

# *TriMet in the Twenty-First Century*

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## *Table of Contents*

Executive Summary.....	1
Introduction.....	2
Transit History.....	2
TriMet’s Response to Urban Changes.....	3
The Problem with Light Rail.....	4
The Westside Express.....	4
Population vs. Job Density.....	5
Transit-Oriented Development.....	6
TriMet’s Liabilities.....	6
Transit’s Alleged Benefits.....	7
Why People Drive.....	8
Designing a 21st-Century Transit System for Portland.....	9
1. The Current Direction.....	9
2. Polycentric Bus Routes.....	10
3. Microtransit.....	12
4. Vouchers.....	13
Recommendations.....	14
Endnotes.....	15

### **FIGURES**

Figure 1: Transit Capabilities.....	4
Figure 2: TriMet Ridership.....	8
Figure 3: TriMet’s Slow Recovery from COVID.....	8
Figure 4: Job Accessibility in the Portland Urban Area.....	9
Figure 5: Polycentric Bus Routes.....	11

# *TriMet in the Twenty-First Century*

## **EXECUTIVE SUMMARY**

The pandemic has made it painfully clear that TriMet's business model is hopelessly out of date. Trends that began decades ago—the dispersion of jobs and residences, telecommuting, and growing automobile ownership—were accelerated or at least continued by the pandemic. Yet TriMet, the Portland area's largest transit agency, still operates a route structure that was designed for the early 1900s.

Prior to the pandemic, instead of updating TriMet's business model, Metro and TriMet attempted to redevelop the Portland area to look more like it did in 1910, using the urban-growth boundary to increase overall population densities and transit-oriented developments to increase densities at the city center and along major transit corridors. Yet, they can't reverse the trends that made TriMet's route structure obsolete: the dispersion of jobs from downtown, near-universal automobile ownership, and the automobile's huge advantages over traditional transit in terms of speed and access to the entire urban area.

Metro and TriMet's biggest mistake was to rely on Big-Box Transit—transit vehicles with high capacities but whose route capacities are often low—that is expensive to build, inflexible in the face of rapidly changing transportation patterns, serves only a small portion of the urban area, and doesn't really make sense in a region whose jobs are finely distributed across the landscape rather than concentrated in a single downtown. While light rail has been particularly expensive, the Westside Express Service (WES) is almost a parody of this problem, costing \$7.5 million a year to operate and never generating enough fares to cover much more than 8 percent of its operating costs.

Data showing transit's share of commuting reveals how badly TriMet's overall system was working before the pandemic. While TriMet carried 42 percent of downtown workers to and from their jobs in 2018, downtown held less than 10 percent of all jobs in the urban area. Outside of downtown, TriMet carried just 3.4 percent of workers to and from their jobs. Though Portland has been celebrated as “the city that loves transit,” the reality is that TriMet provides terrible service to 90 percent of the region's workers and job centers.

The pandemic drastically reduced downtown's role as a job center, and it may never recover many of its former workers who are now productively employed at home. The high-income workers who once rode light rail are now working at home, while low-income workers who once took the bus have increased their automobile ownership and reduced their dependence on transit. Ridership may never recover,

yet TriMet faces nearly \$3 billion in debt plus pension and health care liabilities.

This paper looks at three alternative ways of reforming TriMet for the 21st century. First is to convert TriMet's downtown-centric route system into a polycentric system with multiple hubs all connected with one another by non-stop buses along with local buses radiating away from each hub. Second is to entirely replace fixed bus routes with an on-demand system, something like Uber Pool. Third is to reallocate TriMet's operating subsidies to transit riders in the form of discount vouchers, with lower-income people getting higher discounts, thus targeting subsidies based on incomes and giving TriMet better information about where people want to travel.

