

Passenger Facilities

Safe and well-designed stops, stations, and hubs.

METRO CONNECTS would create well-designed stops and stations—and improve existing facilities—to help keep riders safe and secure, give them better service information, and make transfers easy. We would make improvements at 85 existing and new transit centers and at more than 4,500 bus stops. The improvements would emphasize enhanced safety, new types of customer amenities, and integration between transit providers and other travel modes.

What would passenger facilities look like?

As of 2015, Metro owned and maintained more than 8,000 bus stops, shelters, RapidRide stations, and transit centers. With METRO CONNECTS' proposed expansion of transit service and integration with Sound Transit, the number of Metro-owned stops would increase by approximately 10 percent, and for many trips the fastest option would include a transfer between bus and rail or between buses. Sound Transit's planned and proposed investments would add many more light rail stations.

Not only would there be more stops, stations and transit centers, the number of people using them would increase. The activity at many stops would change, with more riders transferring among buses and rail.

As facilities are built or rejuvenated to accommodate more passengers, they would be designed for easy connections from all available modes—bus, light rail, train, ferry, streetcar, biking, walking, etc.



Facility design principles

METRO CONNECTS envisions top-notch facilities that would give customers a high-quality transit experience.

Facilities would be in the right locations. While following our general guidelines for stop spacing, we would consider topography, safety, lighting, and the presence of sidewalks when deciding where to place stops. Street crossings would be highly visible, well-lit, and located to minimize vehicle/pedestrian conflicts.

Bus loading zones would be close to light rail stations so people transferring would have short walks.

Wayfinding and transit information would be easy to see and understand, and would clearly direct passengers through transfer areas. Consistent signage across all major transfer points would help riders easily navigate Metro's and Sound Transit's systems.

Stops, stations, and pathways would be accessible to all customers, regardless of age or ability. They would have ample space for passenger loading and circulation.

Shelters and waiting areas would include lighting, security features, and protection from rain and wind. Facility designs that limit opportunities for criminal activity would help passengers feel safe and comfortable while waiting for a bus or train.

Transit centers could be spaces for residential, commercial, and community activities, creating a friendly and welcoming atmosphere for transit customers.

Combining many uses at transit centers could also make efficient use of available land, help reduce car trips, and integrate transit with neighborhoods and businesses.



Passenger Facilities, continued

Metro evaluated the future need for transfer locations in the proposed 2040 service network. Figure 19 shows the proposed major transit centers, including Link and some BRT stations. The 85 new or improved transit hubs include:

- All existing, planned, and proposed Sound Transit light rail stations.
- All Metro stops projected to have more than 2,500 daily boardings.
- Other key transfer points and hubs.

Metro and Sound Transit would continue working together to provide passenger facilities that are appropriately sized for the anticipated passenger and bus volumes at light rail stations.

What would it take?

- **Build an extensive system of well-designed and safe passenger stops, stations, and transit centers.** METRO CONNECTS proposes 1,000 additional stops and stations, including 85 new and upgraded transit hubs, by 2040. We would make sure transit facilities are comfortable and easy to use by keeping design guidelines up to date.
- **Work with partners to design facilities that make connections from other modes easy and comfortable.** We would coordinate extensively with Sound Transit early in the design process for light rail and BRT facilities, ensuring that their design makes it easy to transfer between buses and light rail. Minutes spent walking between bus stops and the light rail platform could quickly erode the travel time benefits of the faster service proposed in METRO CONNECTS.



Metro would incorporate principles of universal design, accessibility, social equity, sustainability, and public engagement into the design process.

Coordination between transit agencies and cities would ensure that facility locations are consistent with land-use plans and that their design helps integrate different transportation services. Private, governmental or nonprofit property owners could be partners in transit facility development, helping reduce the costs of land acquisition, construction, and permitting.

Today, only four major transit hubs systemwide have 10,000 or more daily boardings. All four are in downtown Seattle. Westlake Station has the most boardings—28,000 per day.

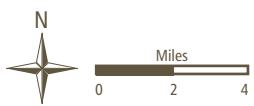
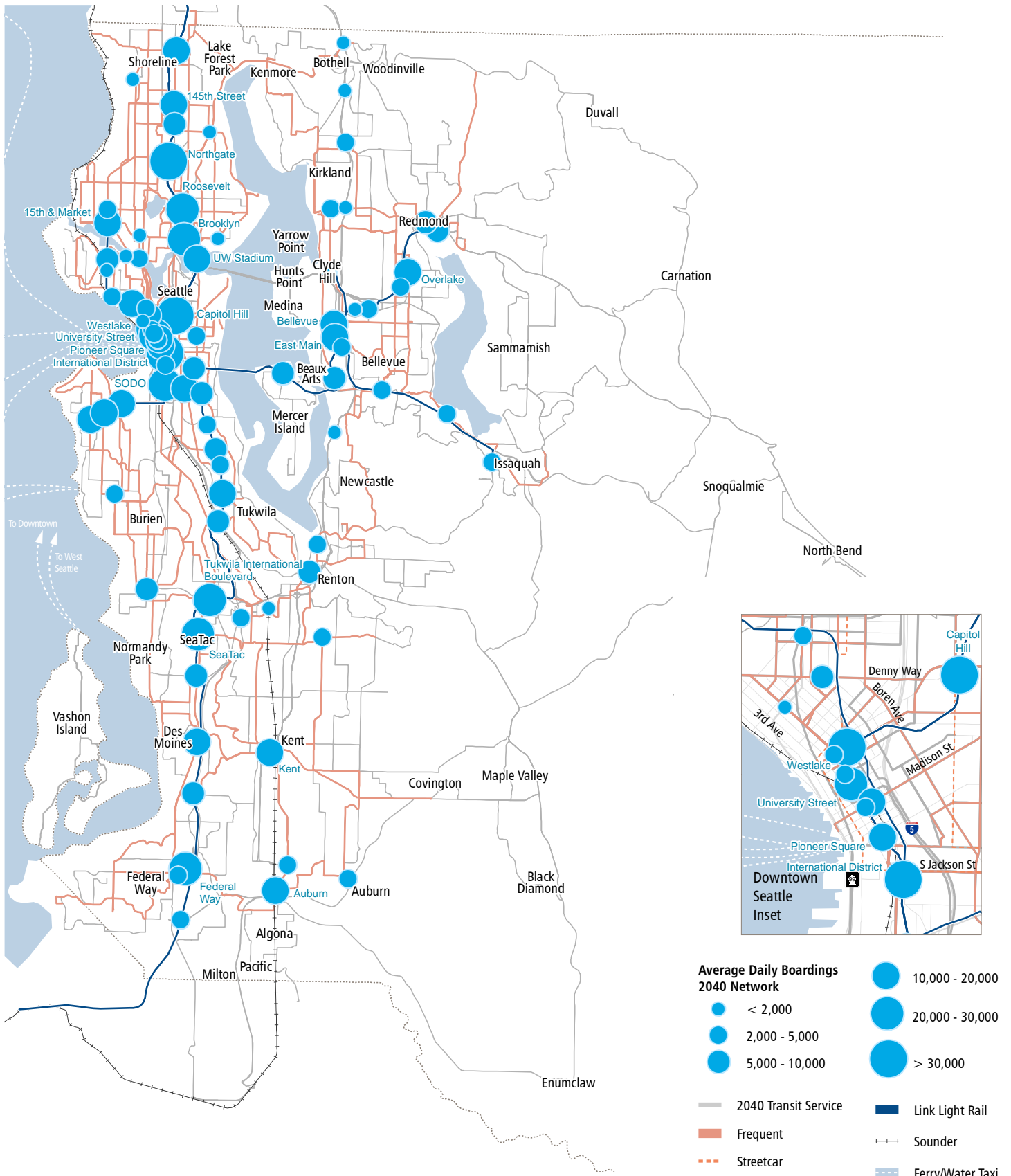
In 2040, as many as 30 hubs across the county could have more than 10,000 boardings. Smaller stops and stations around the county would also see more riders.



FROM OUR CUSTOMERS

“I’ve realized from using RapidRide how nice it is to have all the bells and whistles at bus stops.”

Fig. 19: METRO CONNECTS Anticipated Transit Center Boardings – 2040 Network



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Access to Transit

Safe and abundant options for getting to our service.

We want our customers to have safe, comfortable, and easy access to transit. METRO CONNECTS would develop a portfolio of projects and strategies for improving your walk, bike ride, or drive to or from bus stops and stations.

