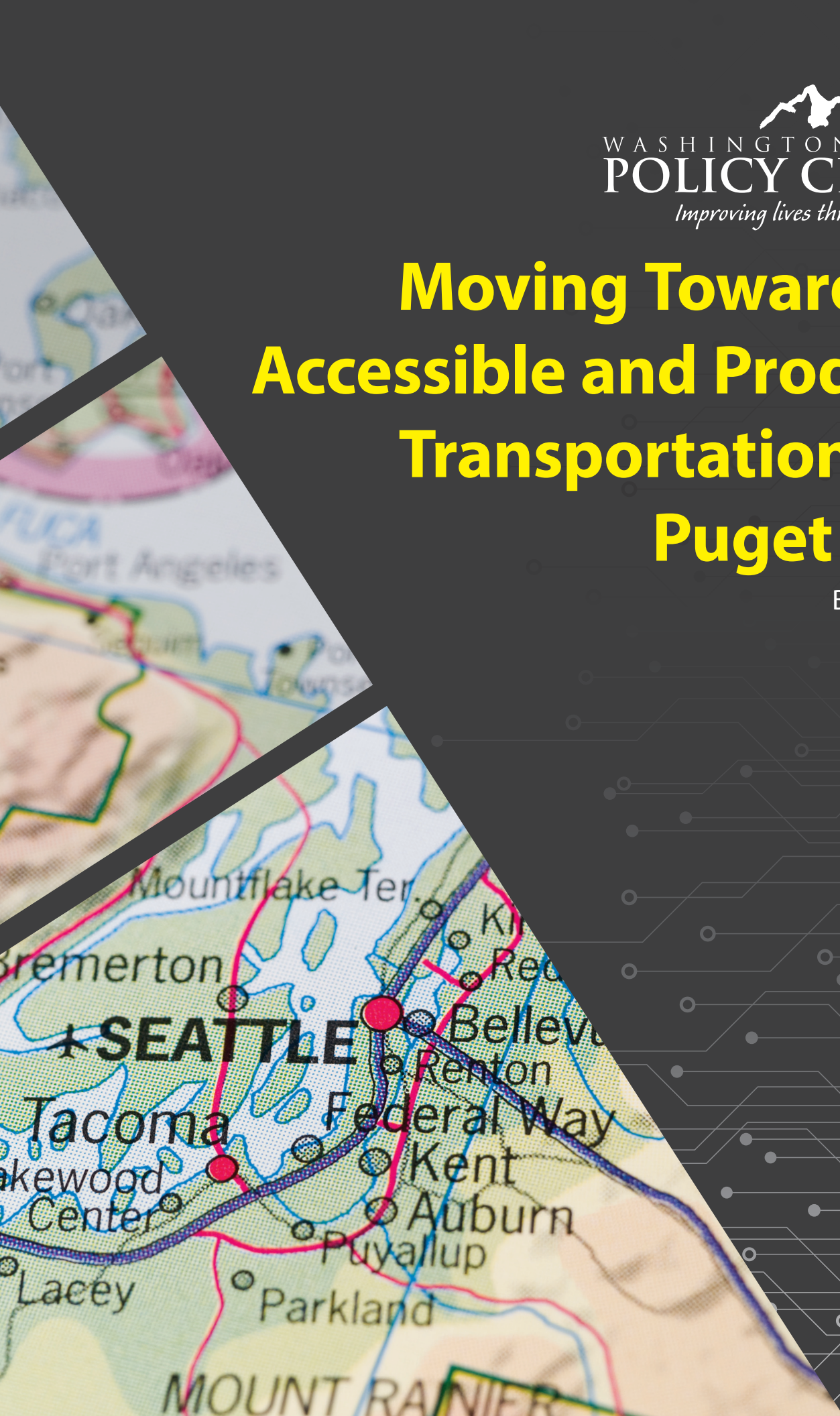
WASHINGTON POLICY CENTER

Improving lives through market solutions

Moving Toward More Accessible and Productive Transportation in the Puget Sound

By Wendell Cox

June 2019



WASHINGTON POLICY CENTER

Improving lives through market solutions

POLICY BRIEF

Moving Toward More Accessible and Productive Transportation in the Puget Sound

By Wendell Cox,
Principal, Demographia (Wendell Cox Consultancy)

October 2019

Key Findings

1. The overwhelming share of population and employment in the Puget Sound is outside the city of Seattle. Even with the city of Seattle's unprecedented population and employment growth since 2010, a sizable majority of new residents and employment have located outside the city.
2. The Puget Sound region is dispersed, both in employment and residences. While downtown Seattle is the strongest Puget Sound Regional Council (PSRC) employment center and has experienced astounding growth since 2010, more than 85 percent of employment is outside downtown.
3. The "Amazon Boom" has brought unprecedented employment growth to downtown Seattle and seems unlikely to play as strong a role in the future. However, even with the "Amazon Boom," nearly 60 percent of employment growth has been outside the city of Seattle since 2010.
4. Autos are used by more than two-thirds of commuters to work trip locations throughout the Puget Sound, with a three-quarters share outside the city of Seattle and just shy of a 50 percent share in the city of Seattle.
5. Transit serves a principally niche market, with 48 percent of the commuting to downtown Seattle, and a 9.3 percent share to the rest of the city. Only 3.5 percent of work trips to destinations in the rest of the Puget Sound are on transit.
6. Downtown dominates transit commuting. PSRC employment centers outside the city of Seattle exhibit transit commuting characteristics more reflective of suburban areas outside centers, with virtually no realistic potential for reducing vehicle miles through expanding transportation choices. As such, transit has little or no potential to reduce traffic congestion regionally.
7. As is typical of virtually all US metropolitan areas, transit access to employment is a small fraction of that accessible by car. It is not feasible to provide comprehensive transit access that is competitive with the auto.
8. Even in the New York metropolitan area, with by far the most comprehensive transit system in the United States, 30-minute access to employment by auto is six times that of transit (600 percent that of transit).
9. In the Seattle metropolitan area (King, Pierce, Snohomish, and Kitsap counties) auto access to employment within 30 minutes is 19 times that of transit (1,900 percent that of transit).
10. Even to downtown Seattle, where transit access is by far the best in the Puget Sound, auto access is more than triple that of transit within 30 minutes.
11. The principal finding of this analysis is that: There is no potential, at any cost, for transit to materially reduce driving or to reduce traffic congestion in the Puget Sound. This finding is supported by PSRC projections, at least for the next two decades.

WASHINGTON
POLICY CENTER
Improving lives through market solutions

COLES CENTER FOR TRANSPORTATION

POLICY BRIEF

Moving Toward More Accessible and Productive Transportation in the Puget Sound

By Wendell Cox,
Principal, Demographia (Wendell Cox Consultancy)

October 2019

Moving Toward More Accessible and Productive Transportation in the Puget Sound

By Wendell Cox,
Principal, Demographia (Wendell Cox Consultancy)

October 2019

Introduction

This report examines the future of transportation within the Puget Sound.[1] Particular emphasis is placed on transit because of the priority it has received through the political process and the substantial public funding that has been committed. The geographic scope is centered on the counties represented in the Puget Sound Regional Council (PSRC).[2] This includes the Seattle metropolitan area as defined by the Office of Management and Budget as well as the adjacent Kitsap County, which is also a metropolitan area. Some data is only available at the Seattle metropolitan area level.

Metropolitan areas are functional or economic "cities," which are also labor and housing markets.[3] They stretch beyond jurisdictional boundaries and include all of the incorporated municipalities (also usually called cities) and unincorporated areas. Over the past two centuries, the world, and especially the United States, has experienced substantial economic growth, which has resulted in substantially increased household affluence and a massive reduction in poverty.

Economic research, such as that by Remy Prud'homme and Chang-Woon Lee at the University of Paris as well as David Hartgen and M. Gregory Fields at the University of North Carolina, Charlotte,[4] suggests that the economic growth of metropolitan areas is enhanced by access - the greater the number of jobs that the average worker can reach in a particular time, the better the economic performance. Nearly all metropolitan areas in the United States have average one-way commute times of 30 minutes or less, including Seattle.

Transportation policy based on minimizing travel times to work is likely to lead to greater affluence and lower levels of poverty. Not only would the success of such policy result in less traffic congestion, but it would also provide greater access for economically disadvantaged people and provide much greater employment

1 The analysis focuses on weekday journey to work (commute), the largest share of which is on roadways. While most daily travel is not for work trips, their concentration during peak hours are the proximate cause of most traffic congestion. Trips for other purposes, personal, commercial and freight, will tend to be well served by a road system that produces better work trip travel times.

2 There are various definitions of Seattle. This report focuses on functional city definitions, that is, cities as integrated economic units (See: Paul C. Cheshire,, Max Nathan and Henry G. Overman (2014),*Urban Economics and Urban Policy: Challenging Conventional Policy Wisdom*, Edward Elgar). These are metropolitan areas, also considered labor markets and housing markets. The official US definitions are based on commuting patterns of the Seattle metropolitan area (MSA) including King, Pierce and Snohomish counties. There is also the Seattle combined statistical area (CSA), which includes the three counties in the MSA, plus Kitsap, Skagit, Island, Mason, Thurston and Lewis. Finally, there is the PSRC region, which includes the three MSA counties as well as Kitsap. The city of Seattle, like numerous other incorporated cities and communities, are components of these functional cities. Built-up urban areas, which include only development that is urban and excludes all rural area are referred to as "physical cities."

3 Seattle-Tacoma-Bellevue metropolitan statistical area.

4 Wendell Cox (2009), "Traffic Congestion, Time, Money & Productivity." Newgeography.com, http://www.newgeography.com/content/001044-traffic-congestion-time-money-productivity.

opportunity. Given the fact that the concentration of employment trips during peak travel periods is the principal cause of traffic congestion, this report focuses on the work trip. Policies that improve access to employment are likely to improve access for other trip purposes.

In addition, a transportation system that minimizes travel times to work will expedite the flow of commercial traffic, from local delivery and service vehicles to intercity trucks traveling on local roadways and freeways and to the Puget Sound's substantial air and seaport facilities.

Long-Range Transportation Plan

The long-term transportation plan is produced by PSRC and emphasizes service to "centers." It is a part of the regional strategy (*Vision 2040*).

> *The emphasis on the development of centers throughout the region is at the heart of VISION 2040's approach to growth management. Centers are locations characterized by compact, pedestrian-oriented development, with a mix of different office, commercial, civic, entertainment, and residential uses. While relatively small geographically, centers are strategic places identified to receive a significant proportion of future population and employment growth when compared to the rest of the urban area.*

According to the PSRC, "Centers create improved accessibility and mobility for walking, biking, and transit, and as a result play a key transportation role in the region."

> *Linking these centers with a highly efficient transportation system allows the region to take actions to reduce the rate of growth in vehicle miles traveled, especially by providing and expanding transportation choices.* [5]

The Seattle urban area has routinely had some of the worst traffic congestion in the nation.[6] It has routinely been nationally ranked with the third or fourth worst traffic congestion. The Seattle urban area is the 14th largest in the nation, yet has traffic congestion worse than larger urban areas such as New York, Chicago, Washington, Dallas-Fort Worth Houston, Atlanta, Washington and Chicago.

