interurban Trail.
transportation plans for improving their networks.

Transit Access Opportunities

Transit agencies in the region have been working to ensure seamless access to transit for pedestrians and bicyclists through improvements to facilities at transit stations and stops. Examples of ongoing and recently completed projects include:

- Pierce Transit appointed a Mobility Coordinator to create an inventory of access surrounding the most common places traveled to by bus. The project measured barriers to access near those places, such as hills, uneven terrain, and lack of curb ramps or sidewalks.
- In 2019, Sound Transit approved $40 million in funding for local jurisdiction implementation of transit access projects in its station areas. Additionally, the agency has been working on an implementation plan to improve passenger access to Sound Transit’s existing and future stations and facilities.
- Washington State Ferries is constructing active transportation facilities for people walking and biking to access its Seattle Multimodal Terminal at Colman Dock, including an Elevated Pedestrian Connector, Marion Street Pedestrian Bridge and new pedestrian promenade on Alaskan Way, as well as a new dedicated entrance and covered holding area for people biking.

In addition to providing sidewalks, bicycle facilities and shared use paths near stations, transit agencies have been working to ensure that active transportation users can safely stow their equipment at stations and on vehicles. As an example, Kitsap Transit recently renovated its Bicycle Barn at the Bainbridge Island Ferry Terminal at Winslow with security and accessibility improvements, as well as dedicated spaces for electric bicycles.

Access and Safety Opportunities

Potential users may be discouraged from using active transportation by the perception that facilities are unsafe. They also may also simply lack information about how to access walking and biking routes. Cities and towns in the Puget Sound region have a number of programs to encourage more walking and biking through education, outreach and wayfinding.

Transit Demand Management (TDM) programs use education, incentives and other strategies to encourage travel by transit, carpooling and walking and biking. As an example, the City of Bellevue administers its SchoolPool program in partnership with King County Metro. Through this program, the city encourages families to explore active transportation for school trips, which could help alleviate congestion at drop-off and pick-up times. During the 2018-2019 schoolyear, the program helped families avoid almost 100,000 single-occupancy vehicle trips to and from school. See the TDM section for more information.

Wayfinding strategies include providing signage, maps and group walks to help users orient themselves and find routes to their destinations. As an example, the City of Seattle has been working with King County Metro, Sound Transit, and others on its Seamless Seattle Pedestrian Wayfinding program. This program will directly support walking and transit user experiences by providing consistent, map-based wayfinding information for users to be able to easily orient themselves and find key destinations close to transit stops.
To improve safety for active transportation, many jurisdictions in the region use local crash data to analyze risk factors at key locations and plan safety improvement projects and programs. Some strategies for improving nonmotorized safety include creating safer pedestrian and bicycle pathways and employing road design techniques, such as street calming measures in residential areas. On the educational side, jurisdictions work to inform both drivers and active transportation users about road safety through campaigns and other events. Jurisdictions may also deploy targeted enforcement efforts to deter unsafe user behavior. See Chapter 2 for more information.

**Future Conditions**

**Planned Investments to 2050**

The Regional Transportation Plan calls for investment in well-connected bicycle and pedestrian networks that provide access to transit. Looking out to 2050, the plan includes a number of nonmotorized projects that will help realize these objectives. Planned investments include 30 projects for new regional trails or extensions to current routes. These projects will help increase shared use path circulation and close some of the current gaps in the trail network. A few highlights include extensions to the Sound to Olympics Trail, East Lake Sammamish Trail, Green River Trail and Pipeline Trail.

Beyond trail projects, the majority of roadway and transit projects in the plan also include components for improving bicycle and pedestrian facility connectivity, safety and access to transit. Examples include improved sidewalks and bicycle lanes near Community Transit’s Swift Bus Rapid Transit routes and a new trail connecting the Tacoma Dome Station to the entrance of Mt. Rainier.

In addition to the trail projects captured in the Regional Capacity list, jurisdictions are planning many smaller scale projects for improving bicycle and pedestrian infrastructure in local areas, such as Regional Growth Centers and high-capacity transit station areas. Beyond these investments in expanded infrastructure, cities and counties will continue to maintain and preserve the current nonmotorized network, and encourage more active transportation through education, outreach and safety programs.

**Active Transportation in 2050**

PSRC’s forecasts show that with the transit-focused regional growth strategy and the planned investments in the transportation system, the average person is forecast to walk or bike 21% more in 2050 than in 2018. The share of trips by walking and biking is expected to grow from 14% of all trips in 2018 to 20% by 2050, and the average time spent walking or biking for transportation purposes is forecast to increase from 11 minutes per day to 14 minutes. With the expanding high-capacity transit system almost 60% of households will live within a half mile of HCT transit service, meaning a larger

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15 The RTP Regional Capacity Project list includes only planned projects that meet the regional thresholds. For stand-alone bicycle and pedestrian projects, only projects over $20 million on separated pathways on dedicated rights of way are included on the list. All other stand-alone bicycle and pedestrian projects are considered programmatic so are not required to be on the list. More information is available here: https://www.psrc.org/sites/default/files/rtp-201806regionalcapacityprojectlistthresholds.pdf
proportion of households will be able to walk or bicycle to transit in the future.

**What’s Ahead?**

PSRC works with its member agencies and the Bicycle and Pedestrian Advisory Committee to support local coordination of planning for active transportation in the region. These groups include representatives from cities, counties, transit agencies and other entities responsible for planning and implementing nonmotorized projects and programs. On a regular basis, the agency has been working with these groups and other local stakeholders to review walking and biking data, discuss current and emerging issues, and look at performance monitoring of regional outcomes.

The following key themes have emerged for improving active transportation as the region grows, including:

- **Improve network connectivity, particularly for accessibility to the transit system.** Expanding and improving facilities in areas with disconnected networks will enhance multimodal system continuity and encourage more active transportation and transit usage. Local jurisdictions should prioritize filling network gaps and expanding nonmotorized coverage when planning transportation projects, particularly in transit station areas.

- **Include equity in the evaluation of needs.** To ensure equitable access to nonmotorized facilities, local jurisdictions should assess the needs of historically disadvantaged populations when planning active transportation projects and programs.

- **Emphasize safety improvements for bicyclists and pedestrians.** To help the region reach its safety goals, local jurisdictions should place an emphasis on pedestrian and bicyclist safety as part of their transportation projects and programs.

- **Continue to refine active transportation performance metrics.** Tracking and refining current metrics for walking and biking will help the region meet its long-range goals for improving accessibility, safety and public health.
Streets and Highways

Streets and highways throughout the region provide the foundation of the multimodal transportation system. Street rights-of-way may include vehicle lanes, transit lanes, bicycle lanes, sidewalks or shoulders, and/or planted strips that provide buffers between vehicular and non-vehicular traffic. Buses, streetcars, freight trucks, automobiles, bicycles, pedestrians, and sometimes light rail all travel via the street network, sometimes in space dedicated to their specific travel mode and sometimes mixed in shared space.

VISION 2050 calls for a multimodal transportation system that supports the regional growth strategy, with strategic expansion of capacity and increased efficiency of the system to move goods, services and people.

Population and jobs are expected to increase 41% and 48% respectively by 2050. This will increase demand for all transportation modes that use the street and highway network, requiring measures to improve the efficiency and capacity for safely moving people and goods. Land use and transportation policies established in VISION 2050, as well as strategies to improve pedestrian, bicycle, transit, automobile, and freight travel modes described in this Regional Transportation Plan, all factor together to impact the operating and safety conditions on the street and highway system. Other elements of the plan also affect these operations. Transportation Demand Management (TDM) strategies seek to encourage travel by transit, carpooling, walking, biking, and telecommuting, and discourage drive-alone travel, allowing the street and highway system to be used more efficiently. Intelligent Transportation Systems (ITS) measures use technology to enhance safety and utilize existing street capacity more efficiently. See the TDM and Technology sections for more information.

Existing Conditions

The region’s street and highway system consists of:

- **Highways** generally carry the highest volumes of vehicular traffic, including trucks, buses, and automobiles. Freeways and expressways are high-speed with controlled access, and do not generally accommodate pedestrian or bicycle travel. Other state highways (state routes) function more as arterials and serve vehicular and nonmotorized travel, as well as providing access to adjacent properties.

- **Arterials and Collectors** are high-volume streets that serve a higher mobility function as well as provide some access to properties. Of these, Principal Arterials have the highest traffic volumes and lowest access function. Minor Arterials have lower volumes than Principal Arterials.

Right-of-Way

Public land reserved for transportation uses including vehicle lanes, bicycle lanes, sidewalks, trails, rail, parking, and buffers between modes, as well as utility and stormwater management uses.
but higher than Collectors, which provide connections between arterials and the local street system. Arterials and collectors serve all modes of transportation. Because they carry higher vehicle volumes, design standards for these types of roadways may seek to separate pedestrians and bicyclists from vehicular traffic to the extent that right-of-way width allows.

- **Local Streets** primarily provide access to residential and commercial properties. They are lower-speed, lower-volume roads that typically serve automobile, bicycle, and pedestrian travel, as well as vehicle parking and door-to-door freight deliveries.

Streets and highways in rural areas have operational and design characteristics unique to their urban counterparts. For example, while arterials in the urban area serve major activity centers and connect residential areas to employment centers, arterials in the rural area often serve longer through trips and are spaced more infrequently, providing fewer direct connections. See the Appendix A (Transportation System Inventory) for a more complete inventory of the region’s streets and highways.

**State System**

The Washington State Department of Transportation (WSDOT) leads the planning, operation, maintenance, and improvement of all Interstate and U.S. highways (I-5, I-90, I-405, and US-2 in the central Puget Sound region) as well as segments of state routes that serve as access-controlled freeways. WSDOT is also responsible for some highways that function as arterials, as well as freeway ramp intersections, but typically works closely with the local jurisdictions where they are located for their planning, operation, maintenance, and improvement. Projects on these facilities may be led by either WSDOT or the local jurisdiction.

**Overview of WSDOT’s Managed Lanes System**

The state’s Managed Lanes System is one approach WSDOT uses to operate its highway facilities efficiently. The system includes High Occupancy Vehicle (HOV) lanes, Express Toll Lanes, and High Occupancy Toll (HOT) lanes that are designed to maximize the movement of people and encourage commuters to use transit or travel together to save time and reduce traffic volumes and congestion.

As illustrated in Figure 13 below, a number of managed lane facilities already operate on the system today. WSDOT is continually looking into ways to maximize efficiency to help keep people moving and has projects currently under construction as well as those planned for the future.
Figure 13 - Current Managed Lanes System Map
Significant progress is being made towards completing the HOV facilities in Pierce County. In 2007, WSDOT opened its first HOV lanes on State Route 16, and in 2010, WSDOT opened the first I-5 HOV lanes in Pierce County. The HOV facilities from the Pierce/King County line to South 38th Street in Tacoma will be complete in 2022. Work also continues to build the HOV lanes from Thorne Lane in Lakewood south to Mounts Road in DuPont. When these HOV facilities are complete, the section from South 38th Street to Thorne Lane remains the final gap needed to implement continuous HOV lanes on I-5 through Pierce County. While not yet funded, this section remains a priority for WSDOT.

Local System

All other arterials, collectors, and local streets are planned, operated, maintained, and improved by the city or county in which they are located. For streets that include transit facilities such as bus stops and rail stations, streetcar, or light rail, the local jurisdiction coordinates closely with the transit agency that provides the service.

Existing characteristics of highways, principals arterials, and minor arterials are presented in the Transportation System Visualization Tool for the Regional Transportation Plan, including the presence of bicycle and pedestrian facilities, location and control type of traffic signals, condition of bridges, and peak hour congestion levels.

