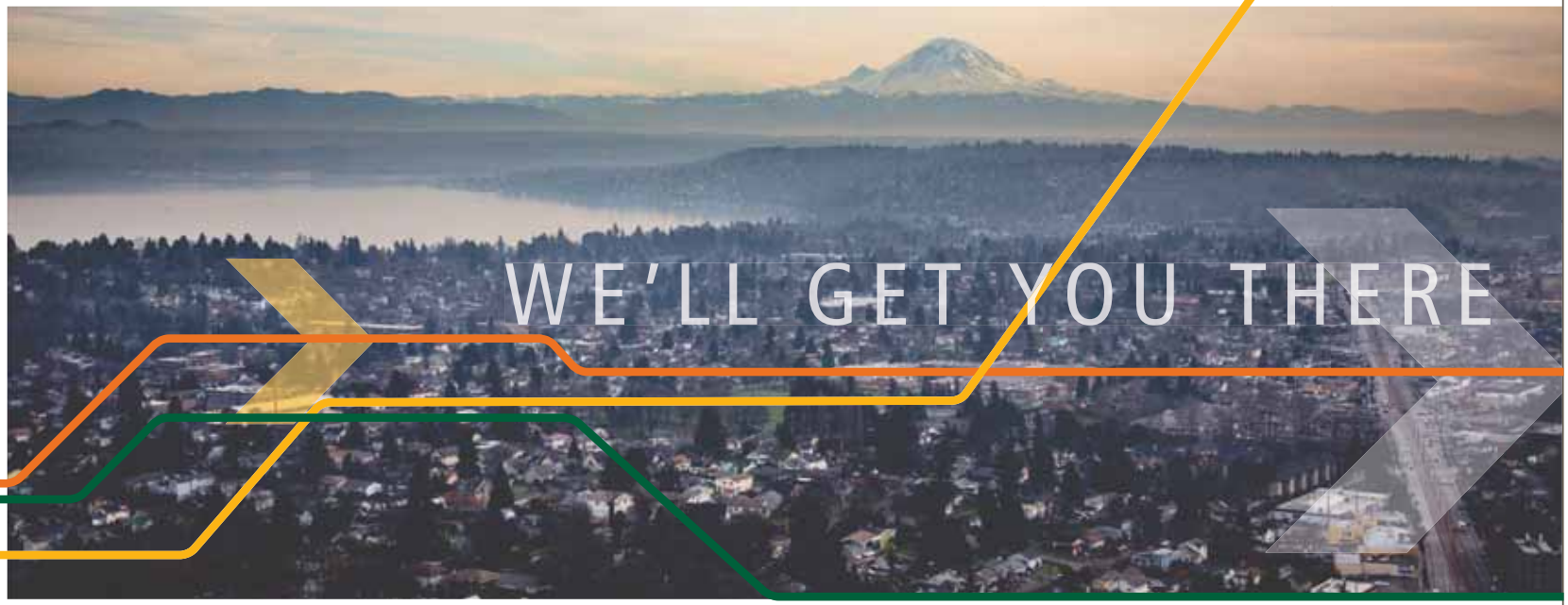


King County METRO

Long-Range Public Transportation Plan

Existing Conditions and Planning Context Report

Final Draft

DRAFT 4-10-15

Metro's Services

The best-known of Metro's offerings is fixed-route bus service. In spring 2014, Metro operated 214 routes. Following service reductions in September 2014, Metro now operates 185 fixed routes with varying levels of frequency, or service families. Service families and the number of routes in each category are: very frequent (27), frequent (17), local (50), hourly (19), and peak service only (72).

Included in the fixed-route network are six RapidRide lines that provide fast, frequent service throughout the day on major travel corridors. RapidRide buses arrive at least every 10 minutes during the busiest morning and evening travel hours. Stations have distinctive shelters and electronic signs that provide real-time bus arrival information. RapidRide has proven to be popular; ridership on all the active routes combined had grown 44 percent above their predecessor routes by year-end 2014. The RapidRide lines carry about 14 percent of Metro bus riders.

About 8,400 bus stops and 130 park-and-ride facilities support the fixed-route bus system.

The maps on the following pages (Figures 2 through 5) show the existing Metro fixed-route network by service family as of spring 2014.

In some areas where fixed-route bus service isn't provided, Metro offers Dial-A-Ride-Transit (DART) service. DART vans operate on variable routes; customers can pre-arrange to be picked up or dropped off at locations off the regular route that are within the defined service area. In 2014, 17 DART routes provided about 1.1 million passenger trips.

To help manage traffic and get people to major events such as football games, Metro provides special event service.

Metro operates Seattle Streetcar services and Sound Transit's Link light rail and most ST Express bus service in King County under contracts with the City of Seattle and Sound Transit, respectively.

Metro's fixed-route buses, DART, special event service, and South Lake Union Streetcar delivered a record-high 120.9 million passenger trips in 2014. On average, that's about 400,000 passenger trips every weekday. Including the Sound Transit services, the grand total number of passenger trips Metro provided in 2014 was 140.7 million—also a record high.

To assist riders who have disabilities or special needs, all Metro buses have wheelchair lifts or ramps, and all routes and trips are accessible. For riders who have disabilities that prevent them from using regular bus service, Metro offers Access paratransit van service, which provided 1.1 million passenger trips in 2014. Metro also has a taxi scrip program and a Community Access Transportation program, which supports community agencies that provide van service for people with disabilities. Altogether, the three paratransit services provided about 1.4 million passenger trips in 2014.

Metro has the largest publicly owned vanpool program in the country. By year-end 2014, about 1,450 Metro vanpools were serving approximately 6,600 people each weekday, for a total of about 3.4 million passenger trips in 2014. Metro also supports the regional Ridematch program, which helps commuters form and sustain new vanpools and carpools.

A relatively new and growing part of the Metro family is the alternative services program. In areas of King County that lack the kind of land use, infrastructure, and density that supports regular bus service, this program works with communities to devise innovative transportation options tailored to local needs. An example is a shuttle service operated by a community organization using a vehicle provided by Metro. Alternative services can be a better match for community needs and can also be more cost-effective than bus service. The King County Council approved $12 million for alternative services in the 2015-2016 biennium.

Figure 1 shows 2014 ridership by mode on Metro services.

Customer Service

Metro provides an array of services to inform and assist customers:

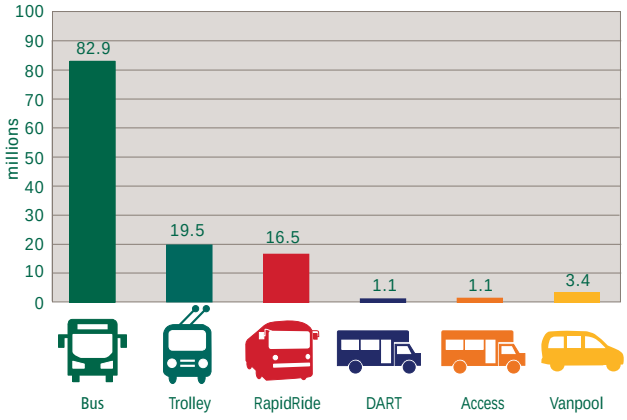
- Metro Online
- A call center open 6 a.m. to 8 p.m. weekdays for trip planning and lost-and-found calls; interpreters are available
- Two customer information offices, in Seattle's Pioneer Square and Westlake Station
- Lost-and-found office
- A transit alert system that sends subscribers emails or text messages about service disruptions or changes
- Real-time bus arrival signs at RapidRide stations
- Social media – Facebook, Metro Matters blog, and Twitter
- Trip Planner (online and smartphone App); provides information for all agencies and modes—bus, train, light rail, streetcar, ferry, water taxi and monorail—in the central Puget Sound region

Employer Services

Metro manages an employee transit pass program that has about 1,900 business accounts. By giving employees an incentive to commute by transit, this program reduces traffic congestion in employment centers and saves parking costs for businesses.

Metro also as has a commute trip reduction program that serves about 480 major employers.

Fig. 1: Annual Boardings By Mode (millions)



Definition of Service Families

Service Family	Frequency (minutes)			Days of Service	Hours of Service
	Peak[1]	Off-Peak	Night		
Very frequent	15 or better	15 or better	30 or better	7 days	16-20 hours
Frequent	15 or better	30	30	7 days	16-20 hours
Local	30	30-60	*	5-7 days	12-16 hours
Hourly	60 or worse	60 or worse	–	5 days	8-12 hours
Peak	8 trips/day minimum	–	–	5 days	Peak
Alternative services	Determined by demand and by community collaboration process				

[1]Peak periods are 5-9 a.m. and 3-7 p.m. weekdays; off-peak are 9 a.m. to 3 p.m. weekdays and 5 a.m. to 7 p.m. weekends; night is 7 p.m. to 5 a.m. all days.

*Night service on local corridors is determined by ridership and connections.

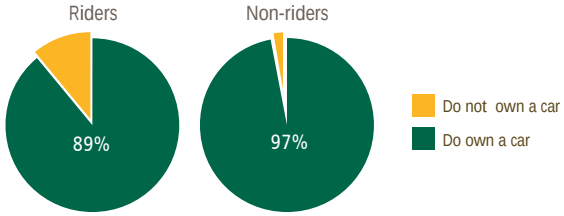
1.2 Service Area and Delivery

Metro's service area is all of King County. With more than 2 million residents, King County is the most populous county in Washington. It hosts more than 1.2 million jobs.

Figure 2 shows King County and the cities within it. The county covers a large and diverse area—more than 2,100 square miles that includes dense urban neighborhoods and small rural communities. However, much of King County is undeveloped. Nearly 83 percent of the population and more than 93 percent of the jobs lie within the county's 39 incorporated cities.

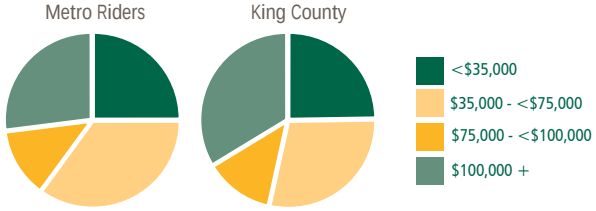
In addition to serving diverse communities, Metro serves a broad range of customers, many of whom are "choice" riders. Nearly 90 percent of regular customers own a vehicle, as depicted on Figure 3. Figure 4 shows a comparison of incomes for Metro riders and non-riders. The income profile of Metro riders closely matches that of the county as a whole. The median annual income of customers is nearly $65,000, and 27 percent earn more than $100,000. More than 60 percent of riders are employed, 10 percent are students, and 13 percent are retired. Metro's customers ride transit not only to save money but also for ease of commuting and to protect the environment. Metro's pass program for businesses and schools also contributes to ridership. The employer Passport program accounts for about 15 percent of Metro's ridership. The University of Washington's U-Pass program accounts for another 9 percent.

Fig. 3: Comparison of Rider and Nonrider Car Ownership



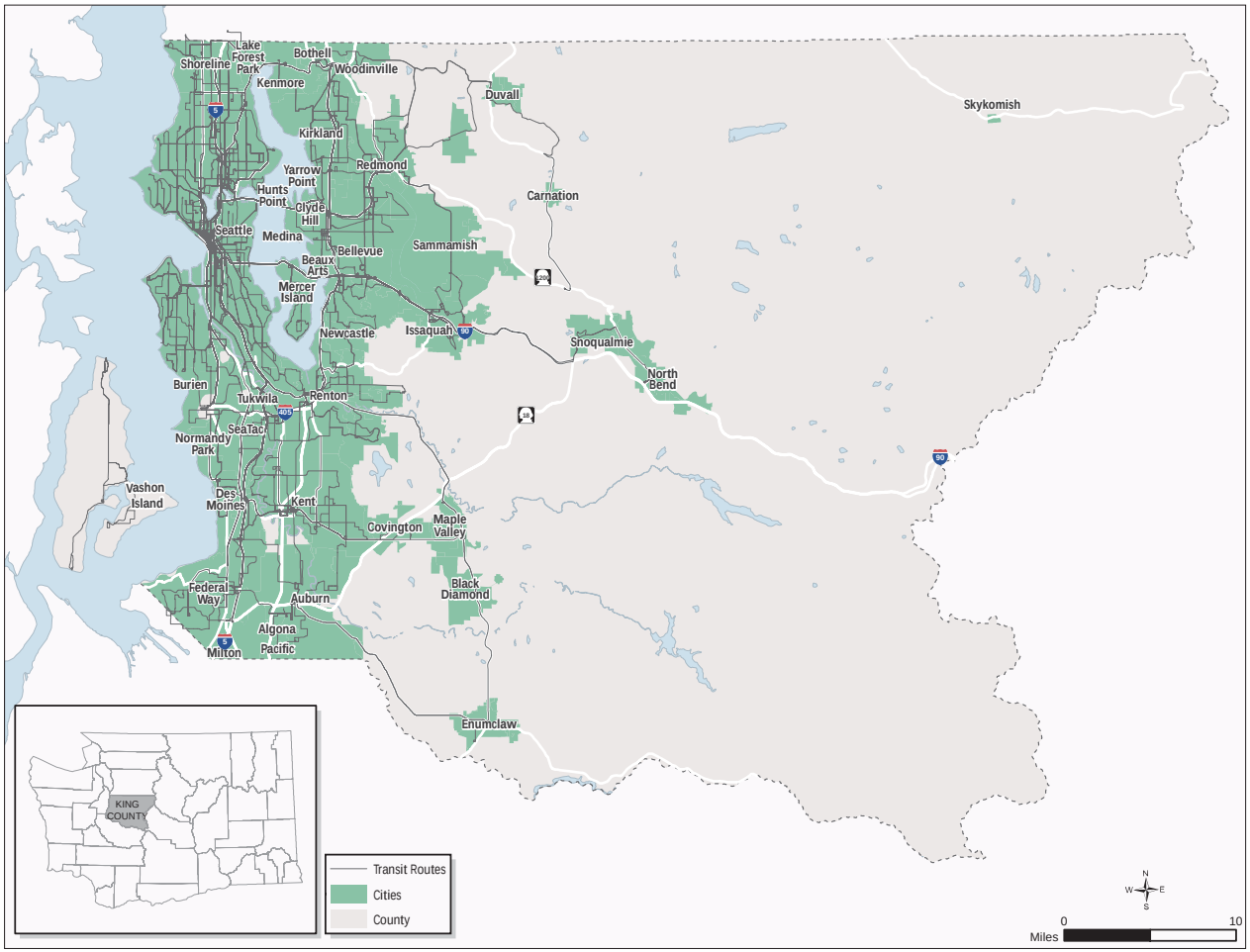
Data source: King County Metro 2013 Rider/Non-rider Survey

Fig. 4: Comparison of Metro Rider and King County Incomes



Data source: King County Metro 2013 Rider/Non-rider Survey

Fig. 2: King County



1.2.1 How is the Population Distributed?

It's important to understand where people live in King County because transit service is typically well used in areas with higher concentrations of people. Figure 5 shows how the county's population is distributed and highlights areas of high density, such as portions of Seattle, Kirkland, Bellevue, Renton, and Federal Way.

Figure 6 shows another way to look at population density. It shows the average population density for the five most-dense cities in the county, along with the average of all cities in the county. The population density of Seattle stands out. It is about 80 to 85 percent higher than the next-most densely populated cities—partly explaining why Seattle has higher demand for transit than other areas. Per capita transit demand is also higher in Seattle.

Figure 7 shows the 10 growth centers with the highest population density. These centers tend to be much denser than the surrounding city or the county as a whole. Transit is a critical part of the transportation network in these areas.

A key element of the region's Vision 2040 plan is to focus future growth into designated centers. Regional growth centers are dense, walkable, mixed-used areas that are targeted for housing and employment growth as well as regional funding. Regional manufacturing/industrial centers are locations for increased employment. These centers are listed on page 7 and shown in Figure 8.

A rough guide for density and appropriate transit service:

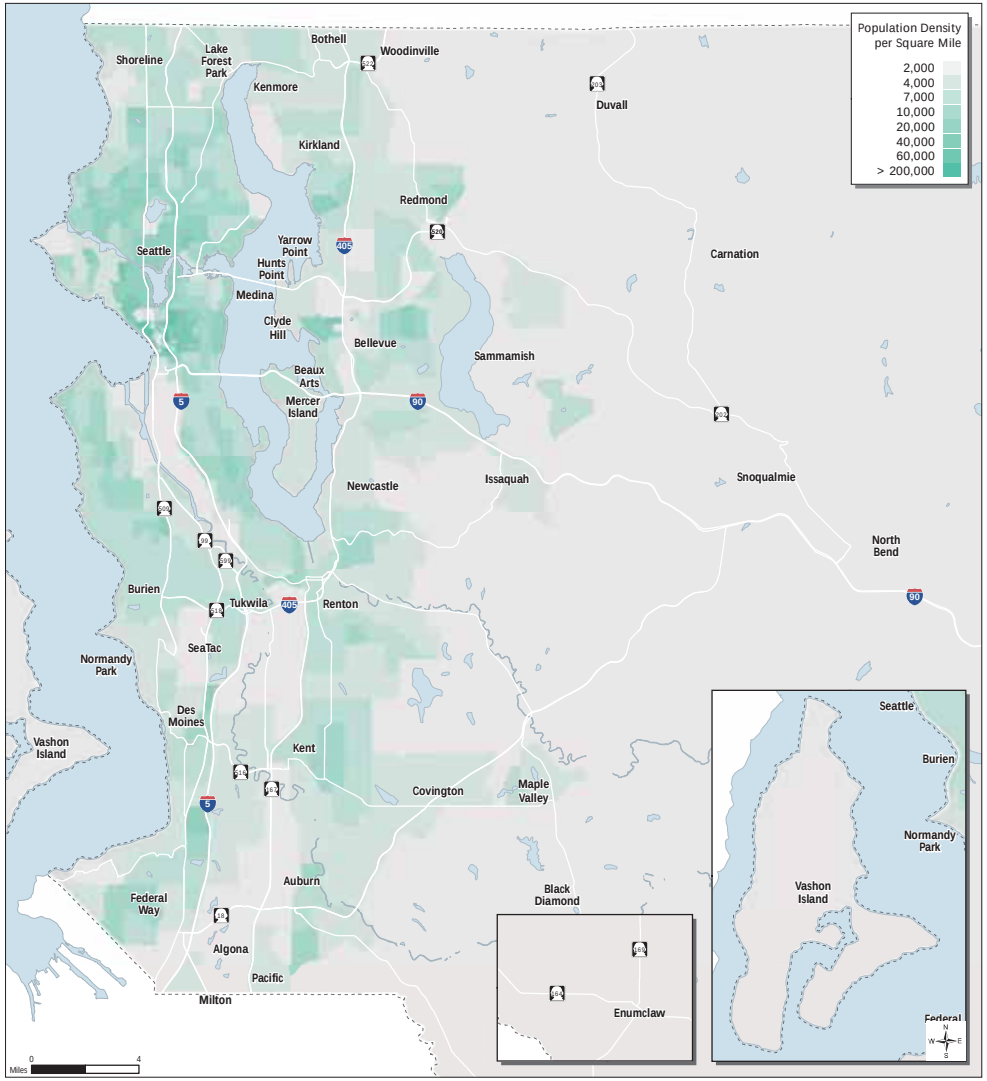
2,000-2,400 persons per square mile = hourly service (often considered minimum density for supporting fixed-route transit)

3,800-4,600 persons per square mile = 30 minute service

6,000-7,400 persons per square mile = frequent bus

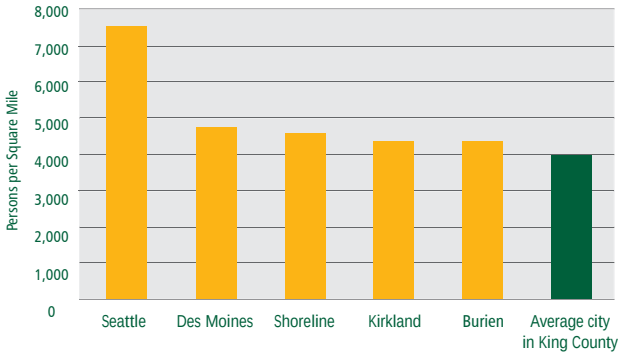
7,600-9,300 persons per square mile = BRT/rail/high capacity transit

Fig. 5. Existing Population Distribution



Data Source: PSRC Travel Demand Model. Accessed January 2015

Fig. 6: Top Five Cities: Population Density Chart



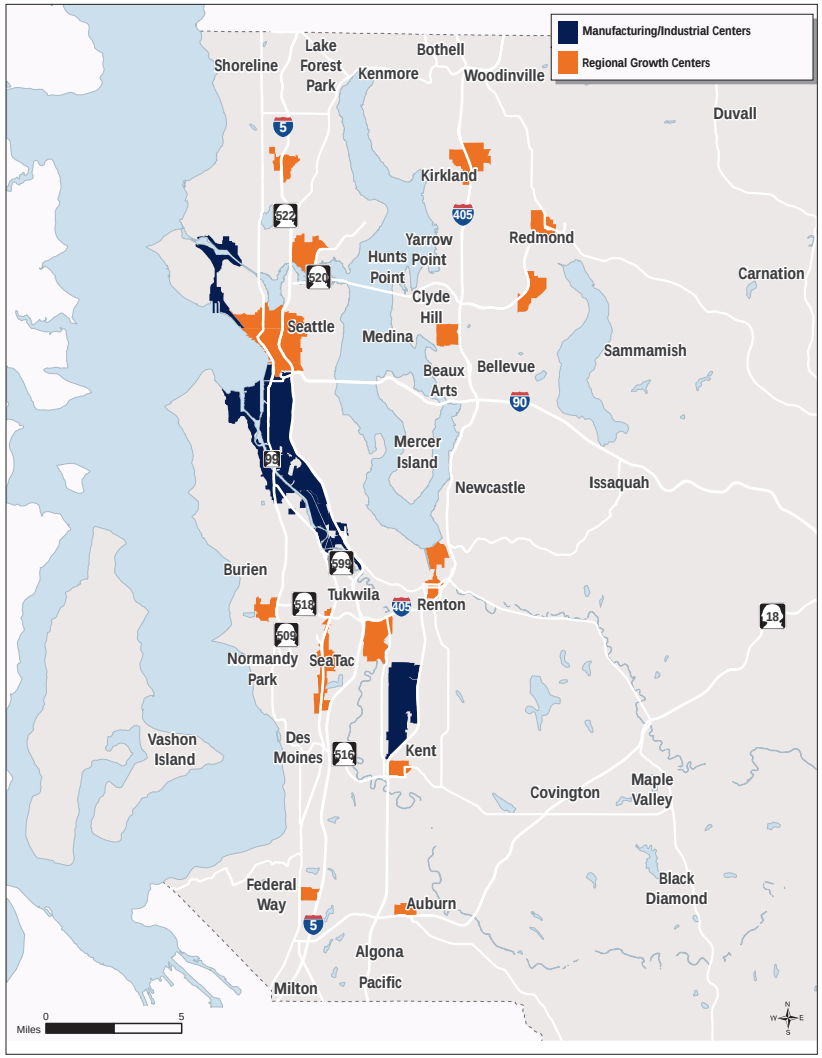
Data Source: PSRC Travel Demand Model. Accessed January 2015

Fig. 7: Growth Centers with the Highest Population Density

Ranking	Growth Center	Population per Square Mile
1	Seattle – First Hill/Capitol Hill	27,615
2	Seattle – Downtown	21,390
3	Seattle – University District	15,435
4	Bellevue – Downtown	14,290
5	Seattle – Uptown	12,295
6	Seattle – South Lake Union	8,325
7	Seattle – Northgate	7,840
8	Federal Way	5,190
9	Burien	4,950
10	SeaTac	4,470

Data Source: PSRC Travel Demand Model. Accessed January 2015

Fig. 8. Growth Centers



Designated Centers in King County

Growth Centers

- Auburn
- Bellevue Downtown
- Burien
- Federal Way
- Kent
- Kirkland Totem Lake
- Redmond Downtown
- Redmond Overlake
- Renton
- SeaTac
- Seattle Downtown
- Seattle First Hill/Capitol Hill
- Seattle Northgate
- Seattle South Lake Union
- Seattle University Community
- Seattle Uptown
- Tukwila

Manufacturing/Industrial Centers

- Ballard-Interbay
- Duwamish
- Kent MIC
- North Tukwila

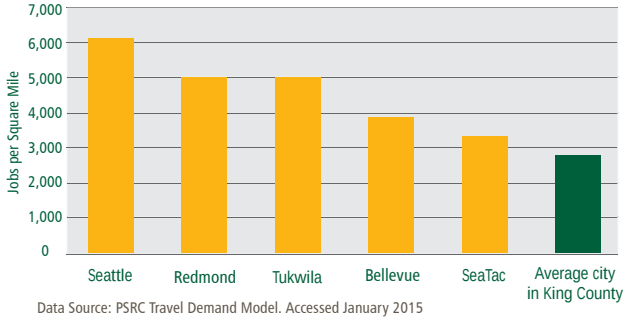
1.2.2 How are Jobs Distributed?