The paper found that a nine-hub system with up to five buses per hour on all routes would cost no more than TriMet is currently spending on bus operations. Average bus speeds would nearly double, and speeds between hubs would be nearly triple light-rail speeds, thus attracting far more riders than TriMet is carrying today. An Uber Pool system would force TriMet to increase fares anywhere from double to octuple current fares and thus probably isn't viable except in places where subsidies are already high. A discount voucher program could work, but it could be unnecessarily complicated for few benefits.

TriMet's most important problem is its focus on downtown Portland. In 2021, Hillsboro had 83,000 jobs, far more than are currently found in downtown Portland. Beaverton had 64,000 and Gresham more than 37,000. If TriMet is to remain relevant in the future, it needs to redesign its system to serve these and other job centers as well as it served downtown. Based on this analysis, this report recommends that:

1. TriMet and the region should immediately cease all planning for infrastructure-heavy transit projects, whether light rail, streetcar, or bus-rapid transit with dedicated bus lanes.
2. TriMet should immediately terminate the WES commuter-rail line, even if it means repaying a depreciated share of the federal government's costs back to the feds, and plan to replace light-rail lines with buses when the rail lines are fully depreciated.
3. TriMet should change its current, downtown-centric bus system into a polycentric system with at least nine transit centers offering non-stop bus service to every other center and local bus routes radiating away from each center.
4. TriMet should test on-demand microtransit

systems in parts of the region that currently have low transit usage (meaning high subsidies per rider) and also test a discount voucher program for low-income riders to determine if such vouchers would truly help low-income people as well as give TriMet better information about changing transportation patterns.

5. Metro, TriMet, Portland, and other cities in the region should stop subsidizing transit-oriented developments, which have done little to boost transit ridership and, due to their high construction costs, make little contribution to housing affordability.

6. To enable it to nimbly respond to changing transportation patterns, TriMet should rapidly pay down its debts and reduce unfunded pension and health care liabilities to zero.

## **INTRODUCTION**

The COVID-19 pandemic severely impacted transit ridership, and transit is the slowest of all major modes of travel to recover. Given the significant increase in the number of people working at home, the decline of downtown Portland, and increased automobile ownership—all trends that predated COVID but were accelerated by the pandemic—transit may never fully recover.

TriMet is particularly unprepared to deal with these changes because its business model is frozen in the '10s—the 1910s, that is. Many of TriMet's buses follow the same routes used by streetcars in the 1910s.<sup>1</sup> Nearly all TriMet routes connect residential areas with downtown Portland, which made sense in the 1910s when most jobs were downtown but made little sense in 2019 when less than 10 percent of the region's jobs were downtown and make even less sense in the post-COVID world.<sup>2</sup>

In 2018, TriMet carried 42 percent of downtown workers to and from work.<sup>3</sup> However, it carried just 3.4 percent of workers in the rest of the region to and from their jobs, showing that it was doing a poor job of serving 90 percent of Portland workers and employment centers.<sup>4</sup>

Between 2019 and 2021, the share of Portland-area workers taking transit to work declined from 7.7 to 2.6 percent.<sup>5</sup> Portland's downtown was already fading in importance before the pandemic, a trend that accelerated in the past three years. As a result, TriMet is virtually irrelevant to almost all Portland-area residents.

Is TriMet doomed to become a vampire agency, providing service to a negligible number of riders and existing mainly to collect taxes to pay off its debts, pension, and health care obligations? Or can TriMet reinvent itself to remain relevant to large numbers of Portland-area residents? This

paper will attempt to answer these questions by evaluating alternative business models for the agency. But first, the paper will look at the history of transit in the Portland area, revealing how TriMet failed to keep up with changes in urban life.

## **TRANSIT HISTORY**

Portland's first public transit began in 1872 using horse-drawn streetcars on First Avenue from Northwest Glisan to Southwest Porter streets.<sup>6</sup> In 1888, an electrical engineer named Frank Sprague installed the first workable electric streetcars in Richmond, Virginia.<sup>7</sup> The system was so successful that Portland entrepreneurs began converting the city's horsecar lines into electric streetcars in 1889.<sup>8</sup>

In 1893, the nation's first electric interurban railway line opened between Portland and Oregon City. By 1910 dozens of streetcar lines connected Portland residential areas with downtown. Downtown was the destination of all these lines because most urban jobs were located in downtown.