The following are key operating characteristics of the existing street and highway system:16

- Residents of the central Puget Sound region drive an average of 17 miles per day. However, vehicle miles traveled varies greatly between people who live inside or outside Regional Growth Centers. People who live within a Regional Growth Center drive an average of 7.1 miles per day, while people living outside drive an average of 17.6 miles per day.

- Traffic congestion is highest during the morning and evening commute periods. In 2018, about 21% of the region’s roadways typically experienced heavy to severe congestion (meaning average speed was less than half of the posted speed limit) during the peak hour. About 15% of additional roadways experienced moderate congestion (meaning average speed was about half to 70% of the posted speed limit) during the peak commute hours. Overall, this reflects just over one-third of the regional roadway system that experiences some level of peak hour congestion.

- In 2018, the average household in the region experienced a total of 62 hours of travel delay due to traffic congestion. Households of lower income tend to drive less with an average total delay of 40 hours per year. Households with people of color experienced congestion at a slightly lower level than the regional average, with an average total delay of 60 hours per year.

The greatest need on the regional roadway system is ongoing maintenance and preservation, which is critical to keeping highways and streets in a safe and usable condition and making the most efficient use of transportation investments to date. In addition, there are notable gaps in facility connections, such as those between SR 167 and SR 509 and the Ports of Tacoma and Seattle which are being addressed through WSDOT’s Puget Sound Gateway Program. There are also needs that require more

16 Key operating characteristics obtained from PSRC’s 2018 travel demand forecasting model.
focused improvements to address access issues or bottlenecks, which can include improvements to make existing capacity more efficient (e.g. measures to encourage increased vehicle occupancies and/or technology solutions) or targeted access or capacity improvements at locations where congestion is most severe. These are discussed in more detail in the following section.

**System Investments**

The plan includes both larger scale investments that modify the overall capacity of the system as well as smaller scale, programmatic investments that maintain or improve the system.

Over 75% of the projects on the financially constrained Regional Capacity Projects list that represent investments on streets and highways are providing multimodal improvements. Examples of these improvements include roadway re-channelization that also provides bicycle lanes, enhanced sidewalks and transit stops; or the addition of a high-occupancy-vehicle (HOV) lane that accommodates carpools and buses. Many multimodal projects include roadway capacity improvements to relieve traffic congestion, but also provide new or enhanced facilities to improve travel for people walking, biking, or using transit.

The plan also includes projects that improve overall roadway operations without significantly increasing the capacity of general-purpose vehicle lanes. Examples include ITS improvements (discussed in detail in the Technology section), or reconfigurations to address bottlenecks at interchange ramps or along arterial roadways.

From those projects in the plan that do add general purpose capacity to the streets and highway network, only 5% in additional lane miles is being added to the total system by 2050. An analysis of the projects adding general purpose capacity finds that 94% are on or connecting to facility segments with heavy or severe congestion, and 66% are within or connected to areas of future growth. The majority (78%) of projects adding general purpose capacity to the system are less than two miles in length. Projects between two and five miles in length are approximately 17% of the total, and there are only six projects (less than 5%) over five miles in length. These projects are the larger scale key highway investment projects that have been underway for many years – the Puget Sound Gateway Program, SR 18 and improvements to I-5 near Joint Base Lewis McChord.

The plan also includes projects on streets and highways that extend the HOV system and add Business Access Transit (BAT) lanes. Several of these projects on interstates and major highways transition current, or add new, HOV lanes to function as express toll lanes in the future (see above). This is
consistent with the plan’s financial strategy assumptions for additional express toll lanes in the future, to both raise revenue and manage travel demand. One key example is the expansion of the I-405 express toll lane system.

The plan also includes significant investments in streets and highways that are not identified on the Regional Capacity Projects list. These investments include improvements at a more local scale for all travel modes and are considered programmatic in the plan’s financial strategy. Examples include bicycle and sidewalk infrastructure, local roadway improvements, and all aspects of maintenance and preservation. While not expressed in detail in the RTP, more details are contained within the transportation elements of city and county comprehensive plans and other local planning documents.

A total of 56% of the investments in the RTP is dedicated to maintenance, preservation and operations. Specific to the streets and highways network, roadway facilities, sidewalks, and bridges in poor condition degrade mobility and safety for users as well as the overall reliability of the transportation system. The plan’s financial strategy recognizes the role of adequate maintenance and preservation in accommodating expected future travel demand and identifies full funding for this critical element. See Chapter 3 and Appendix J (Financial Strategy) for more information.

**Future Conditions**

While population and jobs are expected to increase 41% and 48% respectively by 2050, the number of congested roadways is projected to grow by only 4% (from about 21% to 25%).

The average distance driven by residents of the region is expected to decrease from 17 to under 14 miles per day. Inside Regional Growth Centers the average distance is expected to decrease from 7.1 to 5.5 miles; outside Regional Growth Centers it is expected to decrease from an average of 17.6 to 15.1 miles per day.

As shown on Figure 14, by the year 2050, average annual delay per household is projected to decrease from 62 to 53 hours, a 15% decrease. Households of lower income and households of people of color are projected to experience a similar decrease, and experience traffic delay at levels lower than the regional average. This is due to a combination of land use strategies to increase densities in designated centers, multimodal investments that will increase shares of high-occupancy vehicles such as buses, which will allow available highway and street capacity to be used more efficiently, and focused capacity improvements to relieve traffic bottlenecks.
Figure 14 - Change in Vehicle Delay Per Household

Figure 15 illustrates the daily miles driven per household across various regional geographies. While households in each geography will travel less in 2050 as compared to the base year, rural residents drive more than other residents across the region. This reflects both the different needs and different system outcomes by the various regional geographies, and different mobility choices and travel patterns of residents across the region. Additional information about the effects of VISION 2050 policies and future transportation investments on the multimodal transportation system is provided in Appendix H (System Performance).
What’s Ahead?

Streets and highways provide the foundation of the region’s transportation system, and multimodal improvements planned at the state and local levels have either direct or indirect benefits to users of all modes that use the system. Forecast future characteristics of highways, principal arterials, and minor arterials are presented in the Transportation System Visualization Tool, which is a resource available to jurisdictions to support ongoing local transportation planning and the identification of future needs.

- Through development of their comprehensive plans, counties and cities will support implementation of the projects in this plan, as well as identify additional local improvement projects needed to support the transportation system.
- Completion of long-term key state investments should be prioritized, and commitment made to implementation of the HOV and express toll lane system.
- PSRC will continue to engage with member jurisdictions and other stakeholders on the needs of the system and provide continued data collection and monitoring. In addition, PSRC regularly participates with WSDOT in the development of state plans and programs.
**Freight**

VISION 2050 calls for a safe, efficient and reliable transportation system for the movement of people, goods and services.

Freight transportation refers to the movement of goods from one location to another. Freight is a vital function of the region’s multimodal transportation system, supporting day-to-day livelihood and providing a lynchpin to the region’s economic health. All individuals and businesses in the central Puget Sound region depend on the timely delivery of goods for access to daily essentials. Almost every product used by every person is brought to consumers via the freight system, which provides for a seamless connection between people and goods.

Freight movement is everywhere. Recognizable freight features include cargo ships and planes, trucks, and trains. However, the essential role of freight in everyone’s daily lives may be less visible or understood. Our morning coffee, the clothes we wear, the food we eat, the supplies we use at work, the merchandise that we order online, the materials that build our homes and businesses—all of these are brought to us through the freight system.

The region’s freight transportation system is an integral part of supply chains and consists of an interconnected multimodal network of highways and streets, railways, deep water ports and marine facilities, airports, and oil and gas pipelines. The Washington State Department of Transportation’s (WSDOT’s) Freight System Plan17 categorizes the freight system in the state into three integral components:

- **Global Gateways** that provide freight access to international markets, via marine ports, airports, railways, and highways.
- **Made in Washington**, which are goods manufactured or produced in Washington, delivered within and beyond our borders via marine ports, airports, railways, and highways.
- **Delivering Goods to You**, referring to local freight delivery for business and residents, primarily by truck via the highway and street system.

Each of these components differ in terms of economic impacts, geographic impacts, direct and indirect jobs created, and influences on various supporting industries. They also vary in the policies, design standards, and investment priorities needed to sustain them.

Figure 16 shows the tonnage of freight imported, exported, and transported within Washington State in 2017, as well as the forecast tonnage for 2050. The figure shows that close to 600 million tons moved in, out, and throughout Washington in 2017. The largest percentage of freight is moved by truck, but substantial portions are also carried by rail, water, pipelines, and air. By 2050, freight

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transported within Washington is forecast to increase by more than 40%, and imports and exports by more than 50%. As the largest population and employment center in the state, as well as home to the ports, railroads and highways that serve as major gateways, a substantial portion of current and future cargo tonnage moves into, out of, and within the central Puget Sound region.

Figure 16 - Forecast Freight Growth, 2017 to 2050

In addition to encompassing all modes of transportation, the freight system relies on supporting infrastructure such as intermodal terminals, warehouses, and processing facilities to move goods from one location to another. Goods that arrive through major gateways are transported to warehouses and distribution centers for processing and routing to final destinations, either within or outside of the region. Similarly, goods that are produced within the region are transported to destinations outside the region. There are 10 designated Manufacturing/Industrial Centers (MICs) in the region, which are areas with intensive, concentrated manufacturing and industrial land uses and employment.

Existing Conditions

PSRC worked in coordination with its Freight Advisory Committee to develop an inventory of freight assets describing the significant system components related to goods movement to, from and within the region. Additional data related to truck traffic travel and distribution patterns within the region were also obtained. The major elements of the Regional Freight Inventory are presented in the Transportation System Visualization Tool. More detailed descriptions of the freight system elements are provided in Appendix A (Transportation System Inventory).
The freight assets inventory was developed to provide a better understanding of this system and the associated assets in terms of their unique characteristics and interdependencies. In addition, the inventory shows the connections between the freight system and the broader community and emphasizes the critical role freight and goods movement plays in supporting the region’s economy and maintaining overall quality of life.

Major freight corridors in the central Puget Sound region consist primarily of railroads, waterways, and T-1/T-2 highways and streets that carry the highest volumes of freight. They serve industrial land uses including MICs and warehouse-intensive areas, and connect industry to the regional, statewide, national, and international freight network. Major freight corridors also include intermodal connections, which provide seamless transfer of freight between container ships, rail, and trucks.

While these corridors are critical to freight movement within and beyond the region, they also need to be integrated with other modes. Commuter and recreational routes may intersect with freight routes, requiring design and operational elements to ensure that people are able to travel safely while goods are efficiently and reliably transported.

The following section provides brief highlights of the existing freight system. More details are provided in Appendix A (Transportation System Inventory).

**Ports and Waterways**

Deepwater ports and airports provide the major gateways for freight delivery within the region. They are a critical component of the global supply chain, serving as the point of entry for goods coming into the region and the point of exit for distribution of agricultural and manufactured goods produced in the region. Adequate port capacity and state of good repair of the infrastructure serving the ports are essential to support the role of our region in regional, statewide, national, and international supply chains.
• The Ports of Seattle and Tacoma (Northwest Seaport Alliance) together rank among the top 10 busiest ports in the US and the fourth largest container gateway in North America. In 2019, ships utilizing these ports carried $74.9 billion worth of international trade.\(^{18}\)

• The Port of Everett specializes in high-value, over-dimensional cargo such as airplane and aerospace parts and ranks as the fifth largest port on the west coast in terms of value of goods exported.

Waterways provide connection between the ports and other industrial facilities. Puget Sound and the Duwamish Waterway are both part of the State Strategic Freight Network.

**Railways**

BNSF Railway and Union Pacific operate most of the railways in the region, with Tacoma Rail operating one mainline in the Port of Tacoma/Tacoma Tidelands area. The mainlines owned by these operators have been designated by the State of Washington as Rail Freight Economic Corridors,\(^{19}\) handling products such as grains, lumber, and auto parts. BNSF and Union Pacific railways directly serve the region’s ports with intermodal facilities that provide critical connections between cargo ships and truck and rail networks.