Places with very high employment densities lend themselves to transit since many people are going to the same general location. Areas with dense employment also tend to have limited parking and parking fees, making transit a more attractive choice for commuters.

Figure 9 shows how King County's 1.2 million jobs are distributed. Similar to population density, most jobs are concentrated along the I-5 and I-405 corridors. The largest job centers are evident on the map: downtown Seattle, downtown Bellevue, Overlake, and the University District.

Figure 10 summarizes the average employment densities for the five most jobs-dense communities in the county. Seattle has the highest density, with more than 6,000 jobs per square mile, followed by Redmond and Tukwila, which have about 5,000 jobs per square mile. Figure 11 shows the 10 growth centers with the highest employment density. Like urban growth centers, employment centers tend to be much denser than the surrounding city or the county as a whole. Note that centers are generally smaller areas contained within cities and typically have different level of densities than their overall city-wide averages.

Fig. 10. Top Five Cities: Employment Density Chart



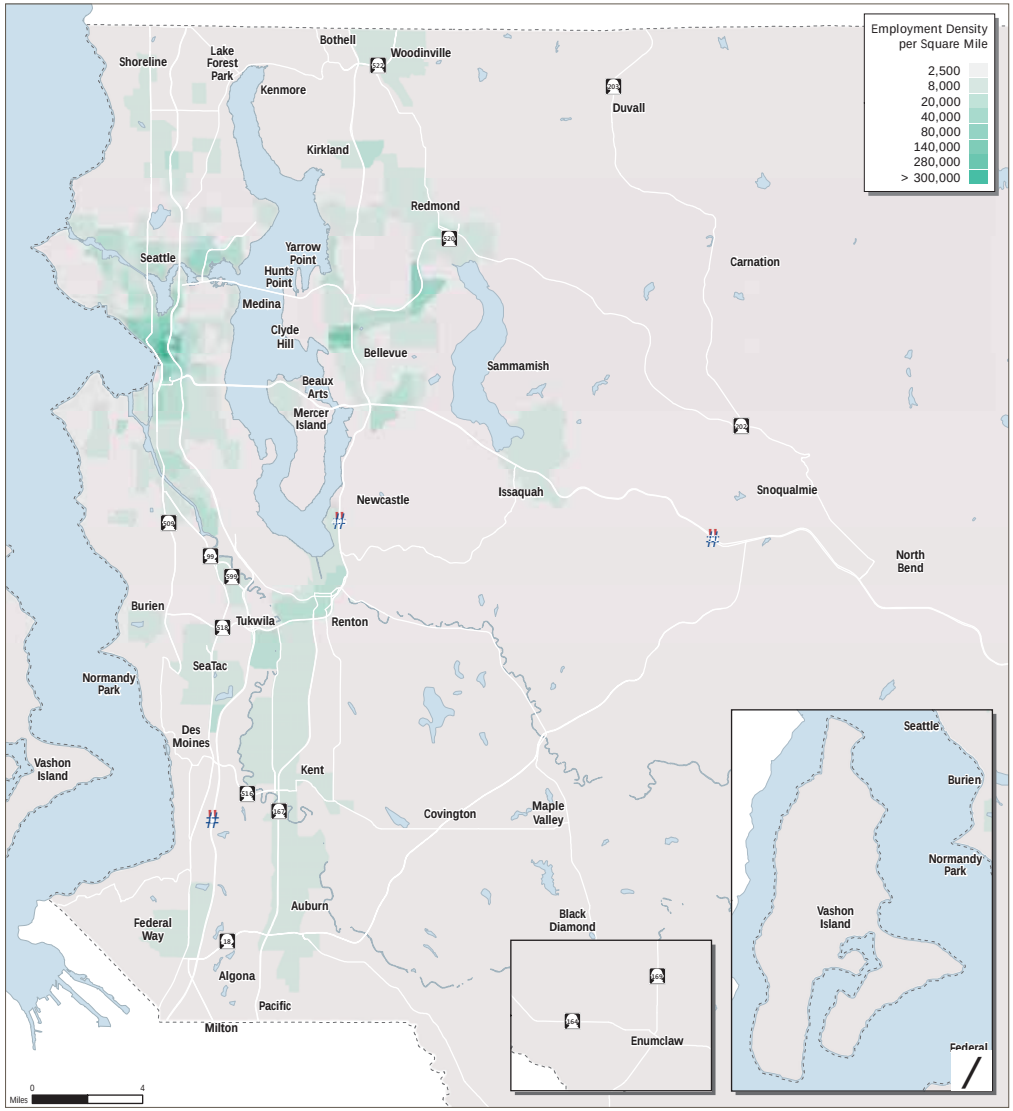
Data Source: PSRC Travel Demand Model. Accessed January 2015

Fig. 11. Growth Centers With the Highest Employment Density

Rank	Growth Center	Employees per Square Mile
1	Seattle–Downtown	104,640
2	Bellevue-Downtown	64,410
3	Seattle–First Hill/Capitol Hill	34,715
4	Redmond–Overlake	32,980
5	Seattle–South Lake Union	31,650
6	Seattle–Uptown	21,760
7	Seattle–University District	19,045
8	Tukwila	11,135
9	Seattle–Northgate	9,160
10	Renton	8,340

Data Source: PSRC Travel Demand Model. Accessed January 2015

Fig. 9. Employment Density Map



1.2.3 Where do People Have Access to Transit?

How well does today's transit service connect people and jobs in King County? One commonly used metric is "transit coverage." Coverage typically describes the land area that is within a defined walking distance from transit stops. Figure 12 illustrates transit coverage during the AM period in King County by all transit services (Metro, Sound Transit, Community Transit, and Pierce Transit).

The walking distances for calculating transit coverage were developed from actual walking routes to transit, such as a sidewalks, paths, and roads. People are willing to walk further to reach high-quality, frequent transit services like RapidRide and Link, so the walk standard is different for those two services than for other transit service. The travel buffer for RapidRide and Link stops and stations is a half-mile, and for other transit stops it's a quarter-mile.

Figure 13 summarizes the proportion of the county's population and employment that is within walking distance to RapidRide, Link, or other transit service. As shown, Metro covers the majority of the population and jobs in the county.

Fig. 13: Population and Employment within Walking Distance to Transit

Population

	All Transit	King County Metro	Sound Transit
All stops (1/4 mile)	65%	65%	6%
RapidRide or Link (1/2 mile)	18%	16%	3%
Combined (1/4 mile for all and 1/2 mile for Link and RapidRide)	68%	68%	8%
Frequent service combined (1/4 mile for frequent or very frequent, and 1/2 mile for Link and RapidRide)	40%	39%	5%

Employment

	All Transit	King County Metro	Sound Transit
All stops (1/4 mile)	77%	77%	24%
RapidRide/Link (1/2 mile)	43%	38%	16%
Combined (1/4 mile for all and 1/2 mile for Link and RapidRide)	81%	81%	30%
Frequent service combined (1/4 mile for frequent or very frequent, and 1/2 mile for Link and RapidRide)	61%	57%	28%

Note: The coverage provided by both Sound Transit and Metro (All Transit) is not the sum of the coverage by both agencies. In many cases, both agencies serve the same areas with different types of transit service, so Sound Transit tends to not greatly expand transit coverage for population or employment.

Source: PSRC Travel Demand Model. Accessed January 2015

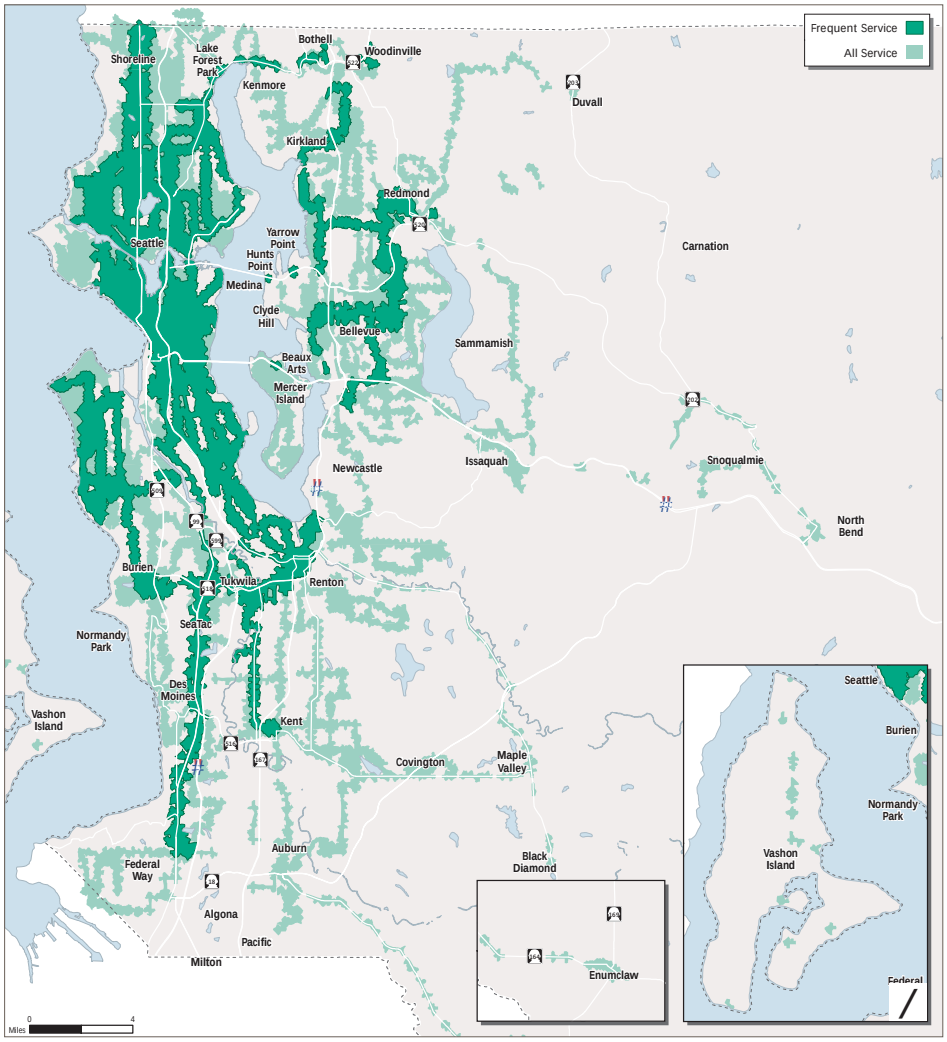
Approximate Walk Times

1/4 Mile = 3-5 minutes to walk

1/2 Mile = 8-10 minutes

1 Mile = 12-15 minutes

Fig. 12: AM Period Transit Coverage



Source: King County Metro and Sound Transit spring 2014 service schedules

1.2.4 Park-and-Ride Facilities

Another consideration in calculating transit coverage is park-and-ride lots, which extend the coverage of the transit network by providing access to people who aren't located near a transit stop. King County has 130 park-and-rides with more than 25,000 parking spaces.

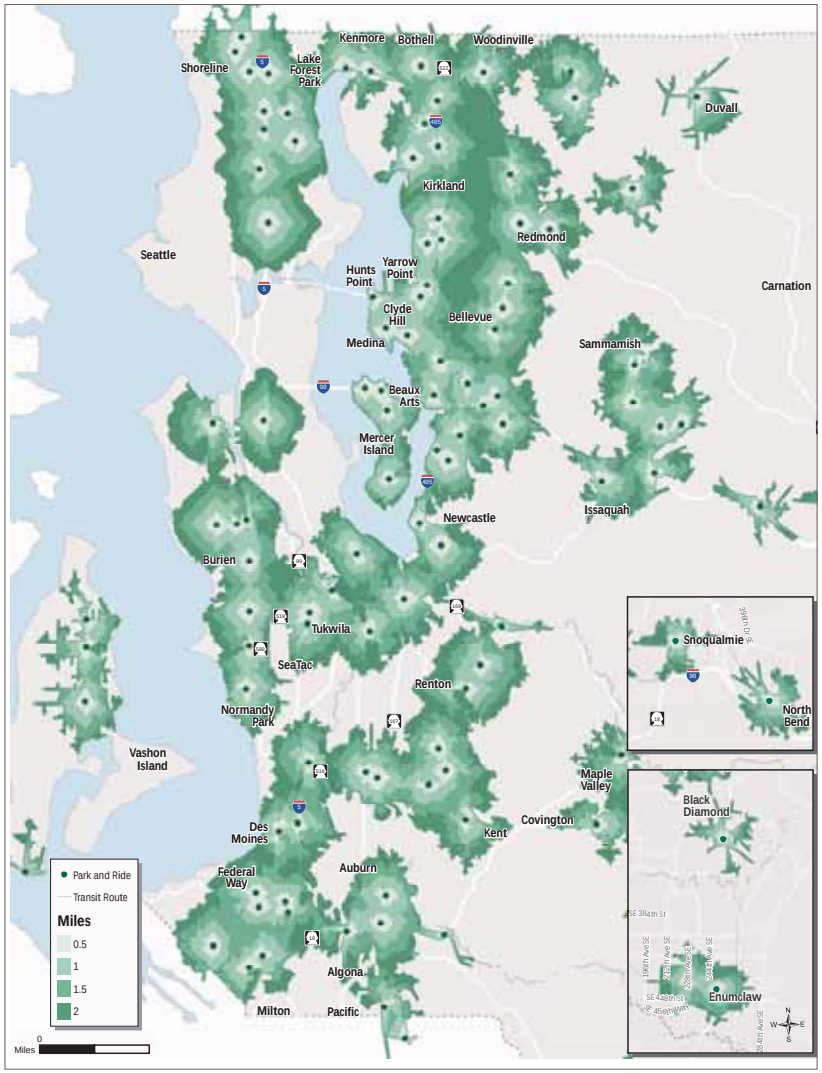
Figure 14 shows the park-and-rides and a two-mile travel area around them. The majority of the park-and-rides are along the I-5, I-405, and I-90 corridors; others are in the less-dense areas of the county.

Figure 15 shows the number of spaces available at park-and-rides and the number of spaces used on a typical weekday. Many are heavily used—especially the larger lots served by very frequent transit routes.

When the number of residences within two miles of a park-and-ride lot is combined with the quarter-mile and half-mile walking distances discussed earlier, the total transit coverage expands to 87 percent of all King County residents and 92 percent of all jobs. This translates into coverage of more than 1.6 million residents and one million jobs.

Ober Park Park-and-Ride on Vashon Island.

Fig. 14: Park-and-Ride Coverage

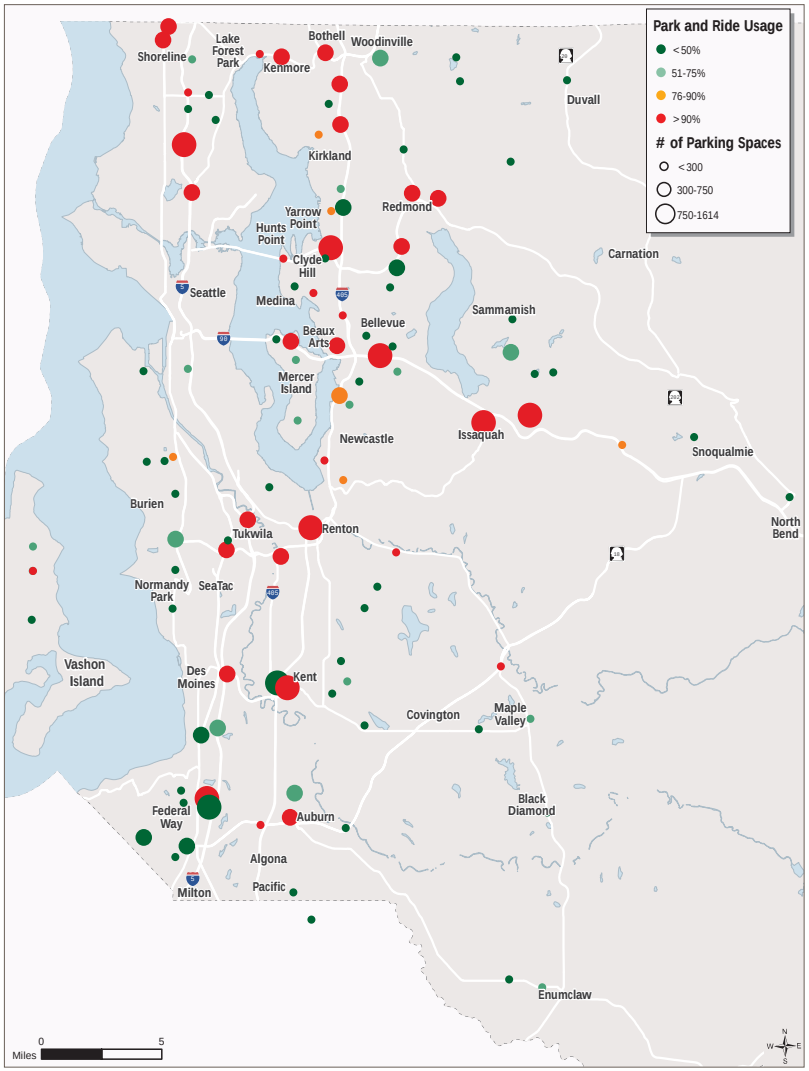


Data source: King County Metro Third Quarter 2014/2013 Park-and-Ride Comparison

Find information about all park-and-rides in King County at http://metro.kingcounty.gov/tops/parknride/

Note:
Some dots on the map represent multiple park-and-rides that function as one park-and-ride (i.e. Northgate Mall Garage, Northgate Transit Center, Northgate Transit Center East Park-and-Ride).

Fig. 15: Park-and-Ride Utilization



Data source: King County Metro Third Quarter 2014/2013 Park-and-Ride Comparison

South Kirkland Park-and-Ride

Note:
Some dots on the map represent multiple park-and-rides that function as one park-and-ride (i.e. Northgate Mall Garage, Northgate Transit Center, Northgate Transit Center East Park-and-Ride).

1.2.5 Transit and Auto Mobility in King County

Another emerging performance measure is "transit mobility," which evaluates the number of destinations people can reach by transit. Transit mobility can evaluate a variety of destinations including jobs, healthcare facilities, parks, schools, and social services. For the analysis presented here, the accessibility of jobs within a 30-minute transit trip during the AM peak period was evaluated. Figure 16 shows the results of the transit mobility analysis in a "heat map" format.

Transit mobility to employment is highest in downtown Seattle and the nearby neighborhoods of Wallingford, the University District, and portions of West Seattle; and in downtown Bellevue, Eastgate, and Factoria. Portions of south King County, including downtown Renton, the Kent Valley, and Southcenter also have high transit mobility.

Outside of downtown Seattle, the areas with the highest transit mobility to employment tend to connect at least two major employment areas via transit. For example, Factoria and Eastgate have 30-minute transit access to downtown Seattle and downtown Bellevue.

For comparison, a similar analysis was performed for auto mobility, which evaluates the number of jobs within a 30-minute drive during the AM peak period. Figure 17 is the auto mobility map. A comparison of the two maps makes it clear that auto mobility is high across much of the county. In most cities along the I-5 and I-405 corridors, a person can reach more than 500,000 jobs within a 30-minute drive during the AM peak period, while only central Seattle has a comparable level of transit mobility. This pattern reflects several factors:

- While 61 percent of all jobs are within a quarter-mile of transit, reaching those jobs within 30 minutes by transit is not always possible, particularly in the lower-density portions of the county.
- Metro's transit service generally provides service to higher-density locations such as urban growth centers. Auto mobility to employment outside of the growth centers tends to be higher than transit.
- Transit mobility tends to be less than auto mobility along many corridors because transit operates in traffic. Exceptions occur where transit can use high-occupancy vehicle or transit-only lanes.

Fig. 16: Transit Employment Mobility AM

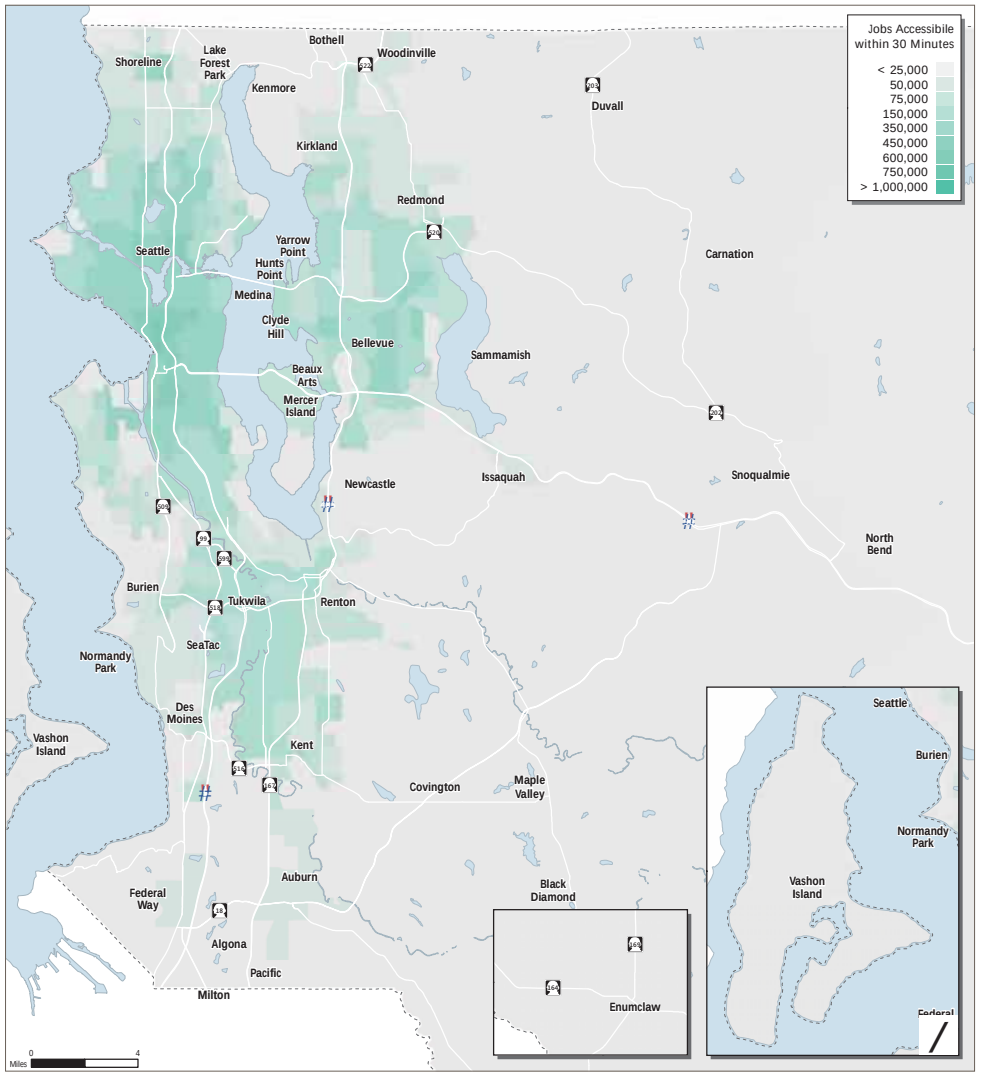
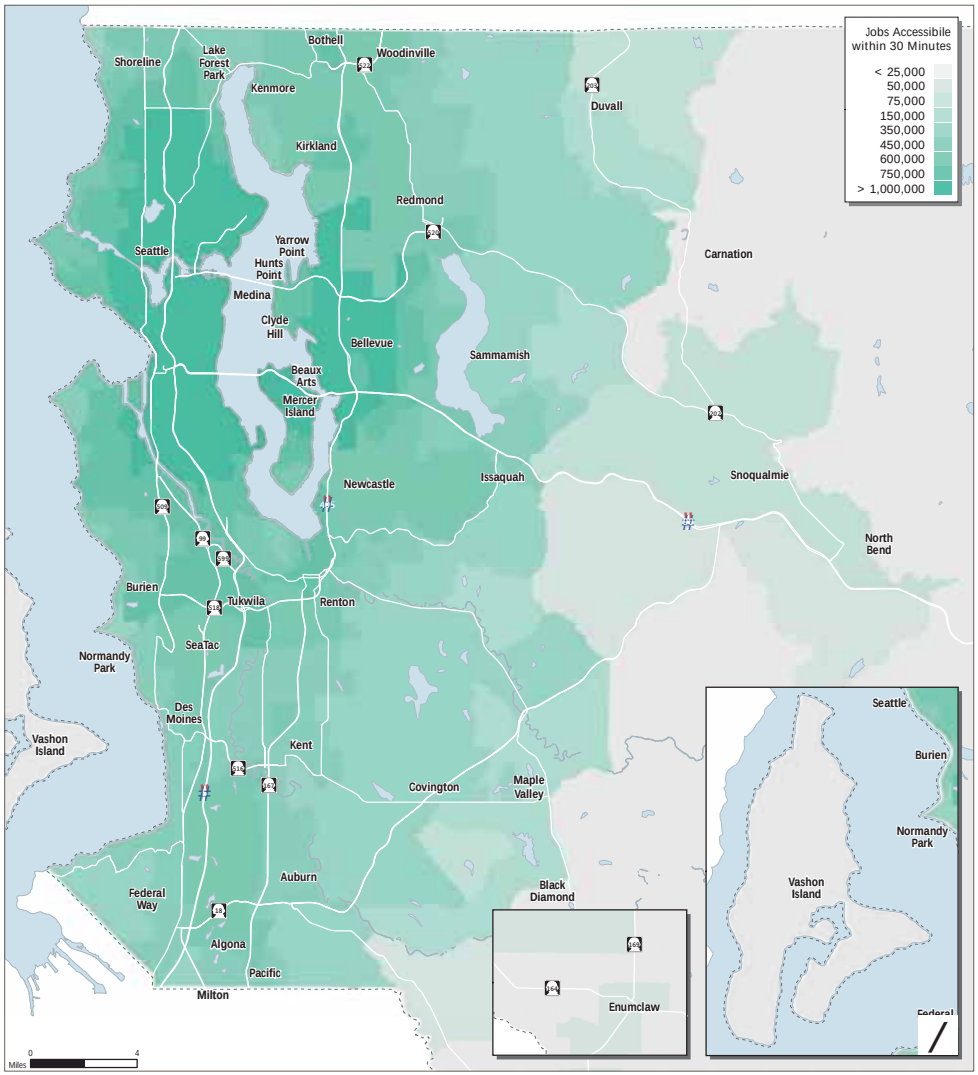


Fig. 17: Auto Employment Mobility AM



Another way to compare auto and transit mobility is to consider the travel times between major origins and destinations. Figure 18 shows the peak commute travel times between selected origins and four major centers: downtown Seattle (Westlake Station), downtown Bellevue, downtown Kent, and Federal Way City Center. The inbound and outbound transit and auto travel times are reported along with the ratio of auto travel time to transit travel time. If the auto/transit travel time ratio is roughly 1.0, then transit takes about as long as driving between the two locations. Ratios above 1.0 indicate that transit is faster than driving, typically because transit can use carpool lanes or other transit-priority features. Ratios substantially below 1.0 indicate that transit is slower than driving, typically because riders need to transfer and buses have to stop for passengers to get on and off.