Including investments by Sound Transit, METRO CONNECTS would expand parking for transit riders in King County by 60 percent and invest equally in improvements for bicyclists and pedestrians. Travel options such as carsharing, bikesharing, taxis, on-demand providers like Uber or Lyft, and public and private shuttles would also help riders reach transit service.

What would access improvements look like?

A person’s decision to drive, ride, walk or bike to transit can be affected by how close they are to a stop, the frequency of service provided there, and the availability of parking, sidewalks, bike lanes, lighting, and other safety and security features.

With the expansion of transit service envisioned in METRO CONNECTS, by 2040 84 percent of customers would get to the bus by walking or biking compared with 78 percent in 2015.⁷

The METRO CONNECTS planning process evaluated ways to improve access to future transit service. We identified four transit access zones where different strategies might be effective. These zones are based on the expected future density of jobs and population and on proposed transit service.

Figure 20 summarizes the zones and types of investments we envision. The estimated number of new stalls is illustrative. The final siting of new stalls would be based on access to the service network—particularly frequent and express service—and on local considerations such as transit demand, traffic impacts, land use and congestion. Figure 21 shows the zones.

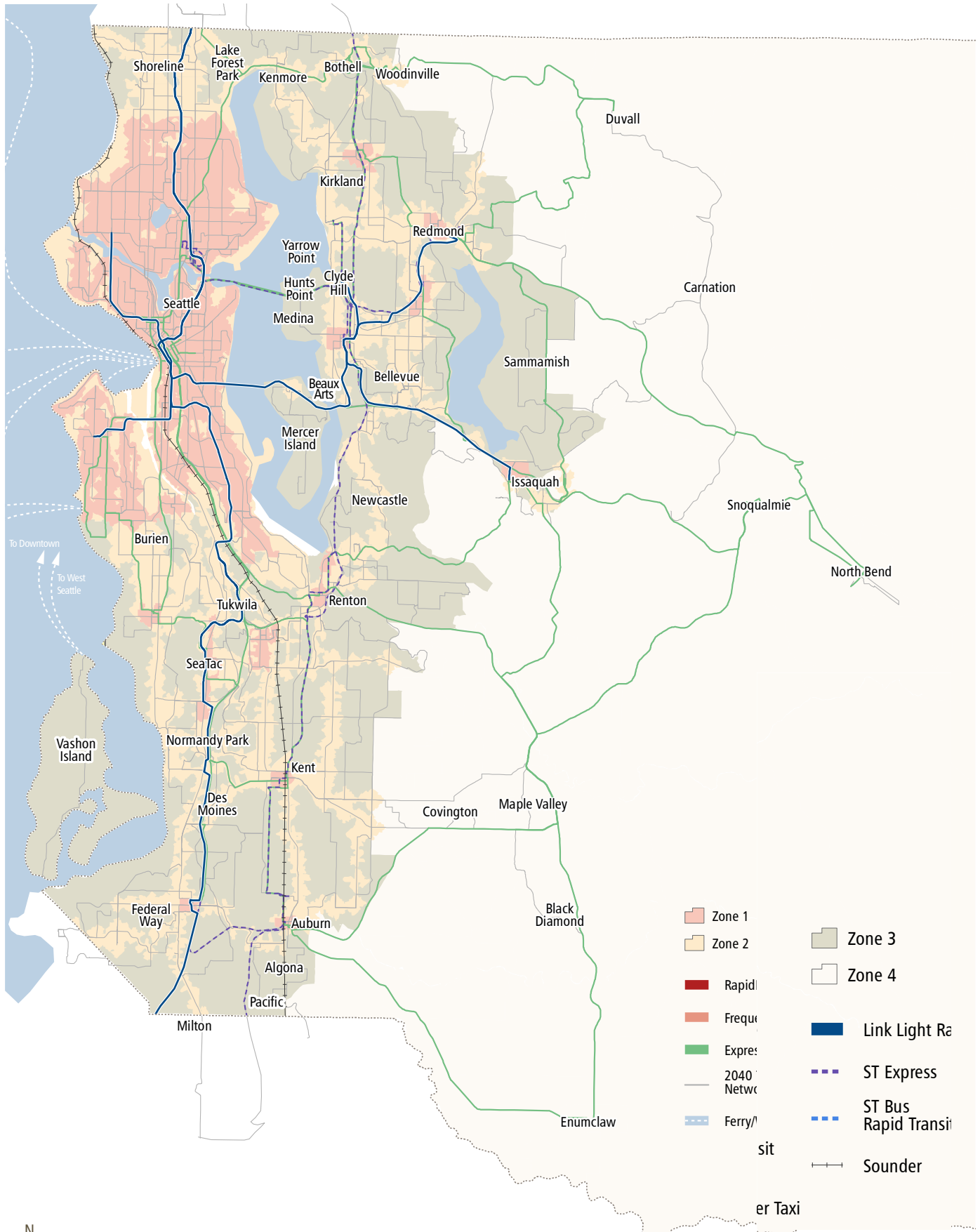
Figure 22, on page 56, illustrates the relationship between park-and-ride expansion and the future light rail, BRT and express network.

⁷ Outputs from model that does not incorporate updated transit mode choice from the most recent PSRC Household Travel Survey.

Fig. 20: Transit Access Zones Description

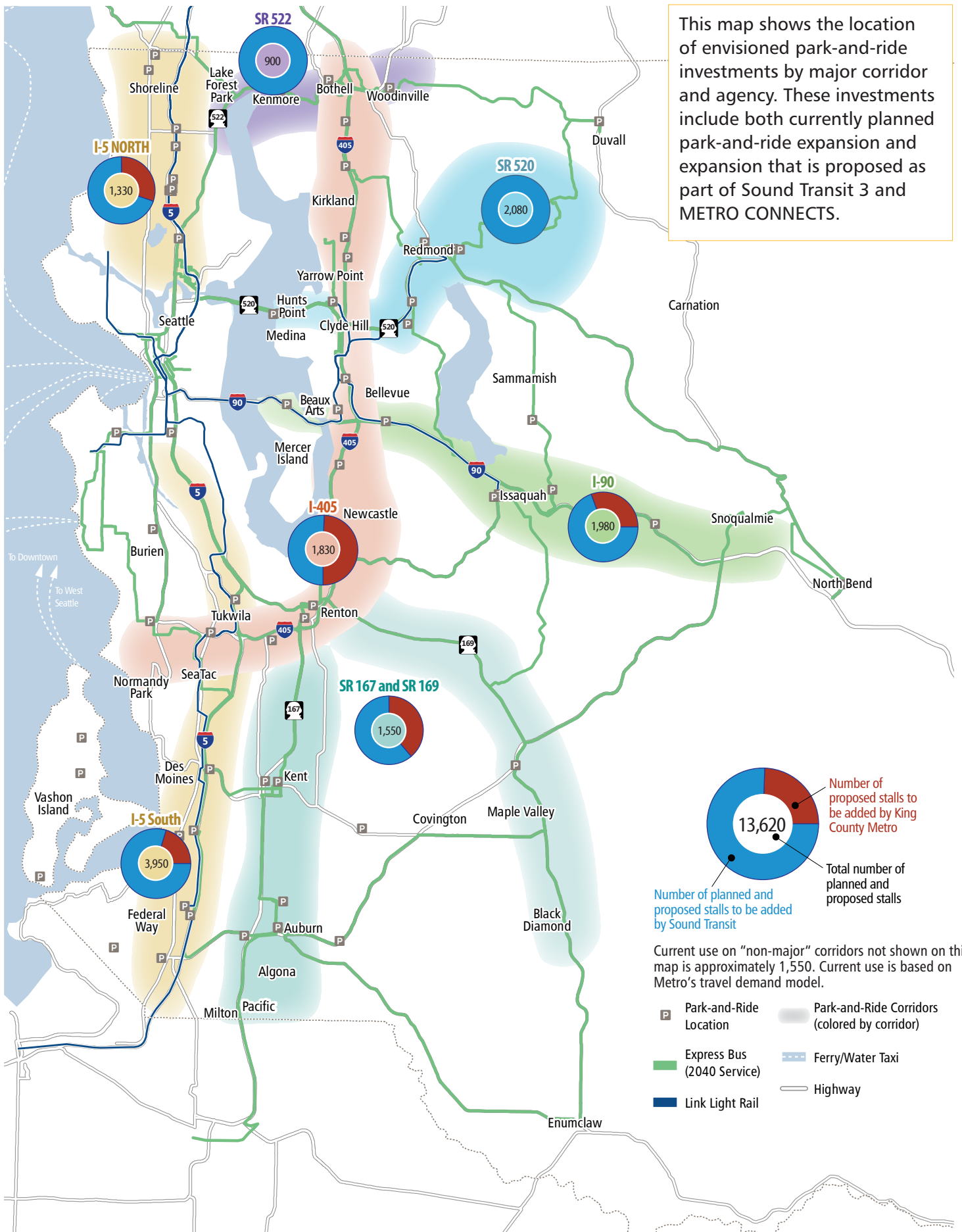
<p>ZONE 1 High-density areas served by a grid of frequent service, such as downtown areas.</p> <p>Improvements Focus on bicycle and pedestrian facilities, little or no expansion of Metro parking.</p> <p>Future bike/walk share 96%</p> <p>Current stalls used: 3,920</p>	<p>ZONE 2 Medium-density areas that are within walking distance of at least one frequent service.</p> <p>Improvements Strong emphasis on more bicycle and pedestrian facilities, little or no expansion of parking.</p> <p>Future bike/walk share 82%</p> <p>Current stalls used: 6,780 Estimated new stalls serving people in Zone 2 by 2040: 4,000</p>	<p>ZONE 3 Lower-density areas within walking distance of less frequent local or express service.</p> <p>Improvements Moderate emphasis on bicycle and pedestrian facilities and some parking investments.</p> <p>Future bike/walk share 50%</p> <p>Current stalls used: 7,300 Estimated new stalls serving people in Zone 3 by 2040: 8,510</p>	<p>ZONE 4 Lowest-density areas with limited or no walk access to transit.</p> <p>Improvements Limited investment in bicycle and pedestrian facilities, emphasis on increasing transit parking.</p> <p>Future bike/walk share 16%</p> <p>Current stalls used: 1,600 Estimated new stalls serving people in Zone 4 by 2040: 1,110</p>
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Fig. 21: Transit Access Zones