Further, as funding priorities have switched toward transit, public authorities have implemented some road projects that have *reduced* capacity. Obviously reducing capacity in an environment of increasing demand tends to lead to longer travel times. For example, the new State Route 99 tunnel has four lanes, instead of the six of the former Alaskan Way viaduct, a 30 percent reduction in capacity. Planning documents project the roadway capacity of the I-90 (Mercer Island) bridge to be 20 percent less with the addition of light rail, and will make automobile travel take longer.[7]

---

5 *Vision 2040,* p. 14-15.

6 Based on a review of travel time index data from the Texas A & M Annual Mobility report (https://mobility.tamu.edu/ums/). The urban area is the continuously built-up area (as designated by the US Census Bureau), excluding adjacent rural areas. It is the "physical city," as opposed to the functional or economic city (the metropolitan area, which includes both urban areas and rural areas from which there is substantial commuting into the urban area)..

7 "Sound Transit's proposal to place light rail across I-90 will increase traffic congestion," by Michael Ennis, Washington Policy Center, 2007, https://www.washingtonpolicy.org/library/docLib/PN2007-12_with_logo.pdf

Public officials have sought to encourage drivers to switch to transit services and much of the planning has involved transit expansion. Three tax-funded transit expansion referenda have been approved by the voters in the three metropolitan area counties in 1996, 2008, and 2016. To at least some degree, campaigns and proponents have stressed an assumption that increased transit would reduce traffic congestion, reinforcing a widely held, but incorrect perception.

Population and Employment

Finding #1: The overwhelming share of population and employment in the Puget Sound is outside the city of Seattle. Even with the city of Seattle's unprecedented population and employment growth since 2010, a sizable majority of new residents and employment have located outside the city.

Mirroring international trends in virtually all major metropolitan areas,[8] Seattle has dispersed substantially since World War II, both in its population and employment patterns. Densities have declined and automobile-oriented development has dominated.

Population: In 1950,[9] the city of Seattle had at least[10] 39 percent of the Puget Sound population. By 2017, the city of Seattle's share of the population had fallen to 17.5 percent, with 82.5 percent of the population outside the city of Seattle (Figure 1).[11]

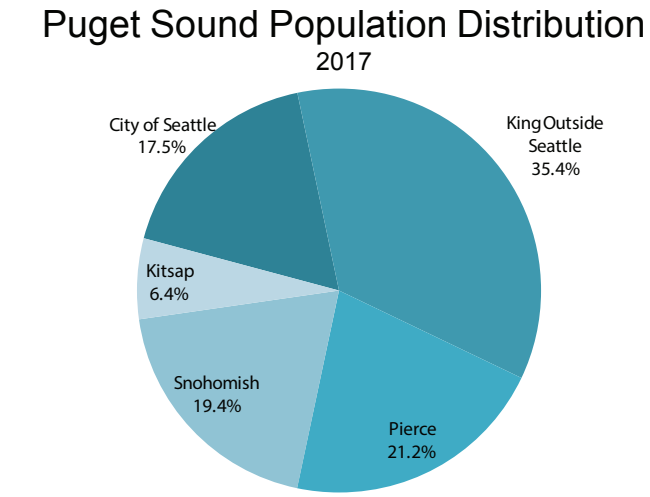


Figure 1

8 According to Shlomo Angel, et al of New York University, urban population densities have declined around the world and the trend is continuing. See: Shlomo Angel, Jason Parent, Daniel L. Civco, and Alejandro M. Blei, "The Persistent Decline in Urban Densities: Global and Historical Evidence of Sprawl," Working Paper WP10SA1, Lincoln Institute, Cambridge, MA, 2011 and Bertaud, Alain. Order without Design: How Markets Shape Cities (The MIT Press). The MIT Press. Kindle Edition.

9 The first census following World War II.

10 "At least" is used because at the time of the 1950 census the northern city limit was largely at 85th Street. Before the 1960 census, annexations moved the city limit to 145th Street (along with smaller annexations elsewhere, in the northeast and south). Between the two censuses, the land area of the city rose from 70.8 to 88.5 square miles, a 25 percent increase. See: Seattle City Clerk, "Seattle Annexation Map," http://clerk.ci.seattle.wa.us/~F_archives/annexations/annexations.htm and Seattle City Clerk, "Seattle Annexation List," http://clerk.ci.seattle.wa.us/~F_archives/annexations/annex_list.htm.The percentage of the Puget Sound population within the current boundaries of the city of Seattle was thus higher, however that amount is not readily available.

11 Over the past five years, nearly 90 percent of major metropolitan area population growth in the United States has been in the suburbs and exurbs. Wendell Cox (2018), "Suburbs & Exurbs Continue to Dominate Metropolitan Growth at Mid-Decade," newgeography.com, http://www.newgeography.com/content/006168-suburbs-exurbs-continue-dominate-metropolitan-growth-mid-decade. This is an international trend, with substantial suburbanization having occurred in virtually all major urban areas in the world. An analysis of 30 built up urban areas from 26 nations, from high income to low income, indicated that the median population density had declined more than 75 percent from the peak year of 1890 to 2000. Each of the 30 urban areas had a lower density than its peak. See: Shlomo Angel (2012), *Planet of Cities,* Lincoln Institute of Land Use Policy, https://www.lincolninst.edu/publications/books/planet-cities

Yet, there has been an important population growth spurt in the city of Seattle, which added more than 115,000 residents from 2010[12] to 2017. This is only one-fifth less than the 141,000 increase in the previous 60 years (1950 to 2010). Despite this stronger growth, nearly three quarters of the region's population growth occurred outside the city of Seattle from 2010 to 2017 (Figure 2).

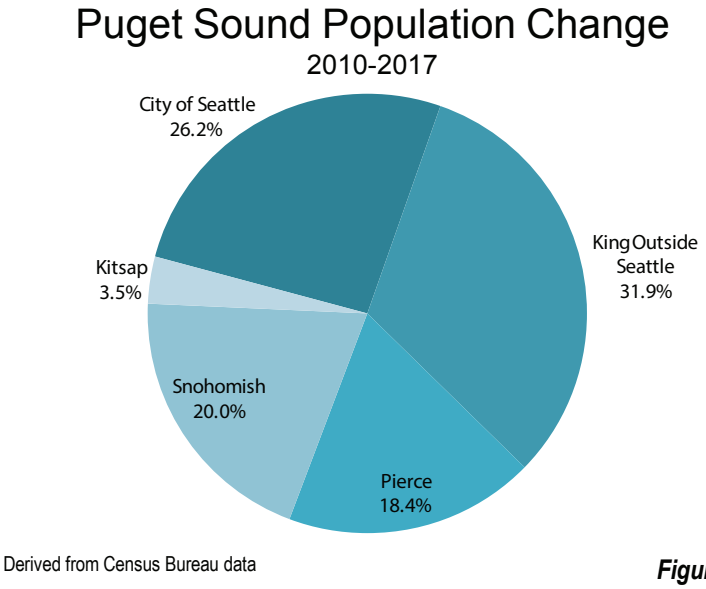


Figure 2

Not a "Return to the City": The resurgence of population growth in the city of Seattle does not indicate a "return to the city" from the suburbs. Between 2010 and 2017, net domestic migration to counties outside King continued at an annual average greater than had occurred during the 2010s to Pierce, Snohomish and Kitsap counties. The big difference was in King County, which had experienced an average annual loss of 3,000 during the 2000s, but averaged a positive 7,600 annually in net domestic migration from 2010 to 2017. This suggests that the strong improvement in the city of Seattle's population growth has resulted principally from net domestic in-migration to the metropolitan area, rather than migration from areas within the Puget Sound but outside the city of Seattle.[13]

Employment: Employment has suburbanized along with population. The city of Seattle has a proportionately greater share of the employment (27.5 percent as opposed to 17.5 percent of the population), reflecting the location of the largest center in the Puget Sound, downtown Seattle. King County outside the City of Seattle has 35.3 percent of the jobs, approximately the same share as its population. Pierce, Snohomish and Kitsap counties have somewhat smaller shares of employment than population (Figure 3).[14]

12 Throughout this report, the year 2010 is used for trend analysis, because this the latest U.S. Census year, PSRC data is generally available for 2010 and it is the first year of data reported by commuteseattle.com

13 The lowest level of geography available in the annual Census estimates is counties, thus no municipality data is produced, except for cities that are also counties (such as San Francisco).

14 This chart shows a combination of data, with the downtown Seattle figure from commuteseattle.com data. The city of Seattle data outside Downtown is estimated with using the American Community Survey figure, minus the Downtown Seattle figure from commuteseattle.com. All of the data is from the American Community Survey. Other figures showing 2017 employment and specifying downtown data are similarly derived.

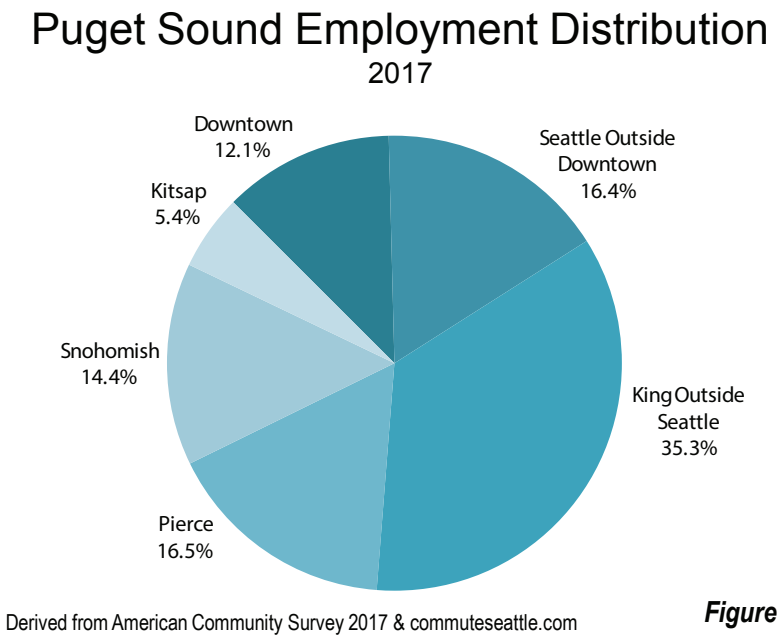


Figure 3

Between 2010 and 2017, employment growth was the greatest in downtown Seattle and outside downtown in the city of Seattle. This is indicative of the "Amazon Boom" (see Section 4). Even so, more than 60 percent of the job gains were outside the city of Seattle (Figures 4 & 5).