The results shown in the table reflect what is shown on the mobility maps. Transit travel times to downtown Seattle are often competitive or better than auto travel times, in part due to the prevalence of HOV lanes that provide access to downtown Seattle. Transit travel times to downtown Bellevue are also competitive from many origin locations.

However, transit travel times to the lower-density centers, such as Kent and Federal Way, tend to be less competitive, in part because traveling via transit to these locations can require transfers or travel on less-direct routes.

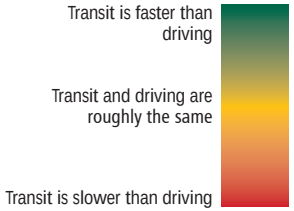


Fig. 18: Average AM Peak Period Travel Time Comparison for Auto and Transit

Center	Origin	Inbound Transit Travel Time	Outbound Transit Travel Time	Inbound Auto Travel Time	Outbound Auto Travel Time	Inbound Auto/ Transit Time Ratio	Outbound Auto/ Transit Time Ratio
Downtown Seattle (Westlake Station)	Aurora Village TC	31	47	39	31	1.258	0.660
	Snoqualmie Ridge	70	65	43	48	0.614	0.738
	Bothell PnR	51	51	47	46	0.922	0.902
	Northgate TC	14	23	23	23	1.643	1.000
	Kirkland TC	43	41	31	38	0.721	0.927
	Downtown Redmond	45	52	34	48	0.756	0.923
	Bellevue TC	36	41	26	39	0.722	0.951
	Issaquah TC	38	39	30	37	0.789	0.949
	Alaska Junction	25	20	24	17	0.960	0.850
	Rainier Beach	39	43	26	24	0.667	0.558
	Burien TC	31	52	27	22	0.871	0.423
	Renton TC	35	46	35	26	1.000	0.565
	Kent TC	30	61	48	36	1.600	0.590
	Federal Way TC	42	40	48	37	1.143	0.925
	Maple Valley	63	107	54	46	0.857	0.430
	Lake City	27	30	28	34	1.037	1.133
	Crown Hill	40	40	25	23	0.625	0.575
	Sandpoint	52	46	28	32	0.538	0.696
	Central District	32	37	17	13	0.531	0.351
	Eastgate/Bellevue College	38	38	21	24	0.553	0.632
	Tukwila Intl Blvd Station	43	42	29	22	0.674	0.524
Bellevue Transit Center	Aurora Village TC	62	89	57	40	0.919	0.449
	Snoqualmie Ridge	70	73	37	28	0.529	0.384
	Bothell PnR	36	19	37	19	1.028	1.000
	Northgate TC	54	43	43	36	0.796	0.837
	Kirkland TC	26	25	18	16	0.692	0.640
	Downtown Redmond	28	49	19	17	0.679	0.347
	Issaquah TC	27	31	24	19	0.889	0.613
	Westlake Station	41	36	39	26	0.951	0.722
	Alaska Junction	66	58	47	31	0.712	0.534
	Rainier Beach	54	59	41	30	0.759	0.508
	Burien TC	76	62	44	31	0.579	0.500
	Renton TC	26	25	34	23	1.308	0.920
	Kent TC	41	46	46	30	1.122	0.652
	Federal Way TC	85	75	56	37	0.659	0.493
	Maple Valley	60	85	49	33	0.817	0.388
	Lake City	59	70	45	34	0.763	0.486
	Crown Hill	68	77	47	39	0.691	0.506
	Sandpoint	59	60	39	34	0.661	0.567
	Central District	68	44	35	19	0.515	0.432
	Eastgate/Bellevue College	27	28	11	13	0.407	0.464
	Tukwila Intl Blvd Station	69	70	40	28	0.580	0.400
Kent Transit Center	Aurora Village TC	82	107	64	67	0.780	0.626
	Snoqualmie Ridge	113	141	37	37	0.327	0.262
	Bothell PnR	77	67	53	61	0.688	0.910
	Northgate TC	90	58	52	59	0.578	1.017
	Kirkland TC	78	52	43	59	0.551	1.135
	Downtown Redmond	71	85	41	62	0.577	0.729
	Bellevue TC	46	41	28	46	0.609	1.122
	Issaquah TC	63	86	32	46	0.508	0.535
	Westlake Station	61	30	36	48	0.590	1.600
	Alaska Junction	77	80	35	40	0.455	0.500
	Rainier Beach	57	61	23	28	0.404	0.459
	Burien TC	38	38	22	25	0.579	0.658
	Renton TC	18	22	15	20	0.833	0.909
	Federal Way TC	38	37	20	21	0.526	0.568
	Maple Valley	58	58	23	21	0.397	0.362
	Lake City	105	120	56	64	0.533	0.533
	Crown Hill	110	128	59	63	0.536	0.492
	Sandpoint	124	111	55	68	0.444	0.613
	Central District	94	85	51	38	0.543	0.447
	Eastgate/Bellevue College	98	82	37	44	0.378	0.537
	Tukwila Intl Blvd Station	53	34	20	24	0.377	0.706
Federal Way Transit Center	Aurora Village TC	71	96	62	65	0.873	0.677
	Snoqualmie Ridge	160	120	48	40	0.300	0.333
	Bothell PnR	92	103	59	73	0.641	0.709
	Northgate TC	60	65	51	57	0.850	0.877
	Kirkland TC	88	92	49	67	0.557	0.728
	Downtown Redmond	84	87	48	72	0.571	0.828
	Bellevue TC	75	85	37	57	0.493	0.671
	Issaquah TC	98	95	40	50	0.408	0.526
	Westlake Station	40	42	37	48	0.925	1.143
	Alaska Junction	77	48	36	42	0.468	0.875
	Rainier Beach	56	66	25	33	0.446	0.500
	Burien TC	51	47	22	26	0.431	0.553
	Renton TC	65	52	25	32	0.385	0.615
	Kent TC	37	38	20	21	0.541	0.553
	Maple Valley	115	109	26	22	0.226	0.202
	Lake City	73	95	55	68	0.753	0.716
	Crown Hill	85	88	57	72	0.671	0.818
	Sandpoint	103	105	53	68	0.515	0.648
	Central District	78	62	36	51	0.462	0.823
	Eastgate/Bellevue College	97	124	43	53	0.443	0.427
	Tukwila Intl Blvd Station	43	44	19	29	0.442	0.659

1.2.6 How Many People Use Transit?

Regional boardings on Metro's fixed-route services, Community Transit, Pierce Transit, and on Sound Transit Central Link light rail and Express bus totaled about 168 million trips in 2014, as shown in Figure 19. Metro carried 70 percent of the region's transit trips. Changes throughout the region, including the expansion of light rail and new development, will cause this share to decrease in the future. However, Metro is still projected to account for 53 percent of the region's boardings in 2040.

Ridership is highest during the peak periods (5 to 9 a.m. and 3 to 7 p.m.), with almost 50 percent of all boardings occurring during this time. Figure 20 shows the annual Metro boardings by time of day.

Metro is projected to account for 53 percent of the region's boardings in 2040.

About 80 percent of all Metro boardings are on routes serving the Seattle core which includes the University District and downtown Seattle—major employment centers that support high levels of transit use. The annual boardings on Metro routes serving the Seattle core and routes not serving the Seattle core are shown in Figure 21. Figures A1 and A2 in the Appendix show the location of Seattle core and non-Seattle-core routes.

Figure 22 shows annual boardings by route frequency. Rider demand is highest for very frequent service, with half of all boardings occurring on routes where buses come every 15 minutes or better. This includes Metro's RapidRide lines, which account for 14 percent of systemwide boardings on just six lines. Local routes (service every 30 to 60 minutes) attract the next highest ridership, with approximately 25 percent of all boardings in 2014. Hourly routes had the smallest share of boardings.

Figure 23 summarizes boardings by mode. Fixed-route diesel and hybrid-electric bus routes carried 65 percent of Metro riders in 2014, and electric trolley routes carried 16 percent. DART service provided only 1 percent of all passenger trips.

Definition of routes that do and do not serve the Seattle core

Routes that serve the Seattle core: routes that connect to the greater downtown Seattle area or the University District from all parts of King County.

Routes that do not serve the Seattle core: routes that operate in other areas of Seattle and King County and no portion of these routes serve the greater downtown Seattle area or the University District.

Fig. 19: Regional Boardings By Agency (millions)

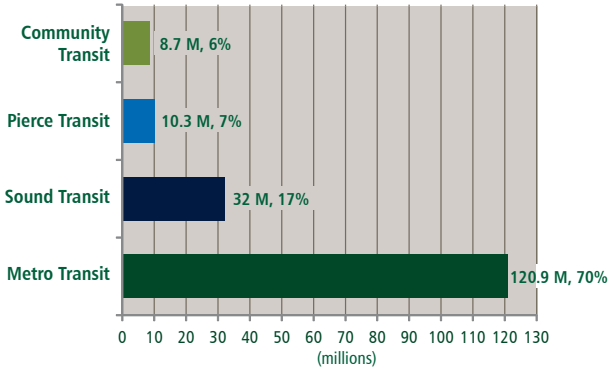


Fig. 20: Annual Metro Boardings By Time Of Day (millions)

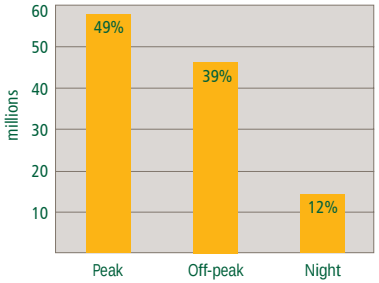


Fig. 21: Annual Boardings By Service Type (millions)

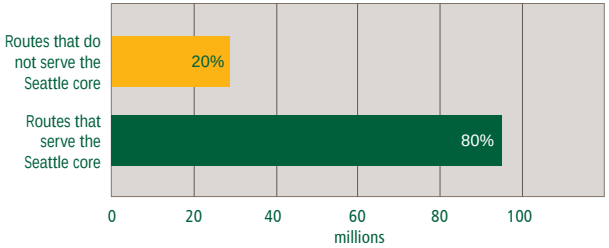


Fig. 22: Annual Boardings By Service Family (millions)

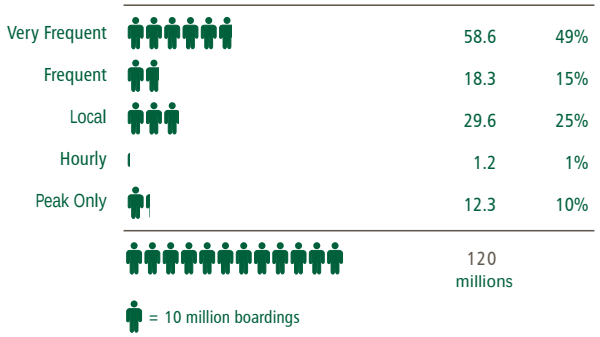
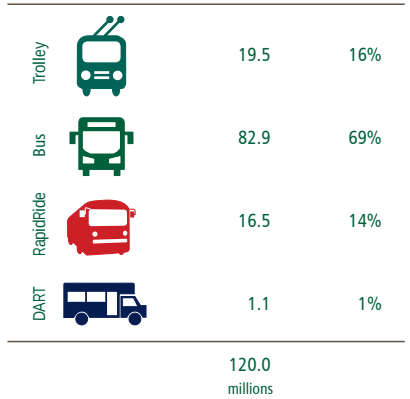


Fig. 23: Annual Boardings By Mode (millions)



1.2.7 How Much Transit Service is Provided?

In 2014, transit agencies in the central Puget Sound region provided more than 5 million platform hours of bus and light rail service. Platform hours are the number of hours a vehicle travels from the time it leaves its base until it returns. Metro provided 68 percent of these service hours. Figure 24 summarizes the number of platform hours of service provided by each agency.

Mirroring rider demand, in 2014 nearly 50 percent of Metro's annual platform hours were provided in the peak periods to support commute trips, and 70 percent of platform hours were allocated to routes serving the Seattle core to support rider demand. Annual platform hours were distributed primarily to very frequent service, followed by local service. The allocation of platform hours by time of day is shown on FIgure 25. Figure 26 summarizes annual platform hours allocated to routes serving the Seattle core and to routes not serving the Seattle core. Annual platform hours by route frequency is illustrated on Figure 27.

In 2014, Metro's fixed-route diesel and hybrid-electric bus routes, including RapidRide, operated just over 3 million platform hours, 86 percent of the systemwide total. DART services accounted for 3 percent of total system platform hours. Figure 28 shows annual platform hours by mode.

Fig. 24: Annual Service Hours By Agency (millions)

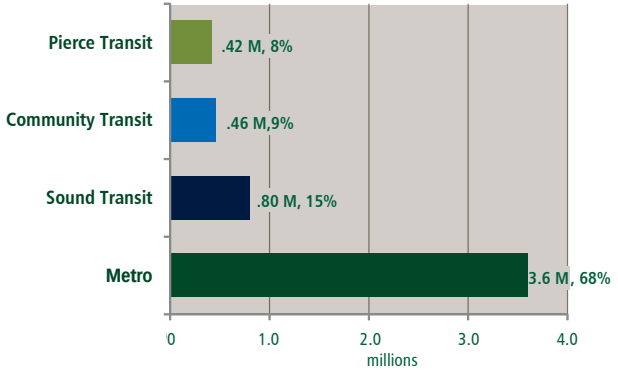


Fig. 25: Annual Metro Platform Hours By Time Of Day (millions)

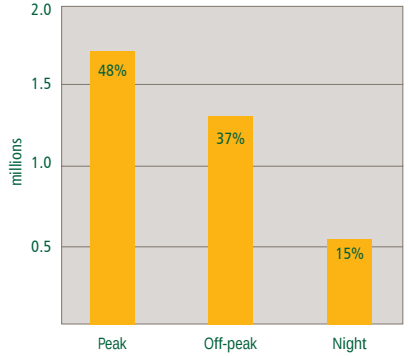


Fig. 26: Annual Metro Platform Hours By Service Type (millions)

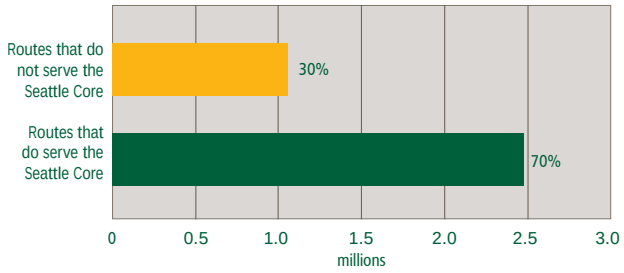


Fig. 27: Annual Metro Platform Hours By Service Family (millions)

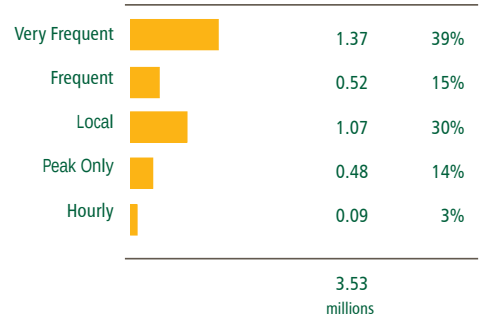
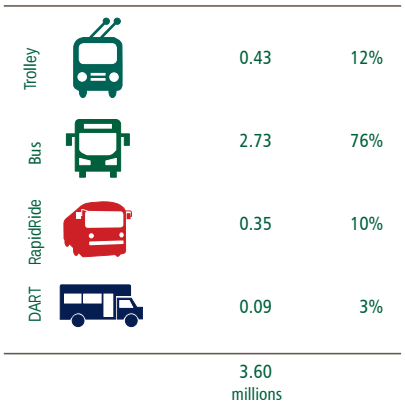


Fig. 28: Annual Metro Platform Hours By Mode (millions)



1.2.8 How People Get to Transit

Metro's customers reach transit service by walking, bicycling, or driving. As Figure 29 shows, the vast majority of transit riders in the county walk or bike to reach transit. However, as shown in Figure 30, there is considerable variation in how people reach transit across the county. In areas shaded light green, most use nonmotorized modes to reach transit (e.g., walk or bike); in areas shaded dark green, most people use a motorized mode (drive). The gradients of green show the relative share of motorized and nonmotorized access.

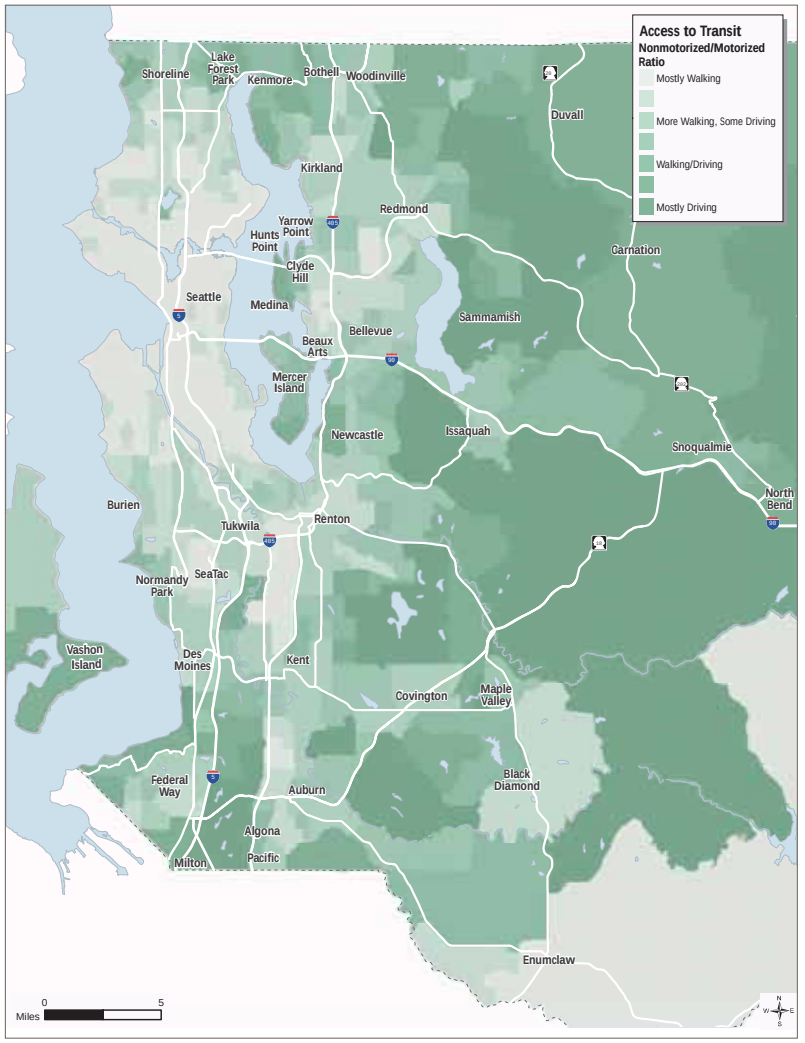
Nonmotorized transit access is primarily concentrated in denser urban areas, including much of Seattle and downtown Bellevue. In the more suburban and rural parts of the county, the primary mode of access is driving, and in many of these areas, customers are driving to park-and-ride lots to reach transit.

Fig. 29: Mode of Access to Transit

Mode of Access to Transit	Percentage
Motorized (drive to transit)	9%
Nonmotorized (walk and bike to transit)	91%

Source: PSRC 2014 Household Travel Survey, PSRC Regional Travel Model

Fig. 30: Distribution of Nonmotorized to Motorized Transit Access - AM Period



1.2.9 Equitable Coverage

The provision of equitable (not equal) transportation options is a goal in Metro's strategic plan. The strategies in the plan are to offer a variety of public transportation products and services for different markets and mobility needs; to provide products and services that provide geographic value in all parts of the county; and to provide travel opportunities for historically disadvantaged populations such as low-income people, youth, seniors, people of color, people with disabilities, and others with limited transportation options.

For the equitable coverage analysis presented here, combined transit coverage was defined as a quarter-mile walking distance to all Metro bus stops and a half-mile walking distance to RapidRide and Link light rail. Frequent service combined was defined as a quarter-mile walking distance to frequent service and a half-mile walking distance to RapidRide and Link. Figure 31 shows the percentage of each demographic population and the total population that are within walking distance to each definition of transit coverage.

Concentrations of minority (non-white) populations are primarily in Rainier Valley and SeaTac, where between 61 and 92 percent of households identify themselves as minorities. Renton, Burien, Newcastle, and Redmond also have concentrations of minority households. Just over 70 percent of minority populations in King County are within walking distance to combined transit service and just over 40 percent are within walking distance to frequent service. Figure 32 shows the combined transit coverage and the distribution of minority populations in King County.

Figure 33 shows the combined transit coverage and the distribution of low-income populations in King County. Areas near the University District and parts of downtown Seattle, Rainier Valley, Burien, White Center, and Kent have high concentrations of low-income populations. Approximately 81 percent of low-income populations in the county are within walking distance to combined transit service, and just over 50 percent of the low-income population is within walking distance to frequent service.

Youth and senior populations are considered to be more transit-dependent because they typically are less likely to drive. In King County, approximately 70 percent of the older population is within walking distance of combined transit service and 37 percent is within walking distance of frequent service.

Youth (17 and younger) live throughout King County, with some areas, such as downtown Seattle and the University District, having very small youth populations. Approximately 61 percent of youth populations in King County are within walking distance to Metro service and RapidRide and Link. Just under 30 percent of youth populations are within walking distance of frequent service.

Equitable transit service is also important to help foreign-born and non-English speaking populations travel to jobs, education and other destinations. SeaTac, Rainier Valley, Overlake, and Redmond have concentrations of non-native populations. Just over 65 percent of the county's non-native residents live within walking distance to non-frequent, RapidRide or Link service. Just over 35 percent of non-native residents are within walking distance to frequent and very frequent service.

Concentrations of non-English speakers are in similar areas as non-native populations: Rainier Valley, Overlake, and Redmond. Just over 70 percent of non-English speakers are within walking distance of combined transit service and 39 percent are within walking distance to frequent service.