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Fig. 22: Planned and Proposed Park-and-Ride Investments by Corridor



Access to Transit, continued

Analysis of motorless modes—walking and biking

King County needs more sidewalks, trails, and bicycle lanes as well as storage facilities to improve bike and pedestrian access to transit. The Puget Sound Regional Council's Transportation 2040 plan describes the region's bicycle and pedestrian needs, and King County is planning for regional trail expansion and improved connections to transit.

Metro and Sound Transit's Non-motorized Connectivity Study evaluated where projects supporting motorless travel could increase transit ridership. Based on this analysis and an investment level similar to that for parking, METRO CONNECTS could fund bicycle and pedestrian access improvements to transit stops across King County in partnership with local jurisdictions' bicycle and pedestrian plans.

To select potential improvements, Metro would identify areas with high potential ridership, giving priority to projects in access zones one and two. Metro would also identify a methodology to estimate the demand for bicycle parking.

We would coordinate with cities, which have plans and requirements for construction of sidewalks, trails and bicycle facilities. Cities can play a critical role in providing sidewalks and trails that connect residents to public transportation.



As the Redmond Transit Center was developed, Metro worked with the City of Redmond and King County Natural Resources and Parks to provide dedicated bike lanes and sidewalks connecting to the Redmond Central Connector Trail to the south and the Sammamish River Trail to the west.

Growing demand for trails and transit

King County has 300 miles of multi-use trails used for some 10 million bicycle and pedestrian trips annually—including a large and growing number of commute trips. The trails network presents opportunities to combine cycling or walking with the fast, frequent transit service envisioned in METRO CONNECTS.

Potential trail routes such as the SR-520 Trail across Lake Washington, the extension of the Mountains to Sound Trail east of Bellevue, the extensive Eastside Rail Corridor/Cross Kirkland Connector trails, and the Lake to Sound Trail from Lake Washington in Renton to Puget Sound in Des Moines would enhance regional mobility.

Our vision is to provide safe and comfortable bicycle and pedestrian connections at park-and-rides, major transit centers, and trails as well as secure bicycle parking.



Access to Transit, continued

Parking analysis

Park-and-rides provide auto access to transit, and by concentrating rider demand they allow Metro to serve low-density areas more efficiently.

Metro provides service to 130 park-and-rides across the county that have a combined total of more than 25,000 parking spaces. Metro and other transportation agencies own or lease these facilities.

Use of park-and-rides is growing, and many are frequently full or nearly full.

To identify where expansion of parking is most critical, we analyzed the transit access zones, shown in Figure 21 on page 55, and Sound Transit’s plans to expand parking. Sound Transit has proposed building more than 10,300 parking stalls in King County as it expands the regional transit system through 2040.

Metro analyzed the number of additional stalls that would be needed in each zone in the future, taking into account dramatically expanded bike and walk access to transit in medium- and high-density zones. The analysis identified where riders who would rely on park-and-rides would live and work. However, the analysis recognized that people might travel to a different area for parking. People in Zone 4 who do not have good walk access to transit would likely drive to Zone 2 or 3 if a park-and-ride is available there.

The analysis suggested the strategies listed on page 59 for transit parking.

- **High- and medium-density zones (1 and 2):** No new parking capacity would be needed for people from high-density zones; limited parking expansion for people from medium-density zones.
- **Low-density zones (3):** Some expansion of transit parking for people from low-density zones.
- **Lowest-density zones (4):** Parking is expected to continue providing an important means of access for people from low-density zones where there isn’t good walk access to transit.

Using this analysis, METRO CONNECTS envisions the addition of more than 13,500 new parking spaces to support anticipated future ridership. These parking spaces are recommended by corridor.

Approximately two-thirds of the suggested future expansion is accounted for by Sound Transit’s proposed projects. If METRO CONNECTS is fully implemented, Metro would consider partnering to provide approximately 3,300 additional parking stalls. Figure 23 shows both existing park-and-ride stalls used by zone and the proportion of riders from each zone that use park-and-rides, and the number of new stalls that would be added to target people from each zone. For example, 8,510 new stalls would be needed to accommodate the projected future riders from Zone 3. The location of those stalls would be determined based on the service network—particularly access to frequent and express service—and on local considerations such as transit demand, traffic impacts, land use and congestion.

Fig. 23: Existing Conditions: Park-and-Ride Access Mode Share and METRO CONNECTS Future Conditions: Estimated Park-and-Ride New Capacity

Transit Access Zone	Park-and-Ride Stalls Used	Proportion of Transit Riders who use Park-and-Rides	Estimated Metro and Sound Transit Planned or Proposed New Park-and-Ride Stalls Provided by 2040	Estimated Proportion of 2040 Transit Riders who use Park-and-Rides
Zone 1	3,920	8%	0	4%*
Zone 2	6,780	41%	4,000	33%*
Zone 3	7,300	64%	8,510	56%
Zone 4	1,600	84%	1,110	84%
Total	19,600	NA	13,620*	NA

*These proportions could be higher if transit riders in these areas use the new Sound Transit lots.
**3,300 from Metro; 10,320 from Sound Transit.

Our parking strategies would be prioritized as follows:

Manage parking supply:

- Increase efficiency, for example by promoting carpools and real-time ridesharing or marketing underutilized lots.
- Implement permits and payment for parking, making it easier for customers to find spaces.
- Improve bicycle and pedestrian access to park-and-rides, for example through better bicycle parking facilities and walkways.

Increase parking supply using relatively low-cost solutions:

- Restripe existing lots to create more spaces.
- Lease more lots, especially in the short term, before we could expand frequent service as proposed or build permanent park-and-rides.
- Use multifamily and commercial lots, which often have parking space available when transit parking is in high demand.
- Add on-street parking, working with cities to minimize impacts.

Build new parking facilities:

Compared to investments in expanding and enhancing service, construction of parking is more expensive for the ridership it generates. This will be a lower priority strategy.

As we consider future park-and-rides, we would coordinate with affected jurisdictions and consider costs and needs, local partnerships, the service network, and other options for accessing transit.



For more information

See Appendix D for more detail on access to transit, including estimates of parking by corridor.

What we've heard about access to transit

As we conducted outreach for this plan, Metro consistently heard from city staff and elected officials about the need for more parking options at major transit centers and park-and-rides. We also learned from our 2014 Rider/Non-Rider Survey that only 34 percent of customers are satisfied with park-and-ride availability.

