

“Light Rail’s Place in Washington State’s Public Transportation System”

By Michael McKenzie

Executive Summary

Cities in Washington such as Seattle and Tacoma are spending increasing amounts of tax payer’s money on building light rail systems in order to get a greater number of people to ride public transportation. But is it working? The results are inconclusive thus far. Ridership is rising, but in year to year numbers that are still somewhat modest, causing skepticism among some. Those in favor suggest that it is a more environmentally friendly method, that it’s more convenient, and will eventually catch on with the masses. Opponents say it has not caught on enough to be worth the considerable investment, claiming improvements for buses get more bang for their buck than light rail. It has been a slow project to materialize initially but is now quickly expanding to more and more locations in and around Seattle and Tacoma. Good or bad, there is about to be more of it.

Introduction

Everyone hates the traffic that permeates densely populated cities like Seattle and Tacoma. The morning and early evening commutes are mostly responsible for creating the

backups that hassle all travelers involved. It is a costly burden to people's time, their money, and the environment as a whole. The bulk of this comes from single occupancy vehicles on the road making their way to work, school, or wherever every day.

Everyone agrees that it is a problem, but deciding what to do about it is where things get more complicated. Most would agree that more mass transportation is needed. One solution that is gaining traction in recent times is light rail. The mostly underground, electric train system is set to add two more extensions to its growing network this year, with more scheduled in the pipeline. So why have light rail? What are its advantages and its drawbacks?

The key arguments of those in favor are that light rail offers:

- Fast travel speeds
- Environmental sustainability of public transportation
- High passenger capacity
- Reduction of road traffic
- Reduction of air pollution

Opponents of light rail argue that it costs too much, takes too long to build, and traffic problems could better tackled by acquiring a higher number of buses and an overall improvement of that system. This paper aims to further explore these aspects in greater detail, in order to understand the current situation and where it is heading.

Background on Light Rail in Washington State

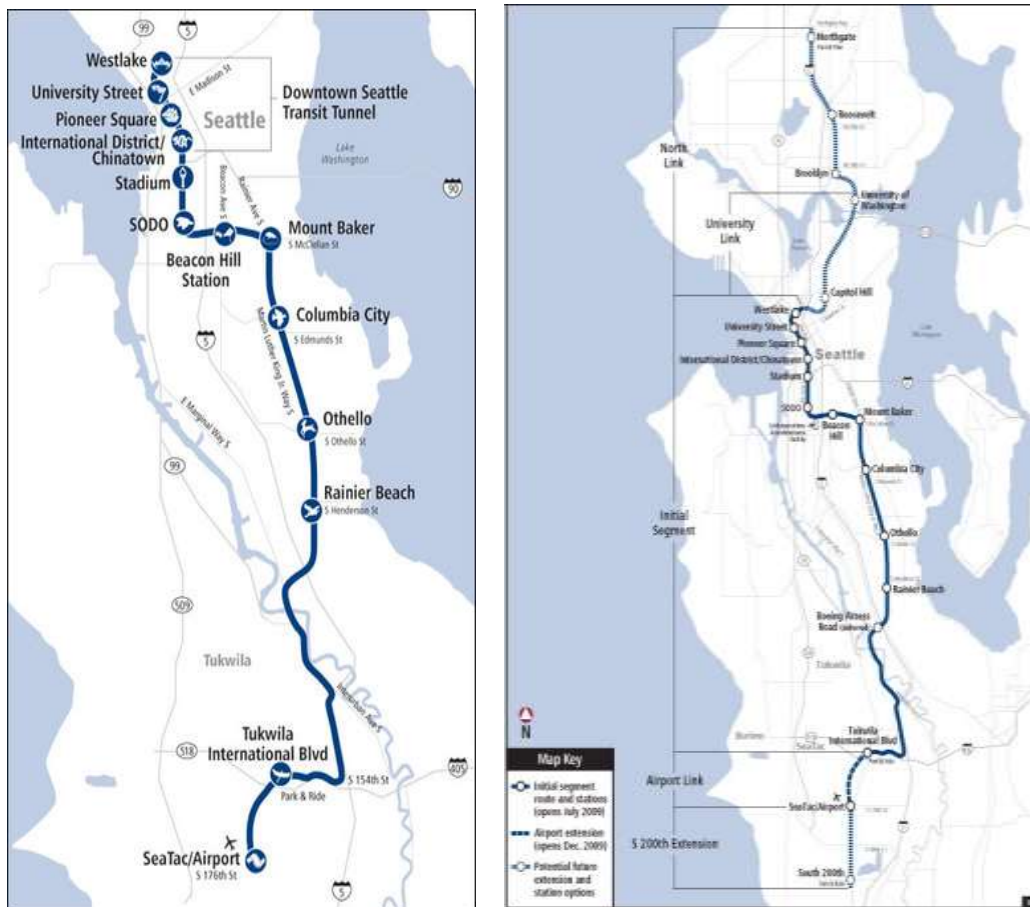


(Photo by Michael McKenzie, 2016)