An image search for the word “city” will return scores of photos of skyscraper-filled downtowns surrounded by residential areas. But downtowns are a recent phenomenon in urban history and didn't exist before the nineteenth century. Downtowns were a product of the factory system, as early steam-powered factories tended to be located next to water and rail transportation centers where they could easily receive raw materials and ship out finished goods.

In 1910, Portland had factories that made brooms and baskets, clothing and cordage, shoes and soap, tents and tobacco products, mattresses and mohair fabric, woolens and wigs. Some factories made cans and other factories packed foods into those cans. Even more factories made bags and boxes to ship and store the products of all the other factories.<sup>9</sup> Most of these factories were downtown, which also had all the city's department stores, nearly all of its banks, most of its hotels, the telephone company, docks, a major railroad yard, restaurants, laundries, newspaper companies, the University of Oregon medical and law schools, and many other sources of employment.<sup>10</sup>

Electric streetcars connected downtown with what later became known as “streetcar suburbs,” including Willamette Heights in Northwest Portland, Rose City Park in Northeast Portland, Mount Tabor in Southeast Portland, and Fulton Park in Southwest Portland. At least forty different companies built streetcar lines in Portland, many of them real estate developers that wanted to connect their developments with downtown.<sup>11</sup> These companies consolidated into the Portland Railway Light & Power Company in 1906.<sup>12</sup>

Low-income workers who couldn't afford daily streetcar rides to work lived within walking distance of downtown.



Three-, four-, and five-story rooming houses were built on the edges of downtown for these people to live in.

The economic forces centralizing jobs in downtown areas were short lived. The turning point came in 1913, when Henry Ford began using a moving assembly line to build his Model Ts. This allowed him to cut the price of his cars in half even as he doubled worker pay, thus allowing auto workers to buy the cars they made for the first time. Just as important, moving assembly lines required a lot more land than the factories they replaced, so as industries adopted this technique, their factories moved out of downtowns.

In 1920, per capita ridership on the nation's transit systems peaked at 287 trips per urban resident. Ridership declined slowly in the late 1920s and drastically in the 1930s. Ridership would briefly increase during World War II, but trips per urban resident would never again reach 1920 levels.<sup>13</sup> In Portland, ridership may have peaked around 1921, when Portland Railway & Light carried 93.9 million trips.<sup>14</sup>

Just as the automobile and moving assembly lines were changing urban form, new technologies were changing transit. In 1921, four brothers named Fageol built the first bus from the ground up in Oakland, California. Fageol Motors called it the Safety Bus because its low floor meant it was unlikely to roll over and also made it easier to board.<sup>15</sup> These buses were far less expensive to buy than streetcars and didn't require tracks, but because the motor was under a long hood in front, they only had 23 seats. This made them more expensive to operate, per seat-mile, than streetcars. Construction of new streetcar lines virtually halted, but there was little movement to convert existing streetcar lines to buses.

In 1927, two of the brothers who started Fageol Motors moved to Ohio and designed a new bus. Instead of one large motor under a long hood in front, they put two smaller motors under the rear seats in back. This made it possible to fit 40 seats in a single bus, thus reducing the operating costs per seat-mile to less than those of streetcars.<sup>16</sup> They called this bus, and the company that made them, Twin Coach.

Within 10 years after the introduction of the Twin Coach, more than 500 of the 1,000 American cities with electric streetcars had converted all their streetcar lines to buses.<sup>17</sup> Transit riders welcomed the buses because they were faster, more flexible, and could easily be made to be as comfortable if not more comfortable than streetcars.