Fig. 31: Access to Public Transportation for Census Populations

Demographic group	Combined (1/4 mile for all and 1/2 mile for Link and RapidRide)	Frequent service combined (1/4 mile for frequent or very frequent, and 1/2 mile for Link and RapidRide)
All population	68%	40%
Minority (non-white) population	71%	41%
Low-income population	81%	51%
Elderly population	70%	37%
Youth population	61%	28%
Non-English speaking population	71%	39%
Foreign-born population	66%	36%
Households without a car	93%	72%

Other transit-dependent populations include households that don't own a car. In King County, between 40 and 65 percent of households in and near downtown Seattle do not own a vehicle. The University District and parts of northwest Seattle and Auburn also have concentrations of households without access to a car. Much of these areas are well served by transit, indicating that strong transit mobility correlates with decreased car ownership. Just over 90 percent of households without a car are within walking distance to combined transit service and 72 percent are within walking distance to frequent service.

Maps on the following pages show the combined transit coverage and distribution in the county of populations of older people, youth, foreign-born and non-English speaking people, and households without a car.

Fig. 32: Minority Population

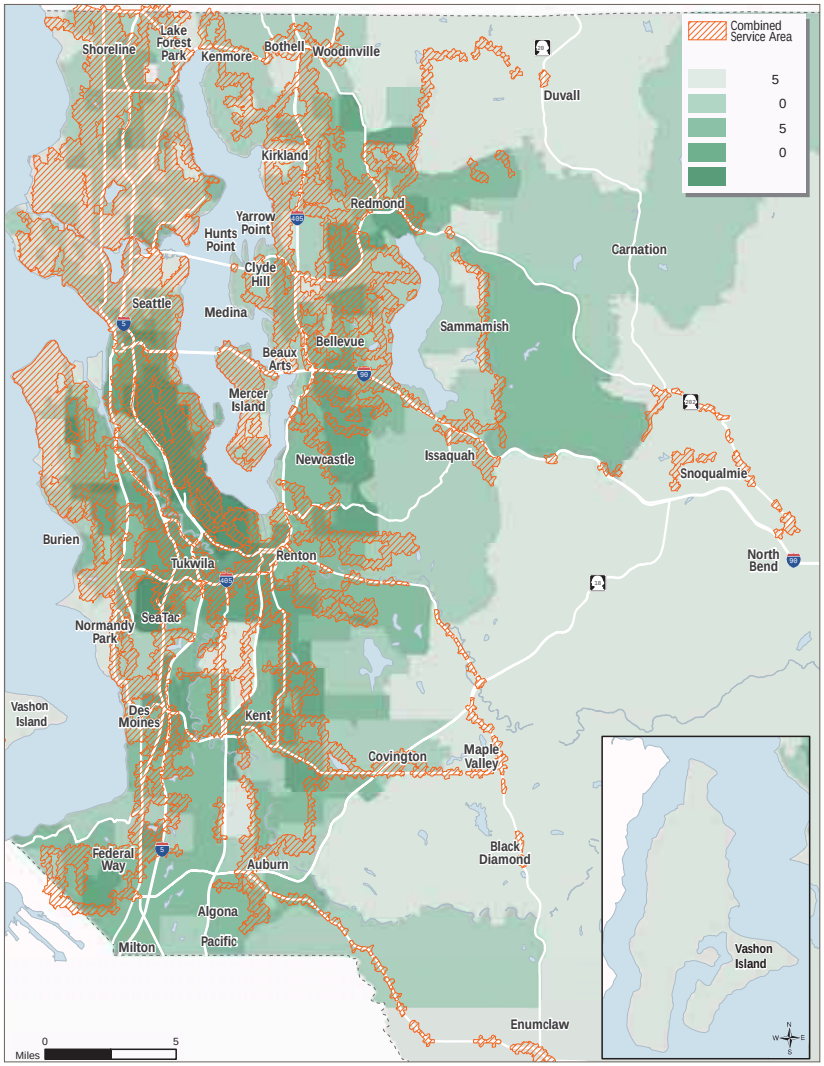


Fig. 33: Low-Income Populations

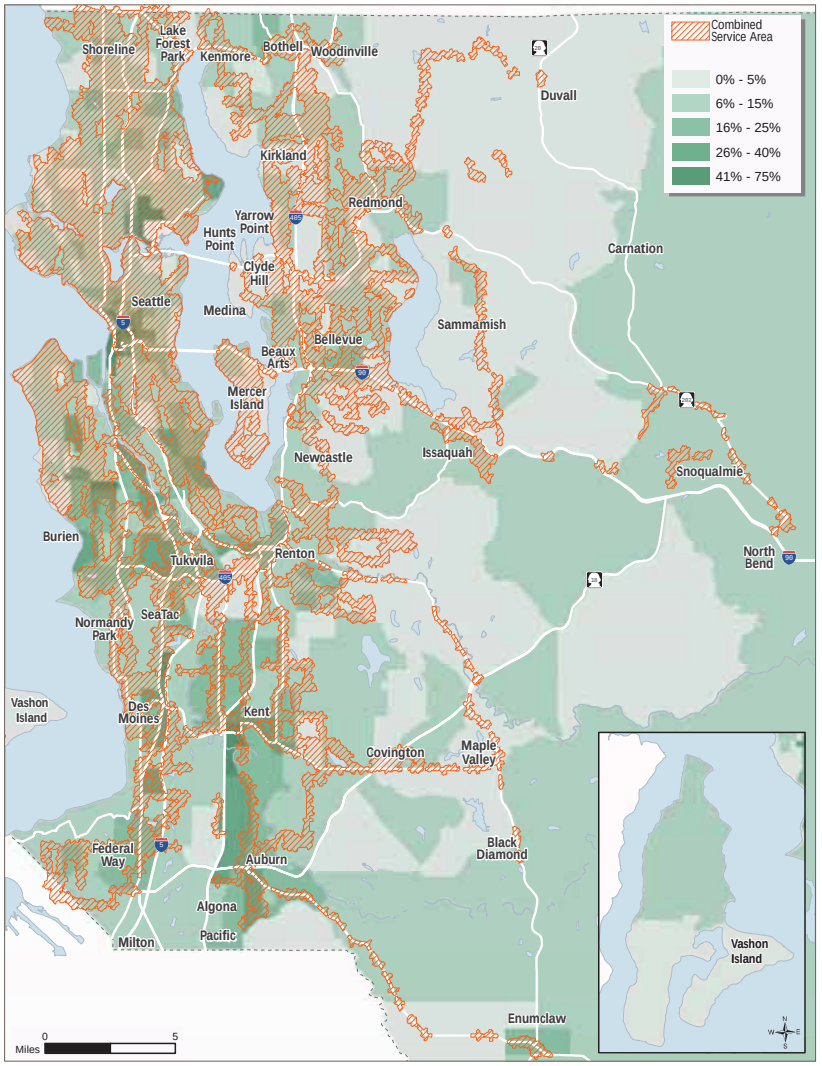


Fig. 34: Elderly Population

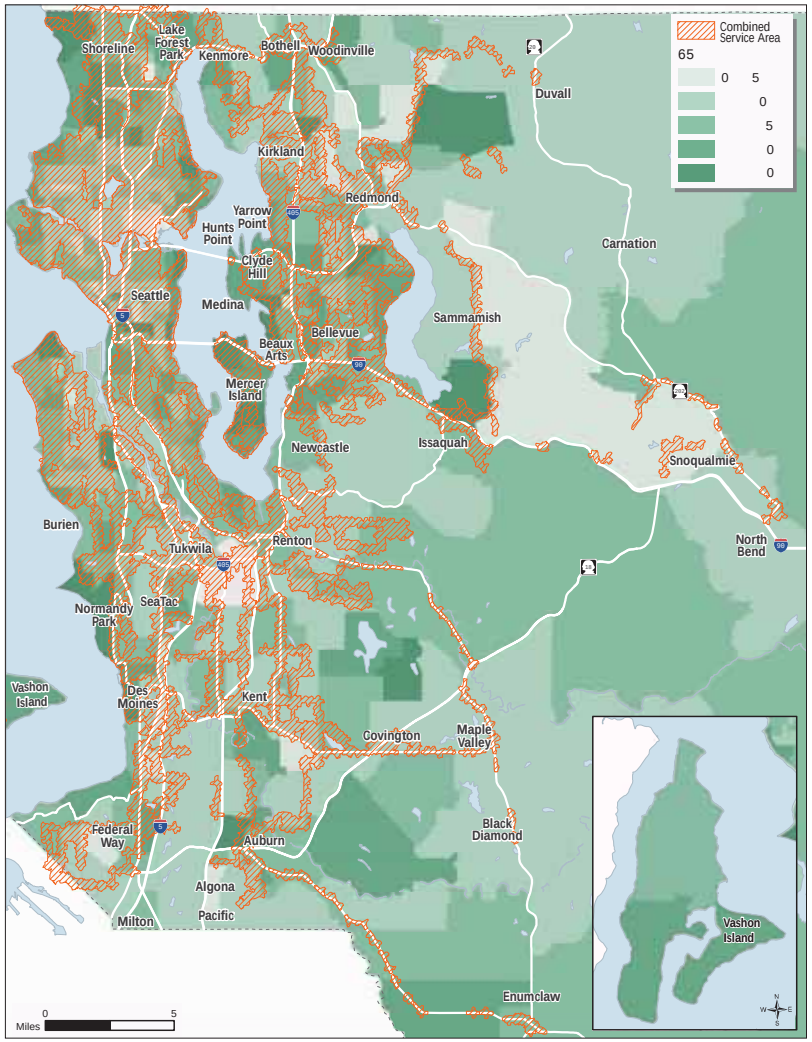


Fig. 35: Youth Population

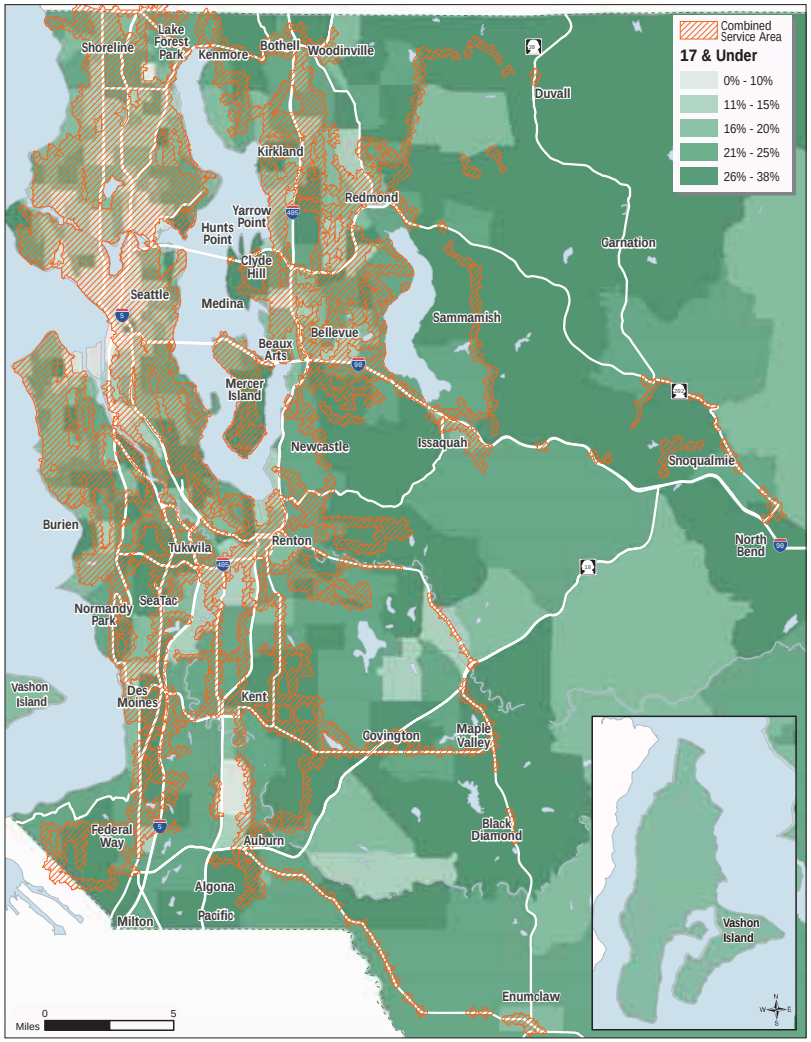


Fig. 36: Foreign-Born Population

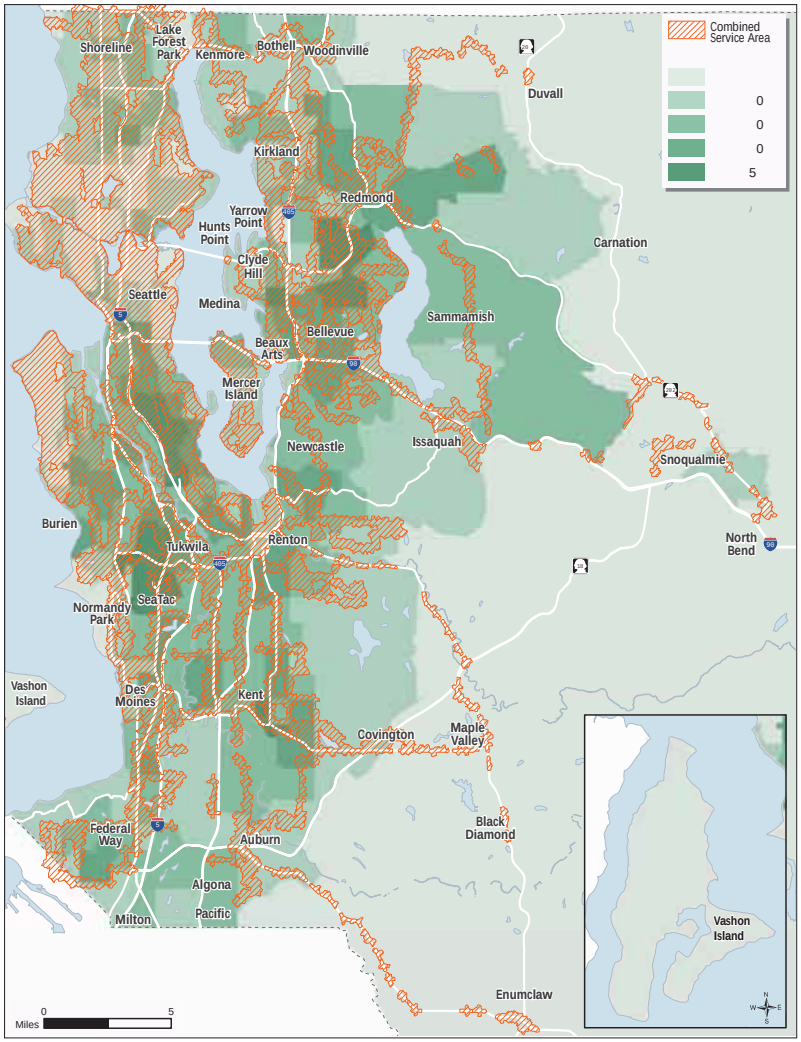


Fig. 37: Non-English Speaking Population

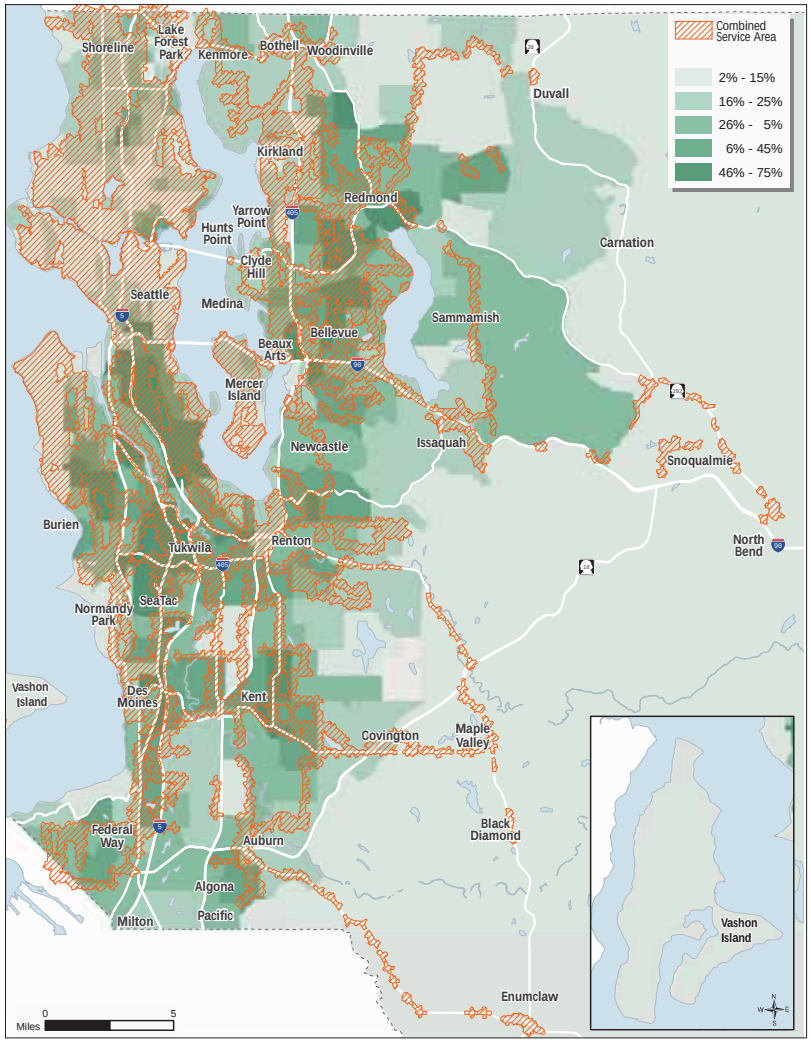
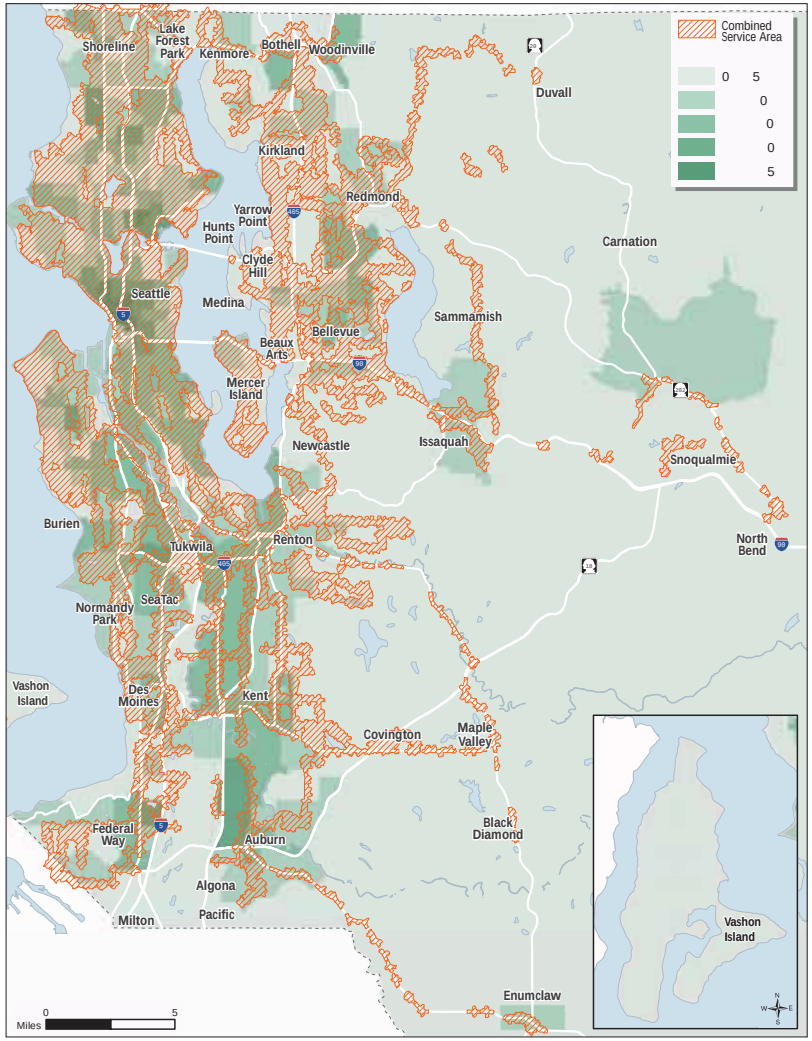


Fig. 38: Households without a Car



1.3 Planning And Development Of Services

Metro's present service network configuration had its origin in the early 1990s. Metro's 1993 Comprehensive Plan for Public Transportation established a multi-centered service network. It de-emphasized the earlier downtown Seattle-centric, radial service pattern that minimized transfers to the detriment of frequency and all-day, multi-destination travel.

The 1993 plan also established a policy basis for allocating transit services based on three subareas (east, west, and south). This policy guided the distribution of service during system expansions and reductions. Though initially based on the population in each subarea, the policy evolved into a formula allocation. The intent was to increase the share of service investment outside of Seattle, in growing suburban areas and in emerging centers of population and employment in the larger suburban cities.

In Metro's 2002–2007 Six-Year Transit Development Plan, that formula concept was reinforced. The policy for service growth stated that for every 200,000 hours of new transit service, 40 percent would go to the east subarea, 40 percent to the south subarea, and 20 percent to the west subarea (the 40/40/20 policy). The policy for service reductions stated that "any systemwide reduction in service investment shall be distributed among the subareas in proportion to each subarea's share of the total service investment." Based on the hours of service provided in each subarea in 2010, 62 percent of the reduction would have to come from the west, 21 percent from the south and 17 percent from the east (the 60/20/20 policy).

1.3.1 A New Service Allocation Policy

In 2010, the King County Council and Executive formed the Regional Transit Task Force to consider a new policy framework to guide transit service investments or reductions. They were responding to a challenging situation: demand for transit service was strong, but Metro's operating revenues had declined steeply because of the 2008 recession, threatening to lead to service cuts.

The task force was made up of members who represented diverse interests and perspectives from across the county. After 10 months of work, they issued a report which recommended that the policy guidance for making service reduction and service growth decisions should be based on three priorities:

- Emphasize productivity due to its linkage to economic development, land use, financial sustainability, and environmental sustainability
- Ensure social equity
- Provide geographic value throughout the county.

The task force also recommended that Metro create clear and transparent guidelines to be used for making service allocation decisions, based upon the recommended policy direction.

They further recommended that the service guidelines reflect the following principles:

- Transparency, clarity and measurability
- Use of the system design factors
- Flexibility to address dynamic financial conditions
- Integration with the regional transportation system
- Development of performance thresholds as the basis for decision-making on network changes.

Other Regional Transit Task Force recommendations were that Metro should adopt performance measures and report on them annually; that King County and Metro must control the agency's operating expenses to achieve sustainability; and that King County, Metro and a community coalition should pursue state legislation to create additional revenue sources for transit.

In July 2011, the King County Council adopted Metro's Strategic Plan for Public Transportation 2011-2012, which incorporated the recommended new policy direction and included new service guidelines. Since then, Metro has used the service guidelines to plan and manage transit service, including making service reductions in September 2014 that were necessary because of Metro's financial situation.

In early 2015, King County formed a Service Guidelines Task Force that is considering potential changes to the service guidelines regarding service types, social equity, geographic value, alternative services, and community mobility contracts. The task force is expected to make recommendations in mid-2015.

1.3.2 How Metro Uses The Service Guidelines

Metro uses the service guidelines to develop proposals to reduce, add, or change service. The guidelines help Metro provide service where it's most needed to make bus service reliable and not too crowded, serve areas with many low-income and minority residents who may depend on transit, and meet public transportation needs throughout the county. The guidelines define objective data that Metro uses to analyze the transit system and make decisions about service.

The following is a summary of how Metro uses the service guidelines:

Each year, Metro evaluates all transit corridors (which connect regional growth, manufacturing / industrial and transit activity centers) to determine what level of service they should have. The evaluation first considers how many jobs and households are nearby, the percentages of low-income or minority residents who ride the bus in those areas, and the corridor's connections to centers of employment or other activity. Each corridor is assigned a preliminary level of service based on the answers. The next step is to look at the actual number of transit users in each corridor and increase the service level if necessary to meet actual demand. The third step evaluates any peak-period service on a corridor to see if it is fast and well-used compared to the local service alternative.

Based on this three-step process, Metro gives each corridor a target service level (very frequent, frequent, local, hourly, or peak-only service). These service levels are assigned for three periods of the day—peak, off-peak and night—for weekdays and weekends.

Metro then assesses each bus route's performance by measuring the rides per service hour and passenger miles per bus mile, and also determines if the bus is often crowded or late. Metro may reduce service on routes performing in the bottom 25 percent of comparable routes, and reinvest this service in other routes where it is needed to reduce crowding or keep buses on time.