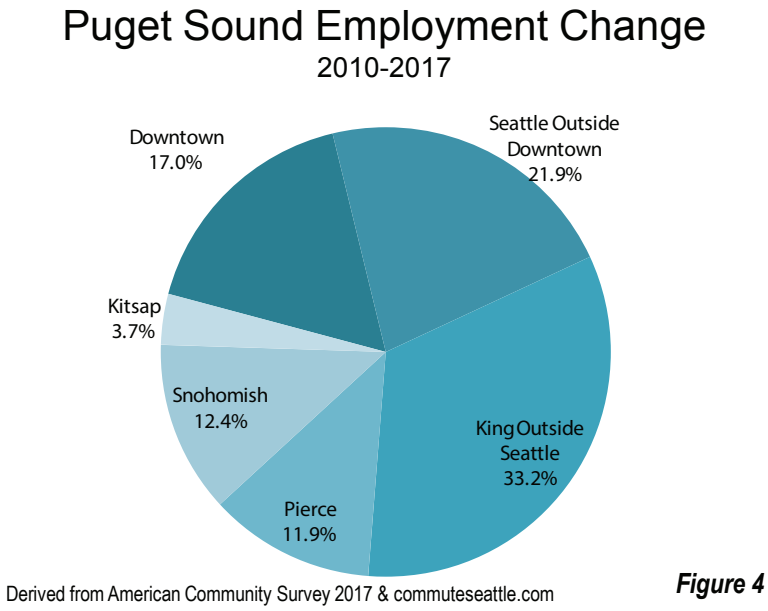
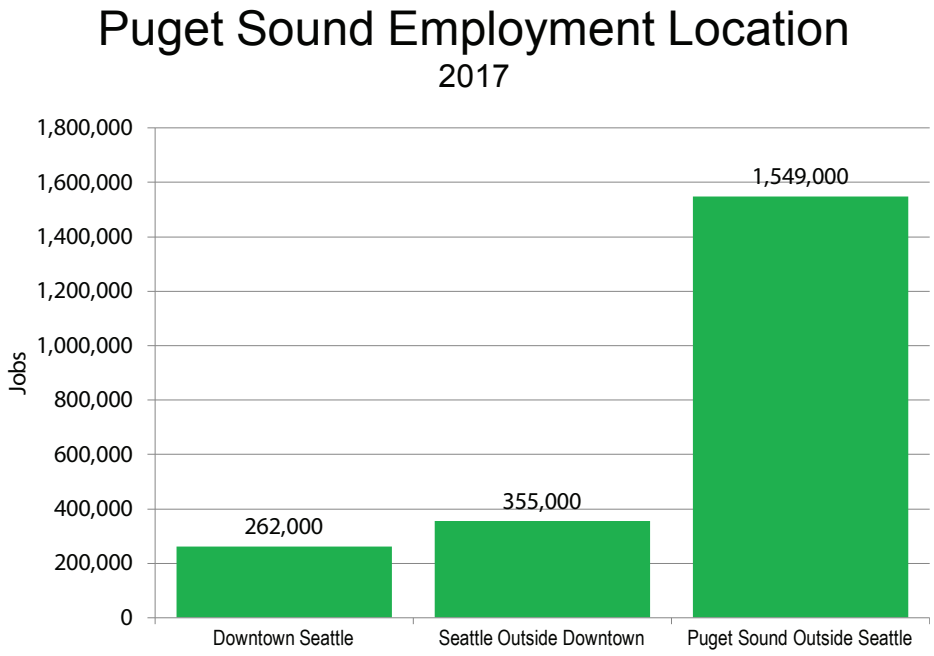


Figure 4



Derived from American Community Survey 2017 & commuteseattle.com

Figure 5

Distribution of Employment and PSRC Employment Centers

Finding #2: The Puget Sound is dispersed, both in employment and residences. While downtown Seattle is the strongest PSRC employment center and has experienced astounding growth since 2010, more than 85 percent of employment is outside downtown.

Finding #3: The "Amazon Boom" has brought unprecedented employment growth to downtown Seattle and seems unlikely to play as strong a role in the future. However, even with the "Amazon Boom," nearly 60 percent of employment growth has been outside the city of Seattle since 2010.

The majority of employment in major US metropolitan areas is dispersed, being outside the traditional downtowns (central business districts or CBDs) and other centers, many of which are called "edge cities."[15] Seattle's employment dispersion is fairly typical for a US metropolitan area. Employment data from the year 2000 was reviewed by researchers at the University of Southern California. They found that Seattle ranked ninth in employment dispersion among the 14 metropolitan areas with more than three million population, near the median for the population category.[16]

Seattle's downtown skyline, certainly among the nation's most significant, can give the impression that "everyone works downtown." But, in 2010 less than 13 percent of Puget Sound employment was in downtown Seattle and adjacent centers.[17] Another 26 percent of employment was in other PSRC employment centers as designated by

15 Until World War II, US metropolitan areas were more "monocentric," with a much more substantial share of employment located in downtown areas. See; Joel Garreau (1991), *Edge city: life on the new frontier,* Doubleday.

16 Bumsoo Lee and Peter Gordon (2007), "Urban Spatial Structure and Economic Growth in US Metropolitan Areas," USC Lusk Center for Real Estate, https://lusk.usc.edu/research/working-papers/urban-spatial-structure-and-economic-growth-us-metropolitan-areas

17 Latest available PSRC employment center data. Centers adjacent to Downtown Seattle include First Hill/Capitol Hill, Uptown, and South Lake Union. Later employment data cited in this report is from the American Community Survey and seattlecommute.com.

PSRC.[18] This leaves 61 percent of Puget Sound employment dispersed throughout the rest of the region (Figure 6).[19]

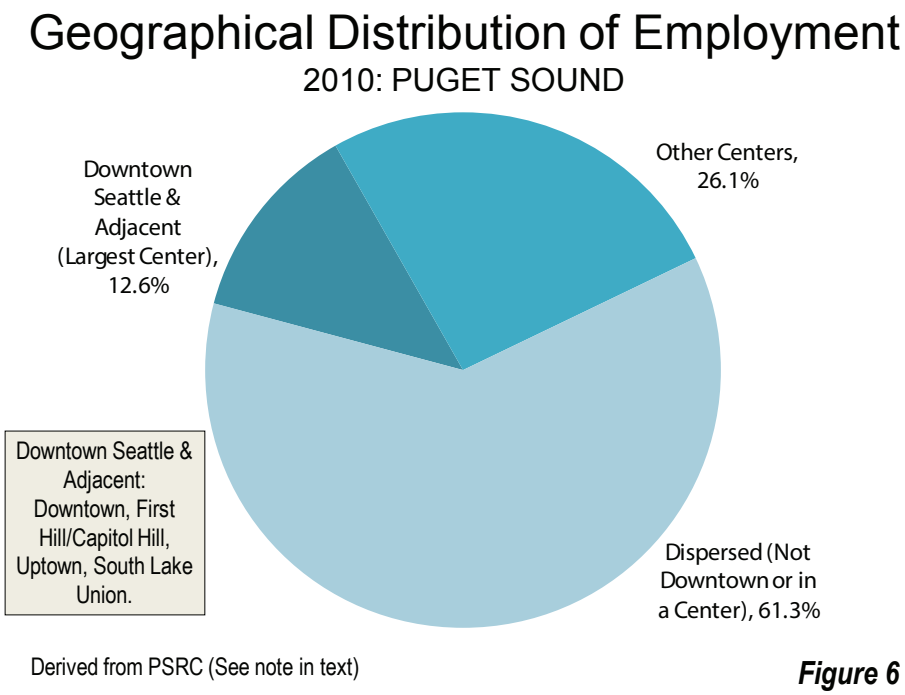


Figure 6

Downtown Seattle: Downtown Seattle has the largest number of employees of any center in the Puget Sound yet it is not dominant as indicated above. Downtown Seattle has experienced strong growth since 2010, from 202,000 to 262,000 jobs, according to commuteseattle.com.[20]

The Amazon Boom: Much of this extraordinary downtown Seattle employment expansion is related to the "Amazon Boom," as *The Seattle Times* called it. Since locating its headquarters in Lake Union, Amazon's employment in Seattle has risen to 45,000. Amazon officials have suggested that another 53,000 jobs have been created by Amazon's investment.[21] By 2017, Amazon had reached "more than twice" the share of prime office space in any large US city.[22]

This development is probably best characterized as a "one-off" occurrence. The rise in downtown employment, considerably influenced by Amazon, has been meteoric.

---

18 PSRC has designated 35 regional growth centers (also called regional centers) which are referred to as PSRC employment centers in this report (See: *Regional Centers Monitoring Report, 2013 Edition, Regional Summary and Comparison*, https://www.psrc.org/sites/default/files/centers_monitoring.pdf). The largest PSRC employment centers are Downtown, Duwamish, Paine Field/Boeing Everett and Bellevue. Northgate, downtown Tacoma, Tukwila, the Port of Tacoma, Bremerton, Redmond, Lake Union and the South Kitsap Industrial Park are other examples. See: "Regional Centers Monitoring Report, 2013 Edition, Regional Summary and Comparison" (February 2014), Puget Sound Regional Council, https://www.psrc.org/sites/default/files/centers_monitoring.pdf.

19 From PSRC, the Washington State Employment Security Department's (ESD) Quarterly Census of Employment and Wages (QCEW) series, which "has represented 85-90% of total employment." This data is used because it includes estimates of employment in the PSRC employment centers. Later employment data in this report is from the American Community Survey and commuteseattle.com.

20 "Commute Seattle Mode Split Survey Results: 2017 Center City Commuter Mode Split" (2018), https://commuteseattle.com/modesplit/

21 Matt Day (November 13, 2018), "What's next for Seattle after HQ2? Amazon plans suggest expansion, then big hiring slowdown," *The Seattle Times*, https://www.seattletimes.com/business/amazon/whats-next-for-seattle-after-hq2-amazon-plans-suggest-expansion-then-big-hiring-slowdown/

22 Mike Rosenberg and Anne Gonzalez (November 30, 2017), "Thanks to Amazon, Seattle is now America's biggest company town," *The Seattle Times*, https://www.seattletimes.com/business/amazon/thanks-to-amazon-seattle-is-now-americas-biggest-company-town/

The company has been rated among the top five in the world in market capitalization as of February 2019. Seattle is also home to another company on the top five list, Microsoft, headquartered in Redmond.[23]

The prospects for this unusual trend continuing seem unlikely. The Amazon-fueled employment growth is unprecedented for a large employment center. There are indications that Amazon's Seattle employment base will grow more slowly in the future.[24] Much of the growth could occur in Amazon's second headquarters location in the Washington metropolitan area (northern Virginia). Amazon indicates that the jobs planned for the now cancelled New York City (Queens) headquarters will be split among its 17 "tech hubs."[25]

Analysis of Commuting in the Puget Sound

Finding #4: Autos are used by more than two-thirds of commuters to work trip locations throughout the Puget Sound, with a three-quarters share outside the city of Seattle and just shy of a 50 percent share in the city of Seattle.

Finding #5: Transit serves a principally niche market, with 48 percent of the commuting to downtown Seattle, and a 9.3 percent share to the rest of the city. Only 3.5 percent of work trips to destinations in the rest of the Puget Sound are on transit.

Finding #6: Downtown dominates transit commuting. PSRC employment centers outside the city of Seattle exhibit transit commuting characteristics more reflective of suburban areas outside centers, with virtually no realistic potential for reducing vehicle miles through expanding transportation choices. As such, transit has little or no potential to reduce traffic congestion regionally.