Construction on the first light rail transit system Washington State began in 1999, after voting measures to increase transit funding passed in King, Snohomish, and Pierce Counties in 1996 (Schaefer, 1996). Sound Transit was established that same year to accommodate the state's growing transportation needs such as rail as well as other city transit including regional express bus lines and the "Sounder" commuter train. Washington's system uses the name "Link Light Rail" to distinguish itself from other systems. Light rail functions similarly to other trolley trains, operating on tracks with a third rail electrically powering the unit, resulting in clean air at the city level.

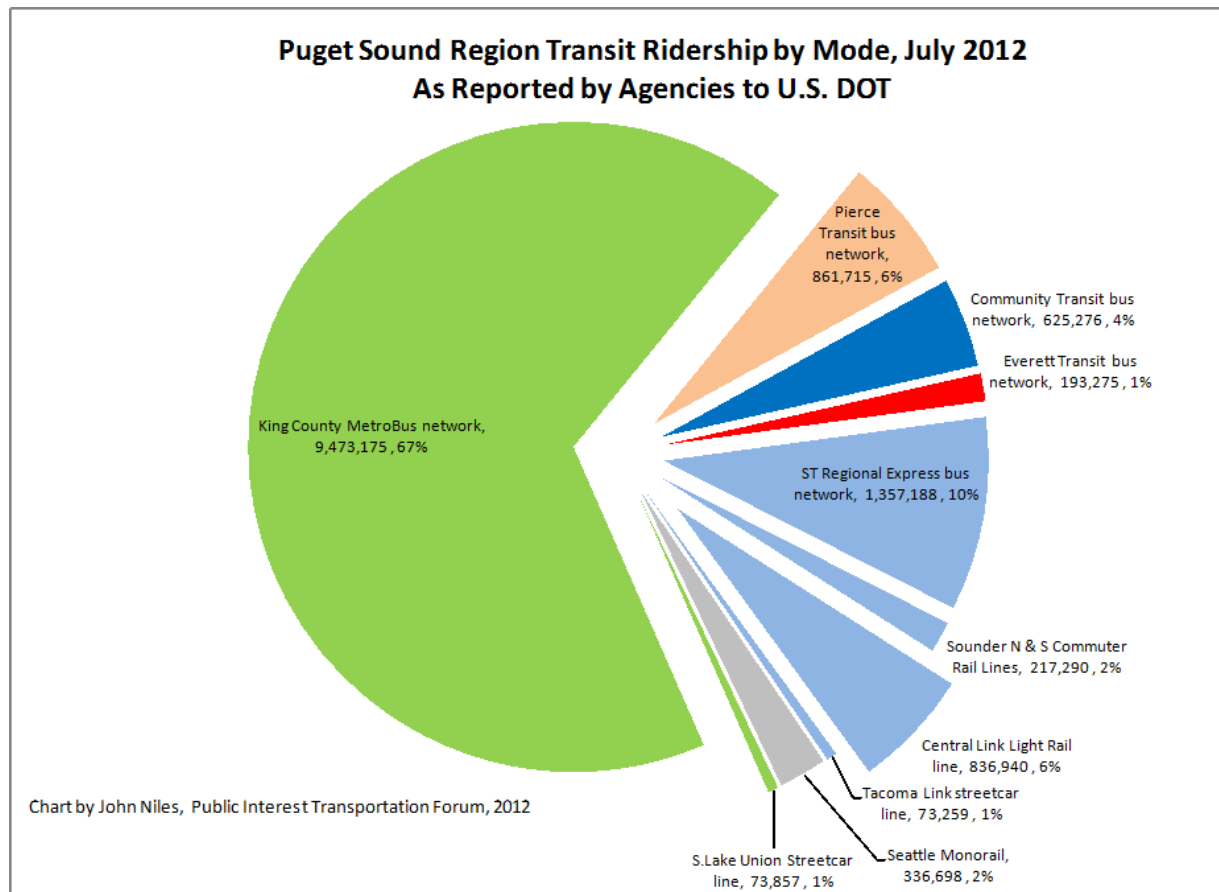
After the long process of construction was over, the first operational rail opened to the public in 2003 in Tacoma. Seattle's more ambitious implementation did not arrive until 2009.