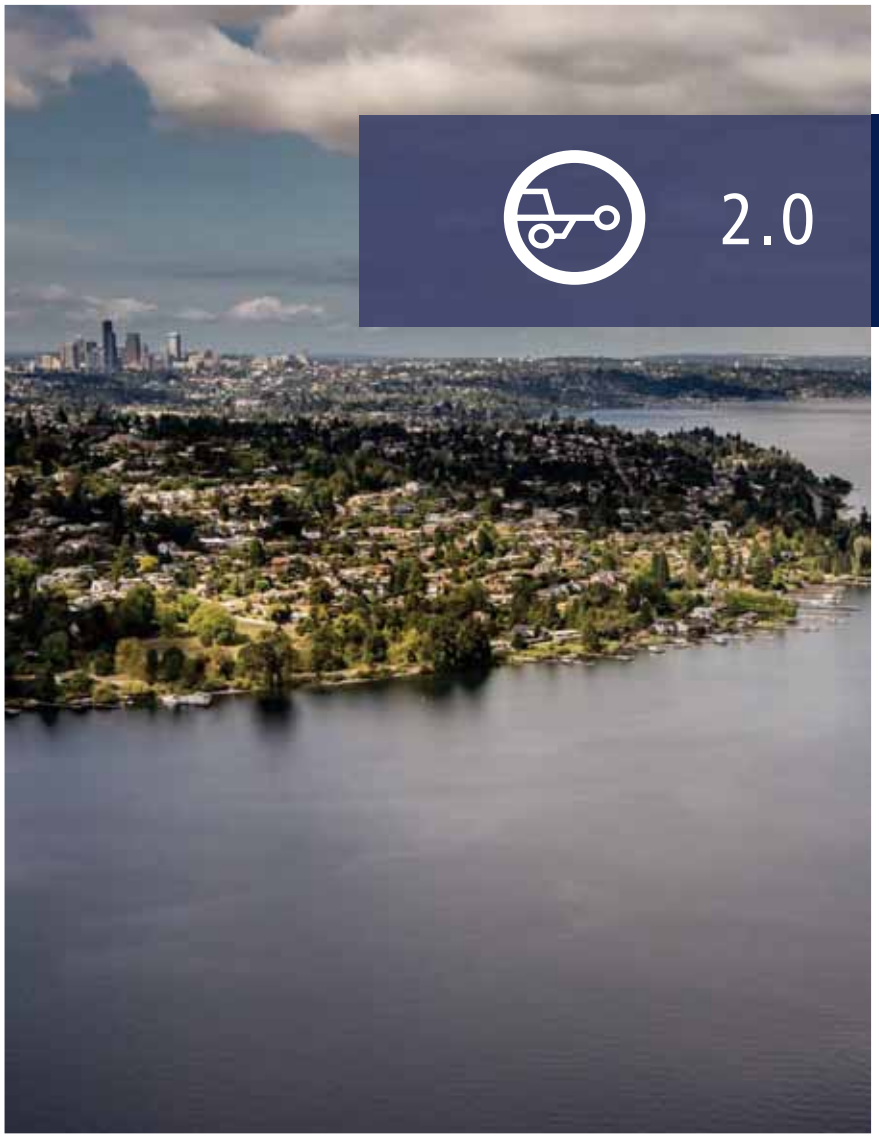
The guidelines also define when Metro should consider restructuring multiple routes in an area—for example, to coordinate with a new segment of Sound Transit's Link light rail.

The service guidelines set priorities for adding service when resources are available, and for reducing service when necessary.

- The priorities for adding service are: 1) reduce overcrowding, 2) improve on-time performance, 3) approach target service levels, and 4) improve service on routes with high performance.
- The priorities for making reductions (while always considering social equity) are: 1) reduce service on routes with performance in the bottom 25 percent of comparable routes, 2) restructure service to improve efficiency, 3) reduce service on routes with performance between 25 and 50 percent among comparable routes, and 4) reduce service on routes with low performance that are on corridors below their target service levels.

There are also guidelines for designing or revising service. A few examples are: make transfers easy, create direct routes, and serve multiple destinations and travel needs.

Every year, Metro analyzes the transit system using the service guidelines and publishes the results. The 2014 Service Guidelines Report found that the Metro system needs about 545,000 additional annual service hours to reduce passenger crowding, improve schedule reliability, and increase service to meet target service levels.



2.0 Connections

Public transportation plays a major role in our economy, quality of life and access to opportunities by connecting people to jobs, social services, shopping, education and more.

More people, jobs, houses and traffic are coming to our region, and public transportation must grow as well.This section examines where growth will occur, pointing to changing needs for transit service.

2.1 Growth

Expected Population, Employment and Transit Growth

Growth is occurring in King County and throughout the four-county central Puget Sound region. The Puget Sound Regional Council's 2015 Regional Macroeconomic Forecast projects that there will be 28 percent more people and 40 percent more jobs in the region by 2040. Cumulatively, that's 28 percent growth over the 26-year forecast period.

The region is forecasted to reach 4.9 million people, an increase of 1.07 million over 2014 levels. The number of households would rise by 665,000 for a total of 2.12 million—a cumulative 45 percent increase.

Wage and salary employment is forecasted to reach 2.75 million jobs, an increase of 850,000 from 2014 levels. When self-employment and military jobs are included, regional employment reaches 2.98 million by 2040—cumulatively, 40 percent more than 2014.

The region's transportation plan assumes that transit will grow to meet increasing demand resulting from population and job growth. Figure 39 summarizes the expected growth in annual transit service hours in 2040. Based on the growth of transit service in the regional model, Metro's annual service is expected to grow by 2.3 million hours, from 3.5 million to 5.8 million annual service hours by 2040. Sound Transit light rail and commuter rail are expected to grow to 428,000 annual hours. Sound Transit Express bus service is projected to remain roughly constant as service will be restructured as light rail expands.

Fig. 39: Growth in Annual Service Hours

	Existing Service Hours	Added Service Hours	Projected 2040 Service Hours
Metro	3,529,00	2,270,000	5,799,000
Sound Transit Bus	520,000	7,000	527,000
Sound Transit Rail*	200,000	228,000	428,000

*Light Rail and Commuter Rail
Data Source: Sound Transit Travel Demand Model

2.2 Access

How Will Transit Access Change With Future Growth?

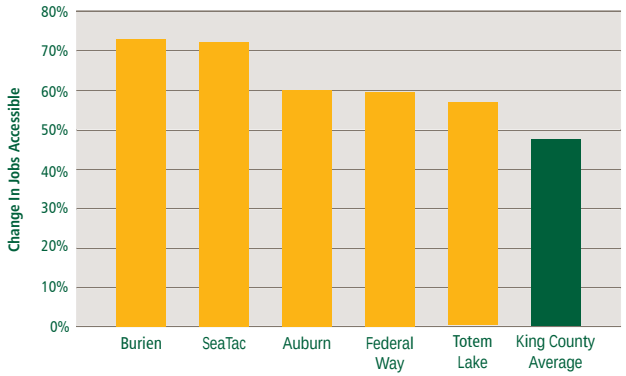
This section shows how mobility to jobs in the region is expected to change in the future based on the projected distribution of job and population growth as well as auto congestion. The analysis assumed the existing transit network and used forecasts of population and employment growth.

As shown in Figure 40, future transit mobility remains highest for areas around downtown Seattle, the University District, portions of West Seattle, downtown Bellevue, Eastgate and Factoria.

As shown in Figure 41, the areas forecasted to experience the largest growth in jobs accessible within 30 minutes on transit are Burien, SeaTac, Auburn, Federal Way and Totem Lake in Kirkland. This is partially due to the large percentage of employment growth forecast for these areas, accessible by the current transit routes.

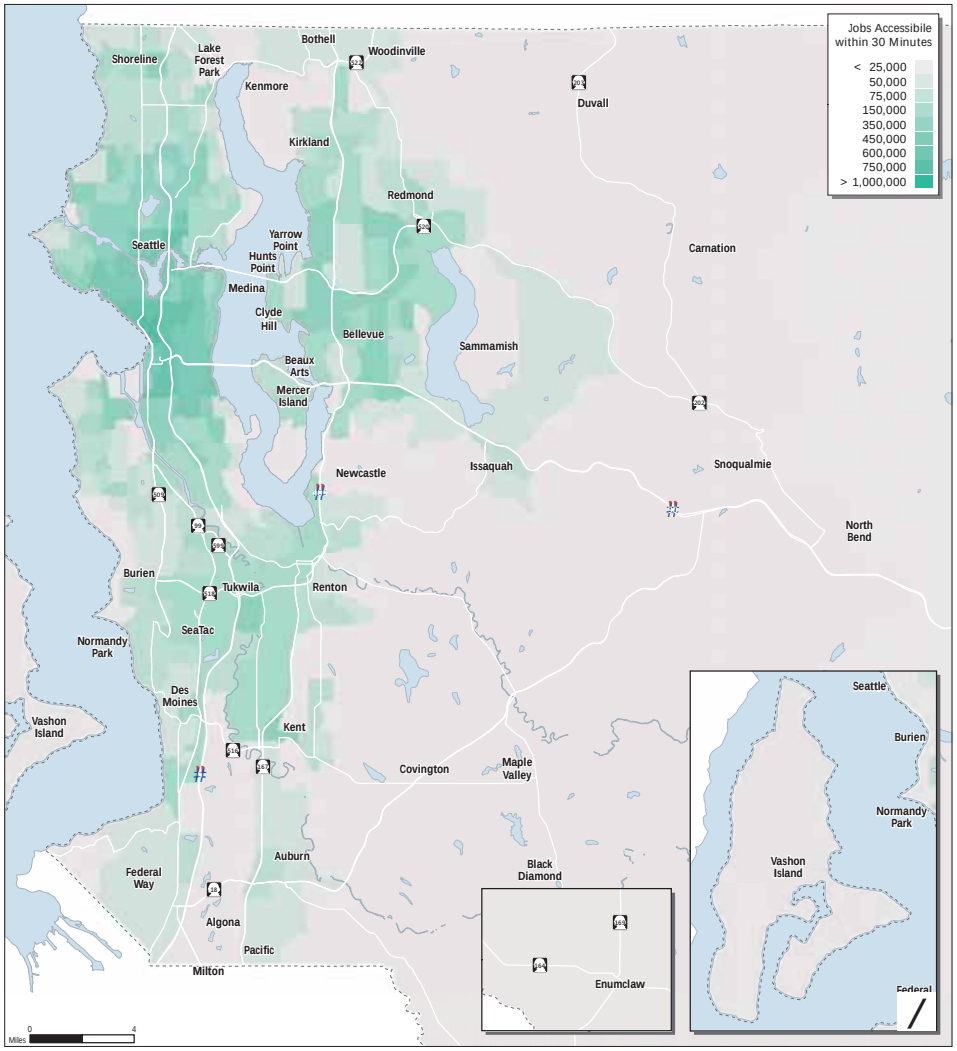
The concentration of employment into regional growth centers and other transit corridors results in a 47 percent increase in jobs accessible within 30 minutes of transit for the county as a whole.

Fig. 41: 2014-2040 Percent Change in Jobs Accessibility via Transit



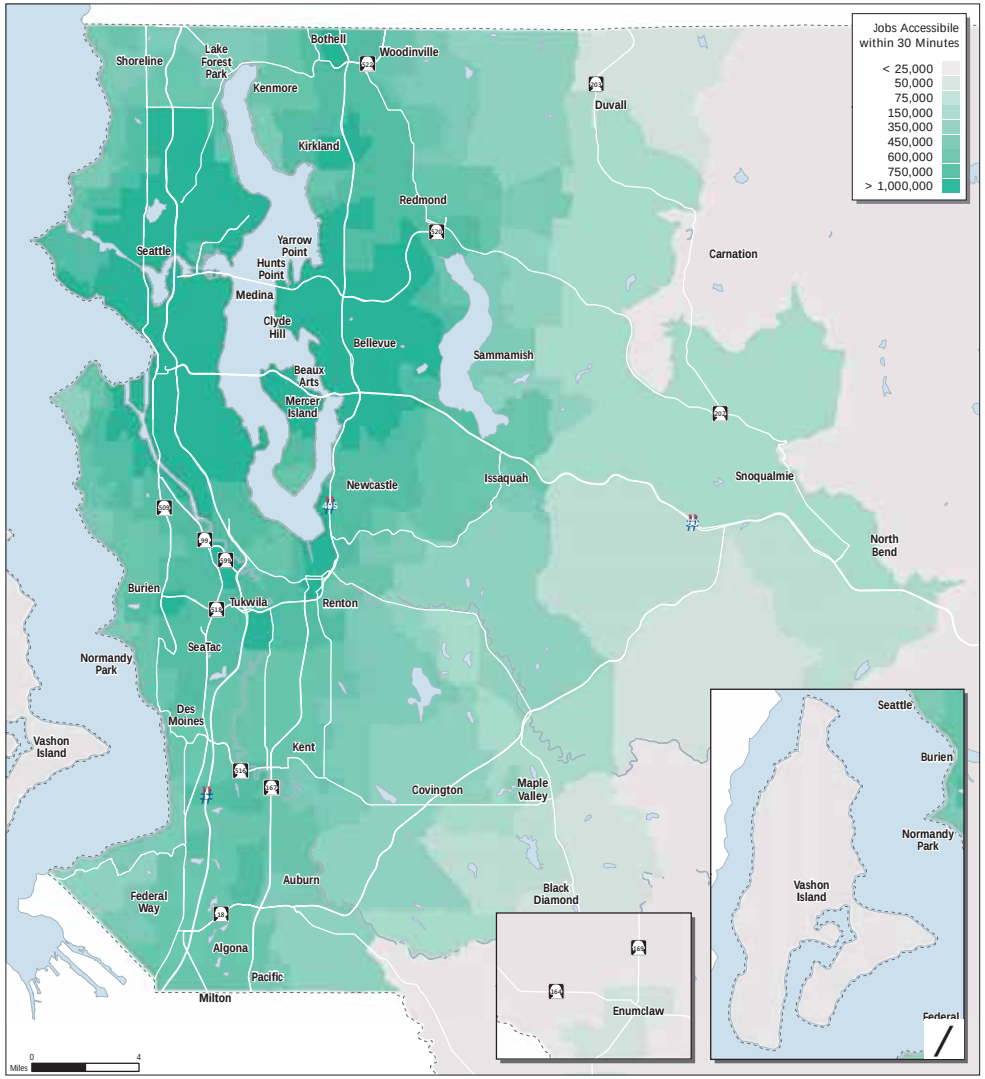
Data source: PSRC Travel Demand Mode. Accessed January 2015

Fig. 40: 2040 Jobs Accessible via Transit - AM Period



Data source: PSRC Travel Demand Mode. Accessed January 2015

Fig. 42: 2040 Jobs Accessible via Auto - AM Period



Data source: PSRC Travel Demand Mode. Accessed January 2015

Future Auto Mobility to Jobs

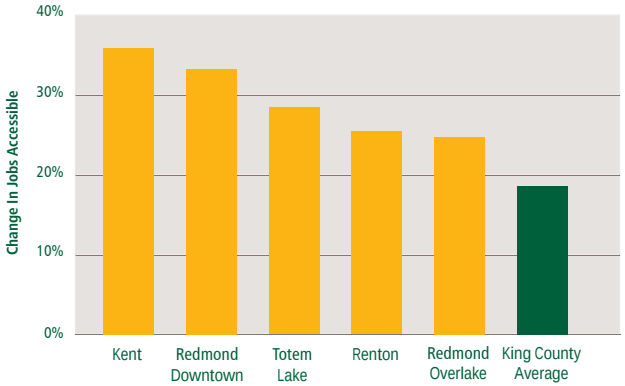
The assessment of future auto mobility to jobs presented here was based on future population and employment growth projections and changes in auto travel time and auto travel patterns predicted by the regional travel model.

As shown in Figure 42, in 2040, overall auto mobility would remain at a higher level than transit mobility, even with higher levels of congestion under 2040 conditions.

Figure 43 shows that areas forecasted to experience the highest percentage change in auto mobility to employment are Kent, Redmond, Totem Lake, Renton and Overlake. Much of the growth in auto accessibility in these areas is due to additional jobs being concentrated where they are accessible by auto from the surrounding neighborhoods.

Some areas, such as Auburn, Burien and Northgate, would exhibit very little change (under 10 percent growth) in mobility to jobs by automobile because of higher levels of auto congestion.

Fig. 43: Top 5 Urban Growth Areas: Percent Change in Jobs Accessible via Auto



Data source: PSRC Travel Demand Mode. Accessed January 2015

Job Accessibility via Transit and Car, 2015 and 2040

An additional perspective on the change in auto and transit mobility is a comparison in the growth in jobs accessible between the two modes. Some areas experience a larger change in jobs accessible via transit versus auto. One example is shown in Figure 44.

In 2015 the average number of jobs accessible via auto within 30 minutes from downtown Seattle is 978,000, while the number of jobs accessible via transit is 431,000.

In 2040, the average number of additional jobs accessible via auto grows by 134,000 whereas the number of additional jobs accessible via transit grows by 162,000.

This indicates that 30-minute access to jobs from downtown Seattle via transit fares better in the face of growing road congestion than job access via auto.

Conversely, Figure 45 shows that some areas in the region are forecasted to have a larger growth in jobs accessible via auto than via transit. These areas may present opportunities for improved transit connections as all of the areas summarized in the figure are expected to experience substantial population and employment growth.

It's important to note that the results in the figure are based on existing transit service, which is not always optimized to serve these locations into the future. The maps (figures 46 and 47) highlight the change in auto and transit job accessibility from existing to 2040.

Fig. 44: Job Accessibility with Higher Transit Accessibility Growth

	Jobs Accessible in 2015 in 30 Minutes		Net Change in Jobs Accessible within 30 Minutes by 2040		Percent Change in Jobs Accessible within 30 Minutes by 2040	
Urban Growth Center	Auto	Transit	Auto	Transit	Auto	Transit
Seattle Uptown	926,000	344,000	88,000	135,000	10%	39%
Seattle Downtown	978,000	431,000	134,000	162,000	14%	38%
Auburn	348,000	32,000	6,000	19,000	2%	59%
Seattle South Lake Union	985,000	367,000	129,000	140,000	13%	38%
Average King County	576,000	74,000	107,000	35,000	19%	47%

Source: PSRC Travel Demand Mode. Accessed January 2015

Fig. 45: Job Accessibility with Higher Auto Accessibility Growth

	Jobs Accessible in 2015 in 30 Minutes		Net Change in Jobs accessible within 30 Minutes by 2040		Percent Change in Jobs Accessible within 30 Minutes by 2040	
Urban Growth Center	Auto	Transit	Auto	Transit	Auto	Transit
Kirkland Totem Lake	594,000	62,000	169,000	35,000	28%	56%
Redmond Downtown	468,000	72,000	156,000	40,000	33%	56%
Renton	612,000	98,000	156,000	45,000	25%	46%
Bellevue	969,000	198,000	178,000	90,000	18%	45%
Average King County	576,000	74,000	107,000	35,000	19%	47%

Source: PSRC Travel Demand Mode. Accessed January 2015

Fig. 46: Change in Jobs Accessible via Transit by 2040 - AM Period

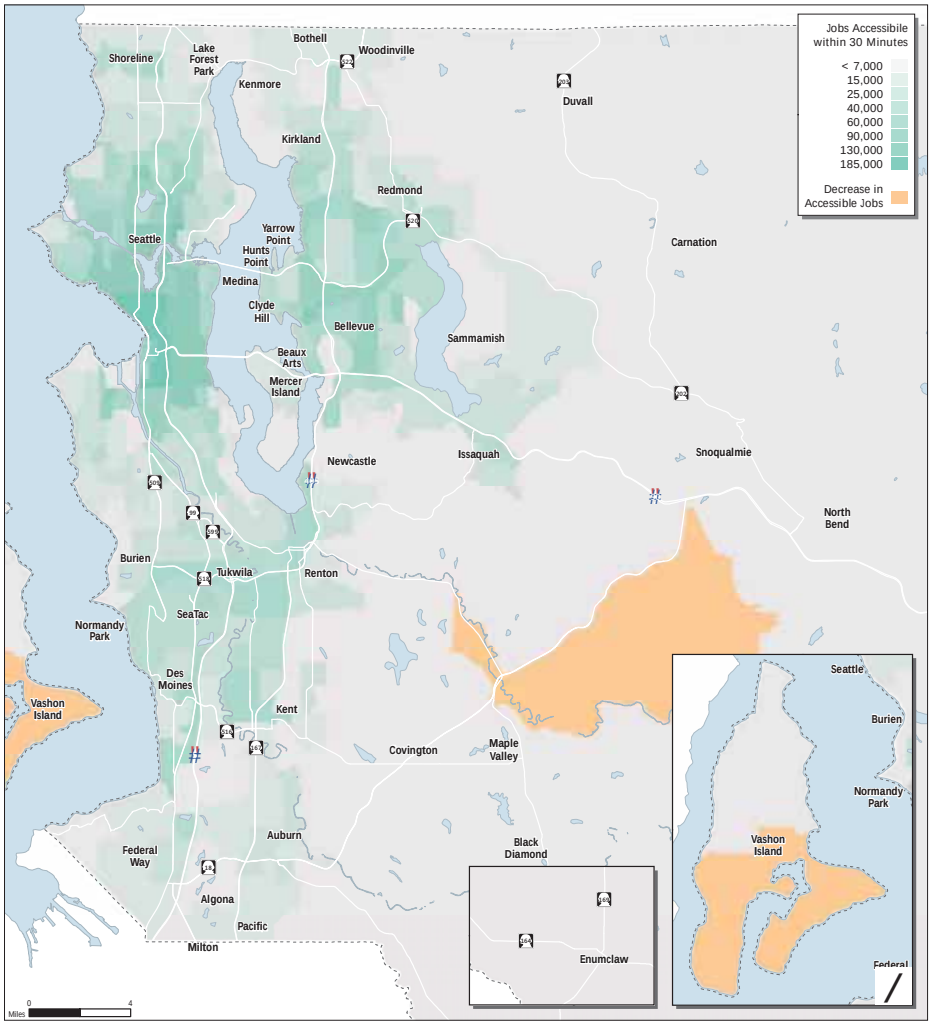
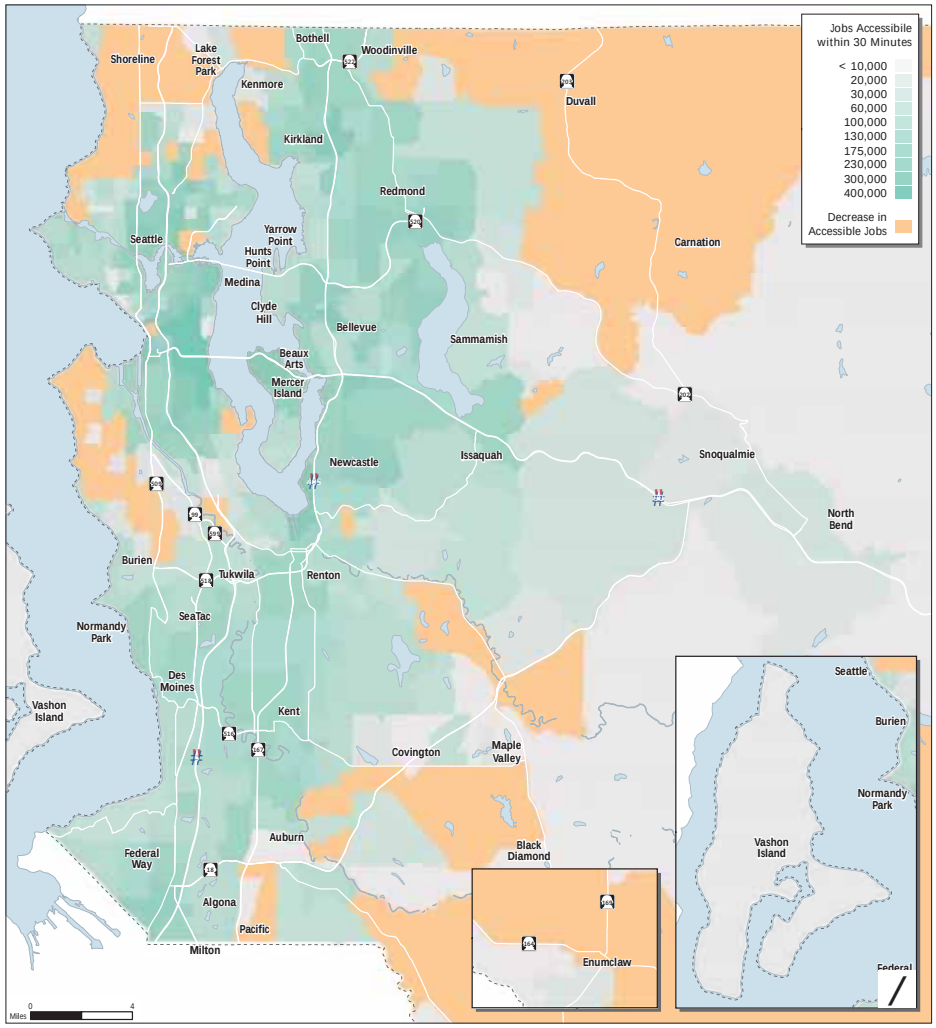


Fig. 47: Change in Jobs Accessible via Auto by 2040 - AM Period



2.3 Mode Share

What Modes Will Be Used To Travel?