Autos[26] are the principal mode of access to work[27] in the Puget Sound (Figure 7), as in every major US metropolitan area. Carpools[28] account for 10.4 percent of work access, while transit has a 9.8 percent commute share.

23 Elvis Picardo (February 3, 2019), "Eight of the World's Top Companies Are American," investopedia.com, https://www.investopedia.com/articles/active-trading/111115/why-all-worlds-top-10-companies-are-american.asp.

24 Matt Day (November 13, 2018), "What's next for Seattle after HQ2? Amazon plans suggest expansion, then big hiring slowdown," *The Seattle Times*, https://www.seattletimes.com/business/amazon/whats-next-for-seattle-after-hq2-amazon-plans-suggest-expansion-then-big-hiring-slowdown/

25 Amazon Day One Blog (February 14, 2019), "Update on Plans for New York City Headquarters," https://blogaboutamazon.com/company-news/update-on-plans-for-new-york-city-headquarters.

26 Automobiles, SUV's and personal trucks.

27 American Community Survey, 2017. This analysis uses commuting data at the work location, rather than the residential location of workers, because transit work trip destinations are far more geographically concentrated than home locations.

28 Including van pools.

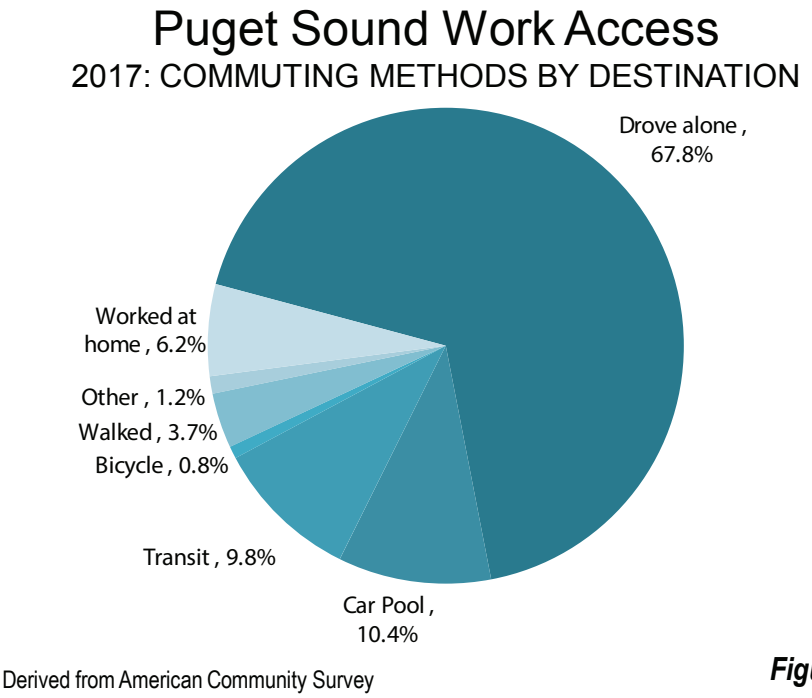


Figure 7

Seattle has the sixth strongest transit commute share among major US metropolitan areas.[29] Working at home accounts for 6.2 percent of work access. Seattle is one of only 10 major metropolitan areas with more workers accessing employment by transit than working at home.[30]

Auto and Transit Commuting: There is, however, considerable contrast in commuting between destinations in the city of Seattle and the rest of the Puget Sound (Figure 8). Transit work trip destinations are highly concentrated geographically in downtown Seattle and to a lesser extent in the city of Seattle. Auto commuting is greater in the Puget Sound, outside the city of Seattle.

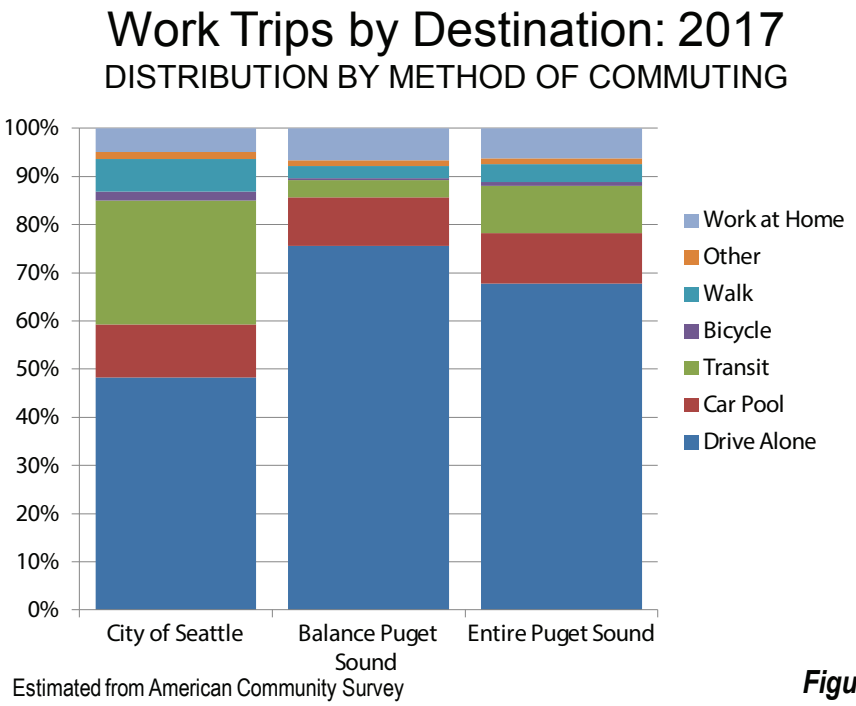
Outside the city of Seattle, 76 percent of work trip destinations in the Puget Sound are reached overwhelmingly by auto commuting. In the city of Seattle, the figure is much lower, at 48 percent. Despite these differences, autos represent the majority of commutes in both areas.[31] Transit destinations are overwhelmingly concentrated in the city of Seattle, with a 48 percent share to downtown, and a 9.3 percent share to the rest of the city. Only 3.5 percent of work trips to destinations in the rest of the Puget Sound are on transit. This is about 30 percent below the national transit work trip market share of 5.0 percent.[32]

29 The 53 metropolitan areas with more than 1,000,000 population.

30 Derived from American Community Survey, 2017 (residence location).

31 Derived from American Community Survey, 2017.

32 Derived from American Community Survey, 2017.



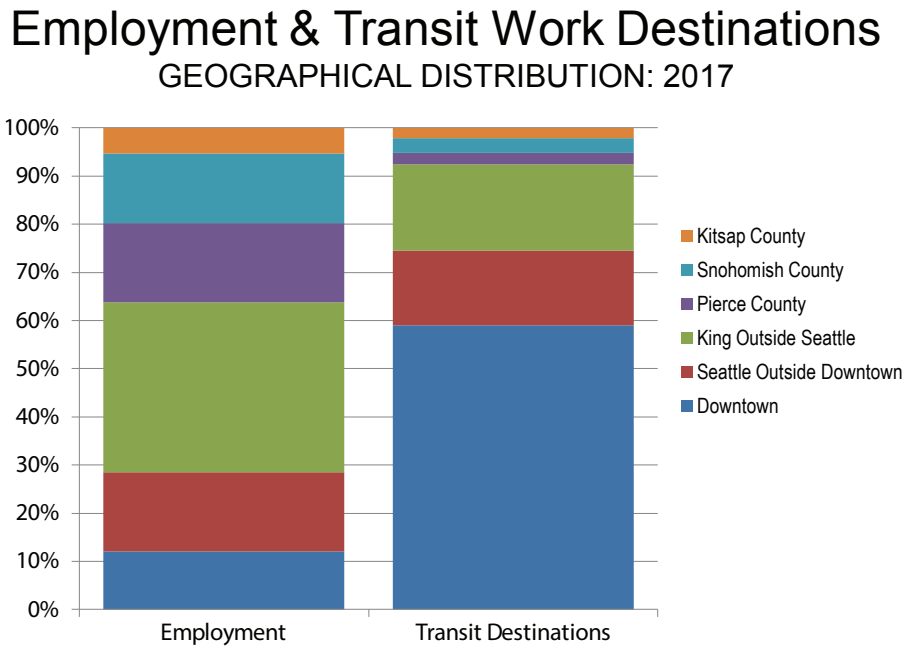
Estimated from American Community Survey

Figure 8

Transit work trips are heavily concentrated to destinations in the city of Seattle (Figure 9) and especially to downtown.

Based on 2017 data, it is estimated that 12 percent of employment is in downtown Seattle.[33] Yet downtown Seattle's share of transit commutes in the Puget Sound is nearly five times as great (59 percent), indicating the intense concentration of transit commuting relative to downtown's share of employment.

In contrast, in King County outside Seattle, a smaller percentage commute by transit when compared to its share of jobs. In Pierce, Snohomish and Kitsap counties, even fewer people took transit to work relative to the number of jobs. In other words, jobs located outside of downtown Seattle are overwhelmingly accessed by car.