An important multimodal consideration for rail freight transport is the presence of at-grade rail crossings of roadways. Trains crossing at these locations intersect with vehicles, people walking, and people biking. Roadway-rail grade crossings are intersections involving very different modes of transportation, with different sizes, weights, and speeds. In addition, these intersections are multi-jurisdictional, involving both highway and railroad authorities responsible for different aspects of design and maintenance. The Washington State Joint Transportation Commission and Freight Mobility Strategic Investment Board (FMSIB) completed an intensive review of road-rail conflicts in 2017 and 2018, establishing a corridor-based process for addressing the impacts on a statewide level; FMSIB maintains a prioritized list of improvement locations to guide funding as it becomes available.\(^{20}\)

The locations of intermodal facilities and at-grade crossings with their priority improvement ranking are provided in the [Transportation System Visualization Tool](#).

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\(^{18}\) Northwest Seaport Alliance, Partnerships Drive Performance, 2019 Annual Report.

\(^{19}\) WSDOT, 2017.

\(^{20}\) Freight Mobility Strategic Investment Board (FMSIB), Study of Road-Rail Conflicts, Phase 2 – Development of Project Priorities, August 2018.
Trucks

Trucks are a critical component of the freight transportation system, and they share the highway and street system with all other modes, including people walking and biking, transit, and automobiles. It is vital that the planning and operation of roadways accommodate freight transport and delivery in conjunction with the safe and efficient movement of people. However, different types of roadways serve different functions in freight transportation, and each has unique needs and considerations. The roadway system serves two critical tiers of freight movement within the region.

- **Truck Freight Economic Corridors** are state-designated transportation corridors of great economic importance within an integrated freight system that carries high freight tonnages. These consist of roadways with T-1 or T-2 designation, meaning they carry at least 4 million tons of freight per year, and first-mile/last-mile connector routes that connect freight-intensive land uses to these high-volume freight routes. These are considered major truck routes within and beyond the central Puget Sound region as they carry a high volume of heavy trucks.

- **Beyond the major truck routes**, the rest of the street network serves the commercial and residential door-to-door delivery component of freight movement. Deliveries to residences and many businesses are generally made in small to medium sized trucks, so freight design considerations are different for these streets than the major freight corridors that must accommodate high volumes of large, heavy trucks.

Figure 17 shows the average total daily miles traveled by trucks within the region; truck travel comprises about 7% of the daily miles traveled by all vehicles. Of this, about 3% reflects heavy truck transport and 4% reflects medium trucks. Overall, the data indicate that greater than 75% of truck travel within the region occurs on major truck routes; less than one-quarter occurs on local streets and is predominantly comprised of medium trucks.

Travel data indicate trucks make a substantial portion of their trips during off-peak periods of the day—in-between the morning peak period and evening peak period when commute-related traffic is heaviest. Roadway congestion is a major impediment to reliable freight delivery, so freight providers make most efficient use of the roadway system and increase reliability by traveling more during less-congested times of day. However, truck travel does also occur during the periods of peak congestion, particularly in the morning. In 2018 the average heavy truck driver in the region spent 56 hours in congestion annually, and the average medium truck driver spent 21 hours in congestion. See Appendix A (Transportation System Inventory).
Heavy truck travel is most concentrated in the MICs and other industrial areas of the region. For example:

- **Analysis of heavy truck movements** indicates that over one-third of heavy truck trips in the region’s industrial lands occur in the Kent Valley, corresponding to the high concentration of manufacturing and warehousing in that area.

- **Concentration of truck traffic** in the North Bend area reflects its role as a gateway to the region. Heavy trucks entering the region concentrate in this area to time their travel on the more congested urban roadways or to meet a specified arrival time at their destination; heavy trucks exiting the region stop to refuel and prepare for the next stage of their cross-state or cross-country trip.

These examples illustrate a regional issue related to freight movement—along with the local and regional economic benefits that come with freight come the operational and maintenance impacts of heavy truck traffic that are primarily addressed by the local jurisdictions in which truck-heavy land uses are located. Partnerships are critical to help address localized impacts of heavy truck traffic in these areas.

Maintenance and preservation of major truck roadways is also essential to efficient freight movement, as degraded streets can increase travel delay and reduce the reliability of freight delivery, and heavy truck travel can increase the rate at which streets in poor condition further degrade. See the Maintenance & Preservation section for further discussion.

### Truck Parking

While heavy truck transport is a critical element of freight movement within and beyond the region, the need for truck parking space has become increasingly strained. Issues related to truck parking include:

- **Driver and Community Health and Safety** – All drivers require access to facilities that provide adequate opportunities for nourishment, rest, and hygiene. In addition to the need to meet

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21 Source: PSRC Baseline (2018) Travel Demand Model; daily miles are presented in millions (M).
these basic human needs, when drivers cannot take adequate breaks they may be forced to park in undesignated and unsafe areas (e.g., roadway shoulders and vacant lots), potentially exposing them to personal harm, property damage, or cargo theft. With a lack of adequate truck parking in designated areas, some drivers may park in available space they find on neighborhood streets that do not have amenities to support them. This can also result in safety hazards due to trucks occupying right of way and blocking the line of sight of other motorists.

- **Roadway Congestion** – If drivers are forced to circulate in a search for parking, this increases vehicle miles traveled on the roadway system, with associated impacts on roadway congestion and air quality, and additional operating costs to the drivers.

Even within the issue of truck parking there are different contexts that warrant different types of solutions. Short-haul truckers who live in the region need space to regularly park their trucks when off duty. Long-haul truckers need places to rest and refuel, and potentially also to wait to time arrivals at their destinations.

Truck parking issues are receiving statewide and national attention. The Washington State Legislature commissioned a truck parking action plan that includes recommendations for immediate next steps in the near-term, and lasting change in the availability of truck parking for short-haul and long-distance commercial vehicle drivers. The action plan is evaluating the magnitude of impacts and the regulatory measures and investments needed to address them. The action plan is currently under development, with completion planned for January 2022. If the action plan is completed prior to finalization of this Regional Transportation Plan, discussion of its findings and recommendations will be incorporated.

**Future Conditions**

**Future Freight Conditions**

With projected population and employment growth through 2050, cargo transported by trucks and other modes is projected to increase by more than 40%. By 2050, the number of truck miles traveled per day is forecast to increase by 27%.

There are a variety of projects in this Plan that will provide benefits to the overall freight system, either directly or indirectly. While freight transport and deliveries will continue to rely on the roadway system, projects and strategies that shift more travelers to high occupancy vehicles and non-vehicular modes are beneficial to freight because they allow roadway capacity to be more used more efficiently by users such as cargo trucks. Of Regional Capacity projects 44% are providing improvements to T-1/T-2 truck routes.

Figure 18 shows that for heavy trucks, the time an average driver spends delayed by congestion is forecast to increase by more than 30% by 2050. For drivers of medium trucks, however, the amount of delay is projected to decrease by about 13%. This reflects the effect of investments in the plan and land use patterns adopted in VISION 2050 that will both improve the freight network itself and reduce the number and shorten the length of some types of passenger vehicle trips. Although delay is expected to increase for heavy trucks that predominantly travel on highways and major arterials, the investments in the plan combined with long-range land use strategies are still beneficial to freight because they will allow roadway congestion to increase at a much lower rate than the rate of population and employment over the same timeline.
Freight Considerations for Future Planning

The investments in the plan include many elements that will be beneficial to regional freight transport and deliveries. Implementation of these projects, as well as additional planning and projects implemented to address freight issues, happen at the local level. The following are important freight-related considerations local jurisdictions should include in their future planning efforts.

- Growth in the number of people living and working in the region, combined with growth in freight transport needed to support them, will increase the potential conflicts between the different modes that carry people and goods. There are distinct safety and mobility considerations with respect to heavy trucks and trains that intersect with pedestrians, bicyclists, and passenger vehicles, depending on the facility type and location, that need to be explicitly addressed when planning for future transportation conditions.

- There are maintenance and preservation considerations unique to major freight corridors that will be exacerbated by growth in heavy truck traffic. Increased heavy truck traffic needed to support future population and industry growth will increase the strain on pavement and bridges. Degraded highways and arterials increase travel delay and reduce the reliability of freight delivery, and heavy truck travel can increase the rate at which streets in poor condition further degrade. Additionally, major freight corridors have high overlap with the Strategic Highway Network and serve as major thoroughfares for moving people. Properly maintaining these facilities is critical for many reasons including the need to accommodate freight transport.

- Increases in heavy trucks needed to accommodate growth in projected long-haul and short-haul freight deliveries will worsen truck parking shortages and issues unless measures are implemented to address this problem.
• Increases in small to medium trucks making door-to-door deliveries, due to growth in population and employment as well as continuing growth in e-commerce, will put increasing strain on the space available to accommodate deliveries.

• While the benefits of freight are regional, both economically and in enabling our daily lives, the impacts of freight transport—particularly by heavy trucks—are borne in great part by the jurisdictions where MICs and other industrial areas are located. Partnerships are important so that the burden of addressing freight traffic issues is more equally shared by all who benefit from reliable freight movement in the region. Growth in freight demand and its related traffic will intensify the needs of local jurisdictions with industrial-heavy land uses that experience the largest volumes of heavy truck traffic and their associated impacts.

**Equity Considerations of Freight**

Figure 19 shows the percentage of households within the region located within 500 feet of a major roadway facilities that also serve as T-1/T-2 truck routes, including households with groups who have historically faced disadvantages and underinvestment. As shown, the percentage of low-income households and households of people of color located within 500 feet of a major truck route is higher than the regional average; the percentages of households with older adults and youth are lower. These trends are projected to increase by 2050, with higher percentages of all groups located within 500 feet of major truck routes. In part, this reflects the typical patterns of higher density housing that is more clustered near major arterials which may also serve as truck routes. Minimizing the air quality and noise impacts of traffic congestion on affected communities, as well as the safety impacts of trucks mixed with other modes of transportation, is an important planning consideration for these facilities and should be prioritized for communities that are disproportionately impacted. Decarbonization efforts are also being focused on trucks and other freight infrastructure, which has the potential to significantly reduce emissions. See the Climate and Environment section for more information.
What’s Ahead?

Most of the planning and projects identified to address freight issues and to maintain or improve its efficiency occur at the local and state level, including implementation of the investments in the RTP. The following considerations are recommended to guide jurisdictions in freight planning in their long-range transportation planning efforts.

- Freight is an integral part of the region’s multimodal transportation system and accommodating freight traffic should be explicitly addressed in transportation planning and programming. However, context matters, and potential strategies and projects to address freight issues are different depending on the setting.

- Freight considerations could be included specifically in roadway design and pavement standards of local jurisdictions. For arterials and highways that are part of major freight routes, this could include heavy haul pavement standards as well as cross section standards to accommodate large trucks.

- Local street systems need to accommodate commercial and residential deliveries, in addition to accommodating people traveling by walking, biking or by vehicle. This can include curb space management policies that determine how street space outside of the vehicle travel lanes should be allocated between its potential uses—loading, parking, nonmotorized travel, stormwater management, and/or landscaping and buffers. Measures could also include building codes that require on-site loading for new commercial and residential development, and innovations such as provision of common delivery lockers to reduce truck dwell times and avoid multiple attempted deliveries. The University of Washington Urban Freight Lab has conducted, and is continuing to conduct, extensive research on this topic, and serves as a resource for jurisdictions seeking options to accommodate deliveries more effectively.

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22 Source: PSRC, 2021
• Local jurisdictions should actively engage with the efforts being led by the State of Washington on truck parking issues. Although this work is ongoing, potential solutions include technology that shows truck drivers where available parking spaces are in real time and measures to expand available truck parking. The State’s truck parking action plan, scheduled for completion in 2022, is planned to include measures such as regulatory frameworks, government-sponsored incentive programs, and/or direct government action.