The online survey conducted in summer 2015 supports the transit access zone approach because it found that priorities varied across the county. For example, parking was more important to Eastside respondents than those from other areas. Parking was the lowest priority for low-income respondents.

METRO CONNECTS proposes to expand all access options according to local priorities.

What would it take?

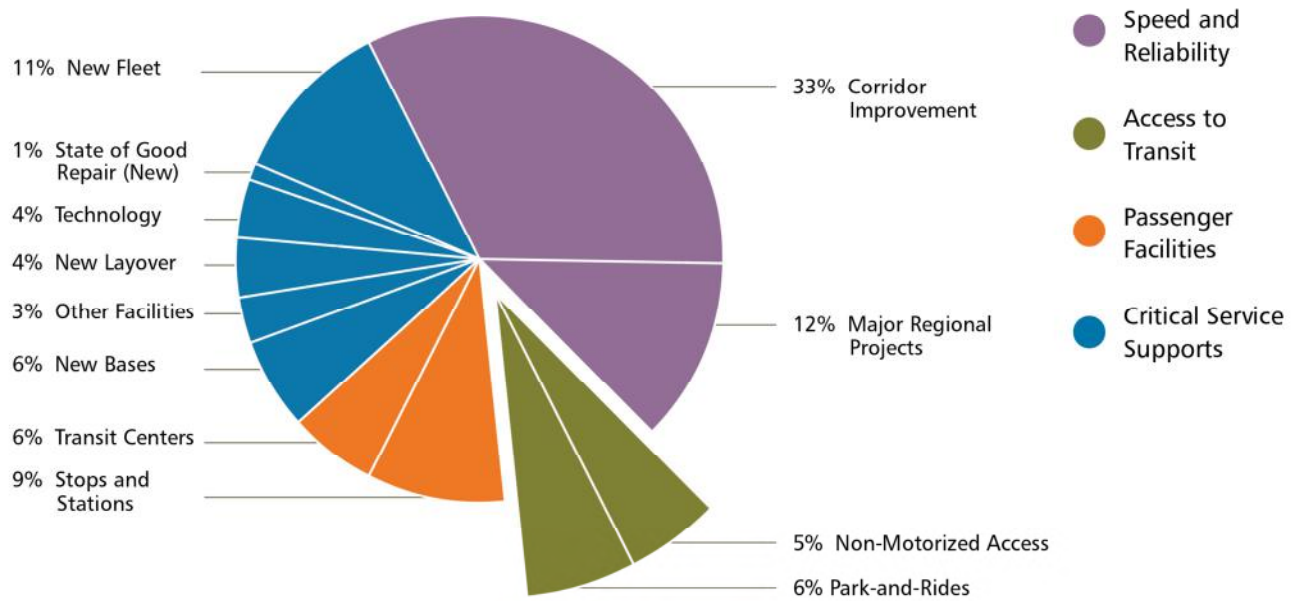
- **Make near-term improvements to parking access and information.** Continue monitoring park-and-rides and pursuing strategies to make the best use of existing resources—including using technology to provide real-time information to customers about parking availability and options for reserving a space.
- **Develop partnerships to improve access to transit.** Work with local cities, King County's Department of Natural Resources and Parks, and other partners to create high-quality trail connections, sidewalks, and bicycle facilities at bus stops and transit centers. Partners could help identify, design, permit, and build access improvements; assist in leased-lot negotiations; and contribute financially. Metro could provide funding to jurisdictions through grants or other mechanisms and help develop grant proposals.

Appendix D. Access to Transit

METRO CONNECTS defines transit access zones, which are described in the full plan, to identify specific types of improvements for different areas of the county. Pedestrian, bicycle, and auto access to transit are all important to support a robust and diverse transit network. The METRO CONNECTS vision includes investments that promote access to transit by all modes. Due to a significant capital investment and stakeholder interest in this topic, the full plan document goes into significant detail on how access to transit was evaluated in METRO CONNECTS.

As shown in Figure D-1, METRO CONNECTS proposes significant investments in both non-motorized and auto access to transit. Access to transit investments make up 11 percent of the METRO CONNECTS capital investment.

Figure D-1 Access to Transit Portion of Capital Costs



Bicycle and Pedestrian Improvements

In the METRO CONNECTS 2040 network, 73% of all King County residents and 87% of all county businesses would be within a half-mile of a frequent transit route. With more people within walking or bicycling distance to transit in the future, Metro would work with local jurisdictions to fund and implement non-motorized transit access improvements that provide customers with safe and easy to use pathways to transit.

The total need, countywide, to complete the non-motorized (sidewalk and bicycling) network far exceeds the resources of any single organization or jurisdiction. In Metro’s Non-motorized Connectivity Study¹⁴ non-motorized access improvement projects that were within one mile of approximately 500 major transit bus stops were identified

¹⁴ “2014. Non-motorized Connectivity Study”, King County Metro and Sound Transit, 2014. Available at: <http://metro.kingcounty.gov/programs-projects/nmcs/>.

by local jurisdictions. This study determined that an investment of about \$1.8 billion would be needed to complete the non-motorized access projects associated with all 500 of the major stops (equaling about \$3.2 million per stop) and that \$450 million would be needed to improve access to transit at the top 25 percent of the bus stops with the worst connectivity. This analysis provides a sense of scale for the need associated with non-motorized improvements.

Considering that there are more than 8,000 transit stops across the county, comprehensive non-motorized access would far outstrip Metro's available resources. METRO CONNECTS proposes to work with jurisdictions to partially fund such improvements.

METRO CONNECTS includes potential funding for non-motorized investment which is intended to leverage funding from local jurisdictions and grants.

Additional non-motorized investments that support the service network envisioned in METRO CONNECTS could be developed by partner agencies and/or local jurisdictions, either independently or in partnership with Metro. At this time, locations have not been identified or prioritized. For cost estimating purposes, a representative investment, roughly equivalent to the proposed investment in park and ride facilities has been used. Note because these costs are in year of expenditure dollars, the differences in total costs between tables D-5 and D-6 are due to the different assumptions in the timing of the park and-ride and non-motorized investments. The total non-motorized costs are smaller than the Park-and-Ride investments because they are assumed to occur earlier in the program. This is, in part, due to the typically long lead time in identifying and procuring the property needed for structured parking and the construction.

As mentioned Metro would contribute to non-motorized transit access improvements in coordination with local jurisdictions. Typical elements to be considered include:

- Sidewalks at major transit hubs
- Bicycle parking at major transit hubs
- Bicycle lanes providing a direct connection to major transit hubs. These include defined portions of the roadway that have been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. Improvements could also include cycle tracks, which are exclusive bike facilities that are physically separated from motor traffic and distinct from the sidewalk via a curb, median, bollards, and/or pavement treatments.

Bicycle and Pedestrian Costing Assumptions

The type and number of facilities described in the plan represent a sample of possible non-motorized improvements that could be constructed. As we move toward implementation, additional facilities or improvements may be identified. For cost estimating purposes, the representative total amount of investment for non-motorized access improvements is equivalent to the amount identified for park-and-ride facilities.

Project costs were estimated for quantities of bicycle parking at major transit hubs, sidewalks, and bicycle lanes and/or cycle tracks by using Metro historical costs, and considering recent engineer's estimates for constructed projects. The engineer's estimates represent the current industry standard for typical unit bid-based costs for known elements such as cement concrete sidewalk, asphalt, concrete curb and gutter, ADA ramp, demolition, and pavement restoration. Typical elements for non-motorized improvements are shown in Table D-1.

Table D-1 Bicycle and Pedestrian Facility Typical Elements

Project Type	Typical Elements
Sidewalks	Site preparation 8-foot new sidewalk (one direction) Curb and gutter Associated stormwater improvements Illumination Americans with Disabilities Act (ADA) compliant ramps
Bicycle parking at major transit hubs	High capacity bike parking in cages with secure access On-demand bicycle lockers
Bicycle Lanes and/or cycle tracks	Site preparation 5-foot bicycle lane (one direction) or 8-foot cycle track (one direction) 8-foot new sidewalk (one direction) Curb and gutter Associated stormwater improvements Illumination ADA ramps

Park-and-Ride Expansion

Table D-2 shows the relative share current of transit access provided by park-and-ride lots in the four transit access zones defined in the plan. These results are based on current park-and-ride utilization data from Metro and travel model data from the Puget Sound Regional Council (PSRC). It is important to recognize that the results in Table D-2 reflect the “home” location of where park-and-ride demand originates, and not the location of the park-and-ride lot itself. As an example, park-and-ride users from Zone 4 areas can and do park at park-and-ride lots located in Zone 2 and 3 areas, where most of the county’s park-and-ride lots are located. It is also important to note that there is no currently available data on the number of people who park on-street and walk to an adjacent transit stop (often referred to as “hide-and-ride”). These types of riders are not considered to be park-and-ride users since they do not park at a lot where they can be counted.