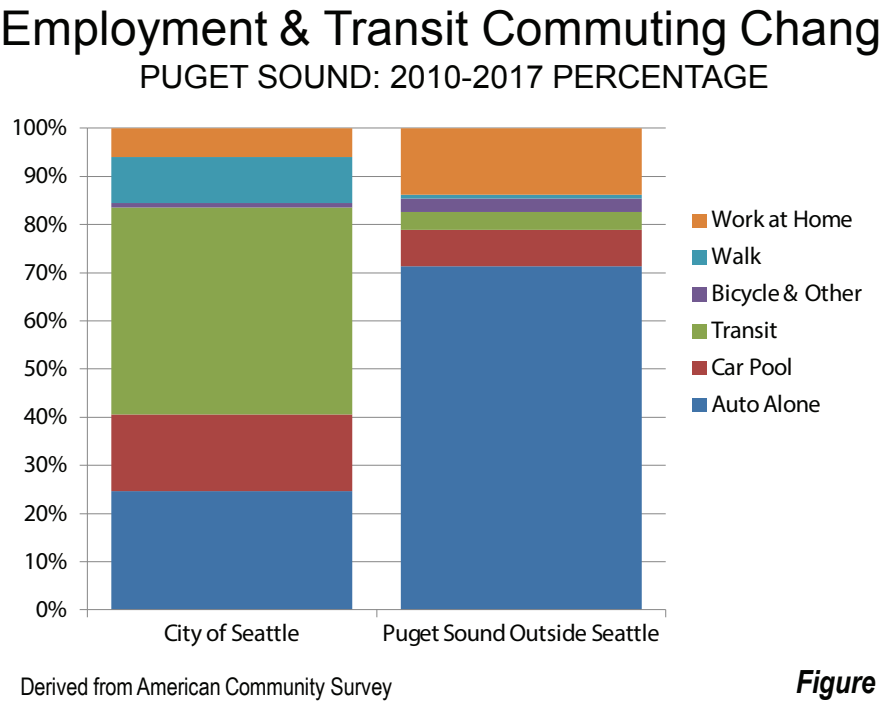


Derived from American Community Survey 2017 & commuteseattle.com

Figure 9

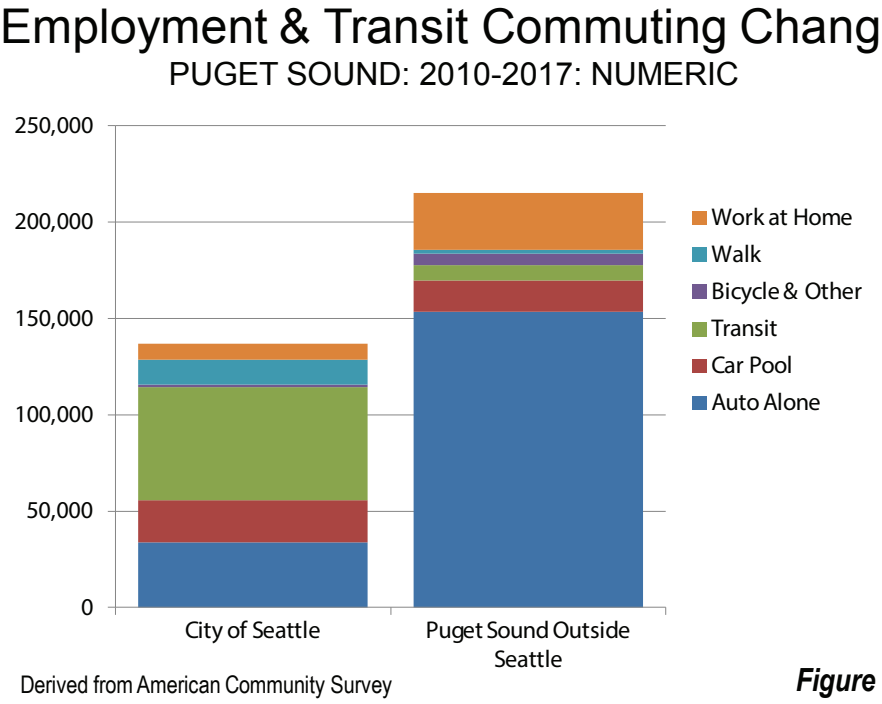
33 Derived from commuteseattle.com and American Community Survey data.

Between 2010 and 2017, the vast majority of additional work trips to destinations outside the city of Seattle were by driving alone and carpooling. The increase in work trips was dominated for city of Seattle destinations by transit (43.0 percent). This is more than 10 times the share of the increase in transit work trip destinations (3.7 percent) in the Puget Sound outside the city of Seattle. (Figures 10 & 11).



Derived from American Community Survey

Figure 10

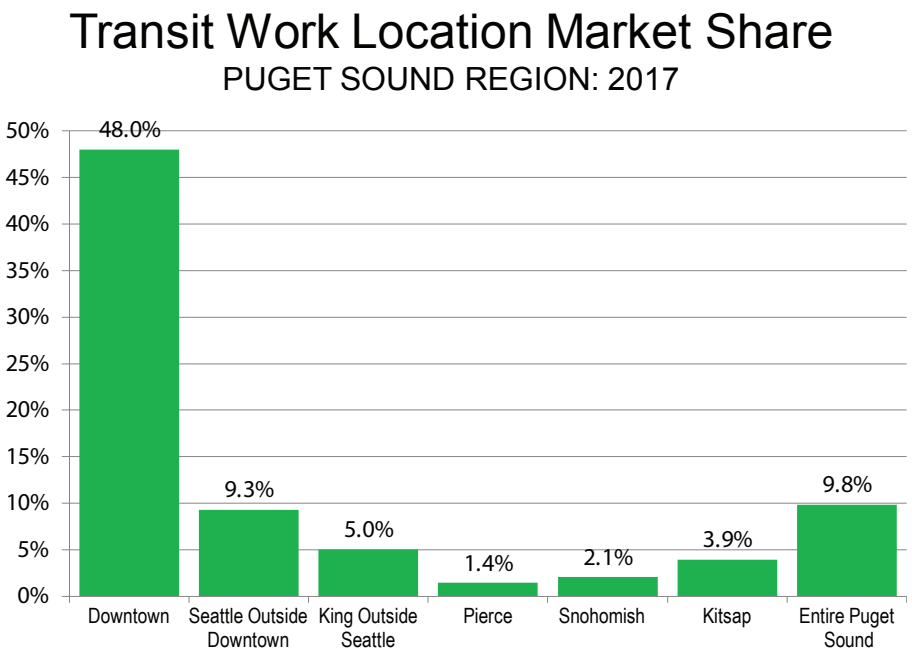


Derived from American Community Survey

Figure 11

Concentration of Transit Commuting: Market share data reflects the concentration of transit market commuting to downtown Seattle (Figure 12). In 2017, 48 percent of commuters to downtown Seattle used transit, well above the 9.3 percent to other locations in the city of Seattle. Transit market shares to locations in Pierce

County (1.4 percent), Snohomish County (2.1 percent), Kitsap County (3.9 percent) and the balance of King County (5.0 percent).[34]



Derived from American Community Survey 2017 & commuteseattle.com

Figure 12

Determinants of High Transit Market Shares: At least three factors are necessary for high transit work-trip market shares. The first factor is large numbers of employees in an employment center. The second factor is that the job density in the employment center be high (these are usually downtowns). The third factor is high levels of transit service to the high-density employment centers from throughout the labor market (metropolitan area).

These factors are illustrated by the fact that nearly 58 percent of all transit commuting in the United States is to destinations in the municipalities (not metropolitan areas) that have the largest downtown areas, the cities of New York, Chicago, Philadelphia, San Francisco, Boston and Washington. This is nearly 10 times their combined share of US employment (six percent).[35] Each of these downtown areas is served by extensive and frequent transit service from throughout the corresponding metropolitan areas.

The Puget Sound region illustrates the connection between large, high density employment centers and high transit market shares. The Puget Sound has one of the largest and densest employment centers in the nation, downtown Seattle. Downtown Seattle is the largest PSRC employment center and has the highest transit work trip market share. Downtown Seattle is also by far the densest job center, with 92,700 employees per square mile. Bellevue has the second highest job density among the PSRC employment centers, at one-third lower than downtown Seattle. South Lake Union is 40 percent less dense than Bellevue and nearly two-thirds less dense than downtown Seattle. Four other PSRC employment centers have employment densities of between 20,000 and 30,000 per square mile, including Redmond Overlake

34 Estimated from American Community Survey, 2017 and commuteseattle.com data.

35 Calculated from American Community Survey, 2017.

and three in the city of Seattle, Uptown, University and First Hill/Capitol Hill.[36] The other 28 less dense PSRC employment centers have an average job density of 6,000 per square mile, nearly 95 percent lower than downtown Seattle. Finally, it is estimated that the employment density throughout the rest of the combined Seattle and Bremerton urban areas[37] is approximately 900 per square mile, about 1/100th of downtown Seattle (Figure 13).[38]

The highest level of transit service is to the largest, densest PSRC employment center, downtown Seattle, as is indicated in Figure 14. Figure 16 shows the average number of transit services (transit runs) per hour during weekday peak periods.[39] Downtown Seattle is the best served with 487 services per hour per square mile, from throughout the Puget Sound. This includes not only the extensive services provided by King County Metro, but also services by Pierce Transit, Community Transit (Snohomish County), Sound Transit, Sounder commuter rail and the Washington State Ferries. The second densest PSRC employment center, Bellevue, has a service level more than 70 percent lower (137). Third densest South Lake Union has more than double the transit services of second densest Bellevue. Redmond Overlake, the fourth densest PSRC employment center has only 73 transit services per hour during peak, less than one third that of the three other densest centers that are relatively close to downtown, which are South Lake Union, Uptown, University and First Hill/Capitol Hill.

The transit market shares of the four PSRC employment centers relatively near downtown (South Lake Union, Uptown, University and First Hill/Capitol Hill) are strong, ranging from 18 percent to 24 percent. This is to be expected, with their large numbers of employees, high employment densities and high levels of transit service.[40]

By comparison, Redmond Overlake, also with a large number of employees and a high job density has a transit work trip market share of only nine percent, which is below the Puget Sound average (2010). A principal factor is the limited transit service level.

Short of convenient and direct (no transfer) service from the entire metropolitan area, of the magnitude converging on downtown and the four nearly strong PSRC employment centers, even strong PSRC employment centers like Redmond Overlake can never be expected to have substantially higher transit market shares. The potential for large transit market shares is even dimmer in the 28 less dense PSRC employment centers. None of the transit plans would involve such high transit service levels to Redmond Overlake.

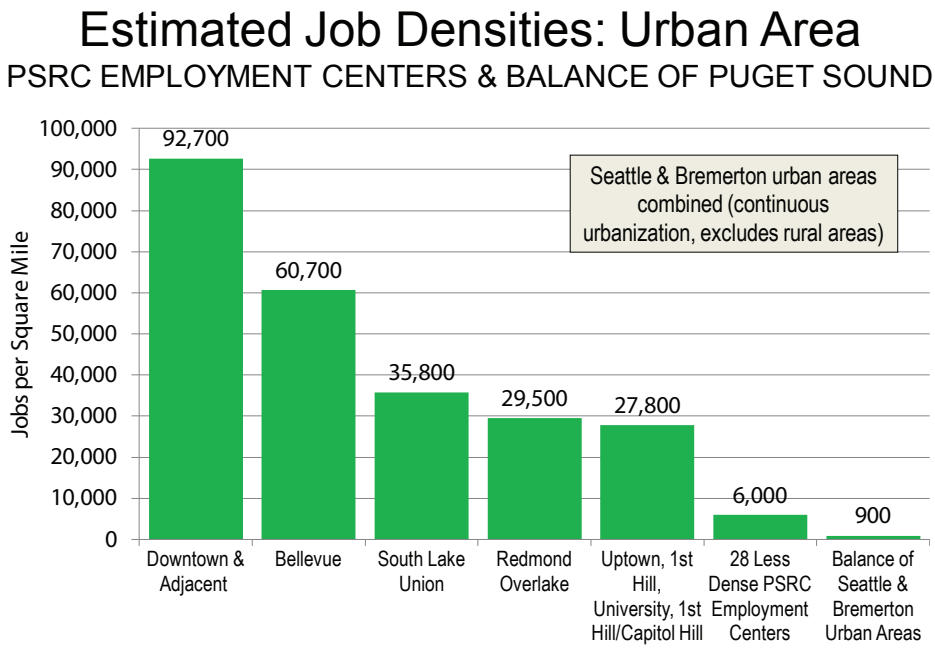
36 Each of these PSRC employment centers are less dense than Redmond Overlake.