• It is important to note that in development of local comprehensive plans, some measures and strategies needed to address freight issues involve land use policy and local development regulations, not just transportation policy. For example, building requirements, loading requirements, and frontage improvement requirements that could help address delivery issues are often specified in zoning and building codes. Coordination between land use and transportation elements of local plans will foster more effective solutions to freight issues.

• Planning for freight traffic may also require reducing conflicts between trucks, trains, and other transportation modes. This could be accomplished through lane configuration or facilities that physically separate trucks from other modes and vulnerable travelers such as pedestrians and bicycles where space allows, or technology solutions such as signalization that provide separate protected phases for each mode to safely cross or enter areas with potential for conflicts.

• PSRC will continue to lead and participate in forums that foster regional cooperation on freight, including facilitating groups such as the PSRC Freight Advisory Committee, and actively participating in State-led activities such as freight planning and truck parking forums. These forums provide opportunity to form partnerships to address and prioritize regional freight issues, share best practices and examples of solutions to freight problems within varying contexts, and leverage resources to address regional freight priorities.

• PSRC will work with member agencies to compile best practices for design, management, and operation of freight transportation, and serve as a clearinghouse to help partner agencies share this information.
Aviation

VISION 2050 recognizes the critical role that aviation plays for people and businesses in the growing central Puget Sound region, as well as its impacts to communities and the environment. The region is currently home to 29 airports of varied sizes and functions. See Figure 20. Continued, coordinated planning is essential for ensuring that the regional airport system can support existing and future demand. Aviation planning and implementation falls under the authority of the Federal Aviation Administration and is the responsibility of airport operators. PSRC recognizes the interrelationship between aviation and the broader region and within the role of the Metropolitan Planning Organization addresses these cross-cutting issues in the Regional Transportation Plan, including access issues and impacts to the broader transportation system and local communities.

Existing Conditions

There are 27 public-use airports and two military-operated airports within the central Puget Sound region. The region is also home to multiple Boeing facilities as well as suppliers and related aerospace companies. Most of the aviation activity in the central Puget Sound region is concentrated in King and Snohomish counties. An in-depth Regional Aviation Baseline Study analyzing the region’s aviation system and needs was published in 2021.

The Federal Aviation Administration works closely with state aviation agencies and local planning organizations to identify public-use airports that are important for inclusion in the National Plan of Integrated Airport Systems (NPIAS). NPIAS is an inventory of existing and proposed airports that are significant to national air transportation in the U.S. and are eligible to receive certain types of federal grant funding. Twelve of the region’s airports are part of the NPIAS system.

Commercial Aviation

Within the region, there are three primary commercial service airports:

- **Seattle-Tacoma International Airport (Sea-Tac)**, in King County, connects the central Puget Sound region to the world by serving approximately 50 million passengers annually. With an area of 2,500 acres—much smaller than other U.S. airports with similar annual passenger numbers—it is severely constrained by urban development and existing topography. Sea-Tac is one of the region’s leading economic engines, with an economic impact of $22.5 billion in 2017. From airport workers who live in neighboring communities to cherry farmers in central Washington, and from shops in tourist destinations like Pike Place Market to corporate giants like Microsoft and Boeing, Sea-Tac touches nearly every aspect of the economy in the central Puget Sound region.
• **Paine Field International Airport** is a unique airport located in Snohomish County, with both significant manufacturing activity and limited commercial service. The airport is currently authorized for up to 24 daily flights and is home to over 650 aircraft, including small, single-engine recreational aircraft, corporate jets, vintage Warbirds, and Boeing Dreamliners. Located about 30 miles north of downtown Seattle, the airport has become a major tourist destination with the opening of the Future of Flight Aviation Center & Boeing Tour, the Flying Heritage & Combat Armor Museum, and the Historic Flight Foundation. Paine Field has an estimated economic impact of $20 billion annually.

• **King County International Airport (Boeing Field)** is one of the nation’s busiest primary non-hub airports, averaging 200,000 takeoffs and landings each year. The airport serves small commercial passenger airlines, cargo carriers, private aircraft owners, helicopters, corporate jets, military and other aircraft. It is also home to Boeing Company final production aircraft services and flight testing operations as well as The Museum of Flight. This airport is severely land constrained with ongoing urban encroachment. Due to its strategic location just four miles south of downtown Seattle and close to other business centers, it is frequently used by celebrities, dignitaries, and sports teams, and supports $3.5 billion in local business.
Figure 20 - National Plan of Integrated Airports System (NPIAS) Airports
General Aviation

General aviation airports in the central Puget Sound region serve different sectors of the aviation community based on the location and local demand. The unique geographic terrain of the region presents unique opportunities for recreational flight and tourism. In addition, there are aviation needs for business, flight instruction, medical, emergency management, law enforcement, local transportation (air ferry), and search/rescue operations. Depending on the user, a wide variety of airports distributed throughout the region meet the needs of General Aviation users.

Air Cargo

Air cargo services enable global marketing and transportation of goods and services, especially for time-sensitive products and trade with distant markets. Economic growth, international trade, and air transport are inextricably linked. Specifically, air cargo service provides fast and reliable delivery of high-value products especially relevant to central Puget Sound region industries, such as the pharmaceutical, technology, aircraft assembly, and aerospace equipment sectors. The air cargo system supports the express carrier industry, which provides guaranteed, rapid, and door-to-door delivery services, and increasingly offers logistics support for other companies. Air cargo also facilitates the development of e-commerce, enabling companies to transport online shopping orders quickly and reliably between regions and countries and allowing products to be stored in large warehouses, which reduces retail and distribution costs.

Air cargo in the central Puget Sound region is generated primarily by activity at Sea-Tac and King County International Airport (Boeing Field), which, combined, account for over 85% of the total Washington state market. Sea-Tac handles two-thirds of the cargo tonnage and has the greatest variety of cargo offerings in the central Puget Sound with a mix of domestic and international belly cargo, domestic and international freighter cargo, as well as express cargo generated by carriers such as FedEx, DHL, and Amazon Air. More information about transportation infrastructure supporting freight and goods movement can be found in the Freight section of this document.

COVID-19

In March 2020, COVID-19 struck the United States and severely affected air travel worldwide. However, by fall 2021, U.S. airline executives saw concrete signs of a domestic leisure travel recovery as a slowing pandemic and more widespread vaccinations drove holiday season bookings. According to Transportation Security Administration data, more than 2.3 million Americans flew for the 2021 Thanksgiving holiday, setting a pandemic record that is close to 2019 numbers. Airports and airlines estimate a recovery to 2019 levels by 2023 to 2024.

Future Conditions

While all three parts of the aviation system must work together, each is affected by unique trends and has a unique demand forecast for the future.

Commercial Aviation

Based on current capacity at Sea-Tac Airport, increased capacity planned through Sea-Tac’s Sustainable Airport Master Plan, and current capacity at Paine Field, the region will be able to accommodate approximately 28,600,000 enplanements by 2027 (enplanements are a measure of
aviation activity; one enplanement is one passenger boarding a plane), up from approximately 24,000,000 enplanements in 2018.23

The regional projected demand for passenger enplanements is 55,600,000 by 2050—nearly double 2018 demand. Based on the forecasted demand, there will be a gap of 27,000,000 unmet enplanements each year by 2050. When planning to accommodate this demand, many factors affecting both existing and potential new capacity need to be considered, including access to individual airports. As population and jobs continue to grow in the region, roads will become more crowded, increasing drive times from outlying areas to existing passenger aviation facilities, with increased parts of the region facing well over an hour drive to access Sea-Tac International Airport. As Sound Transit continues to expand the Link light rail system, this and other multimodal solutions may help increase access to the region’s airports. Airspace throughout the central Puget Sound region will become increasingly crowded, with Sea-Tac in particular facing constraints due to the orientation and spacing of its runways, although new FAA navigation systems will help make better use of air space.

General Aviation

There will be adequate runway capacity within the region’s system of 24 General Aviation airports to accommodate demand through 2050. Potential constraints to the system include a decrease in numbers of private pilots and aircraft maintenance technicians, limited resources for upgrading deteriorating runways, and insufficient hangar space.

Air Cargo

Air cargo growth is driven by globalization and e-commerce as well as strong state exports. Air cargo is tied to commercial flights because a lot of air cargo travels in the bellies of passenger flights, but capacity constraints both at airports and off-site facilities can be limiting factors. As documented in the Regional Aviation Baseline Study, demand for air cargo is expected to more than double by 2050, growing from 539,600 metric tons in 2017 to 1,319,300 tons in 2050. Air cargo demand is often seasonal, so air cargo handling capacity can be significantly stressed during harvest time for high value crops like cherries and or peak shipping periods like the winter holiday season, but facilities may be sufficient or even underutilized during other times of the year. Limiting factors for both Sea-Tac and King County International Airports are insufficient warehousing and landside access facilities. Based on current plans, the region will fall short of on-airport warehouse space for air cargo by 2027. There are opportunities to redesign existing on-airport facilities, develop new off-airport facilities, use Grant County Moses Lake International Airport as a cargo reliever during the harvest time for high value crops like cherries, and shift some traffic to Spokane International Airport to create additional capacity in the central Puget Sound region.

What’s Ahead?

In 2019, the Washington State Legislature created the Commercial Aviation Coordinating Commission (CACC) which has been tasked with identifying and recommending a single preferred location for a new commercial service airport by February 15, 2023. In addition to recommending a new primary

23 Regional Aviation Baseline Study (PSRC 2021) [https://www.psrc.org/aviation-baseline-study](https://www.psrc.org/aviation-baseline-study)
commercial aviation facility, the Commission will recommend additional ways to accommodate capacity needs at other facilities. It is important to note that the CACC’s recommendations will be advisory only. After review by the Washington State Legislature, it will be necessary to conduct detailed financial and environmental analyses, and funding sources and airport governance will need to be identified to implement the recommendations. More information about this ongoing effort may be found on the Washington State Department of Transportation’s [website].

As described earlier, in 2021 PSRC completed a Regional Aviation Baseline Study that provides a clear picture of the different roles and purposes of aviation activity at each of the region’s airports, describes how these activities interact, and identifies future needs in the central Puget Sound region to set the stage for future planning. This study provides a common baseline for policymakers about the region’s aviation needs and options to consider for meeting those needs in the future. This study is the first phase of potentially more focused studies on specific areas of emphasis. PSRC released study findings to the public throughout the project, and directly shared with people who expressed interest through community engagement opportunities as well as with PSRC members and state and local elected officials. The study has also been provided to the CACC to support the development of their recommendations.

As illustrated in mapping contained in the Central Puget Sound Demographic Profile, communities in close proximity to the region’s busiest airports – in particular Sea-Tac, Boeing Field, and Paine Field – have higher percentages of people of color and lower incomes, and community concerns include soil contamination from aircraft fuels and chemicals, and noise and air pollution. There are ongoing efforts related to aviation and the environment in both the public and private sectors. The Puget Sound Regional Emissions Analysis Project, led by King County and in partnership with seven regional partner agencies including PSRC, is a comprehensive update of the region’s greenhouse gas emissions inventory. The project, anticipated to be complete in late 2022, will provide a robust evaluation of all emission sources including aviation, as well as researching pathways to achieve equitable emission reductions.