Table D-2 Existing Conditions: Park-and-Ride Access Mode Share

Transit Access Zone	Park-and-Ride Stalls Used	Proportion of Transit Riders that use Park-and-Ride
Zone 1	3,920	8%
Zone 2	6,780	41%
Zone 3	7,300	64%
Zone 4	1,600	84%
Total	19,600	N/A

As shown in Table D-2, park-and-ride lots provide access to more than half of all transit riders in Zone 3 and 4, meaning that most people who use transit in these areas access it via a park-and-ride lot). On the other hand, in Zone 1, more than 90 percent of transit users walk, bicycle, or get dropped off at a bus stop. In Zone 2, which include a large portion of suburban King County, just over 40 percent of transit users park at a park-and-ride lot to access transit. It is important to note that this data reflects current conditions and not the extensive 2040 transit network envisioned in METRO CONNECTS.

To determine the number of future park-and-ride spaces that Metro could partner to construct, the agency considered several factors:

- Population within walking distance to frequent transit service
- Future local/express service expansion

- Proposed park-and-ride capacity identified to be provided by Sound Transit
- Future park-and-ride access mode shares reasonably assumed for each access zone

With the above considerations in mind, the following assumptions were used:

- Metro’s existing owned and leased lots will be actively managed in the future to provide maximum capacity for transit riders, including pricing to incentivize more efficient use of lots. Metro will continue and expand its leased lot program as a way to add capacity without the significant expense of construction, particularly in areas where long term service expansions would mitigate or reduce the need for auto parking.
- Sound Transit has proposed to construct more than 10,320 new park-and-ride stalls in King County as it expands the regional light rail and bus rapid transit system as part of the planned ST2 and proposed ST3 investments
- People who live in Zone 1 and 2 will be within a half-mile walking-distance to RapidRide and frequent transit and it is proposed that they receive no additional park-and-ride capacity.
- The envisioned expansion of the local/express network, assumes that Zone 3 park-and-ride access mode share could drop from 64 percent in 2015 to 50 percent by 2040. This would represent a 22 percent drop in park-and-ride mode access, which would be mitigated by a 26 percent increase in the amount of transit service in the Zone 3 area. Additionally, it is important to note that a 50 percent park-and-ride access mode share is substantially higher than existing park-and-ride access shares in Zone 1 and 2 in 2015.
- For Zone 4, park-and-ride access mode share is assumed to remain unchanged. Park-and-ride lots would continue to be the predominant means of accessing transit in these low-density areas in the future and additional capacity is proposed to address the growth in ridership in this zone.

Based on these assumptions, Table D-3 summarizes the future park-and-ride capacity envisioned as part of METRO CONNECTS. As shown, both Metro and Sound Transit have identified new park-and-ride supply, with Sound Transit potentially adding more than 10,320 spaces and Metro adding 3,300.

Table D-3 METRO CONNECTS Future Conditions: Park-and-Ride New Capacity

Transit Access Zone	Metro and Sound Transit Planned or Proposed New Park-and-Ride Stalls Provided by 2040	Estimated Proportion of 2040 Transit Riders that use Park-and-Ride
Zone 1	0	4%*
Zone 2	0	33%*
Zone 3	2,900	56%
Zone 4	400	84%
Sound Transit (not assigned to access zones)	10,320	N/A
Total	13,620 (3,300 from Metro, 10,320 from Sound Transit)	N/A

* These proportions could be higher if transit riders in these areas use the new Sound Transit lots.

To identify the most effective locations for Metro to add the 3,300 new park-and-ride spaces, the following factors were considered:

- Transit ridership and population growth along major transit corridors
- Currently utilized locations along the major transit corridors
- Future Sound Transit park-and-ride investments

The results of the location analysis are summarized in Table D-4.

Table D-4 Location of METRO CONNECTS Envisioned New Park-and-Ride Capacity

Major Transit Corridor	Current Usage (parking stalls)	Sound Transit Planned and Proposed Future Growth	Envisioned Metro Future Growth	Total Sound Transit and Metro Growth (percent change from existing)
I-5 North King County	1,850	930	400	1,330 (72%)
SR 522	1,300	900	0	900 (69%)
I-405	2,400	930	900	1,830 (76%)
SR 520	1,500	2,080	0	2,080 (139%)
I-90	4,600	1,380*	600	1,980 (43%)
SR 167 / Southeast County	2,600	950	600	1,550 (60%)
I-5 South King County	3,700	3,150	800	3,950 (107%)
Non-Major Corridors	1,650	0	0	0 (0%)
Total**	19,600	10,320	3,300	13,620 (69%)***

* Sound Transit will expand South Bellevue Park-and-Ride by 881 stalls as part of East Link. This analysis attributes these stalls to the I-90 corridor. The proposed light rail extension to Issaquah would include a 500 space garage.

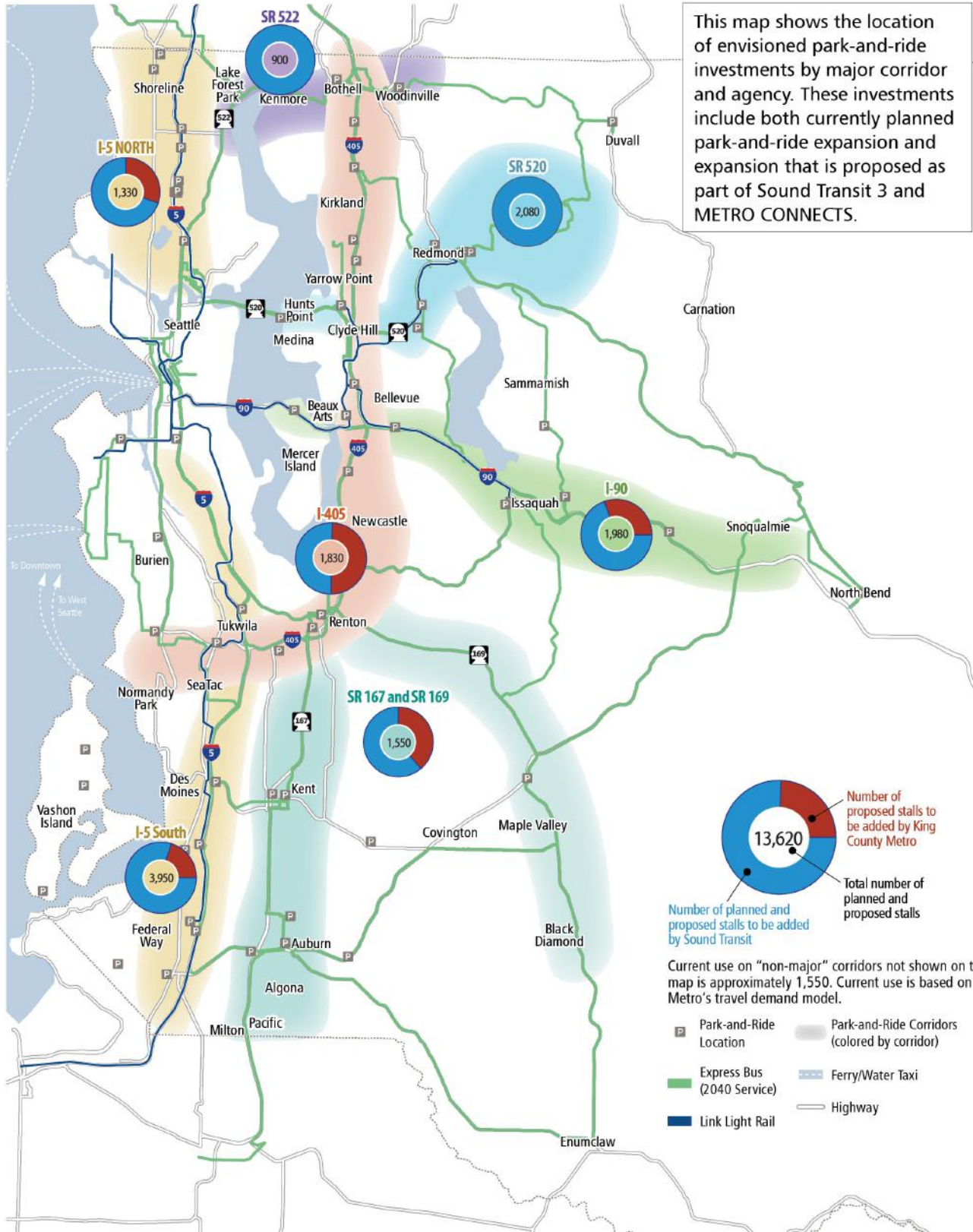
**Reflects total demand, per Metro’s travel demand model. Actual park and ride utilization at all lots in King County, including those owned or leased by Metro, Sound Transit, WSDOT, and others during the first quarter of 2015 is approximately 20,000. Note that total supply of owned lots within the county is approximately 25,000 stalls.