37 Estimated from US Census Bureau and American Community Survey data.

38 Derived from PSRC data for 2010.

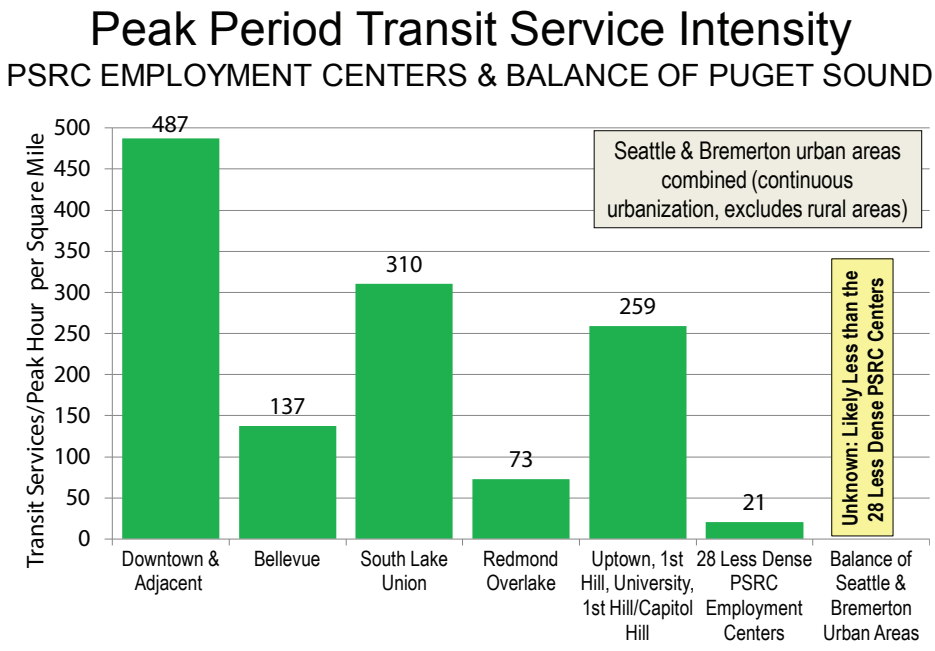
39 Based on transit run data from *Regional Centers Monitoring Report* (PSRC).

40 Transit systems around the world are generally focused to provide higher levels of service to the largest and densest employment centers, which tends to result in higher ridership. The Puget Sound is typical in this regard.



Derived from PSRC & American Community Survey, 2008-2012

Figure 13



Derived from PSRC: 2010 data

Figure 14

Concentration of Transit Commuting: Implications: There is a widespread perception that transit is an effective strategy for reducing traffic congestion. This has been important in obtaining support from voters for regional transit systems, principally urban rail, and has been a pillar of regional planning.

The intense concentration of transit commuting locations and the failure to achieve substantial transit commuting market shares outside the city of Seattle belies any realistic prospect of "reducing vehicle miles traveled" or materially "expanding transportation choices."[41] Moreover, regional projections indicate no substantial progress toward such objectives. These results are not surprising, given the nature

41 *Vision 2040,* p. 14-15

of job distribution, employment densities and transit service throughout the region (above).

Generally, the work trip destination market share of PSRC employment centers outside the city of Seattle looks more like that of the rest of the Puget Sound, which is especially automobile-oriented. This will continue to be the case.

Access to Employment by Transit and Autos

Finding #7: As is typical of virtually all US metropolitan areas, transit access to employment is a small fraction of that accessible by car. It is not feasible to provide comprehensive transit access that is competitive with the auto.

Finding #8: Even in the New York metropolitan area, with by far the most comprehensive transit system in the United States, 30-minute access to employment by auto is six times that of transit (600 percent that of transit).

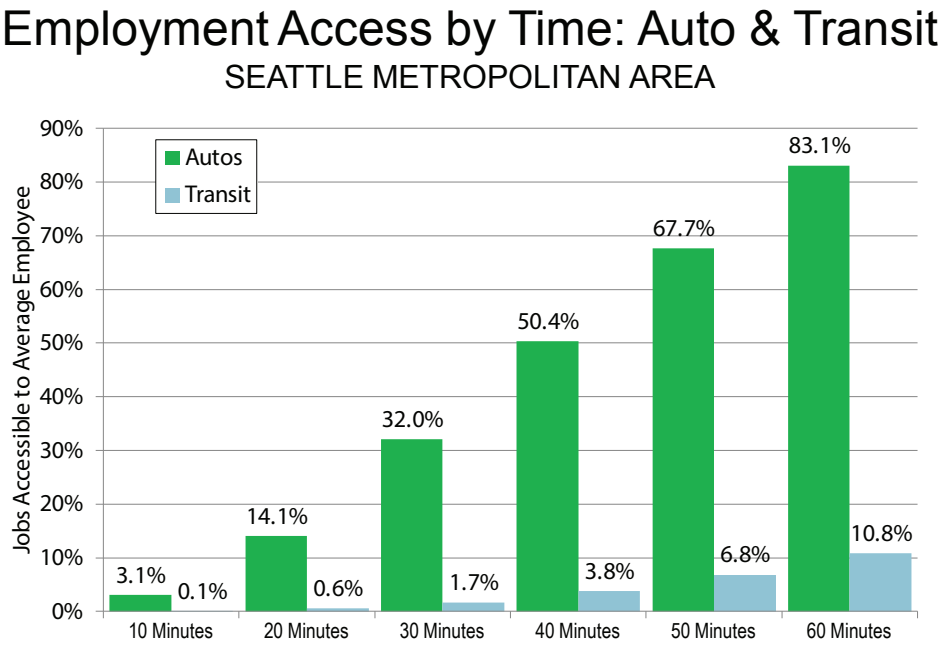
Finding #9: In the Seattle metropolitan area (King, Pierce, Snohomish, and Kitsap counties) auto access to employment within 30 minutes is 19 times that of transit (1,900 percent that of transit).

Finding #10: Even to downtown Seattle, where transit access is by far the best in the Puget Sound, auto access is more than triple that of transit within 30 minutes.

Transit has typically been cited as an alternative to the automobile throughout metropolitan areas. Transportation plans have often cited the percentage of population within a radius (such as one-quarter mile) of the nearest transit rail or bus stop to evaluate transit system coverage. However, being within walking distance of a transit stop only provides access to the destinations on the transit route or routes that serve the stop and on any to which transfers are possible. Transfer times alone can consume much or even all of the 30 minutes. Proximity to transit origins is not a reliable indicator of access to destinations. This can also limit the effectiveness of transit-oriented development, the success of which requires location virtually adjacent to areas (such as downtown) where transit access is highest.

Improved technology has permitted development of much improved transit access measures. Research at the University of Minnesota[42] estimates auto and transit access to employment during the morning peak period in 50 of the largest metropolitan areas (all over 1,000,000 population). In Seattle, 32 percent of jobs are accessible to the average worker by auto, and 1.7 percent by transit in 30 minutes (Figure 15). Thus, *19 times as many jobs can be reached in 30 minutes by car as by transit in the Seattle metropolitan area* (1,900 percent as many).

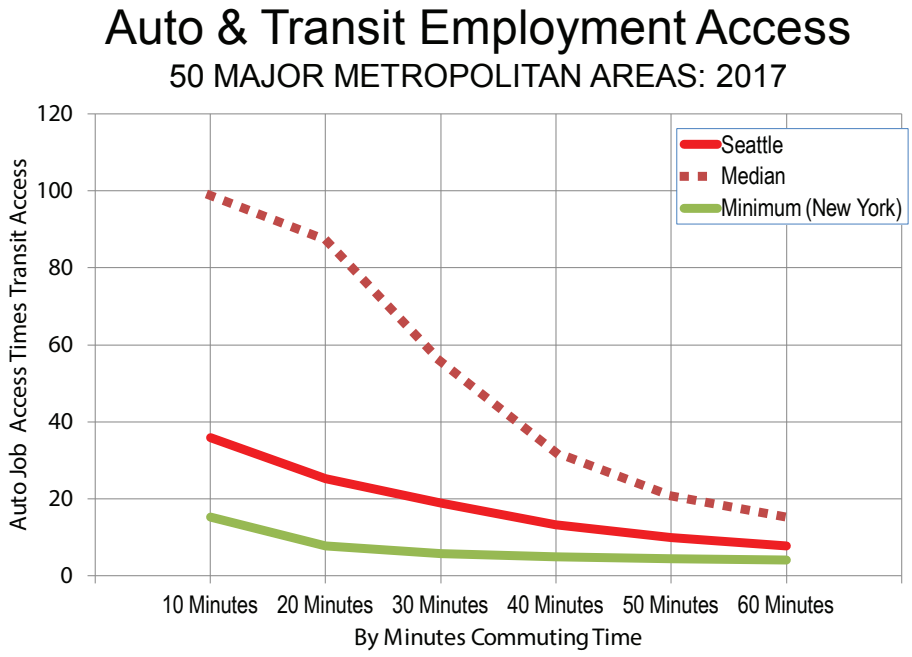
42 Derived from "Access Across America," University of Minnesota Accessibility Observatory (2018), http://access.umn.edu/



Derived from University of Minnesota

Figure 15

New York has by far the largest transit system in the United States. Approximately 40 percent of all transit ridership is in the New York metropolitan area, nearly six times its seven percent share of the national population. Moreover, New York has by far the largest CBD in the United States, with approximately two million jobs, approximately four times that of second ranked Chicago.[43] There is no more favorable environment for transit in the United States. Yet, in New York, autos provide six times (600 percent) the access to employment as transit at 30 minutes, compared to Seattle's 19 times. In the median metropolitan area survey, autos provide 56 times (5,600 percent) the 30-minute access as transit (Figure 16).



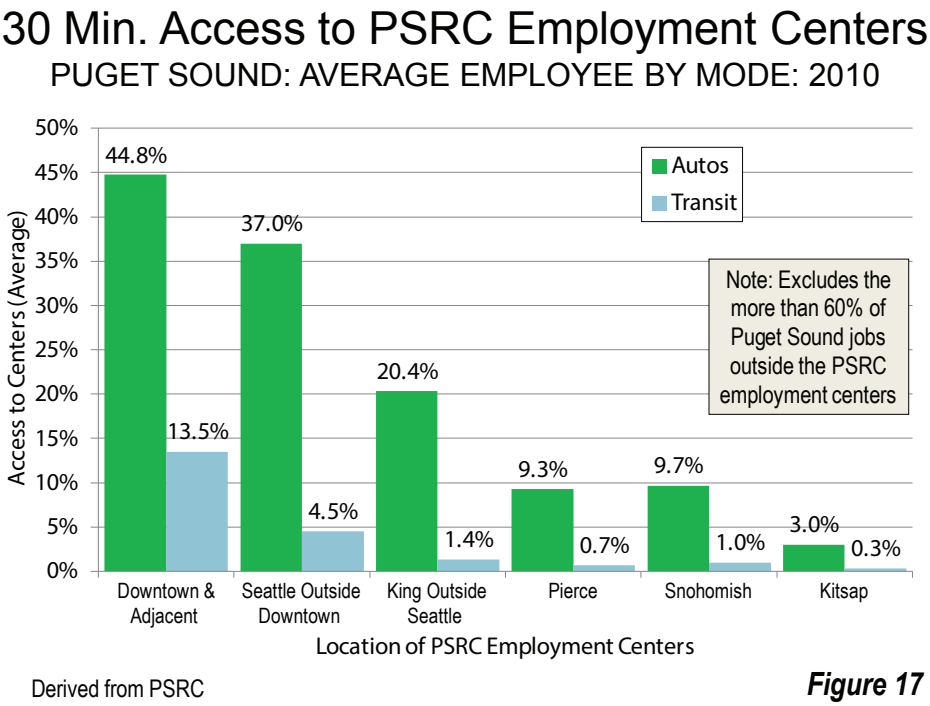
Derived from University of Minnesota

Figure 16

43 Demographia.com (2014), *Demographia United States Central Business Districts, 2006-2010,* http://www.demographia.com/db-cbd2000.pdf

The PSRC also estimates auto and transit accessibility to the PSRC employment centers (2010), using their internal methodology.[44] Workers are able to access the highest share of the Puget Sound jobs that are located in the more central area, the city of Seattle.[45]

30-Minute Access Within the Puget Sound: Half-hour transit access is available to downtown Seattle and adjacent centers to 14 percent of the region's workers. Transit access drops by nearly two-thirds to PSRC employment centers in the city of Seattle outside downtown (five percent). Thirty-minute access to jobs in the employment centers of King County outside the City, as well as in Pierce, Snohomish and Kitsap counties is 1 percent or less (Figure 17). Bellevue has the best 30-minute transit access of any center outside the city of Seattle, at four percent.