A number of organizations and researchers are studying aviation issues in the region, and findings from their studies may help inform next steps to avoid or mitigate any harmful impacts of aviation. These include:

- **Mobile Observations of Ultrafine Particulates Study**, University of Washington
- **Aviation Economic Impact Study**, Washington State Department of Transportation
- **Aviation Biofuels Infrastructure Feasibility Study**, Port of Seattle
- **Washington State Air Cargo Movement Study**, Washington State Legislature
- **Ultra-High-Speed Ground Transportation Study**, Washington State Department of Transportation

Aviation technology continues to advance, with lower carbon fuels and electrification of aircraft offering the potential for reduction or elimination of carbon and other emissions. New and improved aircraft will likely also be significantly quieter, reducing noise impacts to the region and in particular to communities in close proximity to airports or under flight paths. The WSDOT Aviation Division conducted an Electric Aircraft Feasibility Study in 2020 and is continuing the work of the Electric Aircraft Working Group directed by the Legislature in 2018, including coordination with airports and
national partners. The Port of Seattle has developed and implemented a number of initiatives to address noise, air emissions, and other community impacts, including community grant programs and setting a timetable and goals for transitioning to sustainable aviation fuels. Another example of innovation in reducing emissions is Alaska Airlines’ efforts on efficiency improvements to aircraft and navigation systems which reduce overall fuel use.

Continued coordinated planning is needed to ensure the regional airport system can accommodate growth in aviation, and regional goals related to the environment and maintaining a sustainable, multimodal transportation system continue to be met. Planning for the future airport system is guided by the following regional policies:

- The region should maximize aviation capacity within the existing regional airport system before constructing new airports.
- The State of Washington will play a lead role in addressing aviation capacity needs and place a priority on funding and planning the state’s air transportation system. This work is being led by the Commercial Aviation Coordinating Commission.
- When additional capacity is forecast to be needed, and no feasible airport capacity is available within the region, the state will take the lead role in addressing capacity needs, including by funding a site selection study for the placement of new airport(s) if no sponsor is available.

VISION 2050 established the following policy to address the development of new commercial aviation capacity:

- Promote coordinated planning and effective management to optimize the region’s aviation system in a manner that minimizes health, air quality, and noise impacts to communities, including historically marginalized communities. Consider demand management alternatives as future growth needs are analyzed, recognizing capacity constraints at existing facilities and the time and resources necessary to build new ones. Support the ongoing process of development of a new commercial aviation facility in Washington State.

PSRC will continue to work closely with the state, airport operators, its members, and the region’s communities as new capacity is developed to safely and equitably accommodate aviation demand.
Operations and Efficiencies

Transportation Demand Management

Transportation Demand Management (TDM) refers to a coordinated set of programs to help people use the transportation system more efficiently through education, incentives, products (like subsidized transit fare cards), and programs that make it easier and more convenient to use non-drive alone modes such as transit, carpool, vanpool, walking, biking, and teleworking. These programs are typically implemented by cities, counties, transit agencies, transportation management associations (TMAs), non-profits, or other entities.

Many of the TDM programs in the central Puget Sound region were established after the state passed a Commute Trip Reduction (CTR) Law in 1991. The aim of the law is to address traffic congestion, air pollution, and fuel consumption by reducing trips during peak commute periods. The law’s approach is to target worksites with 100 or more full-time employees who commute during peak hours in the most populous counties in the state, which include King, Kitsap, Pierce, and Snohomish counties (referred to as CTR-affected worksites). Jurisdictions in these counties that have large-employer worksites adopt goals and monitor CTR program outcomes.

Existing Conditions

Data Analysis and Challenges

Long-range transportation planning relies on a thorough understanding of current conditions. As demonstrated in other sections of the RTP, data collection and analysis are critical to this understanding. This section addresses the data related to TDM that is currently available and highlights challenges and gaps in that data.

TDM-Specific Data

Program Surveys

State law requires CTR-affected worksites to periodically measure employee commute behavior. To assist in compliance with this requirement, the Washington State Department of Transportation (WSDOT) provides a survey instrument, a process for analyzing the data, and technical assistance. Most CTR programs use the WSDOT survey instrument and conduct a survey at least every other year. Jurisdictions collect the data from the CTR-affected worksites within their boundaries and report that data to WSDOT. This data is used to report on progress toward reducing drive-alone trips and vehicle miles traveled.

The response rate varies from worksite to worksite and year to year. WSDOT offers recommended response rate and sampling policies, but not all worksites are able to achieve the minimum response rate. The survey asks about work schedule, commute distance, and commute mode. Responses are
aggregated by worksite, so changes to an individual’s travel behavior over time are not trackable.

Several TDM programs that are voluntary and not tied to CTR have reported using their own survey tools to evaluate program effectiveness, but there is no consistent standard among these surveys. Data collected by transit agencies from ORCA card taps and statewide vanpooling data have also been used by TDM programs to measure changing travel behaviors.

**Regional Program Inventory**

PSRC developed and distributed a questionnaire to inventory all TDM programs in the region in 2019-2020, including those that are not considered “CTR-affected” and may not be included in WSDOT surveying. The inventory yielded data on 106 TDM programs in the region, 60 of which are not CTR-affected.

Since many TDM programs rely on funding that may not be guaranteed every year, some programs are short-term, and others only operate when funding is available. To capture this, data was collected for local programs operating any time between 2015 and 2020. The survey asked about geographic coverage of a program, trip purpose, employer size (if employer-based), TDM strategies, modes promoted by the program, and target audiences. All four counties in the region are affected by the CTR law, so all jurisdictions in the region have some type of CTR program. Some cities also have other TDM programming such as that offered by a TMA or non-profit.

**Challenges to Data Collection**

Performance measures or other strategies for evaluating outcomes are a standard tool for determining if a public program is achieving its goals, operating as intended, and delivering outcomes efficiently. Such measures are often factored into funding decision-making processes and can be a powerful tool to support a program. More data is needed to evaluate the effectiveness and efficiency of TDM programs across the region and of individual strategies implemented by TDM programs.

It can be difficult to directly correlate behavior changes with TDM programming. If an employer sees more employees commuting to work on transit, this may be indicative that the TDM program is effective but could also be a result of a transit service change or new route/line opening that improves the convenience of transit. Alternatively, based on location or workforce characteristics, CTR-affected worksites may be more likely to have employees commuting via transit, vanpooling, or other non-drive-alone modes regardless of whether they have a program. Several factors impact a person’s mode choice, and it is difficult to determine a TDM program’s role in shaping that decision.

Data privacy is extremely important but also creates some challenges in monitoring and evaluating TDM. For example, the WSDOT survey instrument for CTR programs does not ask about an employee’s race, ethnicity or income, and most employers do not make this information public. Without this information, it is difficult to evaluate the equity of TDM programs and who is participating in programs or receiving these benefits.

**Key Findings and Current Issues in TDM**

While there is room for more robust data specific to TDM programs in the central Puget Sound region, the existing data provides important context and indicates broad trends.
Most TDM Programs Are CTR or Commute-Focused

Of the 106 programs that provided data in the regional TDM program inventory, 46 were CTR programs and 60 were non-CTR programs. More than half of all programs in the inventory (58%) listed work trips as their primary focus, while 26% indicated they addressed all trips. The other 16% of programs were focused on school trips. None of the programs selected “non-work trips” (such as recreation, personal errands, or any other trip that isn’t to/from school or work) as the program focus.

The approach of the CTR law to identify large employers with many employees commuting during peak hours was a good first step in using demand management to tackle congestion and its impacts. Data collected by WSDOT in the 2017/2018 CTR survey cycle indicate that there were nearly 83,000 worksites in the central Puget Sound region at that time (a single company may have several worksites/locations). Of these worksites, only 600 are “CTR-affected,” meaning they have over 100 full-time employees commuting during peak hours (starting work between 6 a.m. and 9 a.m.) and have chosen to implement a CTR program. Though they constitute a small share of total worksites, these 600 sites account for over 500,000 employees, which represents about a quarter of all employees in the region. See Figure 21.

However, this still leaves three quarters of commuters out of the equation. More data analysis is needed to evaluate and identify any trends of which industries or types of jobs are more likely to have CTR programs. Shift-based jobs may be less likely to have a CTR program, given they are less likely to have the bulk of their workforce commuting during peak morning hours and may have more part-time workers. Shift work is common in the healthcare, transportation, law enforcement, and service industries.

Furthermore, according to PSRC’s combined 2017/2019 Regional Household Travel Survey data, only about 24% of all trips made in the central Puget Sound region are commute trips. Expanding the reach of these programs to address work trips at non-affected worksites and even non-work trips could extend the impact of TDM in the region and the state.

Employees Offered Transit Subsidies Are More Likely to Use Transit

According to the 2017/2019 Regional Household Travel Survey data, about 42% of workers in the region said they were offered a transit subsidy by their employer, while 51% said they were not offered a subsidy and 7% were unsure. The transit mode share among workers who were offered a transit subsidy was 18%, compared to 5% among those who were not offered a subsidy and 8% among those who were unsure. Employees who were offered a transit subsidy were more likely to use transit than those who were not.

Education and Marketing are the Most-Utilized TDM Strategies

The regional program inventory asked implementers which TDM strategies they utilized in their
programs. Respondents could select all that applied among the following choices: education, marketing, consultation, regulatory, incentives, trip planning, gamification\textsuperscript{24}, financial support, rewards, and other. Ninety-two percent selected education as one of the strategies they used and 82\% selected marketing. Fifty-two percent of respondents indicated they used incentives, 42\% financial support, and 39\% rewards. Anecdotally, implementers have indicated there often is not enough funding available to subsidize non-drive-alone trips or provide financial support. Education and marketing are lower-cost strategies.

**Non-Drive-Alone Trip Rate is Higher at CTR Worksites**

According to the 2017/2018 CTR survey data collected by WSDOT, just over 47\% of commute trips at CTR-affected worksites\textsuperscript{25} in the region were non-drive-alone trips (i.e., modes other than single occupancy vehicles). Across all worksites in the region, about 32\% of commute trips were non-drive-alone trips. Collectively, CTR-affected worksites with programs in the region have a higher non-drive-alone trip rate than the region as a whole (all worksites). See Figure 22.

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\textsuperscript{24} Gamification refers to the application of game-design elements, like challenges, rewards, and incentives in non-game contexts, like TDM, to increase participation and engagement. An example would be a campaign asking employees to use trip diaries for a month and the person with the fewest drive-alone miles at the end of the month receives a reward.

\textsuperscript{25} This number only reflects employers who are considered CTR-affected and provided survey data to WSDOT.
What’s Ahead?

The Future of TDM

Population and job growth continue to add demand to the regional and statewide transportation network. TDM supports the VISION 2050 transit-focused growth strategy that mitigates congestion by encouraging alternatives to drive-alone trips. TDM efforts can help shift personal mode choice to vanpools, transit, biking, and even eliminating a physical commute through telework. Telework constituted a very small mode share in recent years with varying support from employers until the COVID-19 pandemic prompted a widespread test of telework feasibility. While the mode share of teleworking in the long term is still yet to be determined, the pandemic has undoubtedly changed perceptions and opinions on telework and made it a more viable TDM strategy for many employers.

The following are key issues and steps for moving forward:

Improving TDM Integration in Planning

- Washington State Growth Management Act (GMA) provisions call for the integration of transportation, including demand management, in the comprehensive plans that jurisdictions update periodically.\(^\text{26}\) State law also includes requirements for the CTR plans adopted by counties, cities, and towns. CTR plans must be consistent with and may be incorporated in related state or regional transportation plans and local comprehensive plans.\(^\text{27}\)

- While CTR programming and TDM strategies are often mentioned in local comprehensive plans, there is not always extensive coordination between cities and all TDM programs (especially those that are not affiliated with CTR) during the planning process. Comprehensive plans and affiliated local ordinances affect the success of TDM and CTR programs. For example, parking minimums, resilience and/or emission reduction goals, ordinances related to CTR enforcement, and many other policies can serve to prioritize TDM in local planning, while their absence can undermine TDM effectiveness.

- TDM should be considered and addressed at the planning, programming, and implementation stages of regional and local comprehensive plans.

- There are many jurisdictions in the region where the local comprehensive planning process and the CTR planning process are already well-integrated, but this is not consistently the case. The goal is for improved coordination of TDM programs with transportation and comprehensive plans as well as implementing programs and regulations. Additional guidance to local planning staff and TDM program implementers could improve this coordination.