Claims that the conversion of streetcars to buses resulted from a conspiracy led by General Motors ignore this history. General Motors didn't begin to invest in transit companies until 1938, and it didn't do it to force those companies to convert to buses—the companies were doing that themselves. Instead, its goal was to take market share from

Twin Coach and other bus manufacturers when transit companies bought new buses.<sup>18</sup>

The company operating Portland's transit lines, which had been renamed Portland Traction Company in 1946, converted the city's last three streetcar lines to buses in 1950. The Oregon City interurban line stopped running in 1958. “The motor coach and the private automobile have made streetcar operations obsolete in the United States,” explained Portland Traction Company president Gordon Steele, expressing the consensus within the industry. “It is not economically possible to compete with this newer and better type of transportation.”<sup>19</sup>

After World War II, the number of service jobs grew from under 25 million in 1945 to 130 million just before the pandemic in 2020.<sup>20</sup> These jobs, which are in finance, education, health care, retail, hospitality, and similar fields, are even more decentralized than manufacturing jobs, and thus more difficult to serve with urban transit. Economist William Bogart estimates that no more than 30 to 40 percent of urban jobs are located in downtowns and other major job centers; the rest are finely distributed across the urban landscape.<sup>21</sup>

## **TRIMET'S RESPONSE TO URBAN CHANGES**

TriMet took over Portland's transit lines on December 1, 1969. Over the next decade, it made significant improvements to bus service, including buying new buses, increasing frequencies on popular routes, and building the downtown bus mall, which made it easier for people going to and from places that weren't in downtown to change buses. As a result of these improvements, transit's share of Portland-area commuting increased from 6.9 percent in 1970 to 9.6 percent in 1980.<sup>22</sup> This was better than most urban areas as transit's share of commuting declined during the 1970s in three out of four of the nation's 60 largest urban areas.

Also during the 1970s, Portland's mayor, Neil Goldschmidt, wanted to cancel the Mount Hood Freeway without losing the federal dollars, and the local jobs and construction company profits those dollars would create, that went along with that freeway. In 1973, Congress had passed a law allowing cities to cancel planned interstate freeways and use the federal government's share of the dollars to make transit capital improvements. Goldschmidt decided to use this money to build Portland's first light-rail line.<sup>23</sup>

Goldschmidt didn't choose light rail because it was efficient or because it would attract more riders than buses. He picked light rail *because it was expensive* and would consume all the federal dollars that had been allocated to the Mt. Hood Freeway. As with many politicians since,

Goldschmidt equated the benefit of light rail with its high cost, particularly if some of that cost could be paid for with “free” federal money.

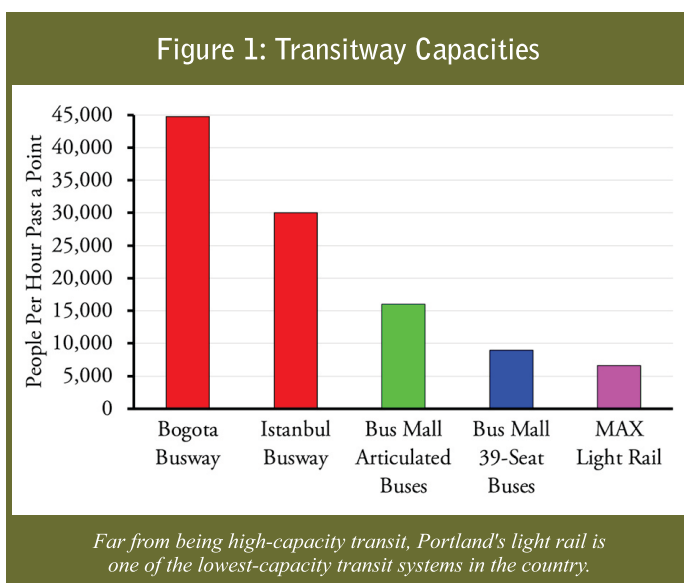
Like almost every federally supported light-rail line built since then, Portland's first light-rail line suffered from a large cost overrun. To help pay for it, TriMet raised bus fares and cut bus service. As a result, transit's share of commuting declined to 6.5 percent in 1990.<sup>24</sup> Transit's share has never risen above 8.5 percent since then. In 2019, it was just 7.7 percent.<sup>25</sup> When counting all motorized travel, transit carried less than 2.0 percent of the Portland area's passenger-miles in 2019.<sup>26</sup>