That system, running a total of 14 miles from Westlake to Tukwila, took five years of construction from start to finish, and clocking in at \$2.3 billion dollars (Sound Transit, 2007). It was originally planned to run 20 miles, but was scaled back to 14 over budgetary concerns. The two lines; “Central Link” for Seattle to SeaTac and “Tacoma Link” in Tacoma will both be interconnected by the end of this year. Light Rail cars come in twos that are able to carry 200 riders a piece (WSDOT, 2014). A 1.7 mile extension from Central Link’s main line to SeaTac Airport was opened later in 2009.



Map of the current Central Link system as of Feb. 2016 (left), and confirmed extensions (right) (Seattle South Side, 2016), (Sound Transit, 2016)

In the beginning, Seattle's Central Link ridership reached a total of 7 million in its first full year of operation, which was more than one million below the projected amount of 8.1 million. The average weekday ridership for 2010 was 21,026, which was 21% below the short-run forecast (Public Interest Transport Forum, 2015).



(Puget Sound Transit Ridership by Mode, PIT Forum, 2012)

As of August 2015, ridership of Central Link is listed at an average of 39,048 daily, and 1,147,933 annually (Sound Transit, 2015). That is up 5% from the previous year's total in 2014. It is unclear how many of those riders would be potentially driving cars otherwise, and thus producing more greenhouse gas emissions and traffic congestion, but supporters of rail claim it

could be a positive start to a gradual shift over time of fewer cars on the road and riders choosing a more sustainable model of public transportation.

So far, it may not be a seismic change, but with more familiarity over time could grow into something more substantial. The public is demanding more mass transportation, and state and federal governments have their priorities set on the future. That is the thinking for public officials tasked with deciding what to fund.

Environmental Impact of Light Rail

Light rail's case as a valuable asset to large cities is in part, built around what is said to be an environmentally sustainable model. There is, however, uncertainty as to how much light rail is helping or harming in terms of energy production.

Light Rail is powered electrically. In Washington State, the bulk of electric energy comes from hydropower. A dominant 65% of our electrical sources accounts for hydropower use. Coming in at second is coal with 15%, 11% for natural gas, 5% for nuclear, 2% for wind (WDOC, 2014). That makes light rail a much cleaner operation in Washington than would be the case in many other states. It also lessens the air pollution that the predominantly biodiesel fueled buses produce. In terms of currently available public transportation, light rail is the cleanest, highest capacity option currently. What is subject to opinion, is whether it can generate and sustain a significant number of travelers so that the lessened environmental impact of humans getting around every day is, actually lessened.

The Federal Transportation Administration (FTA) attests to public transit's positive environmental impact in their report on climate change effects: "Transportation accounts for

29 percent of greenhouse gas emissions in the United States. By moving more people with fewer vehicles, public transportation can reduce greenhouse gas emissions. National averages demonstrate that public transportation produces significantly lower greenhouse gas emissions per passenger mile than private vehicles. Light rail systems produce 62% less and bus transit produces 33% less” (Federal Transit Administration, 2010).

Cato Institute researcher Randal O’Toole on the other hand, believes that while public transportation is necessary, light rail systems end up doing more harm than good. He claims: “Most rail transit lines use more energy per passenger mile, and many generate more greenhouse gases, than the average passenger automobile.” O’Toole goes on to suggest that rail transit comes with no guarantee that cities will save energy or meet greenhouse gas reduction goals. O’Toole admits that a rail transit uses less direct energy output than buses, but argues that it does not make enough of a difference when not enough people have been shown to ride them, and that the rails are supplemented with what he calls “feeder buses” that tend to have low ridership rates, so unnecessary energy costs and greenhouse gas emissions ultimately are being produced as a result. (O’Toole, 2008).

A public transport system that people will ride in large quantities is sure to be a good thing for energy usage, it seems to be as of yet undetermined whether light rail can become that system in the future in Washington or if it is just taking up valuable resources without enough patronization to justify its existence.

The already high impact the emissions from fossil fueled vehicles have on the environment are multiplied when factoring in the amount of traffic congestion in the state,

particularly Seattle, which ranks as 5th worst in the nation in 2015, according to TomTom navigation company (Lindblom, 2015). “Drivers in the metro area spent an average 89 hours of last year delayed in traffic jams, and an evening commute that should take 30 minutes at the speed limit averaged 53 minutes, the company’s data found” (Lindblom, 2015).