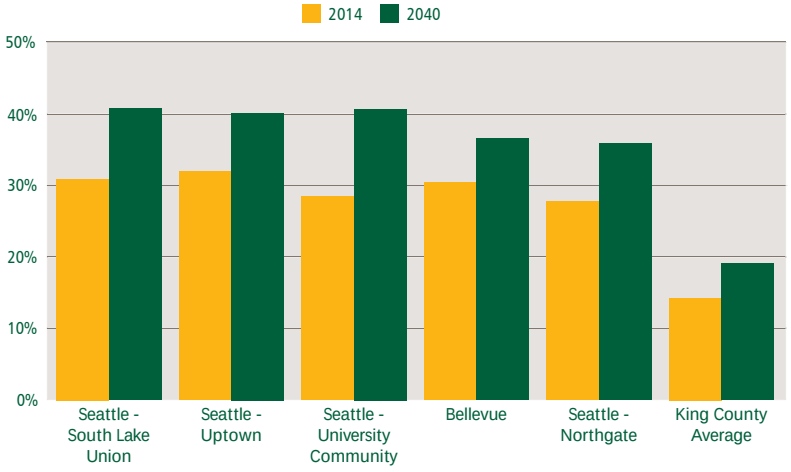
Figure 48 shows the transit mode share forecasted for 2040. The shading represents the areas with a higher transit mode share for work commute trips.

As the figure shows, the urban growth areas with the highest transit mode share in the future are South Lake Union, the University District, Uptown, Bellevue and Northgate (also on Figure 49).

Figure 50 shows the percentage growth in commute transit trips. Large growth in transit usage is primarily focused around areas with future light rail service, such as SeaTac, Bellevue and Redmond (Figure 51).

Areas such as Renton and Auburn show a large percentage increase because their existing transit trip values are relatively low. The large amount of additional transit service provided countywide enables a large increase in transit usage for these particular areas.

Fig. 49: Top 5 Urban Growth Areas: Transit Mode Share - Commute Trips



Source: PSRC Travel Demand Mode. Accessed January 2015

Fig. 48: 2040 Transit Mode Share

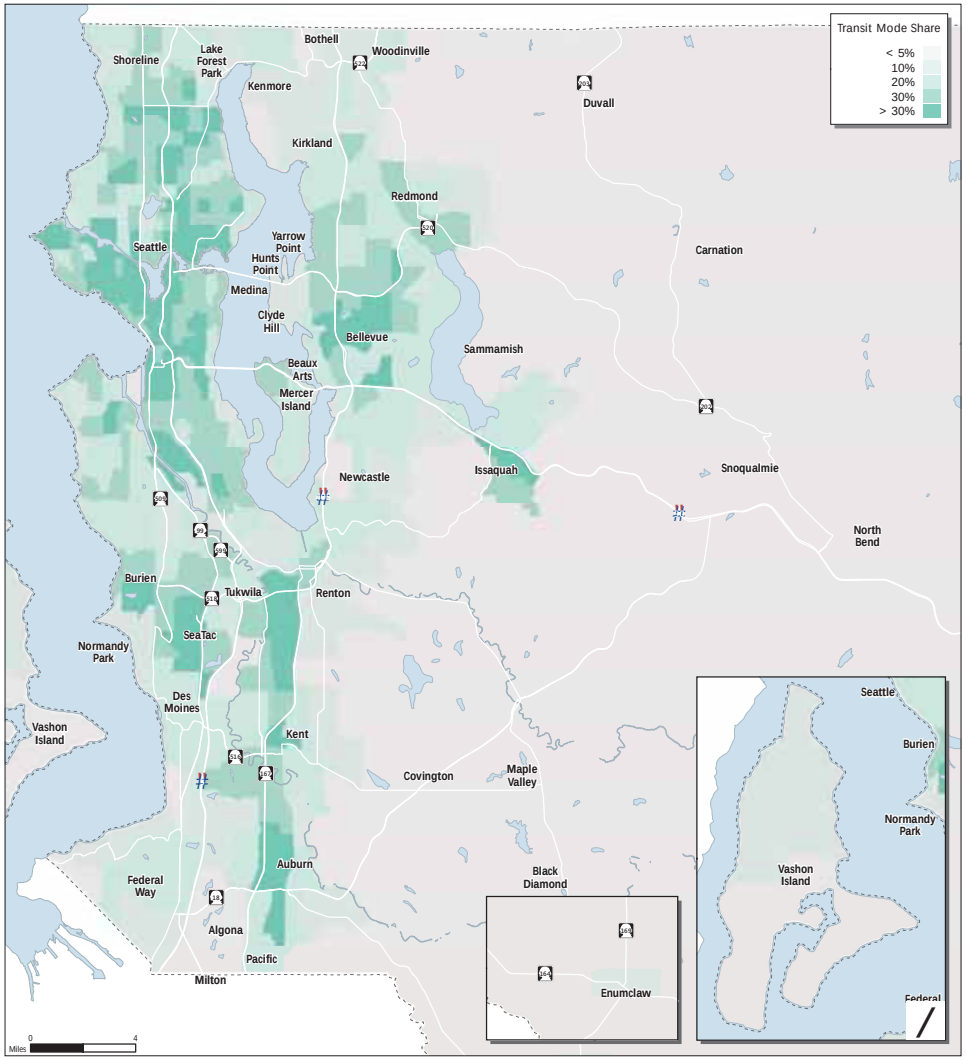


Fig. 50: 2040 Percent Change in Transit Trips

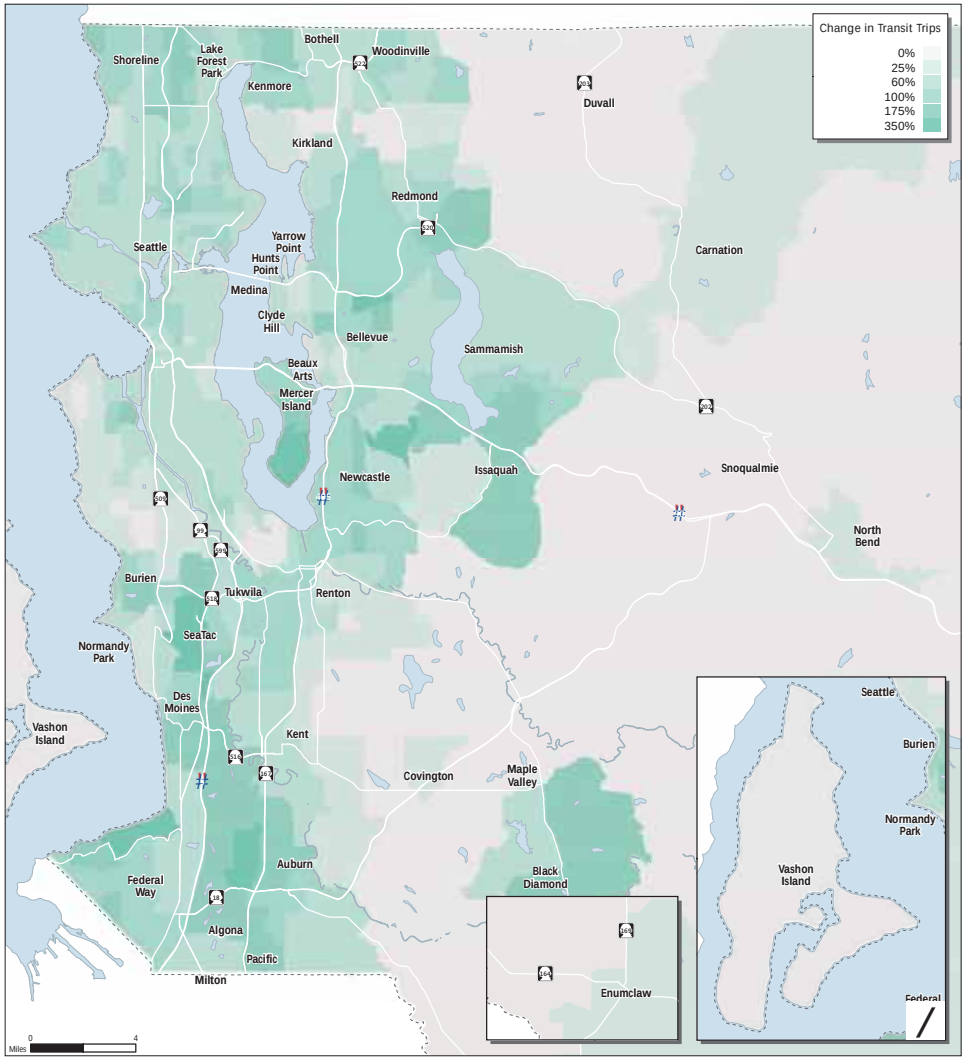
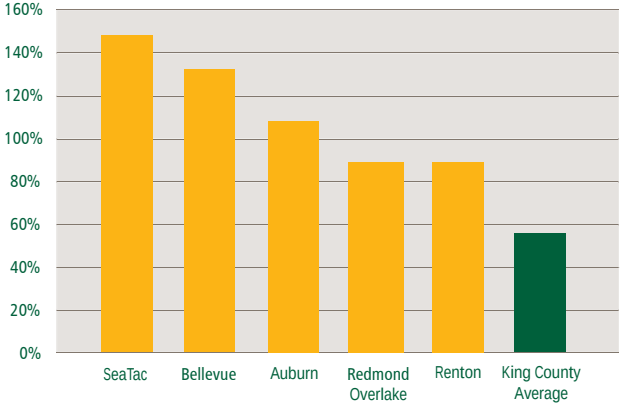


Fig. 51: Top 5 Urban Growth Areas: Percent Change in Transit Trips – Commute Trips



Source: PSRC Travel Demand Mode. Accessed January 2015

3.0 Partnership

As our region's population grows and traffic congestion gets worse, public transportation will become even more critical than it is today for maintaining our region's quality of life, supporting our economy, and protecting our beautiful natural environment. Partnerships are key to building a transit system that works for the region. Metro will collaborate with regional stakeholders, including local governments and other transit providers, to build an integrated public transportation network that helps manage and serve our region's growing population. Figure A16 in the Appendix shows the areas where each of the regional transit agencies in the region provide service.

3.1 Where is Population Growth Occurring?

King County has seen a steady increase in population of more than 2 percent per year over the past 30 years, growing from 1.3 million people in 1980 to more than 2 million in 2014 (see Figure 52). This rate of population growth is more than twice that of Washington state as a whole. By 2040, another 360,000 people are expected to live in King County.

Figure 53 shows the projected distribution of population growth across the region: the darker shaded areas are expected to experience the greatest percentage increase over the existing population by 2040. The areas with higher expected growth include the Overlake area of Redmond, downtown Bellevue, downtown Seattle, Renton, Auburn, and Black Diamond.

With large percentage increases in development, these centers will likely experience noticeable changes in traffic that may create opportunities to expand transit. However, when planning transit service, it is important to consider not only percentage changes in population but also whether this growth results in population densities that support transit. Transit demand increases faster than population growth when densities exceed 7,400 people per square mile.

Fig. 52: King County Population Growth

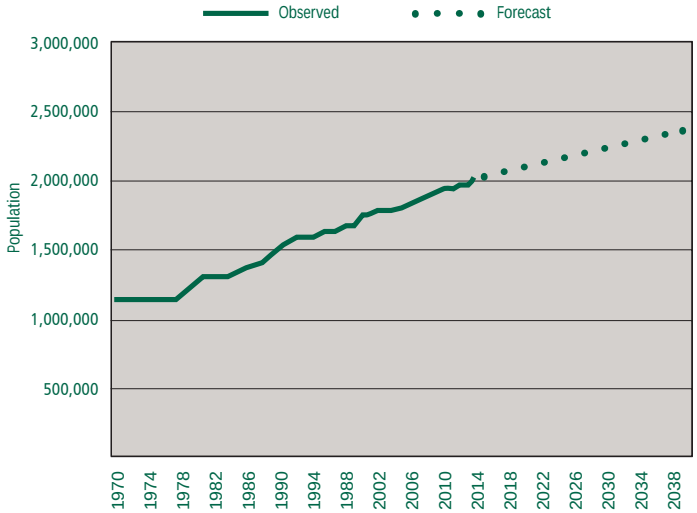


Fig. 53: 2014-2040 Percent Population Change

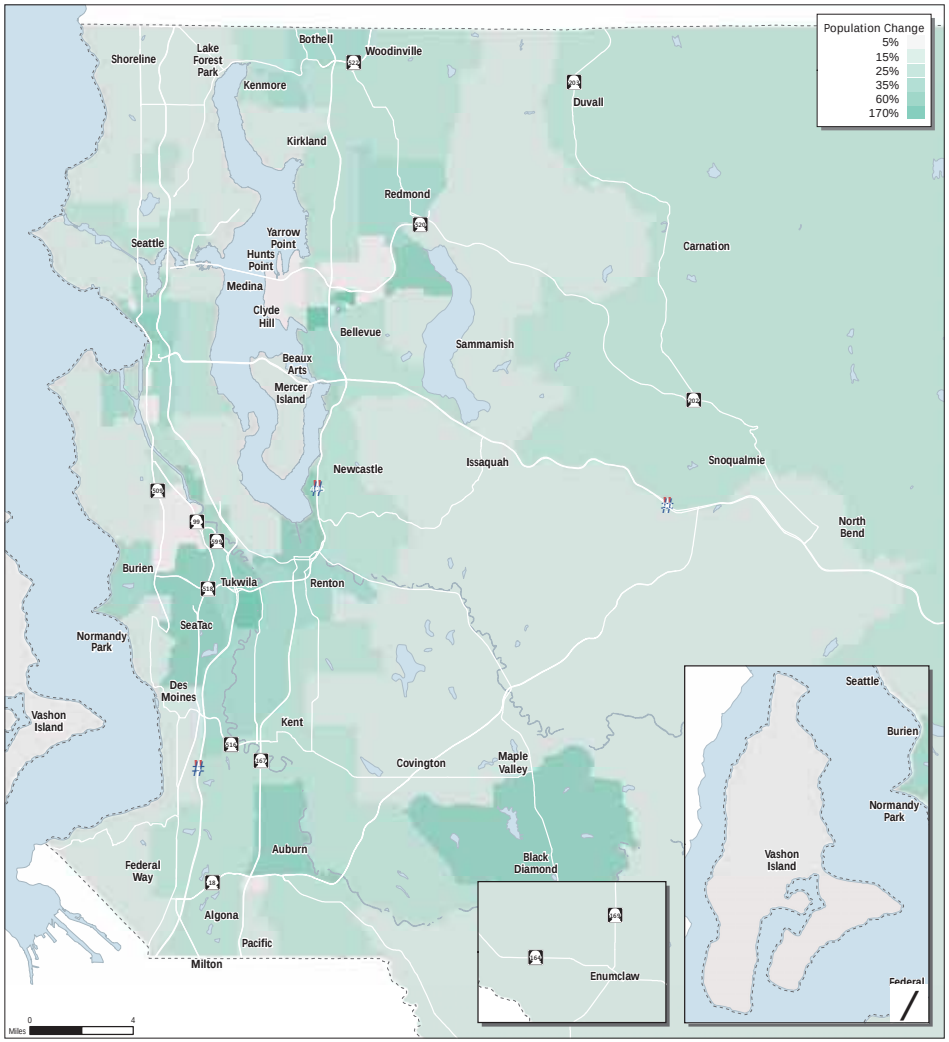


Figure 54 shows the five cities that are expected to have the greatest population growth between 2014 and 2040. Nearly 55 percent of King County's population growth is expected to occur in these cities, and much of that growth will be concentrated in PSRC-designated regional growth centers and other higher-density areas that can be well-served by transit.

As shown in Figures 55 and 56, population density is expected to increase between 2014 and 2040 throughout much of the county's urbanized areas. Most of the areas with the greatest increase in population density are urban growth centers and locations along major transit corridors such as the Bel-Red corridor, Rainier Valley, and portions of the RapidRide E Line Corridor (SR 99) in north Seattle and Shoreline.

Population densities that occur in clusters tend to create travel demand not just to the clusters from other parts of the county, but also within the clusters. In places where large clusters have formed, a grid or multi-centric transit network is the most efficient design to meet demand within and between these clusters.

Note that some rapidly growing areas, such as Black Diamond and Auburn as shown on Figure 81, will remain low-density in the future.

Fig. 54: Top 5 Cities: 2014-2040 Population Increase

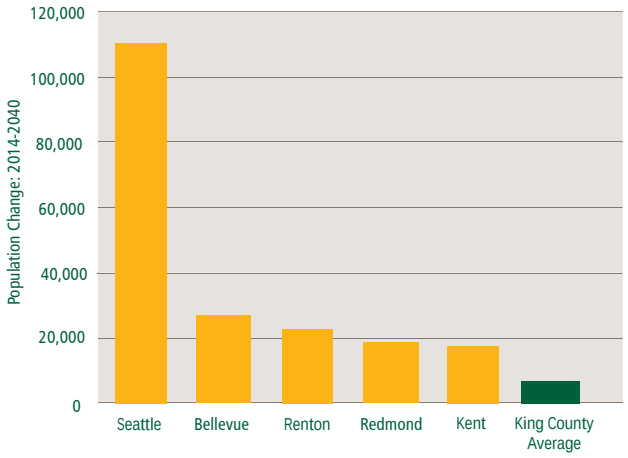


Fig. 55: Existing Population Density

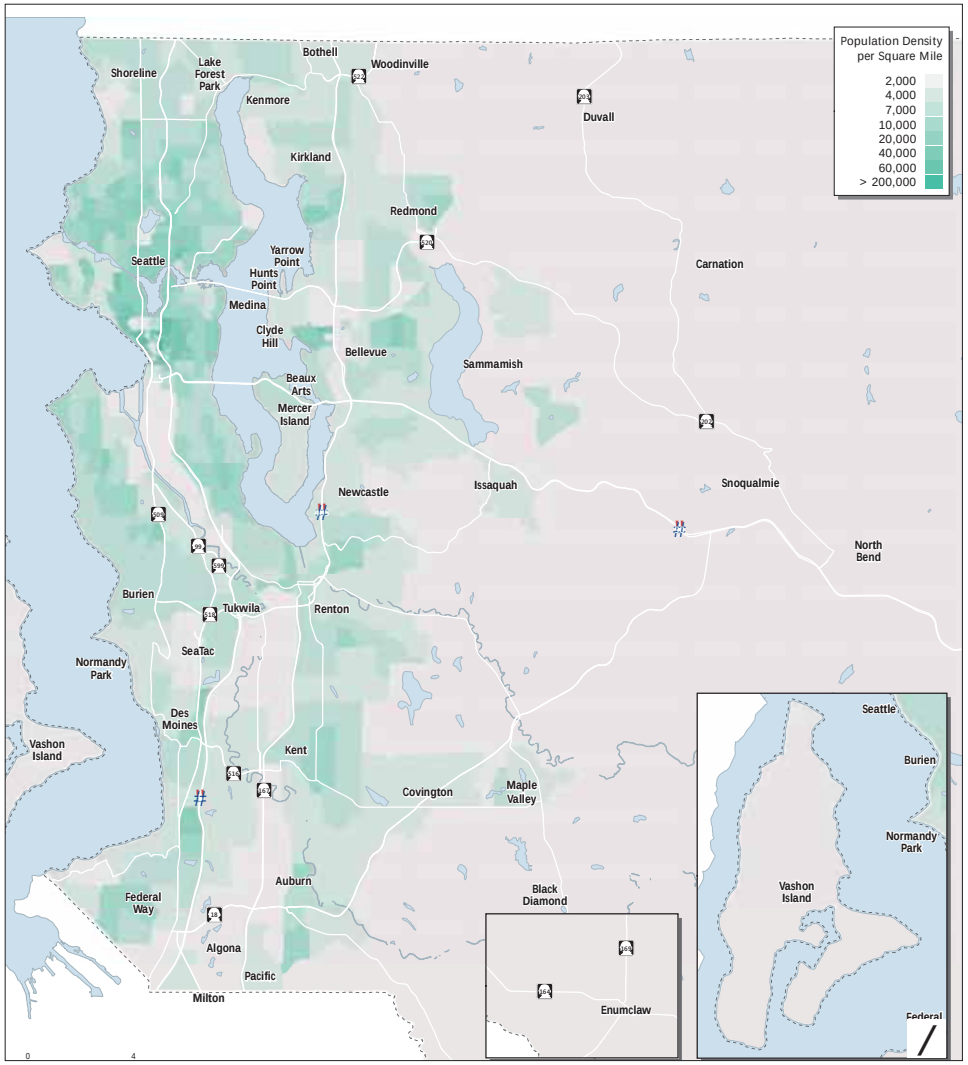
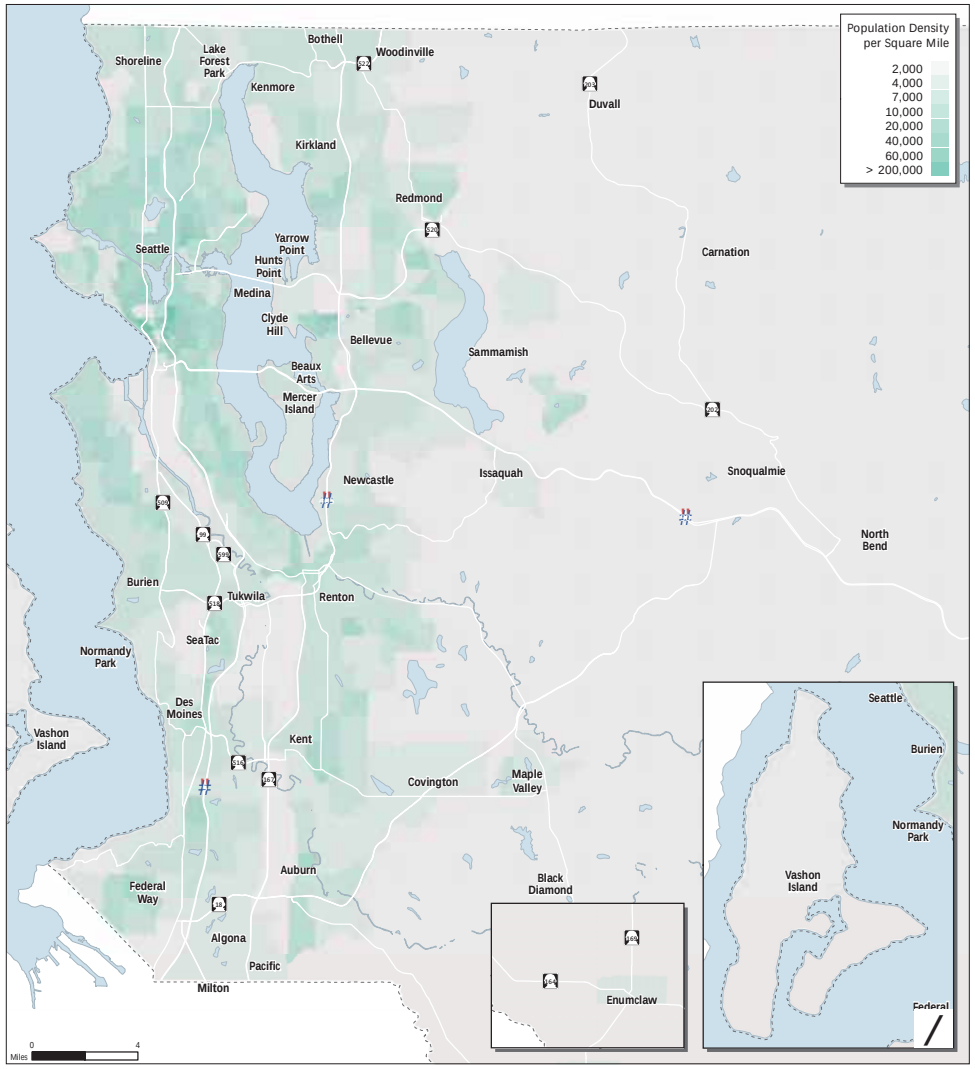
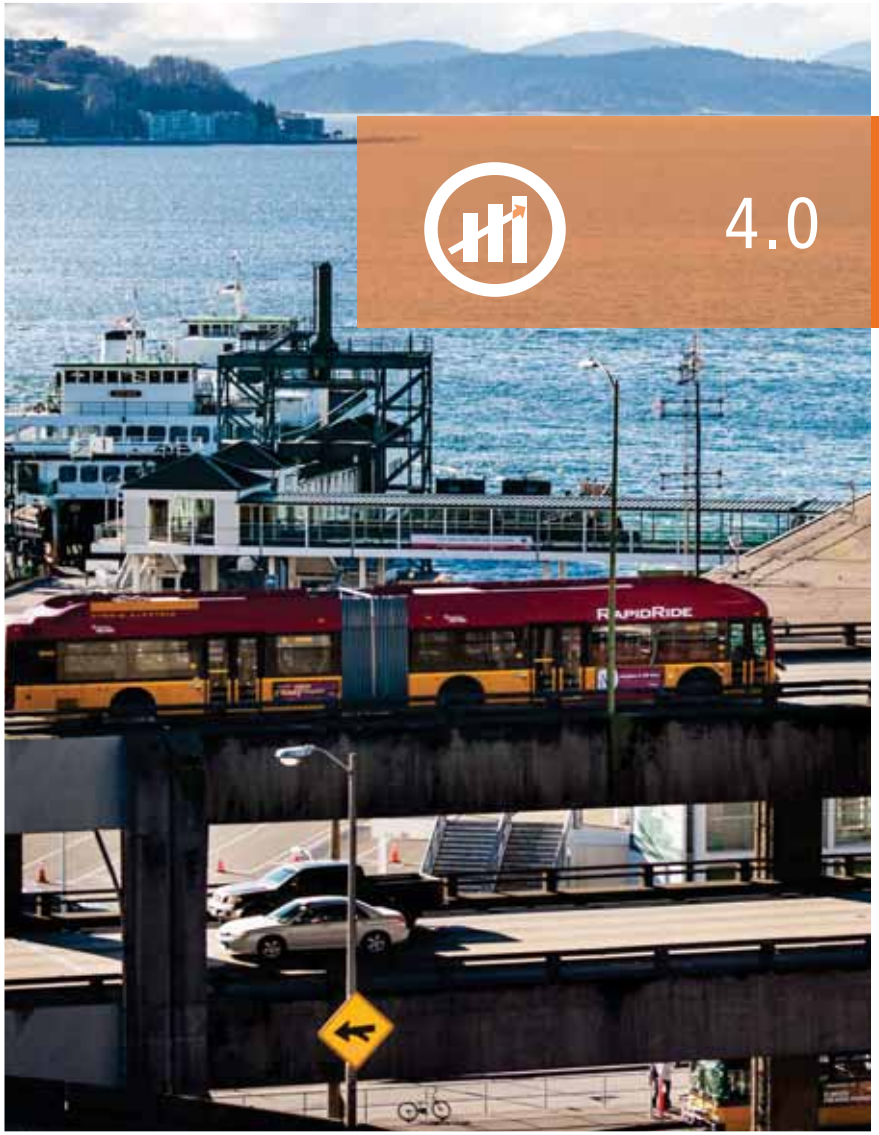


Fig. 56: 2040 Population Density





4.0 Economic Growth

Transportation enables our economy to grow by moving people, goods, and services. With our region's geographical constraints and practical limitations on the amount of new roadway we can build, public transportation will play an increasingly important role in connecting people to the places they want to go. Metro will also help the region make the most of existing roadway capacity to enable the county's economic engine to thrive.