***This analysis does not include the leased lot program.

Table D-4 indicates that all major transit corridors would receive additional park-and-ride spaces, with the largest percentage increases in the I-405, SR 520, and I-5 South King County corridors. In terms of total number of new stalls, the I-5 South King County and SR 520 corridors would increase the most. In total, the park-and-ride system would increase by 69 percent.

Figure D-2 shows the location of envisioned park-and-ride investments by corridor.

Figure D-2 Planned and Proposed Park-and-Ride Investments by Corridor



Park-and-Ride Expansion Cost Estimating Assumptions

Park-and-rides traditionally have been constructed as structured parking garages or surface parking lots. The cost analysis assumed structured parking, which at a higher cost provides a conservative cost estimate. This was also used as an assumption because many locations are spatially constrained and a surface lot is prohibitive. This costing assumption is also consistent with ST3 planning for typical light rail transit garages.

Costs were estimated based on historical construction information from Metro's most recently completed projects in Burien and Redmond Park-and-Ride structured parking facilities. These projects were adjusted using Construction Cost Index (CCI) inflation rates, and then divided to determine a unit price per structured stall which was then applied to the number of stalls.

Typical elements of a structured parking facility include the following:

- Structured parking garage and foundation
- Pedestrian plaza/sidewalk
- Stairs/elevators
- Electrical components
- Illumination
- Utilities
- Site civil work to access garage entrance
- Right-of-way (based on typical structured garages in King County)

Access to Transit Parking Cost Estimates

Table D-5 and Table D-6 summarize the estimated costs for access to transit improvements included in METRO CONNECTS.

Table D-5 *Bicycle and Pedestrian Cost Estimates*

Non-motorized Access Improvements	Unit	Total Units	Estimated Metro Cost (in millions YOE \$)
Sidewalks	Per mile (one way)	50	\$218
Bicycle Parking at Major Transit Hubs	Per each	55	\$34
Bicycle Lanes	Per mile (one way)	40	\$245
Unidentified Investments	---	---	\$49
		Total	\$546

Table D-6 *Park-and-Ride Expansion Cost Estimates*

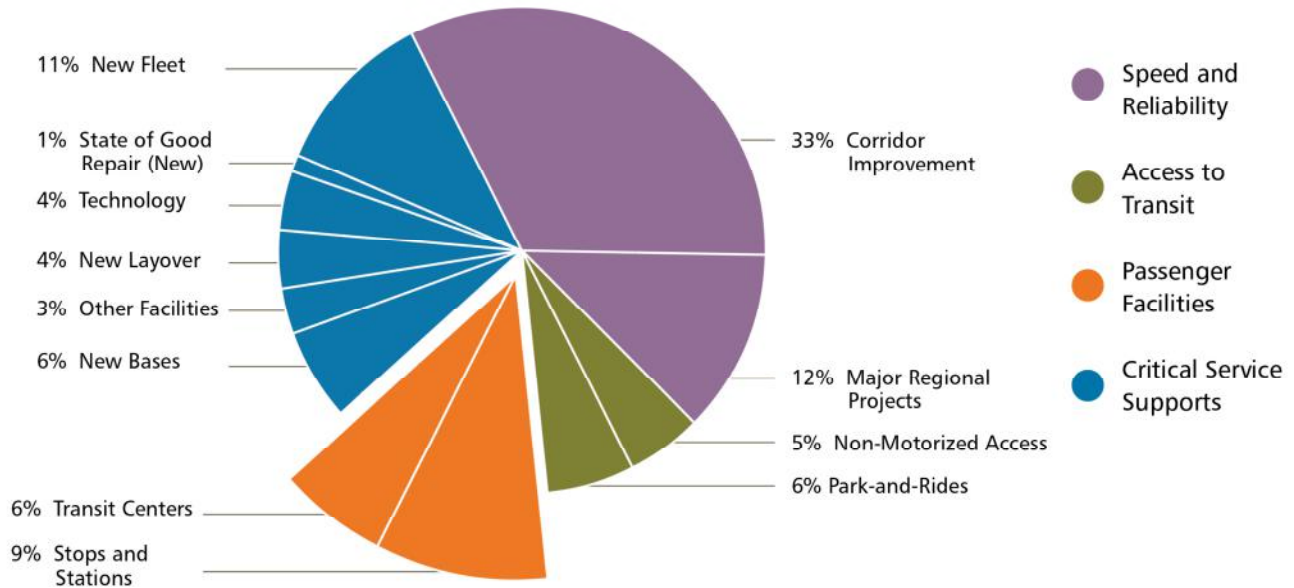
Vehicular Access to Transit Investments	Unit	Total Units	Estimated Metro Cost (in millions YOE \$)
Park-and-Ride Garage Structure	Stall	3,300	\$552
Unidentified Investments	---	---	\$54
		Total	\$606

Appendix E. Passenger Facilities

Improving the passenger experience is a key part of METRO CONNECTS and represents a significant element of Metro’s proposed capital investment. There are two major categories of passenger facilities: transit centers and bus stops and shelters.

As shown in Figure E-1, passenger facility investments make up 15 percent of the METRO CONNECTS capital investment.

Figure E-1 *Passenger Facilities Portion of Capital Costs*



Transit Centers

Metro has tentatively identified the locations of major transit centers or transfer facilities that would be needed to support the envisioned future service network in 2040. By 2040, total transit boardings in King County would double compared to 2015. This growth in ridership would be shared between Sound Transit, with new riders on expanded rail and bus rapid transit (BRT) service, King County Metro, and to a lesser extent Pierce Transit. To achieve this level of transit ridership growth, the envisioned METRO CONNECTS 2040 service network relies on a significantly higher level of bus-to-bus and bus-to rail transfers than the existing network. The facilities necessary to effectively meet customer needs in this future system are very different from what is provided by current facilities. For one, there will be greater passenger activity, including boardings, alightings, and transfers than exists today. Through Metro’s integration with Sound Transit, full busloads of passengers would be expected to transfer to light rail trains to complete their commute, especially during the peak periods. With the anticipated increase in activity, the location and design of transfer facilities would become more important in order to create an efficient and effective transit network and a comfortable, safe, and easy-to-navigate environment for passengers.

Metro calculated the need for future transit centers based upon the envisioned 2040 service network using the following methodology:

- Identified locations of high boarding and transfer activity (more than 2,500 daily boardings/transfers) and high bus volumes (more than 40 buses per hour during the peak period)
- Evaluated existing facilities at each location
- Identified areas that Sound Transit (ST) is planning and proposing investments in bus/rail integration facilities (ST2 or ST3), at which ST plans to include:
 - 2 off-street bus bays
 - 5 off-street bus layovers
 - 2 on-street bus bays
 - An area of approximately one acre at each site
 - A canopy, wind screen, benches, trash cans, information pylon, etc.
- Determined net future investment needed

The locations of major facilities in the METRO CONNECTS 2040 service network and their anticipated boarding and transfer levels are shown in Figure E-2 and Figure E-3. These figures illustrate the anticipated passenger volumes and activities at these locations.

Several of the envisioned future transfer points are existing or planned light rail stations that will be designed and constructed by Sound Transit. In addition to being located at light rail stations, major transit centers and transfer points would be located where bus boardings are high and transfers are anticipated.