Measuring Program Effectiveness and Efficiency

- As outlined in the Existing Conditions section, given a lack of data it is difficult to track the impacts of TDM programs in the region. Specifically, there is not a consistent data collection

\(^{26}\text{RCW 36.70A.070 Section 6(a(vi)) and 6(b) address the transportation element of the comprehensive plan. Demand-management strategies are among the listed requirements.}\)

\(^{27}\text{RCW 70A.15.4020}\)
strategy across CTR and other TDM programs and there is no parallel data on worksites without CTR programs to compare to those with programs.

- PSRC should coordinate with TDM implementers in the region to identify opportunities to collect data and evaluate the effectiveness and efficiency of TDM programs and share evaluation strategies.

- Demonstrating that TDM strategies effectively accomplish program goals (including reducing drive-alone trips) is a critical first step ahead of any efforts to increase funding of TDM or to expand the CTR Law. Defining program goals, identifying the best TDM strategies to support those goals, and measuring how effectively the strategies achieved the goals are all areas where information sharing among implementers and use of a shared vocabulary may improve outcomes. Furthermore, measures related to program efficiency (relating outcomes to resource inputs) are important in expanding a program with many implementers already competing for limited resources. Continued coordination between WSDOT, PSRC, and implementers in the region is needed to advance this effort.

Evaluating and Addressing Equity in TDM

- A common concern with many of the region’s TDM programs stemming from the CTR law is that affected CTR worksites that choose to comply tend to be white-collar, office jobs. The result of this may be that the programs benefit only a segment of the population that is more likely to earn higher incomes and may have less of a need for employer benefits like transit subsidies than those with lower incomes.

- Programs do not consistently collect or share demographic data to determine the equity of TDM program availability or outcomes. Thus, it is unclear if TDM program benefits are equitably provided across regional populations, specifically people of color and low-income populations. Furthermore, there is no complete list of every CTR and TDM program in the region to guarantee statistically valid analysis, even if this data was available.

- TDM implementers should evaluate the equitable distribution and benefits of TDM programs and, if there are deficiencies, identify opportunities to improve equity.

- PSRC will continue collaborating with state agencies, employers, and local implementers to integrate equity considerations into TDM efforts, including strategies to collect data and evaluate TDM programs.

Modernizing the CTR Law

- The transportation landscape has changed significantly since the passage of the Commute Trip Reduction Law in 1991 and the subsequent Commute Trip Reduction Efficiency Act in 2006. Teleworking is a more viable alternative to physical commuting and there is increasing travel demand outside of peak hours. Currently the CTR law affects only a small portion of all employers in the region and is focused on employees traveling during peak hours only.

- The goals and priorities of the CTR law should be evaluated in coordination with the 2021-2022 CTR Program Update initiative at WSDOT, including an exploration of expanding its scope.

- Specific considerations include expanding focus from large employers during peak hours to include more employers (those that are not currently CTR-affected), commutes outside of
peak hours, and non-commute trips. Expansions to the CTR law scope or implementation may require increased resources for the program.

**Technology**

Intelligent Transportation Systems (ITS) are technologies that help the transportation system operate more efficiently and effectively. By doing so, they have the potential to improve mobility, increase safety, and reduce emissions. ITS benefits are multimodal and apply to personal vehicles, transit, freight, as well as pedestrians and bicyclists.

Figure 23 provides examples of the different types of ITS assets that are being used across the region, which generally fit into four categories:

- **Traffic Control Systems** are hardware or devices that interface directly with travelers to improve traffic flow and minimize barriers to mobility across modes.
- **Communication Tools** include *traveler information tools* used to inform travelers about travel times, conditions and schedules and *internal communication tools* used to relay information between devices and operators.
- **Data Management Systems** are tools used to collect multimodal traveler data and systems used to collect tolls and other revenues.
- **Traffic Management Tools** are operating systems that use different elements from the categories above to monitor traffic, identify issues, and manage the transportation system in a coordinated manner.

In addition to these more established ITS technologies, there are other newer and still emerging technologies that have the potential to affect the transportation system in ways that are not yet totally clear. **Shared mobility** is broadly defined as transportation resources—such as cars, scooters, and bicycles—that are shared among users and provide short-term, on-demand access to transportation services. While these services have seen significant growth over the past decade, they still account for only a small portion of overall travel in the region. The extent that these services will continue to grow (particularly in the aftermath of the COVID-19 pandemic) and the effects they will have on the broader transportation system remain uncertain.

**Autonomous (i.e., “self-driving”) vehicle technology** has seen major advancements in recent years but is still in the relatively early stages of development, and the timeline for and impacts of its widespread deployment on the roadways is unclear. The same is true for **connected vehicle technology**, which allows vehicles to communicate directly with other vehicles and traffic infrastructure.
Existing Conditions

Signal/ITS Inventory

PSRC staff worked with member agencies to collect data for a regional traffic signal/ITS inventory to help support and inform regional and local ITS planning. Appendix A (Transportation System Inventory) and PSRC’s Transportation System Visualization Tool provide the locations of various ITS assets, with the aim of helping jurisdictions identify where needs and investment opportunities may exist. ITS can be used to move all modes more efficiently and safely, from freight to transit to private vehicles to bicyclists and pedestrians. ITS and operational investments are critical for an effective transportation network that benefits all users of the system. There are thousands of intersections throughout the PSRC region, most of which require some level of traffic control to ensure safety and proper traffic flow. At some intersections, basic elements such as static signage and marked crosswalks may be sufficient to manage the level of activity. In others, signals and other ITS tools may
be more appropriate. For example, there are nearly 700 intersections in the region where National Highway System28 (NHS) roadways intersect; these are likely to have concentrated levels of activity across all modes, and thus likely to require more sophisticated traffic control. This is reflected by the over 90% of such intersections that are signalized. See Figure 24.

It is important to note that not every intersection necessarily benefits from traffic signals or other ITS investments. Jurisdictions must take various contextual factors into account when deciding what type of traffic control to deploy at an intersection, including traffic volumes, nonmotorized activity, the presence of transit and/or freight, and crash history (among other factors).

### ITS Assets

The ITS inventory captures data about an array of ITS tools that benefit users of the region’s transportation system.

**Signal coordination**, when two or more signals along a corridor have synchronized timing cycles, minimizes the number of times motorists, transit vehicles, and bicyclists must stop when traveling along a corridor. It is most effective along higher-volume roadways where signals are within ~3/4 of a mile of each other.29 In the central Puget Sound region, approximately 70% of the 2,600 signals along the NHS are coordinated.

Signal coordination both reduces travel time and improves safety by increasing the efficiency of traffic flow. Coordinated signals along intersection-dense corridors improve safety for all modes by reducing the amount of time spent lingering at busy intersections. Jurisdictions have the flexibility to change coordinated signal timing based on their policy goals. For example, the City of Bremerton is enacting safety improvements for pedestrians along two major corridors by updating their coordinated timing cycles to provide pedestrians with more clearance time to cross the roadway.

**Adaptive signal control (ASC)** is technology that continually adjusts signal timing on the fly based on existing traffic conditions along a corridor. It provides quicker, more reliable travel times and enhances transit operations by meeting travel demand in real-time. It also improves safety and prevents traffic incidents by quickly adapting to unforeseen events or conditions. Like signal coordination, ASC can be programmed based on policy goals to best accommodate the needs of all modes that traverse the corridor. In the central Puget Sound region, approximately 9% of signals along the NHS have ASC, although with several projects planned or under construction that number will likely increase soon.

**Transit Signal Priority (TSP)** reduces delay for transit riders by modifying signal timing as transit vehicles approach an intersection. It decreases transit travel time and improves a transit route’s reliability and efficiency. This technology is most effective along congested corridors where transit routes are frequently delayed, such as SR 99 in Snohomish County or Pacific Avenue in Tacoma. In the central Puget Sound region, approximately 12% of signals along the NHS have TSP.

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28 The National Highway System is a federally defined network of high-volume roadways that serve major population centers, intermodal transportation facilities, and other major travel destinations.

Figure 24 - NHS Signalized Intersections
Accessible Pedestrian Signals (APS) use tones and vibrating push buttons to make it easier and safer for pedestrians with a visual impairment to cross roadways and travel through an area. In the central Puget Sound region, approximately 32% of signals along the NHS meet APS standards. Overall, nearly 100% of signals along the NHS in the region have at least some type of pedestrian signal.

In addition, although quantitative information was not collected for these assets, there are several other ITS tools being deployed in the region that improve safety for pedestrians and bicyclists. Examples include: Rectangular Rapid Flashing Beacons (RRFBs), which provide a high-visibility strobe-like warning to drivers when pedestrians and bicyclists use a crosswalk; mid-block crosswalks to aid pedestrians and bicyclists across high-speed roadways; and “head start” signal timing which gives pedestrians and bicyclists a few seconds head start to enter crosswalks before cars and trucks.

There are jurisdictions across the region investing in these types of pedestrian- and bicyclist-oriented ITS features to improve safety for nonmotorized users of the system, including Edmonds, Everett, Poulsbo, Federal Way, Tacoma, Sumner, and many others.

One area where there are significant gaps is before-and-after performance data that could be used to quantify the benefits of ITS investments. It has been established over decades of deployment that ITS projects have the potential to provide mobility, safety, and environmental benefits. However, continued tracking and validation of these types of performance measurements often does not occur due to cost, lack of other resources, or the inherent difficulty in quantifying certain benefits. While there are increasingly more opportunities to obtain performance data and a growing number of jurisdictions that are attempting to do so, there are still a relative lack of measures being deployed in the region.

30 APS data is not available for approximately 250 signals

*For full results of the ITS Inventory please see Appendix A (Transportation System Inventory).
Newer and Emerging Technologies

Shared Mobility

An array of shared mobility services have been present in the region for nearly a decade, including car sharing, ridehailing, micromobility and others (see sidebar for definitions). Pre-COVID-19 these services were growing at a fairly steady rate and expanding to more jurisdictions across the region. With the emergence of the pandemic it is less clear what future trends will be for shared mobility usage, particularly for services such as ridehailing and ridesharing that require simultaneous sharing in close quarters with other people (as opposed to micromobility or carsharing, which do not).  

In general, it is not yet clear what share of the transportation market shared mobility will capture. While use and recognition of shared mobility will likely continue to grow, the share within the region and nationally remains low compared to other modes of travel. This makes it difficult to predict future shared-mobility related changes and impacts to the system.

However, various benefits and challenges have emerged based on the current usage of shared mobility. One of the most immediately recognizable benefits of these services is that they help meet the demand for more convenient and flexible transportation options. In addition, they have the potential to provide easier access to travel for special needs populations such as persons with disabilities, seniors, or youth who are unable to drive. There are also opportunities for shared mobility providers to partner with the public sector to increase access to employment and educational opportunities for disadvantaged communities. An example of this in the region was Pierce Transit’s Mobility on Demand pilot program, where they partnered with Lyft to provide key transportation connections to populations outside of the Pierce Transit service area.

In terms of challenges, managing and developing a regulatory framework for this dynamic industry has proven to be a significant task for local governments. Challenges have included contested curb  

TYPES OF SHARED MOBILITY SERVICES

Car Sharing: A shared-use car rental service that allows users to rent vehicles by the hour and, in some cases, return the car to any available parking spot (e.g., Car2Go)

Ridehailing: A service that allows the legal usage of personal vehicles to operate as the functional equivalent of taxicabs. Ridehailing relies largely on mobile phone and GPS technology (e.g., Uber, Lyft).

Micromobility: Short distance shared-use transportation provided by lightweight (usually single-person) vehicles such as bicycles scooters.

Micro-Transit: A privately or publicly operated transit system that has greater operational flexibility than public transit and relies heavily on mobile phone technology (e.g., Chariot, Via).