Socioeconomic Aspect

A diverse group of demographics need to make their way around the city one way or another each day. Office commuters, students, tourists, people in low income communities all tend to be prime candidates for public transportation. That is a lot of people to accommodate. Public transportation planners have a lot to consider, and it is a simple reality that some commuters will not be enticed to leave their cars for anything. But the ones who can be swayed can be a boost for cities to get closer to meeting goals in emissions reductions. Perhaps young people who begin riding a transportation system that is convenient to them will be less likely to want to run out and get their first driver’s license at the earliest opportunity.

In terms of fares, rail trips range from \$2.25-\$3.00, which is about the same as most buses, give or take a quarter. On Tacoma Link is currently free to ride, with a \$1.50 charge coming in fall 2016. A ride of the full length from SeaTac Airport to Westlake Station typically takes 38 minutes (Sound Transit, 2016). Most stops on Central Link are about three to five minutes long. The current length of the Tacoma Link takes 10 minutes to ride altogether (Sound Transit, 2016).

One policy development affecting Seattle’s public transit is the \$930 million “Move Seattle” transportation levy, which was passed by voters in November, 2015. The levy imposes

a tax on property owners, estimated to cost the median household \$272 a year, over nine years. The levy covers investments in public transportation, as well as devoting a portion to infrastructure maintenance. Terms of the levy include an oversight committee comprised of Seattle residents, appointed by the Mayor and City Council to keep track of expenses and revenues, and give input on how to spend proceeds (Seattle.gov, 2016).

Of course the economic principal is true that people generally respond to incentives to make themselves better off. To many, it seems like an obvious question; if there is a faster, easier, and still affordable way for them to get where they need to go, why would a city not fund that? Well unfortunately, the reality is much more complicated and messy than that.

Alternatives to Light Rail

As noted earlier, not everyone is on board with the idea of light rail. Some believe more buses are the way to go. Arguments can be made for progress of bus system improvements, as evidenced by King County Metro's bus system, boarding 400,000 riders on weekdays, with 40% of downtown employees getting to work and back by transit (Lindblom, 2008).

The region of Seattle, Everett and Tacoma is ranked at 7th in the nation for the amount of overall commuters that use public transit at 8%. It is also true that buses are a much faster acting solution than rail. There is only a waiting period of two years once ordered, compared to light rail which has shown can take anywhere from four to ten years, depending on how big the route is (Lindblom, 2008). There is also the emerging option of bus-rapid transit (BRT), which aims to achieve the best of both worlds by having a little more space for passengers and fewer stops. Rob Sims, a former chairman of Sound Transit and current King County Executive is in

favor of this solution, with his office being quoted as saying “It wouldn’t cost \$18 billion” (Lindblom, 2008).

Though buses would be cheaper than rail and be ready for commuters earlier, transit officials would have to solve major problems, including what to do about probable slower car-pool lanes. Once it is built and the pain of planning and paying is over, a city pretty much knows what they can expect with rail with slow steady progress, perhaps frustratingly so at times. It is a more exacting method than buses, which make more stops and can suffer delays with traffic and passenger boarding. A report in the Seattle Times from 2008 suggests that bus transit is aware of this and covers for it in statistical manipulation. “Community Transit buses arrive on time on more than 94 percent of their trips from Snohomish County to Bellevue and Seattle, which sounds good. But Community Transit pads its schedule to adapt to gradually slower highway travel. A morning ride from Lynnwood to Seattle was scheduled at 24 minutes in 2002, but is now 32 minutes. An afternoon ride from Overlake to Edmonds used to take 66 minutes, but is now 72 minutes.” (Lindblom, 2008)

Almost everyone who has taken a bus in and around Seattle is familiar with how crowded they can get at peak traffic hours. Hearing the driver’s voice from the loud speaker telling everyone to squish together and make room for more riders getting on is sound all too recognizable for regulars. There is also the matter of personal preference. Some would rather ride a train than a bus. Lots of riders do make use of both, and it is possible that there can be a balance of these modes rather than an either-or situation. It simply would not be cost effective or practical to pour all monetary resources into rail, nor does it seem likely to the relevant

policy makers funding these projects that going with an exclusively bus based model would it be as effective in reducing traffic.