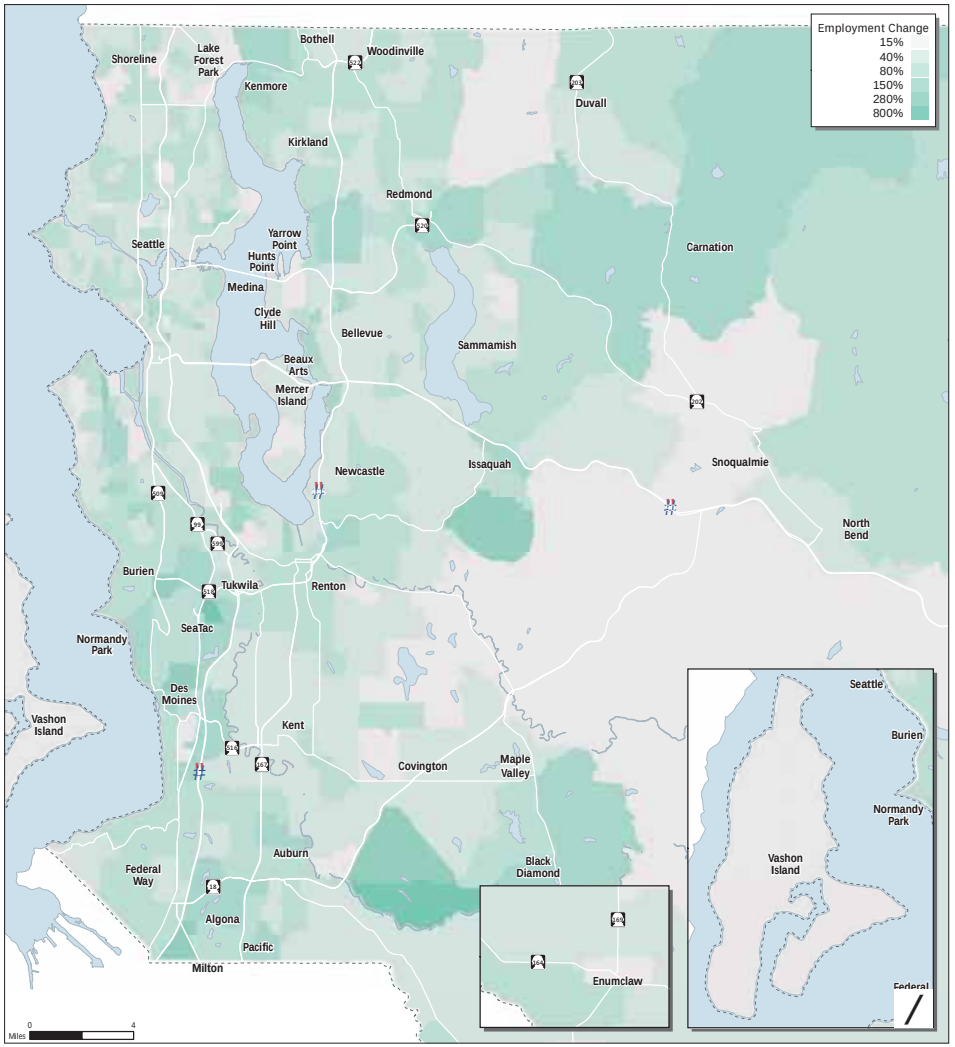
4.1 Where Is The Job Growth Happening?

In addition to a growing population, King County is expected to see a major influx of new employment over the next 25 years. Measured by total employment, King County is the largest economy in the state; it is home to nearly 42 percent of the jobs in Washington. Based on PSRC forecasts, King County's job growth between 2014 and 2040 will outpace population growth—560,000 new jobs compared to 360,000 new residents.

This means that King County will continue to attract workers from adjacent counties, potentially increasing traffic congestion and placing an increasing emphasis on transit to move people to and from their workplaces.

Figure 57 shows where the percentage growth in employment is expected to be highest in King County between 2014 and 2040. Just as transit demand increases faster than population growth once population reaches a certain density, transit demand grows faster than employment growth when employment densities exceed 51,000 jobs per square mile. The most significant changes in employment growth are not necessarily where the percent change is the highest, but where the growth above this density level is the greatest.

Fig. 57: 2014-2040 Percent Employment Change



Even more than population, employment growth is expected to concentrate in PSRC regional growth centers. More than 30 percent of all new jobs are expected to be within these dense urban areas. Figure 58 shows the five cities in the county that are expected to see the most job growth over the next 25 years. The employment growth in these five cities is even more concentrated, with more than 45 percent of the job growth expected to occur in their regional growth centers.

Figures 59 and 60 show the employment density in 2014 and projected for 2040. Areas with notable changes in employment density include Northgate, the Bel-Red Corridor, Issaquah, and portions of Renton, Tukwila and SeaTac. As employment density increases in these areas, a grid or multi-centric transit network will be the most efficient way to meet travel demand between and within these areas.

When population and employment growth are shown together, the results of the emphasis on concentrating population and employment growth in regional growth centers and other urbanized areas becomes apparent. Figure 61 shows both the total increase in population and employment (height of the bars), along with the percentage increase (color) for areas around King County. Given the importance of both population and employment density to future transit service, understanding where major growth is expected to occur and how transit can potentially serve that growth is key to the development of Metro's long-range plan. Several areas stand out:

- Downtown Bellevue, which is expected to see major growth in population and employment.
- Seattle's Center City, including downtown, Capitol Hill/First Hill, South Lake Union and Uptown. Combined, these urban growth centers will see the largest increase in population and employment in the county.
- SeaTac, which will see substantial job growth and some increase in population.
- Redmond-Overlake, which is expected to see a major increase in population to complement the area's existing employment base.
- Central Renton and Issaquah, which will see substantial increases in both population and employment.

Fig. 58: Top 5 Cities: 2014-2040 Employment Increase

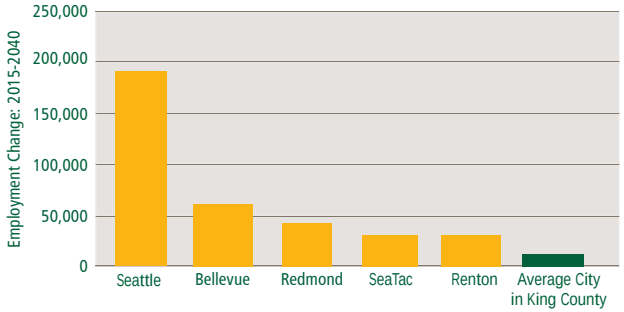


Fig. 59: Existing Employment Density

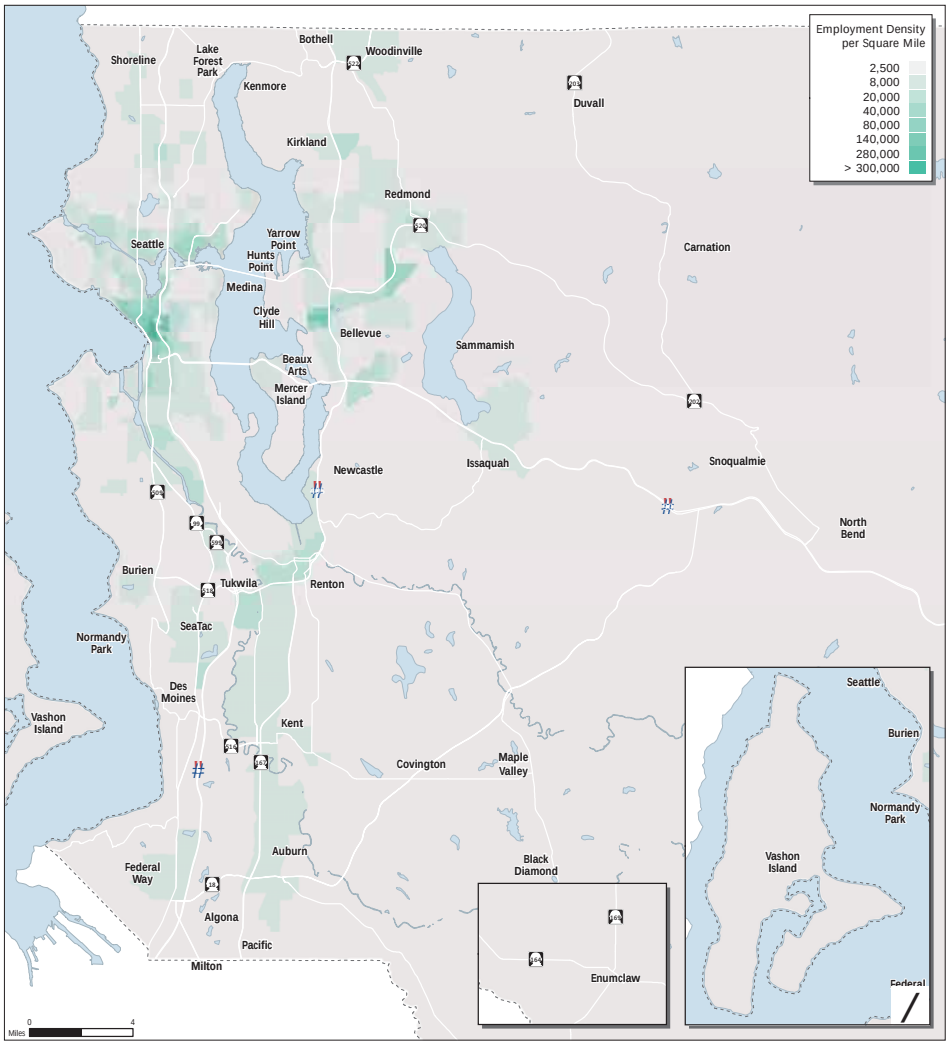


Fig. 60: 2040 Employment Density

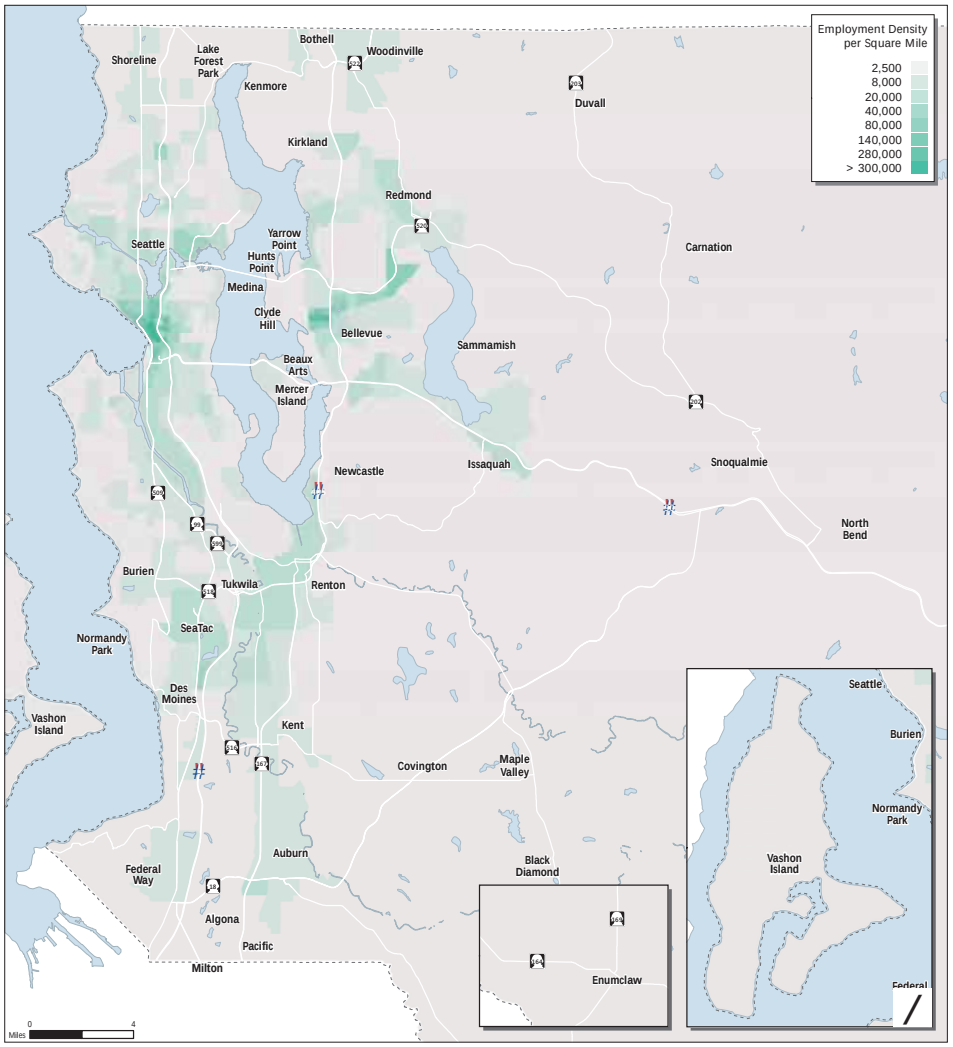
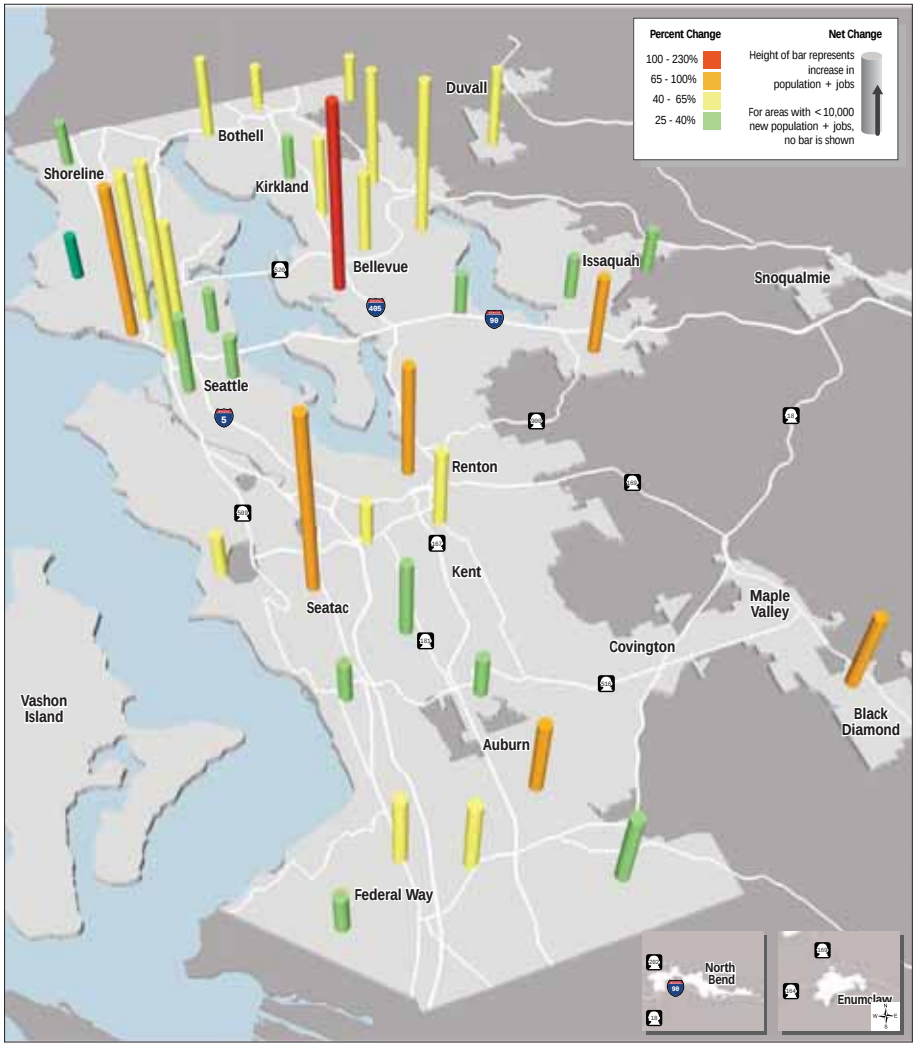
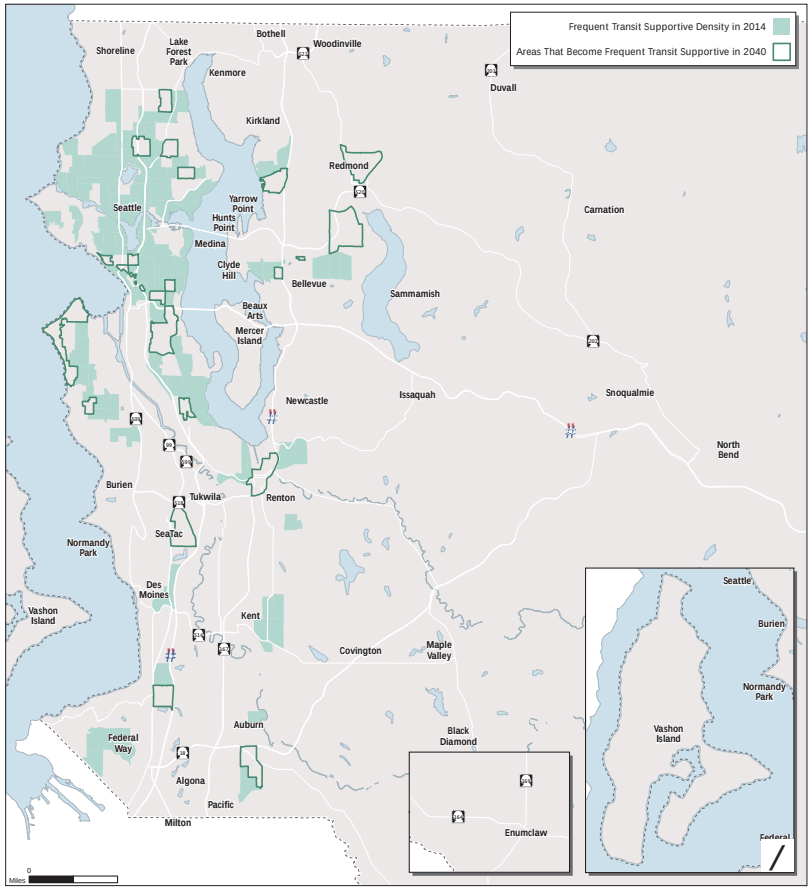


Fig. 61: Change in Population and Jobs



Additionally, a key aspect in long-range transit planning is identifying transit supportive areas based on population or employment density. Research has shown that the density needed to support more frequent transit service ranges from 6,700 to 10,000 people per square mile and 45,000 to 64,000 jobs per square mile at a minimum. Figure 62 highlights areas that have or will have transit supportive densities both in 2014 and by 2040. Similar areas stand out on this map as in Figure 60, such as SeaTac, Redmond-Overlake, portions of Seattle, Renton and Downtown Bellevue. However, this map and the density thresholds should not be interpreted as the only means to identify transit supportive areas. Rather, the map provides additional context to understand the scale of growth in population and employment and its relation to transit.

Fig. 62: Change in Transit Supportive Density 2040



4.2 Mobility How Well Does the System Connect People To Employment?

Section 1 of this document highlighted the proportion of population and employment that is connected by the current transit system. It also introduced the concept of transit mobility, which can be evaluated by identifying the number of jobs accessible within a 30-minute transit ride from locations across the county.

As part of long-range planning process, Metro will be evaluating how to best connect future population and employment centers through an expanded and optimized transit system. To help inform the development of future transit scenarios, this section evaluates how expected growth aligns with the current transit system. This evaluation is helpful because today's transit hubs will continue to be transit hubs in the future. By evaluating future growth against the backdrop of the current transit system, we can find potential gaps in the system—areas that will have substantial growth in the future, but have less robust transit today.

Figure 63, on the next page, summarizes the proportion of new jobs and employment within the area served by the existing Metro system and the ST2 light rail system currently planned and under construction. It shows that slightly more than half of all new population growth in the county would occur within a quarter-mile of an existing Metro transit stop. About 24 percent of the new population growth would be within a half-mile of an existing RapidRide or ST2 Link light rail stop. Sixty-seven percent of all new jobs in the county will be within a quarter-mile of the existing Metro system. A large proportion of those jobs (43 percent) will also be within a half-mile of either the existing RapidRide system or ST2 Link light rail. This result reflects the fact that much of the county's employment growth is expected within dense areas, particularly PSRC regional growth centers.

Figure 64 shows the service coverage of Metro's existing transit network and the future Link light rail network with the change in population and jobs between 2014 and 2040. It shows that the current frequent network has notable gaps in coverage in the higher growth areas of south King County, such as SeaTac and Tukwila, and in portions of the Eastside, notably Redmond, Kirkland, Bothell and Issaquah.