Metro would contribute to investments in transit centers and bus stop projects to support the METRO CONNECTS 2040 service network but assumes that these investments would be built in partnership with local jurisdictions, state agencies, and other transit providers to ensure they meet the jurisdictional character and needs. Transit centers will include both on- and off-street facilities. Approximately 85 transit centers would be needed to support the 2040 service network. The type of investments and design of transit will be based upon a number of factors, including bus volumes and location. Consistent design elements, such as wayfinding signage and passenger information, can help to provide consistency across all sites. Coordination among Metro and other transit providers would be required to create standard features at major transit centers.

Transit Center and Transfer Point Costing Assumptions

The estimated cost for off-street facilities was based on historical construction cost information from Metro's most recently completed facilities: Burien and Redmond Transit Centers. The costs were adjusted using CCI inflation rates and then divided to determine a unit price per bus bay. The estimated costs for on-street facilities were based on a recent engineer's estimate for a minor roadway widening/bus bulb plan. The estimates represent the current industry standard for typical unit bid-based costs for known elements such as cement concrete sidewalk, asphalt, concrete curb and gutter, ADA ramp, and pavement restoration. Typical elements are shown in Table E-1.

Table E-1 On- and Off-Street Facility Typical Elements

Project Type	Typical Elements
Off-street transit center facility	Right-of-way (based on right-of-way required for Burien/Redmond Transit Centers) 6 active bus bays 6 to 8 layover spaces Emergency call stations Security Driver comfort station Minor roadway work Sidewalk modifications Driveways Access road paving
On-street transit center facility	Roadway paving Sidewalk Concrete pad Additional signage

Figure E-2 Transit Centers – METRO CONNECTS Anticipated Boarding and Transfer Levels

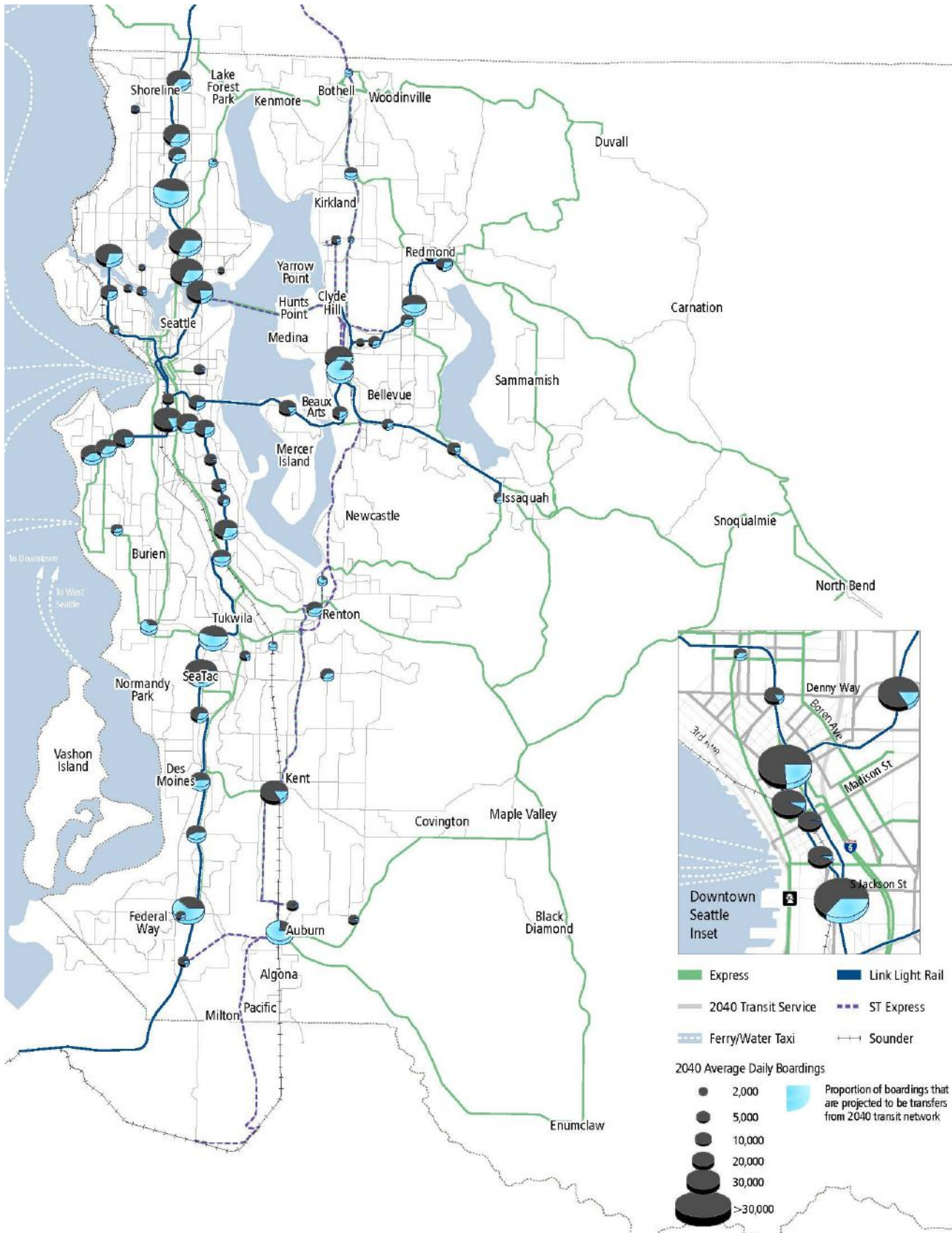
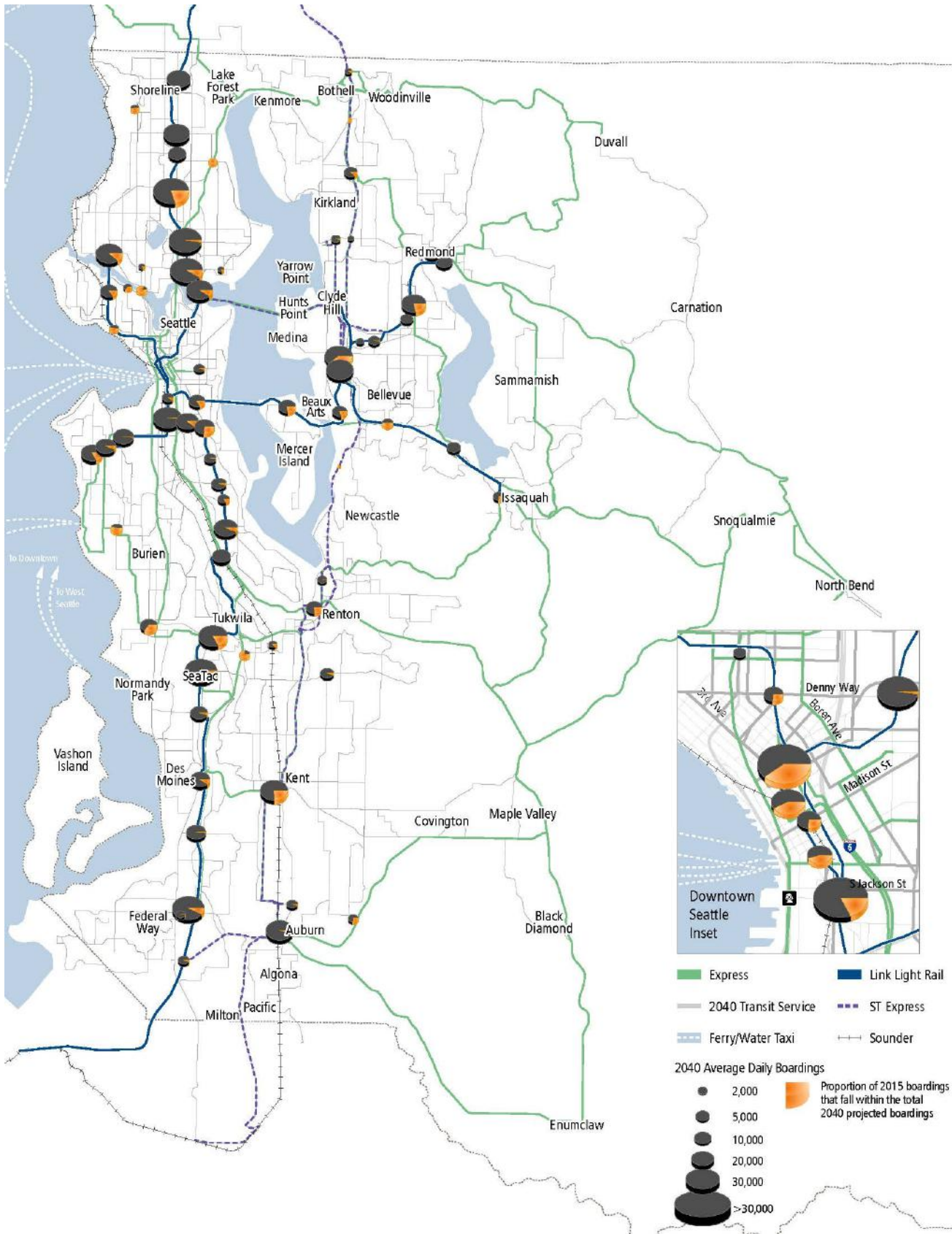