Ridesharing: Refers to organized carpool services facilitated by transit agencies, carpooling apps that match drivers with riders on daily commutes (e.g., Scoop), and on-demand carpool options (e.g., UberPool).

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space/parking, conflicts with positioning of bikes and scooters on sidewalks and other areas, employment and minimum-wage standards for drivers, and difficulties associated with obtaining and tracking data. For providers, the volatile and rapidly changing nature of the industry has led to a steady influx of new permitting requirements and unstable operating expenses. Establishing an economically sustainable business model that can keep up with new technological developments while navigating an uncertain regulatory framework has proven to be difficult. These challenges have led to significant turnover among providers and raise questions about the overall viability of the industry.

Finally, there are issues related to how these services will hinder or help to meet policy goals such as vehicle miles traveled (VMT) reduction, increased transit use, and more concentrated growth in regional centers, and it is not yet clear what impact growth in shared mobility services will have. While some jurisdictions in the region have developed plans aimed at aligning shared mobility with broader policy goals, decision makers across the region will need to continue to monitor how the industry evolves and develop strategies that seek to maximize benefits and minimize disruptions.

**Connected and Autonomous Vehicles**

The expectations and timelines for connected/autonomous vehicles (i.e. “CAV”) hitting roadways in significant numbers have tempered in recent years. Vehicles with partial automation, such as automatic lane and parking assistance, are seeing wider adoption in vehicles at higher price ranges. Fully autonomous vehicles are being deployed in pilot programs and geographically limited implementations that allow for more controlled and predictable environments but are likely far from seeing widespread utilization.

At this early stage, benefits and challenges associated with widespread CAV adoption are still difficult to assess. For example, potential benefits of CAV technology have been stated to include a significant decrease in the number of crashes and a reduction in roadway fatalities and serious injuries. At the same time, such safety benefits are not guaranteed, and new safety risks may be introduced by CAV technology. Defective hardware or software has the potential to cause accidents that would be less likely to occur under human control, and new cybersecurity risks could result in serious collisions if vehicles are hacked.

Currently, the regulatory framework surrounding safety conflicts between autonomous vehicles and other road users has been at the forefront of related state and federal government agendas. The Washington State Autonomous Vehicle Work Group was developed by the Washington State Transportation Commission per direction from the state Legislature in 2018 and is comprised of stakeholders representing both the public and private sectors. The purpose of this group is to assess potential impacts that autonomous and connected vehicles may have on Washington state and identify policy, regulatory and public education needs to prepare for the operation of these vehicles on the region’s roadways in the future.

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Future Conditions

The Regional Transportation Plan includes investments that maintain existing ITS and traffic operations infrastructure, as well as a broad array of new state and local projects and programs. This includes projects such as managed lanes (including express toll lanes) on the interstates, hard shoulder running operations, and other innovative methods of managing travel flow. While the plan does not include a line-item list of ITS projects, the financial strategy does assume a certain level of ITS investment based on local comprehensive plans and prior expenditures. In addition, many of the projects that are line-itemed in the plan through the Regional Capacity Project List include ITS-based elements. The plan supports investing in ITS because they are cost-effective tools for maximizing the operational efficiency of the transportation infrastructure and system.

These established ITS technologies and operational assets are expected to become increasingly more intertwined with newer and emerging technologies as the plan progresses. In addition to the advancement of shared mobility services and CAV technology, the region will also see a potentially rapid increase in the adoption of electric vehicle technology for passenger, transit, and freight vehicles; greater use of real-time traveler information systems to reduce idling and improve the efficiency of freight vehicles; and the continued growth of the electric bicycle market, among other developments. See the Climate and Environment section for more information.

Within the current landscape, the bulk of investment in the research and development of emerging technologies is occurring in the private sector, while the public sector is primarily focused on establishing a regulatory framework, designing infrastructure, and developing plans and policies that seek to maximize benefits and minimize disruptions brought about by the technologies. The plan assumes the continuation of these trends, although there is clearly significant uncertainty regarding what exactly that will look like, the types of impacts and disruptions that will be felt, and the timeline for their deployment and integration into the broader transportation system.

What’s Ahead?

Recommended actions related to ITS and emerging technologies were developed based on input received from stakeholders from across the region, and policy board discussions. These include:

- PSRC should work with and support member jurisdictions in monitoring emerging ITS activities, highlighting best practices, sharing technical assistance, and providing information on ITS assets and benefits.
- Agencies across the region vary in terms of how much they have invested in ITS assets. This can be due to different needs and opportunities, as well as different levels of awareness and resources.
- In coordination with PSRC staff committees and member agencies, PSRC should consider developing a guidance document for these jurisdictions that includes examples of best practices and highlights the benefits of various ITS deployments. In addition, PSRC should

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continue to provide opportunities for jurisdictions to come together and share technical assistance, highlight best practices, and discuss emerging ITS activities and issues on an ongoing basis.

- Jurisdictions should consider a multi-pronged approach to better highlight the benefits of ITS, including exploring more cost-effective options for retrieving data (e.g., downloading from controllers), developing and building more performance measures into ITS projects, and educating different groups on the benefits of ITS.
**Safety**

VISION 2050 set a goal for the region to have a “sustainable, equitable, affordable, safe, and efficient multimodal transportation system, with specific emphasis on an integrated regional transit network that supports the Regional Growth Strategy and promotes vitality of the economy, environment, and health.” In addition, VISION 2050 includes the following policy related to safety:

*Improve the safety of the transportation system and, in the long term, achieve the state’s goal of zero deaths and serious injuries.*

Safety was one of the key policy focus areas identified by PSRC’s Transportation Policy Board early in the development of the RTP and is a cross-cutting issue addressed throughout all relevant sections of the plan.

This section provides information on recent data trends related to safety, as well as programs and activities throughout the region, the state and at the national level. In addition, ongoing and future work is identified to continue to make progress towards achieving state and regional safety goals.

**Safety Data Trends**

Figure 25 shows the total number of crashes that resulted in fatalities and/or serious injuries in the Puget Sound region between 2010 and 2019. After a decrease in the early part of the decade, there was a significant increase between 2013 and 2016, followed by a leveling-out through 2019.

**Figure 25 - Number of Fatal/Serious Injury Crashes in the Puget Sound Region, 2010 – 2019**

![Graph showing the number of fatal/serious injury crashes in the Puget Sound region from 2010 to 2019.](image)

It is notable that when looking over a longer period, significant progress on safety has been made in the region. In 2002, the total number of fatal and serious injury crashes was over 1,550, substantially higher than at any point over the last decade. However, there is clearly still a lot of work to be done for the region to reach the goal of zero. Recent trends show significant differences across modes, with pedestrian fatalities increasing at a much faster rate than other modes. Figure 26 below shows the breakdown of fatalities and serious injuries by mode from 2010 – 2019, while Figure 27 highlights the percent change by mode during that same period.
As highlighted in Figure 27, for motorists and bicyclists the total number of fatalities and serious injuries remained relatively stable between 2010 and 2019; however, for pedestrians there was a 27% increase during that same period.

**Elements of Safety**

Safety impacts every aspect of the transportation system, covering all modes and encompassing a variety of attributes from facility design to security to personal behavior. The Federal Highway Administration (FHWA) refers to the Four E’s of safety: engineering, enforcement, education and emergency medical services.

Many organizations and jurisdictions have implemented programs and projects aimed at improving safety and reducing deaths and serious injuries. All seek to achieve the long-term goal of zero fatalities and serious injuries.
National

PSRC hosted a TOOLBOX peer networking session in 2020 on transportation safety and invited the National Safety Council (NSC) to discuss their work and overall trends. The NSC developed a Road to Zero Coalition, which focuses on implementing proven, evidence-based strategies and advancing life-saving technologies to reduce fatalities and serious injuries. The coalition describes three interrelated approaches:

- Engagement and partnership to support policies and identify and share resources for research, roadway and vehicle engineering and design, enforcement, education and trauma care.
- Technology promises strong advances in safety, including in-vehicle technology and connective systems. Partnerships, education and incentives can assist in the prioritization of these applications, for research and evaluation, and to increase adoption.
- Prioritizing a Safe System approach can establish an overall safety culture through an increase in awareness, education and reinforcement.

The Federal Highway Administration further elaborates on the Safe System approach which acknowledges that people are fallible and make mistakes, and addresses system design and operations on anticipating these mistakes and lessening their impact. There are six key principles included in the Safe System approach:

- **Death and serious injuries are unacceptable** – modify how users, vehicles, infrastructure and emergency response operate to both reduce the likelihood of crashes and to reduce their severity when they do occur
- **People make mistakes** – to the extent possible, design and operate the system to anticipate these mistakes and avoid death and serious injury
- **People are vulnerable** – understanding and managing the system to within survivable limits when crashes occur
- **Responsibility is shared** – this includes those who design and manage the system, vehicle manufacturers, emergency responders and law enforcement, and all users of the system
- **Safety is proactive** – use tools and data trends to identify patterns and risk and apply effective countermeasures at a system level
- **Redundancy is critical** – strengthen all parts of the system

There are five elements that work together in a holistic approach:

- **Safe road users** – all users of the system are equal, and all share responsibility to operate safely, with support from education and enforcement. For example, safe walking means crossing the street during the “walk” phase at a signalized intersection; safe biking means riding in the direction of traffic; safe driving means following signs and speed limits and being aware of other users. This element also addresses users not being distracted or impaired.

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37 https://www.nsc.org/getmedia/485b0d61-e657-44e7-84f2-1a4206a7ea33/rtz-report.pdf.aspx
38 https://safety.fhwa.dot.gov/zerodeaths/zero_deaths_vision.cfm
following rules and behaving within the limits of the infrastructure design, and education and enforcement tools that can help.

- **Safe vehicles** – as noted earlier, vehicles are continuing to incorporate technology that makes them safer for people both inside and outside the vehicle if crashes occur, and also to assist drivers in being more aware of their surroundings.

- **Safe speeds** – there is a clear link between speeds and the ability to survive a crash. According to the USDOT, a pedestrian struck by a vehicle traveling at 20 miles per hour (mph) has a 90% chance of survival; at 42 mph that is reduced to 50%, and at 58 mph the chance of survival is reduced to 10%.\(^\text{39}\) Roundabouts at intersections are an example of an effective treatment to reduce speeds and the potential impact of a crash. According to FHWA, context-sensitive speed limits can also be effective (e.g., reducing speeds in urban areas with a higher level of pedestrian traffic).

- **Safe roads** – the design of roads can also result in lowering both the incidence and severity of crashes. For example, separating users of the system both physically (such as sidewalks, dedicated turn lanes, etc.) and through timed transfers (e.g., providing pedestrians dedicated signal time while traffic is stopped), as well as increasing awareness of other users and hazards (e.g., rumble strips and street lighting) can help to make roads safer for all users. The concept of safe roads extends through all aspects of the system, from design and construction of the facility through to maintenance and operation.

- **Post-crash care** – this element relies on the quick and efficient response when a crash occurs, including emergency responders, crash investigators, incident clearing, and follow-up actions. Data collection and documentation can help shed light on causal factors for future mitigation.

**State**

Washington state has adopted “Target Zero” as the required Strategic Highway Safety Plan under FHWA’s Highway Safety Improvement Program. Target Zero sets a goal of zero deaths and serious injuries on roadways by 2030. The plan identifies key actions under three categories – High Risk Behavior, Crash Type and Road Users – that the state or local jurisdictions can take to improve traffic safety. The plan also addresses system and technological approaches and identifies best practices in policies, regulations, equity and partnerships.

The Washington Traffic Safety Commission provides information on state safety trends and their grant programs that address impaired driving, motorcycle safety, communications, community traffic safety and local law enforcement support, youth programs, and others. In 2021 the Commission launched a new “Together We Get There” campaign to develop awareness and foster an overall traffic safety culture.