Expansions and future of light rail

As mentioned previously, there are currently two extensions of the Link Rail slated to open in 2016. Beginning with a stop at the University of Washington, continuing to one in Capitol Hill, which will then connect to the rest of the system at Westlake Station. Construction began on this latest three mile project in 2009 when the rest of the system first introduced. It is on track to open March 19th and is estimated to cost \$1.9 billion to build. Rides from University Station to downtown are said to take 8 minutes, and a trip to the airport is listed at just under an hour. The project is projected to have 71,000 riders by 2030 to make for a grand total of 114,000 across the system by then. It is being funded by a sales tax, MVET tax, and federal grants (Sound Transit, 2016).

So far, this iteration is going considerably smoother than previous ones. Construction is currently six months ahead of schedule and \$150 million under budget (Green, 2016). Increased efficiency like this on big construction projects is often the result of experience from lessons learned through difficulties of previous installments.

Also on the agenda is SeaTac's extension from the airport to Angle Lake Station on South 200th Street, targeted for an early fall opening. The budget for this one is a total of \$383 million. Rider projection is 5,400 daily by 2018 (Sound Transit, 2016).

Off in the more distant future is an extension stemming from the SeaTac station to one in Federal Way, which on pace to begin construction in 2019 to open in 2023 (Sound Transit,

2016). An extension in Northgate connecting to University Link has also been funded for \$1.9 billion (Sound Transit, 2016).

There is much disagreement as to rail's effectiveness over the long haul, but with these and possibly more future extensions, it is clear that Link Rail is quickly developing a more significant presence in Washington's immediate public transportation plans.

Light Rail in Other Regions

So how are other American cities that have built light rail doing? Is the picture anymore clear as to its potential viability with regions that have had theirs for longer? There seems to be a lack of overwhelmingly positive testimony compared to criticism. Several cities such as Buffalo, Portland, San Jose, San Diego, and Sacramento have all built light rail systems that have been running since the 1980s. Yonah Freemark, a project manager at the Metropolitan Planning Council in Chicago, has made the case that light rail has underachieved in these places. "...It doesn't take much digging to find that over the past thirty years, these initial five systems in themselves neither rescued the center cities of their respective regions nor resulted in higher transit use — the dual goals of those first-generation lines." He says. Freemark goes on to look at census data that finds that among four of the five said cities, the share of regional workers choosing to ride transit to work declined, with San Jose being the exception. (Freemark, 2014)

In another of his critiques on light rail transit, Randal O'Toole noted that 9.8 percent of Portland residents used public transportation before light rail was built there, compared to that year's total of 7.6 percent (O'Toole, 2007). Columnist and Portland light rail supporter Paul Weyrich countered this by saying that light-rail as well as streetcar development have

stimulated some \$6 billion in adjacent development for the city. “This new development long-term is of great benefit to the City, such as wages, taxes and the contributions of these residents.” Weyrich says (Weyrich, 2007). O’Toole responded to this by saying that much of the money for new developments is by government subsidies, which are not justified due to only 2.2 percent of Portland’s passenger travel taking public transit (O’Toole, 2007).

What about other in countries? Does anyone have a system with some consensus? Japan is one place where it is highly agreed upon that their system works well. Japan is one a great example of how well light rail can work. And it is not just limited to one city, but the entire connected country. No one misses out. When your country is the size of California though, it makes things a lot more manageable.

Having had the experience of taking these trains myself, I can attest to it being a well running, affordable, and convenient system throughout different cities. The only drawback is being squished in the human stuffing session that can occur if you are unlucky enough to catch the last train of the day in a busy city like Tokyo. In my experience, they run on time with absolute certainty. You can in fact, set your watch by them. Of course Japan’s culture places a far greater value on efficiency and timeliness than does ours in America. It is tough to hash out what we could be learning from them or another country because our foundations are so different from one another.

Conclusion

At the rates mentioned for building rail, these are obviously not cheap endeavors made on a whim. They are investments that are believed to pay dividends over a long time frame. You do not build a rail extension to fix the city's immediate traffic complaints, you do it to preemptively quell the ones ten or twenty years from now.

Rail has, so far, generated enough confidence as one step in a long term, multifaceted solution for an ever-present point of public demand. A point in which, like most civil public matters many disagree on the best approach to. It is a complex issue and there are potential flaws in every system. No idea is perfect. For the time being though, Light Rail does not appear to be on the way out anytime soon, quite the opposite. It remains to be seen how the legacy of rail will be shaped at this point. In all likelihood, the introduction into more communities will provide more definitive answers as to the indication of the payoff for the experiment over the next several years.

For better or worse, Link Light Rail, for the time being, is convincing enough of the right people that it should be held up as an important piece of the puzzle in the long term future plans for Washington State public transportation.

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