Figure E-3 Current and METRO CONNECTS 2040 Boarding Levels



Bus Stops and Shelters

Bus stops and shelters are some of the most important places where customers interact with the agency. Annually, Metro makes an investment in these facilities and also ensures that they are maintained in a state of good repair. Metro serves a variety of bus stops and shelters containing different amenities, based on ridership and service levels. As the agency grows and modifies its service network to meet future needs consistent with the METRO CONNECTS vision, it will need to provide new and expanded passenger facilities. As with transit centers, the envisioned increase in ridership and the increased level of transfer activity will merit an increased investment in passenger facilities, creating a more comfortable and safe environment for passengers.

Metro assumes these facilities would be developed in partnership with local jurisdictions, state agencies, and/or other transit providers. In particular high ridership and transfer facilities will be built with close coordination and partnership with jurisdictions to ensure they meet local needs and character.

Metro currently serves standard bus stops (unsheltered or sheltered) and RapidRide bus stops (standard, enhanced, and stations). Metro owns and maintains approximately 8,400 bus stops with nearly 1,700 of these having shelters. Each type of facility includes different programmatic elements based on passenger needs.

Standard Bus stops (non-RapidRide)

At bus stops with lower ridership, Metro provides a bus stop sign, which indicates to passengers where and which buses will stop to pick them up. Metro provides bus shelters at bus stops based on ridership. Metro's current threshold for installation of a bus shelter at a bus stop is 50 or more riders per day within the city of Seattle and 25 or more riders per day in areas outside of Seattle (Metro 2013). The anticipated increase in ridership associated with the METRO CONNECTS 2040 service network means that the number of facilities will grow.

Metro calculated the need for future standard bus stop improvements based upon the envisioned 2040 service network using the following methodology:

- Calculated number of bus stops with fewer than 1000 daily boardings
 - Assumed that all existing shelters remain in place
 - Assumed that the proportion of stops that meet the daily shelter requirements increases proportionally with ridership on non-RapidRide lines
 - For newly identified shelters:
 - Assumed half will receive standard shelter investment (bus shelter, shelter footing, litter receptacle, bench)
 - Assumed half will receive twice the standard shelter investment.
- Calculated number of bus stops with more than 1,000 daily boardings, low transfer activity (fewer than 500 daily transfers)
 - Assumed four times the standard shelter investment at these locations
- Calculated number of bus stops with more than 1,000 daily boardings, high transfer activity
 - Assumed an investment comparable to a RapidRide station
- Assumed that half of existing sheltered bus stops will need an additional investment equal to the standard shelter investment as ridership grows

RapidRide Bus Stops

Metro's BRT system, known as RapidRide, currently has six limited-stop bus routes. These routes have three classes of bus stops: standard, enhanced, and station. All bus stops have unique design and branding that identifies them as RapidRide stops. RapidRide standard and enhanced bus stops have features that are similar, respectively, to non-sheltered and sheltered bus stops that are not part of the RapidRide system. RapidRide stations are the largest in size and have the highest level of passenger amenities:

- Shelters that are well-lit so people can see around themselves and be seen.
- Shelters with more weather protection overhead than typical shelters.
- Lights on top of station shelters help identify them from a distance.
- ORCA card readers at stations that allow riders with ORCA cards to pay before they board a RapidRide bus and get on at any door.
- Electronic signs that display how many minutes it will be until the next bus will arrive. When a RapidRide station is served by additional routes, the signs also display the arrival time for them.
- Large, illuminated maps of the RapidRide line showing all the bus stops and destinations.
- Request signals at the bus stop that trigger a light at night to indicate to the driver that they are waiting.
- Accessible boarding platforms which also have, benches, trash receptacles, and bicycle racks.
- Amenities for the sight and hearing impaired, including tactile paving, different colored/textured pathways, braille signage, and audio announcement buttons.

The scale of amenities provided at each RapidRide stop is based on several factors, including ridership. Generally, RapidRide stops with more than 150 daily boardings receive the station level of amenities, stops with 50 to 149 daily boardings receive a RapidRide enhanced bus stop, and stops with less than 50 daily boardings receive a standard RapidRide stop (Metro 2013).

The need for future RapidRide bus stops is based upon the METRO CONNECTS 2040 service network which identifies that the system will grow to 26 lines. The following methodology was used to determine the individual elements:

- Reviewed the existing percentage of bus stops with stations, enhanced, and standard amenities
- Determined the total number of RapidRide bus stops based on miles of envisioned 2040 RapidRide service and half-mile stop spacing
 - Estimated the growth in riders/mile from existing to the future (approximately 45 percent)
 - Applied a riders/mile growth rate to the existing station percentages
- Calculated the number of RapidRide stops by type by multiplying the new station percentages and the number of new RapidRide stops

Passenger Facility Cost Estimating Key Assumptions

Passenger facilities are assumed to include investments along existing and future RapidRide corridors, as well as non-RapidRide corridors. Estimated costs were based on historical construction cost information from Metro for passenger facilities, extrapolated into the future. Non-RapidRide corridors were broken down into categories according to the number of boardings/transfers and appropriate costs were applied. Additionally, costs were estimated to support expansion of the RapidRide network which will require more facilities of all types.

Typical elements are shown in Table E-2.

Table E-2 Bus Stop and Shelter Typical Elements

Project Type	Typical Elements
Standard shelter (Non-RapidRide/fewer boardings)	50 percent of shelters identified include 1 shelter 50 percent of shelters identified include 2 shelters Litter receptacle Bench
Standard shelter (Non-RapidRide/low transfers)	4 standard shelters Litter receptacle Bench
Standard shelter (Non-RapidRide/high transfers)	Comparable elements to RapidRide station, including; <ul style="list-style-type: none"> • Shelter and foundation • Bench • Lit blade • Litter receptacle • Bicycle rack (optional) • iStop (optional) • Pedestrian lighting • Real-time bus information • Power supply 50 percent of existing sheltered bus stops receive additional improvements: <ul style="list-style-type: none"> • 1 additional standard shelter • Litter receptacle • Bench
RapidRide standard bus stop	Bench iStop (optional) Unlit blade marker (RapidRide branding sign)
RapidRide enhanced bus stop	Shelter and foundation Bench iStop (optional) Litter receptacle
RapidRide station	Shelter and foundation Bench Lit blade Litter receptacle Bicycle rack (optional) iStop (optional) Pedestrian lighting Real-time bus information Power supply

Passenger Facility Cost Estimates

Table E-3 shows the level of investment in passenger facilities to accommodate future ridership at transfer centers. Table E-4 shows the estimated costs for bus stops and shelters.

Table E-3 METRO CONNECTS Transit Center Estimated Costs

Transit Center Investments	Unit	Total Units*	Estimated Metro Costs (in millions YOE \$)
Off-street Transit Center	Bus Bay	80	\$503
On-street Transit Center	Bus Bay	40	\$11
Unidentified Investments	---	---	\$50
Total			\$564

* A single transit center is comprised of multiple bays. This quantity allows for consistent cost estimation across locations, but does not specify the size of each facility.

Table E-4 METRO CONNECTS Bus Stops and Shelters Estimated Costs

Bus Stops and Stations Investments	Unit	Total Units	Estimated Metro Costs (in millions YOE \$)
Bus Stop Projects			
Shelters (low boarding activity)	Shelter	1,180	\$132
Shelters (low transfers)	Shelter	350	\$105
Shelters (high transfers)	Shelter	405	\$169
Existing Bus stop Improvements			
Standard Bus stop (RapidRide)	Bus Stop	110	\$21
Enhanced Bus stop (RapidRide)	Bus Stop	240	\$46
Station (RapidRide)	Station	720	\$369
Unidentified Investments	---	---	\$88
Total			\$990