Derived from PSRC

Figure 17

Access by auto is considerably greater than by transit. Half-hour auto access is available to downtown Seattle and adjacent centers for 44.8 percent of the region's workers, compared to only 13.5 percent by transit. Downtown jobs are accessible by auto for 3.3 times as many workers as by transit, or 330 percent as much access (Figure 18). The advantage of autos in employment access relative to transit is higher in the city of Seattle outside downtown and far higher outside the city in the rest of the Puget Sound.

The data in Figure 18 includes only the PSRC employment centers, which, including downtown, represented only 39 percent of the Puget Sound's jobs in 2010.[46] Transit access to the more that 60 percent of jobs outside the PSRC employment centers would likely be considerably less than access to the PSRC employment centers. For example, none of the jobs in Pierce County outside the PSRC employment

44 Which differs from that of the University of Minnesota.

45 Weighted averages of access data.

46 Overall PSRC access figures covering all employment in the Puget Sound were not identified. The data in Figure 18 is the auto access number from Figure 17 divided by the transit number from Figure 17.

centers are included in Figure 18 (downtown Tacoma, port of Tacoma, Tacoma Mall, Lakewood, Puyallup downtown and Puyallup South Hill).

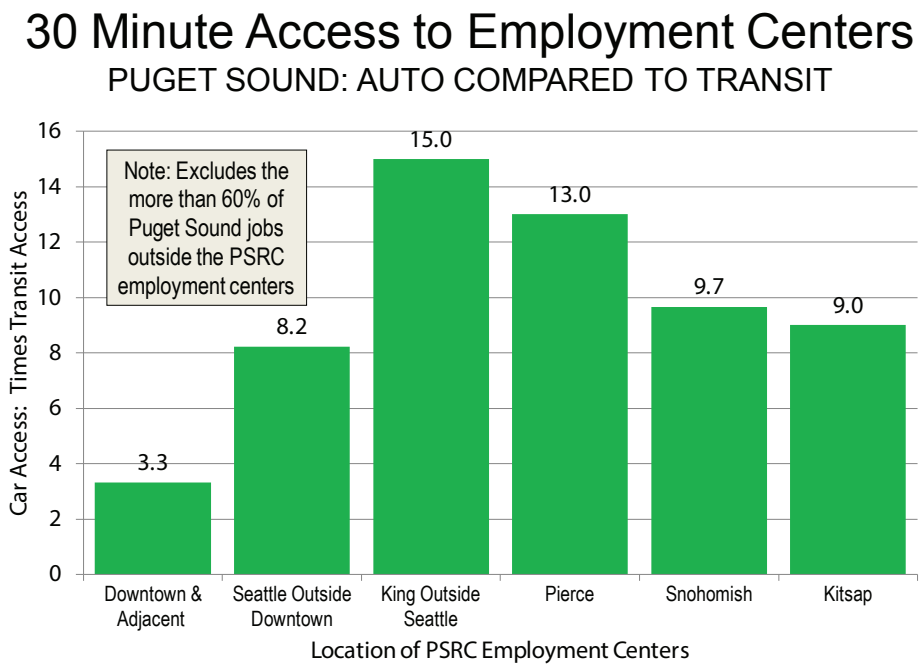


Figure 18

The PSRC also provides 45-minute estimates, which show a similar relationship between auto and transit access, with 55 percent of jobs accessible by auto and 12 percent by transit. Autos access 4.7 times as many jobs as transit in 45 minutes.

Potential for Ride Hailing to Improve Transit Access? Ride hailing (such as Uber or Lyft) can augment transit service, making origins and destinations more accessible.[47] However, it seems unlikely that there is potential for materially closing the gap with auto access. The time necessary to transfer between transit and ride hailing services could add substantially to travel time. This can make completing the entire trip by ride-hailing or commuting by personal vehicle more attractive.

The Impossibility of Comprehensive Transit Competitiveness: It is not conceivable to improve transit enough to attract meaningful numbers of drivers from their cars throughout a major metropolitan area (labor market). The auto's "door to door" access is particularly impossible for transit to compete with. Transit is most competitive to downtown locations, but is less competitive than autos even there, as the downtown Seattle access figures indicate. However, just to replicate the transit access of a downtown area would require a system of routes converging on virtually every employment location in a metropolitan area, with at least similar service frequency.

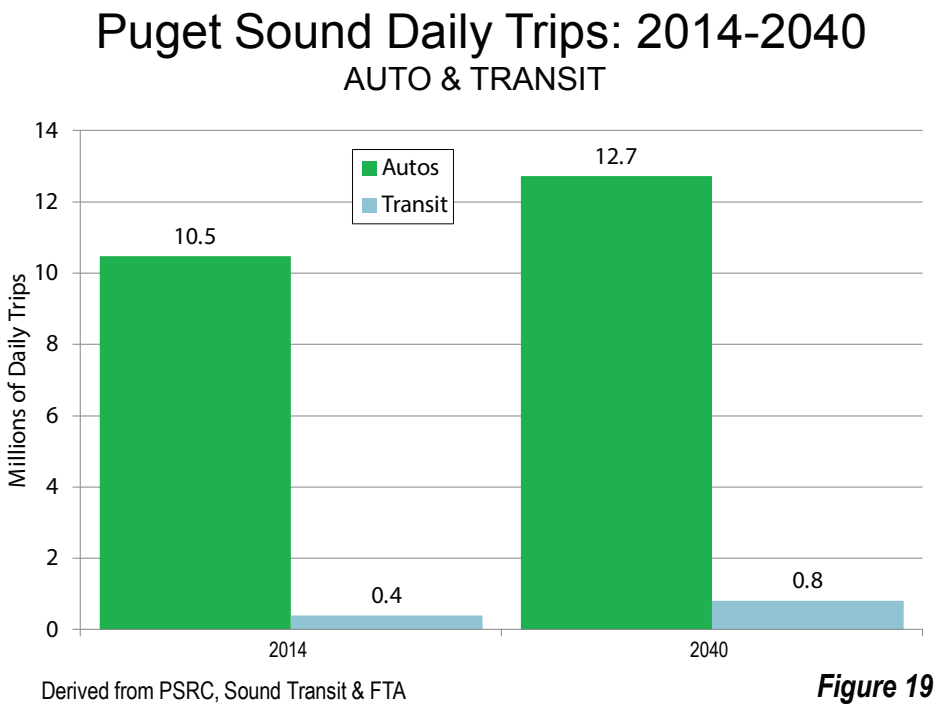
Despite strong proclivities toward transit and aversion to autos among urban leadership, no major metropolitan area in the world has seriously considered a system that would achieve auto-competitiveness. Indeed, such a system could consume most or all of the household income of a metropolitan area.[48]

47 This would address the "last mile" problem that plagues transit, in which transit access points (origin or destination) are not close enough to reach by walking.

48 Jean-Claude Ziv & Wendell Cox (2007), "Megacities and Affluence: Transport and Land Use Considerations," 11th World Conference on Transportation Research, https://trid.trb.org/view/890075.

The Challenging Future

PSRC and Sound Transit projections indicate that more than 80 percent of the increase in auto and transit trips by 2040 will be in autos (Figure 19).[49]



Derived from PSRC, Sound Transit & FTA

Figure 19

This is not surprising, given the much more limited access to employment by transit in comparison to autos. Obviously, since transit service is generally higher during peak work trip travel times, access by auto for other trips would seem likely to be even greater in comparison to transit.

There are additional challenges for transit in the Puget Sound that could make it even more difficult for transit to achieve the market share projected for 2040.

Pervasive Transit Ridership Losses: In recent years, there has been a pervasive loss in transit ridership in the nation's major metropolitan areas. One of the greatest losses have occurred in Los Angeles, where ridership remains below levels achieved at about the time its huge new urban rail system was put under construction.[50] Recent research suggests a substantial increase in auto ownership among households most dependent on transit as the most important factor. One potential cause for greater auto access was cited as "a narrative where a transit-using populace is replaced by people who are more likely to drive."[51] This dynamic sometimes involves "gentrification,"[52] and is to be expected. Low-income households, which are displaced by affluent

49 Transit trips (as opposed to boardings, which count transfers and can result in counting trips more than once) are estimated from Sound Transit ("Sound Transit 3, Appendix C, June 2018), using the maximum projection, increased to estimate transit trips in Kitsap County. Auto trips are from the RTP, Appendix K, page 4. Financial data is from the RTP, Appendix P, page 25.

50 Wendell Cox (March 7, 2018), "Connecting the Dots by Transit in Los Angeles?," newgeography.com, http://www.newgeography.com/content/005900-connecting-dots-transit-los-angeles.

51 See: Tracy Jean Rosenthal (February 20, 2018), "Transit-oriented development? More like transit rider displacement," *Los Angeles Times.* http://www.latimes.com/opinion/op-ed/la-oe-rosenthal-transit-gentrification-metro-ridership-20180220-story.html.

52 See: Center for Opportunity Urbanism (2019), *Beyond Gentrification: Toward More Equitable Urban Growth*, https://opportunityurbanism.org/wp-content/uploads/2019/01/Toward-More-Equitable-Urban-Growth.pdf.

households in well-served transit neighborhoods, will obviously use transit less frequently and will find cars to be a necessity.