Local

Local jurisdictions are addressing safety through various types of projects and programs. Over 20 cities and towns across the region have developed Local Road Safety Plans, which prioritize projects based on analysis of WSDOT crash data to identify risk factors and key locations. Many other jurisdictions in the region incorporate safety initiatives as part of other planning and implementation efforts.

Some examples of local safety projects and initiatives happening across the region include:

- Proactively educating users of the transportation system through collaboration with local advocacy groups, safety campaigns, and other events
- Creating safer pedestrian and bicycle pathways, including safe routes to school
- Employing road design techniques that improve safety
- Deploying street calming measures in residential areas
- Upgrading railroad crossings
- Targeted enforcement efforts (e.g., Target Zero Patrols, DUI Patrols)

What’s Ahead?

As described throughout this section, many efforts are underway to address safety and make progress towards the goal of zero fatalities and serious injuries on the region’s transportation system.

PSRC will continue to emphasize safety throughout all aspects of the planning process, from the overall system goal as identified in VISION 2050, to the long-range planning and investments identified in the Regional Transportation Plan, and through the more detailed project evaluation criteria that is used to award PSRC’s federal transportation dollars to specific near-term transportation investments.

Project Selection

PSRC conducts a project selection process every two years to award Federal Highway and Federal Transit Administration funds to priority projects. The evaluation criteria are grounded in the policies and direction from VISION 2050, and the work to prepare for the 2022 project selection process identified key improvements to how safety will be addressed and evaluated. In addition, PSRC is called on to develop guidance and to work with partners to identify best practices and effective solutions.

Examples of Local Safety Plans and Initiatives

The City of Bellevue adopted a VISION Zero Strategic Plan and the City Council passed a resolution in 2020 approving a Safe Systems approach. The City also produced a story map that includes a dynamic data dashboard.

The City of Poulsbo’s Street and Pedestrian Safety Plan focuses on identifying high-risk locations for nonmotorized users and developing potential strategies and counter-measures to make them safer.
Future Work

Some key next steps on safety will include the following:

- Data collection and monitoring of state and regional safety trends, considering contextual layers such as population and employment growth, travel mode changes, and equity.
- Continued prioritization of safe infrastructure and separation of vulnerable modes in project development.
- An evaluation of the safety revisions included in PSRC’s project selection process for determination of any further changes needed in subsequent funding competitions.
- PSRC will work with partners to develop guidance and compile best practices on effective safety measures and programs.
- PSRC will convene regional partners and stakeholders to discuss the challenges and solutions in meeting safety goals. This will include addressing the full spectrum of safety elements and a Safe Systems Approach.
**Maintenance and Preservation**

Maintaining and preserving the region’s transportation assets in a safe and usable condition is critical to keeping people and goods moving throughout the region. These under-the-radar investments, which range from repaving projects to the replacement of transit vehicles to seismic retrofits, make the transportation network function in a safe and usable manner.

While the two are often discussed together, maintenance and preservation are somewhat distinct. *Maintenance* refers to more routine preventative activities that maintain or improve the functional condition of an asset (e.g., “chip seal” – the application of a protective surface to an existing pavement), while *preservation* refers to costlier activities intended to more significantly extend an asset’s useful life (e.g., structural reinforcement of an existing bridge or reconstruction of a roadway). *Operations* are noncapital costs associated with operating all facets of the transportation system (e.g., transit operations, active traffic management, or traffic signal retiming).

Federal transportation policies have increasingly prioritized the maintenance, preservation, and optimization of existing transportation infrastructure and services. Federal law and regulations emphasize maintaining and preserving existing transportation infrastructure and services through the deployment of performance-based planning measures. The purpose of this approach is to increase accountability and transparency at the local level, improve decision making through better information, and ultimately provide the most efficient investment of federal transportation funds towards maintenance and preservation of transportation infrastructure. In addition to this federal direction, the Policy Framework for PSRC’s Federal Funds sets aside a portion of both FHWA and FTA funds for maintenance and preservation investments.

Years of deferred maintenance in the central Puget Sound region have resulted in a significant backlog of maintenance and preservation investment projects, and many agencies are experiencing shortfalls in revenues to address needs. Responding to these fiscal realities, cities, counties, the Washington State Department of Transportation (WSDOT), and transit agencies are stretching dollars further through innovative cost saving measures in maintenance and preservation project design, phasing, and timing. For example, cities are using more expensive concrete when paving highly used transit lanes whereas remaining lanes are treated with asphalt or other less expensive materials. On highways, WSDOT has implemented new approaches to extending the life of pavements through practices such as dowel-bar retrofitting (a method of reinforcing cracks in highway pavement by inserting steel dowel bars in slots cut across the cracks). Additionally, key safety investments such as seismic retrofits are being prioritized.

Despite these measures, existing resources are currently not sufficient to make critical maintenance and preservation investments to keep people and goods moving, which can have significant consequences to the system and the economy. For these reasons, the region commits as a top priority to maintain, preserve, and operate the existing transportation system in a safe and usable state. Maintenance, preservation, and operations programs represent approximately 56% percent of
the plan’s total costs, and preservation and maintenance needs on all facilities are included as part of
the plan’s financial strategy.

**Current State of Maintenance and Preservation in the Region**

To identify and better understand the key maintenance, preservation, and asset management issues
facing agencies across the region, PSRC staff has:

- Conducted interviews with a sample of 15 local jurisdictions to better understand the spectrum
  of local asset management practices. See more detail on the interview findings in Appendix C
  (Maintenance and Preservation).
- Reached out to several peer Metropolitan Planning Organizations to learn about other regions’
  approaches to data coordination.
- Conducted a comprehensive review of existing condition data on state, transit agency, and city
  and county-owned assets across various asset categories (e.g., pavement, bridges, sidewalks,
  ITS, etc.), including identifying where gaps exist and which issues are hindering data collection
  and integration.

The findings from these interviews, discussions and research are discussed below.

**Estimating Regional and Local Need is a Challenge**

A main area of focus has been identifying issues and challenges associated with collecting and
integrating transportation asset condition data. Discussions with stakeholders highlight that the
current disparate and inconsistent local approaches to data collection and management across the
region limits PSRC’s ability to integrate data, and to understand and communicate transportation
asset conditions at the regional scale. This lack of comprehensive, consistent and integrated regional
data for a number of transportation asset categories makes it more difficult to effectively estimate
what the maintenance and preservation need is at the regional scale, as well as to conduct other types
of cross-jurisdictional needs assessments.

In addition, major gaps in datasets within jurisdictions, insufficient resources to collect new data, and a
lack of access to tools required to process condition data have impacted some jurisdictions’ ability to
accurately and comprehensively estimate need at the local scale as well.

These limitations in articulating current and future maintenance and preservation needs lead to a less
comprehensive approach to planning and delivering investments at the regional and local levels,
reduce opportunities for cross-jurisdictional collaboration and shared resources, and potentially
decrease competitiveness for funding opportunities.

**Maintenance and Preservation is Underfunded across the Region**

While asset condition data and estimates of need at the regional scale are incomplete, we know from
interviews and stakeholder discussions that years of deferred maintenance have led to jurisdictions
across the region facing significant maintenance and preservation backlogs, particularly when it
comes to pavement and bridges. Many agencies are experiencing budget shortfalls and existing
resources allocated to maintenance and preservation have not been sufficient to address these
backlogs or, in some cases, prevent them from growing.
Different jurisdictions face different types of challenges in funding their maintenance and preservation needs. For example, jurisdictions with a high concentration of freight routes traveled by heavy haul trucks often face a large backlog of pavement rehabilitation and reconstruction work that leaves little funding for proactive preventative maintenance, ensuring that the backlog will continue over time. Some jurisdictions are unable to obtain maintenance grants because their assets are in poor condition (leading to a perpetual cycle of disinvestment), while others struggle to meet growing compliance requirements for assets such as stormwater infrastructure or Americans with Disabilities Act (ADA) compliant curb ramps. In addition, maintenance and preservation often competes directly with other funding priorities, such as capacity investments, in the budgeting process. Constrained budgets mean that decision makers sometimes make the difficult choice to allocate fewer resources towards maintenance and preservation than is necessary.

**Maintenance and Preservation in the Regional Transportation Plan**

The plan commits, as a high priority, to funding the maintenance, preservation and safe operation of the existing transportation infrastructure. The methodologies used to estimate these needs across transportation assets incorporate not only the cost of meeting the existing backlog, but also of maintaining a certain state of good repair. PSRC worked with stakeholders to determine specific definitions for each asset. For example, pavement being in a “state of good repair” is defined as being in satisfactory condition per the industry standard Pavement Condition Index rating system. For bridges, a “state of good repair” means (among other things) that a bridge is replaced in a timely manner when it has reached the end of its useful service life (per WSDOT’s useful life definitions). The plan’s financial strategy reflects a concerted effort to develop informed estimates of maintenance and preservation need.

Some examples of the major investments assumed in the plan for maintenance and preservation include:

- Over $10 billion to replace and preserve the region’s bridges and culverts. Specific to bridges, nearly 12% of locally owned bridges will need to be replaced by 2050, at an estimated cost of $2.6 billion, and 7% of state-owned bridges at an estimated cost of $1.7 billion.

- The plan assumes 11 of Washington State Ferries’ existing 21 ferries will need to be replaced by 2050 at an estimated cost of $2.7 billion. Including the need for five new ferries to replace retired vessels as well as to serve as relief vessels, the total investment in the plan is $3.8 billion.

- Maintaining and preserving the region’s roadways – including addressing the existing backlog – is a $28 billion investment. The needs of I-5 alone are estimated to be at

**Seismic Retrofits**

Washington state has the second highest risk in the country of large, damaging earthquakes. In the Puget Sound region, earthquakes have the potential to damage critical transportation infrastructure such as bridges.

WSDOT has identified bridges around the state in need of seismic retrofit. Much has been accomplished over the last two decades, but much work still remains. An estimated need of $1.1 billion or more exists for bridges in the Puget Sound region.

To manage this large need, WSDOT has focused on lifeline routes, consisting of a network of critical corridors supporting essential services and emergency response. Important to note is that I-5 through Seattle is a high-cost corridor and currently unfunded.
least $2.5 billion based on the most recent data available. This investment includes pavement, bridges, fish barriers electrical and other necessary preservation needs. Nearly 1/5th of the state’s total preservation needs by cost are on I-5.

As shown in Figure 28 below, the plan identifies a total of $168.9 billion in estimated need to maintain, preserve, and operate the existing system, which represents 56% of the total investment planned between 2022 and 2050.

Figure 28 - Maintenance, Preservation, & Operations Expenditure Estimates ($2022 Constant)

What’s Ahead?

While the RTP financial strategy captures the full maintenance and preservation need of the system through 2050, the findings above indicate that maintenance and preservation remain underfunded and that agencies are often unable to meet the full need in the short-term. Some key action steps for the future include:

- PSRC will continue to refine methodologies and analysis tools to reflect needs and impacts related to maintenance and preservation. This may include consideration of opportunities and tools available to evaluate impacts to the transportation system if it is not fully maintained and preserved into the future, or alternative scenarios reflective of current trends in the levels of investment.
- Continued monitoring of overall investment levels in maintenance and preservation should occur, as well as the use of various funding mechanisms.
- Given the significant preservation needs on I-5, more complete and current data should be routinely gathered to inform decision makers and identify actionable steps moving forward.
Summary

The investments, programs, strategies, and actions presented in this chapter will work together as an integrated multimodal transportation system supporting the vision for an equitable, sustainable and prosperous region.

Investments address the critical task of repairing and maintaining existing transportation assets, building a more well-rounded transportation network, and making the current system work more efficiently and safely for all users.

Building, maintaining, and operating this integrated system will be a significant undertaking, requiring a sustained commitment to raising and deploying resources, working together, and continuing to innovate and respond to change.