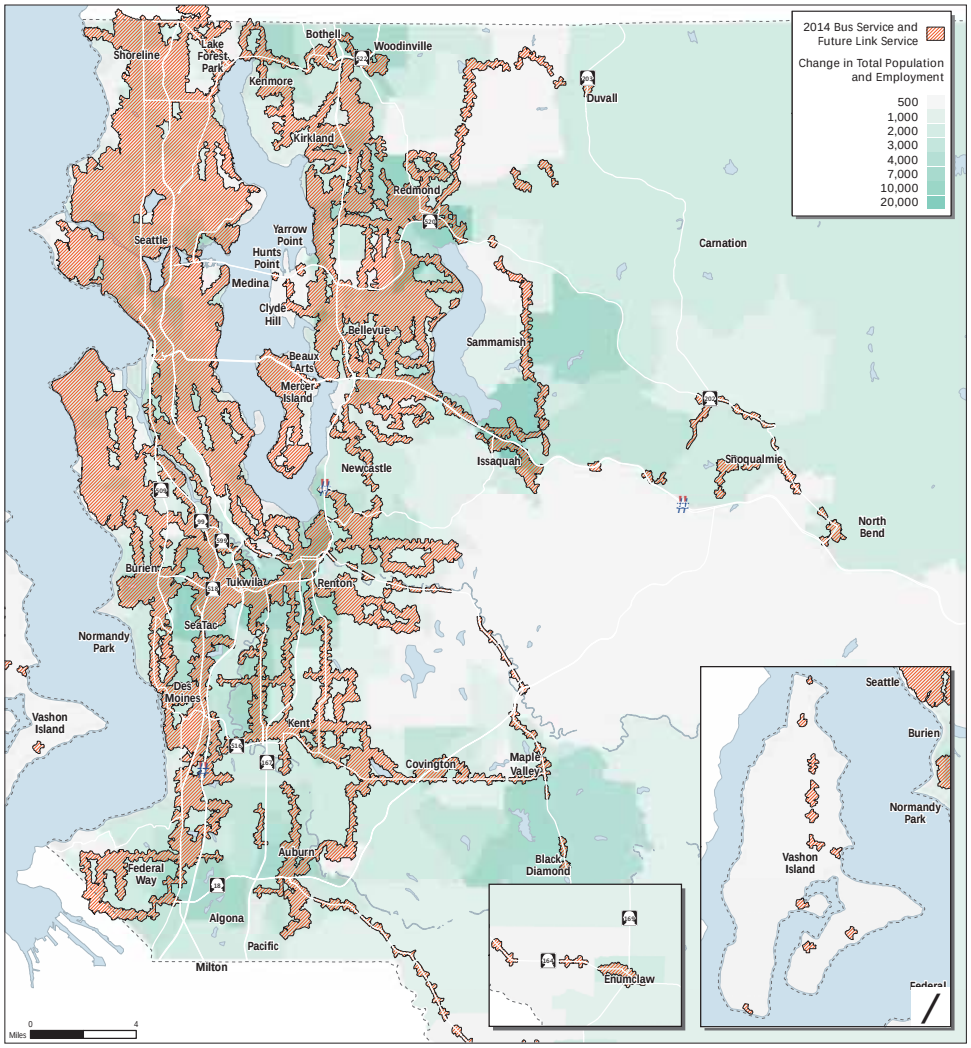
Fig. 63: Proportion of Population and Employment Growth Served by Current Transit

New Population Growth	All Transit	King County Metro	Sound Transit
All Stops (1/4 mile)	73%	73%	14%
RapidRide or Link (1/2 mile)	32%	25%	15%
Combined (1/4 mile for all and 1/2 mile for Link and RR)	76%	75%	21%
Frequent Service Combined (1/4 mile for frequent or very frequent, and 1/2 mile for Link and RR)	53%	51%	18%

New Employment Growth	All Transit	King County Metro	Sound Transit
All Stops (1/4 mile)	79%	79%	28%
RapidRide or Link (1/2 mile)	50%	45%	26%
Combined (1/4 mile for all and 1/2 mile for Link and RR)	83%	83%	37%
Frequent Service Combined (1/4 mile for frequent or very frequent, and 1/2 mile for Link and RR)	65%	64%	32%

Note: The coverage provided by both Sound Transit and Metro (All Transit) is not the sum of the coverage by both agencies. In many cases, both agencies serve the same areas with different types of transit service. Therefore, Sound Transit tends to not greatly expand transit coverage for population or employment.

Fig. 64: Existing Metro Transit Network and Future Link Service with 2040 Population and Employment Growth



4.3 Economic Benefits Of Transit

Transit networks provide significant economic benefits to local and national economies and can act in both city-serving and city-shaping capacities. Transit can be city-shaping when transportation and land use planning happen concurrently, creating the framework for unleashing the economic potential of a city. Transit investment can help shape areas with potential for development by making them more competitive, livable and affordable.

Transit can be city-serving when priority is given to transportation investments that serve land use and community assets, providing people with more transportation choices for travel to the places they want to live, work, shop and play. When transit serves multiple objectives, such as affordable transportation and housing as well as reduction of greenhouse-gas emissions, a wider variety of funding sources can be utilized for making improvements to the transit network.

Investments in transit can lead to direct economic benefits, including time and cost savings, enhanced mobility and access, and increased productivity, as shown in Figure 65.

Transit can also provide indirect economic benefits. When access to transit reduces household spending on fossil fuels, families have more money to spend in economic sectors that return a stronger benefit to the local economy (Seattle Transit Master Plan, 2012). According to research by the Center for Neighborhood Technology (CNT), households in cities where jobs and services are readily accessible by transit are more economically resilient and better able to respond to gas price increases (CNT, 2011).

Other indirect economic benefits of transit include:

- Using land resources more efficiently
- Stimulating community vitality
- Promoting health by expanding options for walking and bicycle trips
- Reducing pollution and greenhouse-gas emissions.

The economic benefits of transit have been recognized across King County and continue to grow as the regional transit system expands. This section includes several case studies that illustrate how these benefits have been realized, and identifies steps Metro might take to maximize economic benefit when planning for future transit.

4.3.1 National and Local Metrics on the Economic Benefits of Transit

The American Public Transportation Association (APTA) conducts research and maintains statistics on the direct and indirect economic benefits of public transportation investment. According to APTA, public benefits provided by public transportation can accrue directly as measureable economic savings and gains, or as social or environmental benefits that indirectly benefit local and national economies.

Direct benefits can affect the economy either by stimulating short-term spending or by leading to longer-term cumulative impacts on cost, mobility and economic productivity. A program of enhanced public transportation investment sustained over 20 years can have a total effect on the economy in the range of 3.7 times the amount spent annually (Cambridge Systematics, 2014).

APTA and other researchers quantify the short-term stimulus benefits of public transportation spending in the following ways:

- Every dollar invested in public transportation generates approximately four dollars in economic returns (APTA, 2015).
- Every $10 million in operating investment in public transportation yields $32 million in increased business sales (APTA, 2015).
- Every $10 million in capital investment yields $30 million in increased business sales (APTA 2015).
- Every $1 billion invested in public transportation capital and operations creates and supports an average of 36,000 jobs (APTA, 2011).
- $1 billion of annual spending generates $432 million in federal, state and local tax revenues (Cambridge Systematics, 2014).

Longer-term, the cumulative impacts that public transportation investments have on economic productivity include:

- Lower travel and vehicle ownership cost:
  - According to APTA's Transit Saving Report, a two-person household can save, on the average, more than $10,174 per year by downsizing to one car (APTA, 2015).
- Reduced traffic congestion:
  - Without public transportation, congestion costs in 2011 would have risen by nearly $21 billion—from $121 billion to $142 billion—in 498 urban areas (TTI, 2012).
  - The latest research shows that in 2011, U.S. public transportation use saved 865 million hours in travel time and 450 million gallons of fuel in 498 urban areas (TTI, 2012).
- Savings on worker wage and reliability:
  - A 10 percent change in transit service leads to an average of $45 million of added worker wages for the average metropolitan area (Cambridge Systematics, 2014).
- Access to broader labor markets:
  - Between 2006 and 2011, households living in areas served by transit had better access to jobs and lower average transportation costs than the region as a whole (CNT, 2013).
  - Findings suggest that between 379,000 and 480,000 jobs could potentially be lost or gained nationwide by the year 2040, depending on steps taken to address the transportation capacity constraint (Cambridge Systematics, 2013).
- Job creation and increased job hours:
  - A recent report by Smart Growth America analyzed stimulus-funded infrastructure projects and found that each dollar spent on public transportation created 31 percent more jobs and resulted in 70 percent more job hours than a dollar spent building roads. Investments in improving/maintaining existing streets generated 16 percent more jobs per dollar than building new roads (Smart Growth America, 2011).
- Induced impacts on spending of worker wages:
  - If ridership were to double nationwide, long-term growth in disposable income due to savings would total $28.5 billion per year by the year 2020 (Cambridge Systematics, 2014).
- Improved property values:
  - From 2006-2011, residential property values performed 42 percent better on average if they were located near public transportation with high-frequency service (CNT, 2013).

Public transportation capital investment and operations can also lead to a wide range of social benefits that indirectly influence economic performance and sustainability, including impacts on energy use, air quality, carbon emissions, health, equity, and public costs associated with land-use development patterns (Cambridge Systematics, 2014).

The following section explores case studies that demonstrate ways in which the city-shaping and city-serving potential of transit investment has been leveraged in King County to provide the kinds of economic benefits described above.

Fig. 65: Direct and Indirect Economic Benefits of Transit

4.3.2 King County Case Studies of Transit Economic Benefit

Downtown Redmond

Downtown Redmond is served by the RapidRide B Line, several other Metro routes, and two Sound Transit Express routes. These services combine to offer frequent service within Redmond, as well as reliable connections from Redmond to major employment centers in Bellevue and Seattle. A light rail station is planned for Redmond's downtown core.

In 2008, Metro, Sound Transit and the City of Redmond worked together to redevelop an existing 4.8-acre park-and-ride near downtown, turning it into a mixed-use apartment community to increase housing options near transit and to catalyze additional development near the transit center (Figure 95). The city has also completed several projects to improve the active transportation network, including new multi-modal street connections, a shared-use trail through downtown, and a new central park. Since these projects were completed, more than five significant mixed-use developments have been planned or built within the Redmond's downtown area as of July 2013.

South Lake Union

Several Metro bus routes and the Seattle Streetcar (Figure 67) serve South Lake Union and connect the neighborhood to the regional transit network. In 2003, property owners and businesses in South Lake Union partnered with Metro and the City of Seattle in a stakeholder-led process to design and fund the streetcar, with the private sector contributing half the cost.

Of the potential new commuting trips attracted to the neighborhood by 2040, APTA estimates that nearly 800 are expected to be jobs directly enabled by transit capacity. By 2040, these jobs would be expected to create over $65 million of wage income, $301 million in business output and over $106 million annually in Seattle's regional economy" (Cambridge Systematics, 2013). The Seattle Downtown Transportation Alliance agreed that increasing transit, bicycle and walking trips is the only way Seattle will be able to physically accommodate the projected housing and jobs in the center city.

Downtown Bellevue

The Downtown Bellevue Transit Center station area (Figure 68) is served by many Metro bus routes, including the RapidRide B Line and Sound Transit Express bus service. Sound Transit Link light rail will also serve the area starting in 2023.

Many Bellevue employers have identified existing and future transit service as a significant factor in their decision to locate in downtown Bellevue. The city sees abundant transit as a key strategy to support the growth planned for the downtown area while furthering the city's vision of a thriving and livable downtown. The downtown Bellevue area around the transit center has increasingly dense employment, residential and civic uses where mixed-use and commercial zoning permits very high housing and job densities with a balanced jobs-to-housing capacity ratio.

Fig. 66: Downtown Redmond

(Image source: Rutledge Maul Architects)

Fig. 67: South Lake Union

(Image source: Wikimedia Commons)

Fig. 68: Downtown Bellevue

(Image source: eastsideeasyrider.org)

4.3.3 Next Steps: Maximizing Economic Benefit with Future Transit Planning

Transit planning can maximize the economic benefits of transit by leveraging opportunities for integrated investments. Planning that strives for multiple benefits—such as providing affordable transportation, housing and job choices—allows agencies to build partnerships around shared values. These partnerships can lead to additional economic benefits by expanding access to a wider diversity of funding opportunities.

Steps that could be taken to attain multiple benefits include:

- Identifying unique conditions and opportunities in each place served by transit.
- Building a shared vision through partnerships between and among agencies and property owners.
- Facilitating livable communities through development-oriented transit planning.
- Rewarding smart growth policies with transit service improvements.
- Improving access and connectivity to increase the effectiveness and efficiency of all modes.
- Integrating improvements to gain access to multiple funding sources such as multimodal or affordable housing grants.
- Creating livable, walkable communities in which system users have many choices.

The following case studies provide examples of partnership models, visioning tools and analytical methodologies that can help to inform next steps for maximizing economic benefit in future transit planning.

Development-Oriented Transit Planning

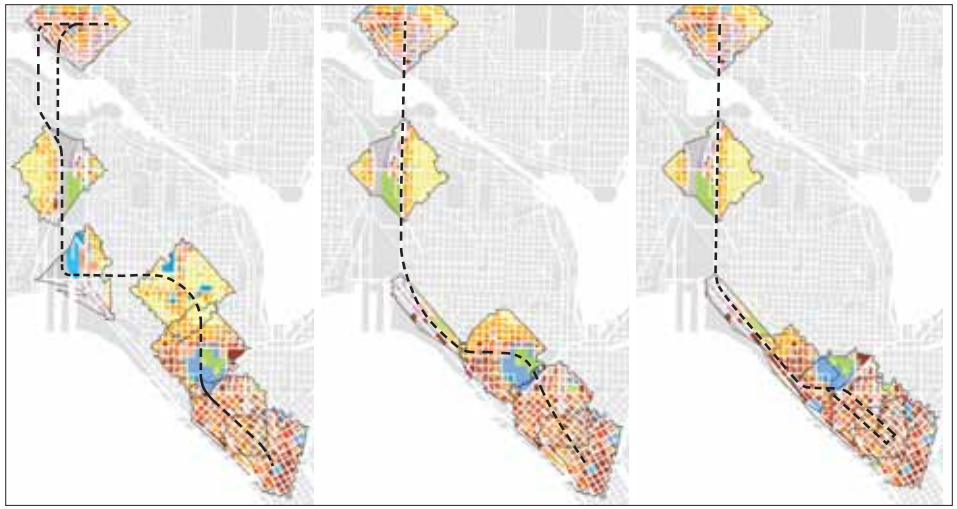
The Ballard to Downtown High Capacity Transit Study used a methodology for integrating transit and land use that was based on the likelihood of development occurring in response to transit service in potential station areas. The study reviewed existing development, neighborhood and transportation plans and identified parcels likely to redevelop within the project timeframe. After adjusting for the specific context and value of each parcel in the study area, the study evaluated data to estimate the potential increases in residents and jobs as a result of transit investments. Study findings will be used to evaluate alternatives in future phases of the project. Figure 69 shows walkshed analysis completed as part of the study.

Tools for Building Partnerships Around a Common Vision

TransLink, in Vancouver, British Columbia, partnered with Metro Vancouver, local municipalities and other stakeholders to publish a handbook of ideas and strategies for making communities more livable, walkable and transit-oriented. The publication gives public agencies, municipalities and stakeholders a shared vision for a livable, sustainable, economically vibrant region. Its supports shared responsibilities and partnerships around a common goal of creating more livable places around transit in Metro Vancouver.

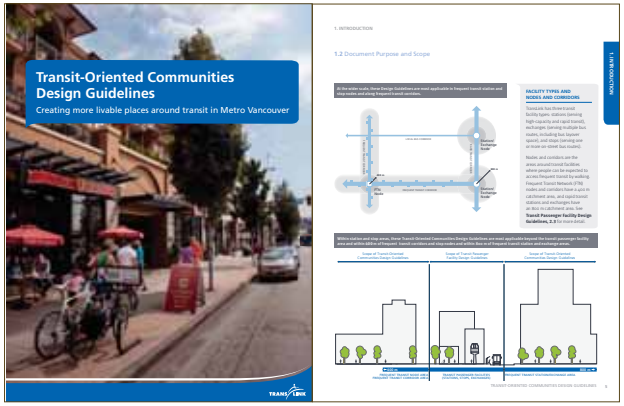
The guidelines in this publication were applied with the B.C. Burquitlam Station Area Transportation and Transit Integration Plan (Figure 70). Stakeholders worked together to address the opportunities for the transit agency, a university, and both cities bordering the station. The resulting plan's transit-oriented development strategy goal is "to promote the transition of the current Burquitlam area toward a more compact and mixed form of development that is more supportive of transit users and contains improved amenities for local users." The plan also describes the bus–rail transit exchange, layover configuration, multi-modal street requirements, mobility improvements and land-use changes needed to attain the vision of a high-density, walkable urban neighborhood. The cities agreed to implement these changes to maximize TransLink's transit investments.

Fig. 69: Development-Oriented Transit Planning



Ballard to Downtown HCT Study Transit and Land Use Integration Analysis walksheds. (Sound Transit, City of Seattle)

Fig. 70: Tools for Building Partnerships Around a Common Vision



Transit-Oriented Communities Design Guidelines (TransLink)

Burquitlam Station Area Transportation + Transit Integration Plan design concept. (City of Coquitlam, TransLink)

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5.0 Accountability

Metro is accountable to the people of King County, and the Long-Range Public Transportation Plan will create measurable objectives to assure that all public transportation investments add economic, social and environmental value.

Metro currently reports annual and monthly performance on a variety of measurable objectives in areas such as customer service, finances, ridership and service performance. This information is presented in the Accountability Center on Metro's website, http://metro.kingcounty.gov/am/accountability. Various annual reports provide additional information, such as how well Metro serves minority populations and how well Metro is progressing toward the strategic plan goals.

5.1 Service and Financial Performance

Metro measures service performance in a number of ways, including:

- rides per platform hour
- passenger miles per platform miles
- cost per boarding

5.1.1 Route Performance Metrics

Metro assesses each route's productivity using two measures: rides per platform hour and passenger miles per platform mile. Productivity is analyzed in the peak, off-peak, and night periods based on the market the route serves.

Rides per Platform Hour

Rides per platform hour is the total ridership divided by the total hours a bus travels from the time it leaves its base until it returns. In 2014, routes serving the Seattle core provided 41 rides per platform hour—substantially higher than the 24 boardings per hour on routes not serving the Seattle core (Figure 71).

Passenger Miles per Platform Miles

Passenger miles per platform miles is the total miles traveled by all passengers divided by the total miles the bus operates from its base until it returns. This is summarized on Figure 72 for routes that serve the Seattle core and routes not serving the Seattle core. In 2014, passenger miles per platform miles on Seattle core service was 15, substantially higher than the 7 boardings per hour on routes not serving the Seattle core.

5.1.2 Cost per Boarding

Figure 73 shows the cost per boarding by route frequency. Boardings per hour on very frequent service had the lowest cost per boarding at $3.51 while hourly routes had the highest operating cost per boarding at $11.05 per boarding.

Figure 74 summarizes cost per boarding by time of day. Routes operating at night had the highest operating cost per boarding at $5.67 per boarding. Routes operating during the off-peak had the lowest operating cost per boarding at $4.04 per boarding in 2014.

Cost per boarding for routes serving the Seattle core and routes not serving the Seattle core is shown on Figure 75. Operating costs per boarding were higher on routes not serving the Seattle core ($6.07) than on those that do serve the Seattle core ($3.86).

Fig. 71: Rides per Platform Hour by Service Type

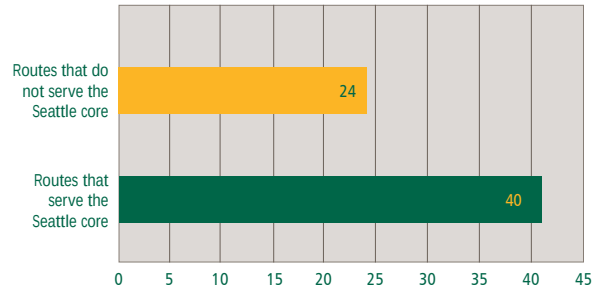


Fig. 72: Passenger Mile per Platform Mile by Service Type

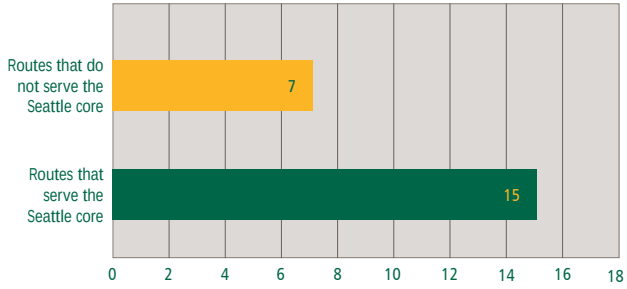


Fig. 73: Cost per Boarding by Service Family

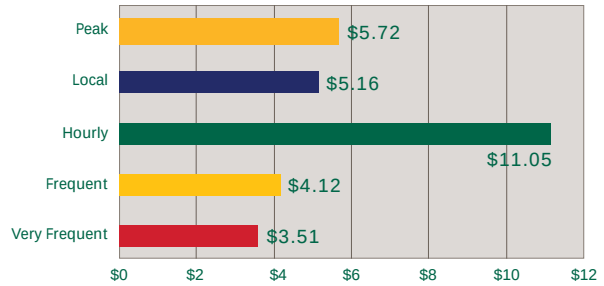


Fig. 74: Cost per Boarding by Time of Day

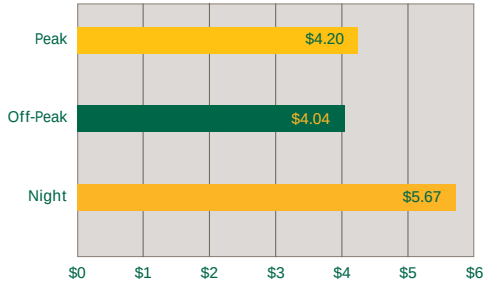
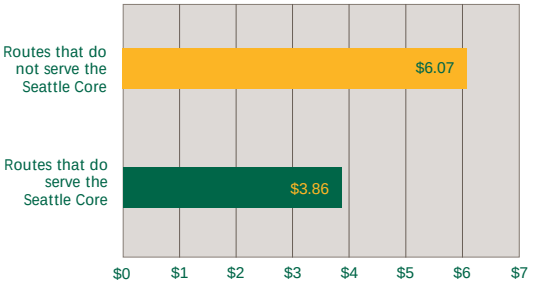


Fig. 75: Cost per Boarding by Service Type



5.2 Measuring Metro's Effect on the Environment

Transportation of all types is responsible for one-third of greenhouse gas (GHG) emissions in the United States. Unlike other forms of transportation, such as a private vehicle, public transportation reduces annual CO2 emissions by 37 million metric tons. According to the PSRC, half of GHG emissions in the central Puget Sound region can be attributed to transportation. In King County alone, 16 percent of GHG emissions are derived from personal transportation, which produces 8.8 million metric tons of CO2 emissions each year. SOV's are one of the largest sources of GHG emissions. Figure 76 provides a comparison of GHG emissions emitted by Metro vehicles and SOV's.

PSRC's Transportation 2040 plan includes recommendations for transit agencies and municipalities throughout the region to reduce their GHG emissions by focusing on transit-oriented development, implementing a roadway pricing system, offering alternative transportation options and improving vehicle technology.

Metro works to reduce GHG emissions and energy use by increasing vehicle efficiency and encouraging the use of alternatives to driving alone (public transit, rideshare, walking and biking) and investing in transit-oriented communities. These actions are consistent with King County's Strategic Climate Action Plan and Energy Plan.

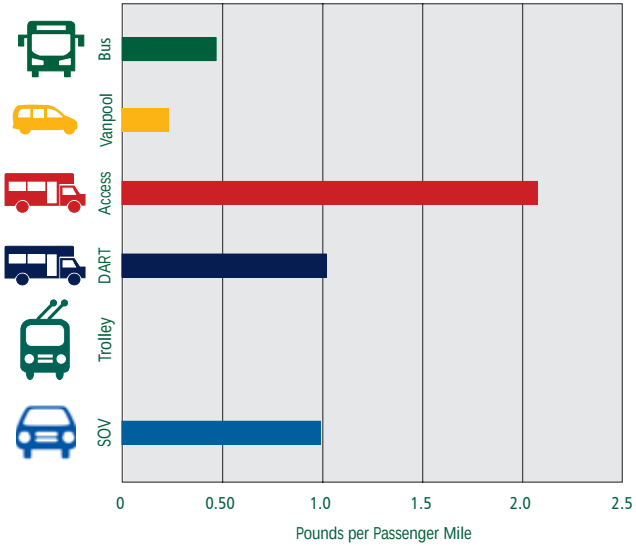
Nationally, Metro has been a leader in the adoption of several energy-efficient transportation technologies. Metro is replacing diesel buses with hybrid-electric buses, which can reduce CO2 emissions by up to 40 percent. Today Metro operates a fleet of 712 hybrid buses. Metro's electric trolley network produces no GHG emissions and carries 16 percent of Metro riders. Metro has also introduced electric rideshare vehicles into the Vanpool fleet and operates a fleet of 712 hybrid buses. In 2015 Metro will test two prototype battery-powered buses.

Metro's Commute Trip Reduction program helped decrease the rate of SOV use during the commute periods by 7 percent between 2007 and 2011—decreasing GHG emissions by 32,000 metric tons.

Metro is recognized as a leader by the American Public Transportation Association for efforts to reduce greenhouse gas emissions, reduce energy and water use, generate less waste, and increase recycling. APTA awarded Metro its Gold level recognition for these achievements in 2013.

Metro has an active Sustainability Program and publishes an annual progress report. Learn more at http://metro.kingcounty.gov/am/sustainability/

Fig. 76: Annual GHG Emissions per Passenger Mile by Mode (2013)



King County Metro Data 2013; Environmental Protection Agency May 2014