The Seattle urban area, with the Amazon Boom, has avoided the transit ridership losses that have pervaded across the nation. However, the Seattle urban area has recently seen its ridership gains substantially moderated, especially in the last year. One factor cited in national transit losses has been greater access to cars by low-income households,[53] which has increased since the Great Recession, perhaps by expanding credit for car purchases and the increased reliability of older cars.[54] Ride hailing services (such as Uber, Lyft and other car sharing services) have also been cited as a cause of declining transit ridership nationally. Already, Uber and Lyft have reported daily ridership just in the city of Seattle that exceeds that of the light rail system throughout the Puget Sound.[55]

Autonomous Cars: Autonomous cars, according to some reports, could reduce the cost of mobility and, combined with their quicker door-to-door trips, attract even more people from transit to autos. Low-income residents could be particular beneficiaries as the broadened affordable access to jobs and other activities throughout the area could reap important improvements in income and quality of life. The opportunities lost to transit could be gained by transit-dependent residents who are unable to afford cars. Creative shifting of subsidies from the costlier conventional transit services to door-to-door mobility could substantially increase employment opportunities and reduce unemployment.

Worsening Traffic Congestion: At the same time, traffic congestion is projected to increase through 2040, according to the Regional Transportation Plan, which projects additional traffic delays per capita.[56] Traffic congestion could be exacerbated by the Puget Sound's state-mandated growth management policy, with its urban growth boundary, outside of which urban development is largely prohibited. The higher expected population densities are likely to make traffic congestion even worse.[57]

53 Michael Manville, Brian D. Taylor, Evelyn Blumenberg *(2018), "Falling Transit Ridership," California and Southern California, Institute of Transportation Studies, U.C.L.A., https://www.scag.ca.gov/Documents/ITS_SCAG_Transit_Ridership.pdf

54 See recent research on the economic advantages of auto access for low-income households. King, David & J. Smart, Michael & Manville, Michael. (2019). The Poverty of the Carless: Toward Universal Auto Access. Journal of Planning Education and Research. https://www.researchgate.net/publication/330813946_The_Poverty_of_the_Carless_Toward_Universal_Auto_Access

55 David Gutman (November 5, 2018), "How popular are Uber and Lyft in Seattle? Ridership numbers kept secret until recently give us a clue," *The Seattle Times,* https://www.seattletimes.com/seattle-news/transportation/how-popular-are-uber-and-lyft-in-seattle-ridership-numbers-kept-secret-until-recently-give-us-a-clue/

56 Regional Transportation Plan.

57 See Peter Gordon & Harry W. Richardson, "Beyond Polycentricity: The Dispersed Metropolis, Los Angeles, 1970-1990" (1996), *Journal of the American Planning Association,* https://www.tandfonline.com/doi/abs/10.1080/01944369608975695

Conclusion

Finding #11: The principal finding of this analysis is that: There is no potential, at any cost, for transit to materially reduce driving or to reduce traffic congestion in the Puget Sound. This finding is supported by PSRC projections, at least for the next two decades.

The Regional Transportation Plan projects that autos will continue to represent the overwhelming majority of trips in 2040 and the share of transit trips will remain small. It is estimated that nearly 16 times as many trips will be taken by auto as by transit, yet spending on state highways is projected to be less than one-third that of transit (Figure 20).[58] The funding disparity is even higher in "system improvements," (as opposed to Maintenance and Preservation) with 82 percent of the spending on transit and 18 percent on state highways.

Projections to 2050 indicate no expectation that the Puget Sound will continue to rely principally on automobile modes of transport (Figure 21).

Despite the considerable public policy efforts, transit falls far short of representing a regional transportation alternative in the Puget Sound region. Substantial public funds are committed to transit by taxpayers throughout the Puget Sound, and especially in the Sound Transit district. Yet, access to PSRC employment centers by transit is considerably less than by auto and will not materially improve under current plans. Transit access is largely limited to niche markets, such as downtown Seattle, and negligible to destinations elsewhere in the Puget Sound.

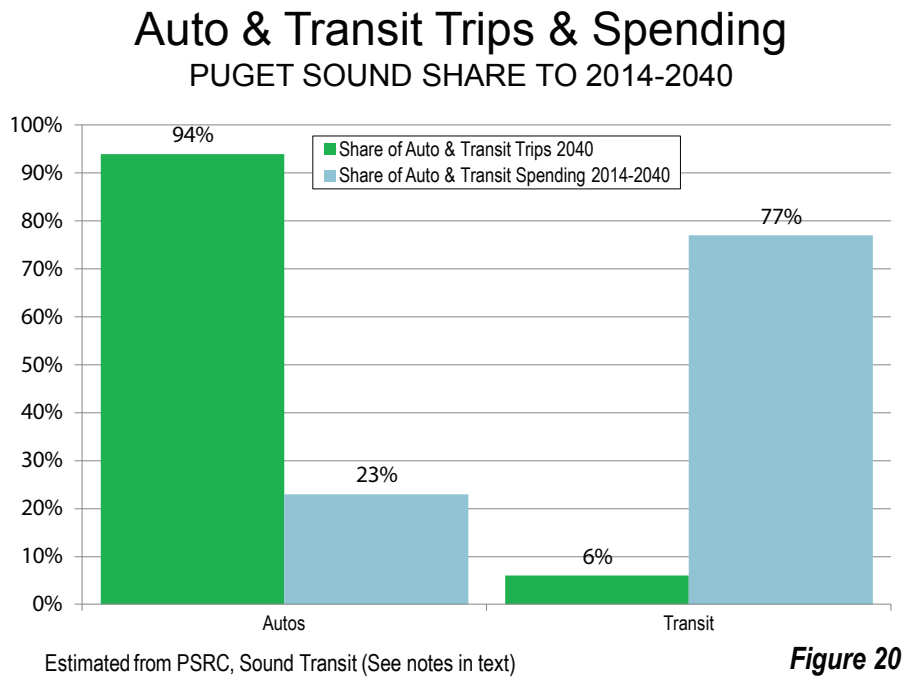
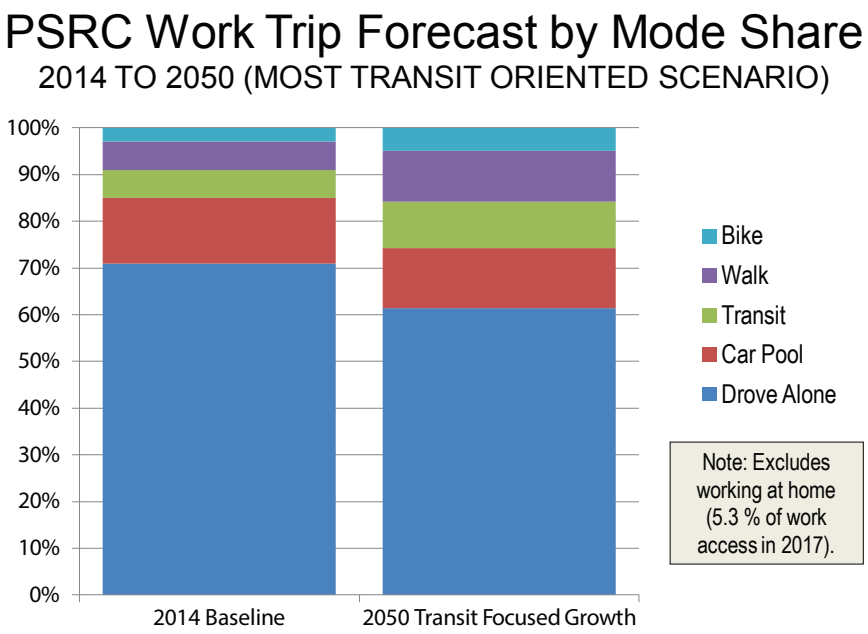


Figure 20

58 Transit trips (as opposed to boardings, which count transfers and can result in counting trips more than once) are estimated from Sound Transit ("Sound Transit 3, Appendix C, June 2018), using the maximum projection, increased to estimate transit trips in Kitsap County. Auto trips are from the RTP, Appendix K, page 4. Financial data is from the RTP, Appendix P, page 25.



Derived from PSRC Vision 2050 Draft and American Community Survey, 2017.

Figure 21

Attracting a significant share of drivers from their cars is a prerequisite for reducing traffic congestion by transit use. As former principal planner of the World Bank Alain Bertaud put it, if commuting were faster by transit "…drivers would have switched modes already.[59] In other words, people generally value expeditious urban travel more than the mode of travel. Transit has little ability to substitute for the automobile as the preferred mode of travel for most people in the Puget Sound region, as the above analysis shows.

Best serving the economic needs of a metropolitan area requires minimizing travel times to employment. Focusing transportation policy on economic growth may seem unnecessary in a metropolitan economy as successful as that of the Puget Sound. However, despite the high incomes in the Puget Sound region, there are still many households with lower incomes. Many workers do not have access to cars and are at a distinct disadvantage in seeking employment opportunities throughout the broader jobs-rich markets beyond the limited locations accessible by transit. Even some with good access to transit may find it infeasible to pick up and drop off children at daycare facilities without unacceptably long travel times. The increase in transit service over the next two decades is not likely to materially increase access for this demographic, whose only hope may be less costly mobility to jobs around the metropolitan area by autonomous cars.

At the same time, improving access to employment expands opportunities for those with middle-incomes and higher, because employment opportunities are widely dispersed outside downtown Seattle in the larger Puget Sound region.

The increase in working at home around the nation has made work trip travel unnecessary for many and as a result both solves the employment access problem and reduces traffic volumes. More working at home, to the extent that it makes economic sense, could improve economic performance.

59 Alain Bertaud (2018), *Order without Design: How Markets Shape Cities*. The MIT Press.

Planning for the Future: The very purpose of transportation is optimal access - the ability to go from one point in the area to another in the shortest possible amount of time, without regard to transport mode. Only recently, however, has it been feasible to measure transportation access, as is now reported on by the University of Minnesota, the Center for Neighborhood Technology website, "All Transit" (https://alltransit.cnt.org) and PSRC. Now that such measures are available, transportation planning should principally focus on access. Individual projects and packages of projects should be evaluated on the extent to which they improve access and their cost effectiveness in achieving such improvements. The principal measure should be a regional composite. However, sub-regional indicators should also be used, such as for geographical sectors and for areas exhibiting economic disadvantages, such as low-incomes and lack of automobile availability.

Such performance measures would provide invaluable information for prioritizing public funding in making decisions with respect to improving access, such as roadway capacity expansions, transit and other alternatives. This is likely to improve economic performance (such as job creation and economic growth) by facilitating additional employment opportunities, leading to greater affluence and less poverty.

Published by Washington Policy Center

Washington Policy Center is an independent research organization in Washington state. Nothing here should be construed as an attempt to aid or hinder the passage of any legislation before any legislative body.

If you have any comments or questions about this study, please contact us at:

Washington Policy Center
PO Box 3643
Seattle, WA 98124-3643

Online: www.washingtonpolicy.org
E-mail: wpc@washingtonpolicy.org
Phone: (206) 937-9691

Wendell Cox is principal of Wendell Cox Consultancy, an international public policy firm. He has consulted for government and private organizations in the United States, the United Kingdom, France, Canada, Australia, and New Zealand and for scores of public policy organizations. He served as a visiting professor at the Conservatoire National des Arts et Metiers, a national university located in central Paris and has delivered guest lectures such as at Tongji University, (Shanghai), Cairo University, the University of Toronto, the University of Paris, the University of Sydney.

WASHINGTON
POLICY CENTER

Improving lives through market solutions

www.washingtonpolicy.org