## THE PROBLEM WITH LIGHT RAIL

Technically, the only difference between light rail and streetcars, which were rendered obsolete by buses in 1927, is that streetcars have no couplers while multiple light-rail cars can be coupled together and operated as a train. In some cities, three or four cars may be coupled together, but due to Portland's short city blocks, light-rail trains can be no more than two cars long. In addition, for safety reasons, most of TriMet's system can move no more than 20 trains per hour.<sup>27</sup> This severely limits light rail's capacity to move people.

Portland transit planners frequently call light rail “high-capacity transit,” but in reality the opposite is true. The “light” in light rail refers not to weight, but to capacity. As defined in the American Public Transit Association's transit glossary, light rail is “an electric railway with a ‘light volume’ transit capacity.”<sup>28</sup>

The average TriMet light-rail car has 67 seats and room for 99 people standing, which is a lot more than a bus.<sup>29</sup> However, 20 two-car trains per hour times 166 people per car works out to a capacity of just 6,640 people per hour past a point.



Buses can move far more people at a far lower cost. Portland's downtown bus mall could handle an estimated 166 buses per hour, and for a time TriMet scheduled 160 buses per hour during rush hours.<sup>30</sup> TriMet's typical bus has 39 seats and standing room for 17 more.<sup>31</sup> Running 160 buses per hour capable of holding 56 people each represents a capacity of nearly 9,000 people per hour. This capacity could be increased using articulated buses, which can carry 100 people and thus could move 16,000 people per hour.

Exclusive bus lanes on a highway can move even more people using no more space than a light-rail line. Istanbul has a busway that carries more than 250 buses per hour for a capacity of up to 30,000 people per hour, and it routinely carries well over 20,000 people an hour.<sup>32</sup> Bogota, Columbia has busways that can move nearly 45,000 people per hour and often carries more than 40,000 people per hour, though it uses more space than light rail because it includes passing lanes.<sup>33</sup>

Portland transit demand is low enough that such high capacities are not needed. But light rail's low capacity creates problems where multiple light-rail lines merge together. For example, when TriMet was planning the Yellow light-rail line, it didn't want to put it on First Avenue because that would limit the capacity of the Blue line. Instead, it put the Yellow line on the Fifth and Sixth Avenue bus mall even though that reduced the capacity of the mall to move people because buses plus light rail had a lower capacity than buses alone.<sup>34</sup>

All these lines cross the Steel Bridge, where TriMet is able to run 40 trains an hour because trains don't stop on the bridge. Before the pandemic, however, TriMet worried that even 40 trains per hour would become inadequate; and the agency was considering spending at least \$2 billion building two tunnels under the Willamette River that would allow as many as 64 trains per hour.<sup>35</sup> Such high expenses wouldn't be necessary if TriMet had stuck with buses, which unlike rail are capable of serving low-, medium-, and high-demand transit corridors at reasonable costs per seat-mile and passenger-mile.

## THE WESTSIDE EXPRESS

TriMet's Westside Express Service (WES) commuter-rail line, which connects Beaverton, Tigard, Tualatin, and Wilsonville, is not as financially disastrous as light rail but should be even more embarrassing to local transit planners. The communities it serves are important job centers, but their job and residential densities are too low to be effectively served by rail transit.

WES was originally predicted to cost \$104 million and to attract 3,000 weekday riders in 2020.<sup>36</sup> This was a ridiculously small number of riders for such a high cost. As it turned out, the final cost was more than 50 percent greater

at \$166 million.<sup>37</sup> Averaged annually, the highest weekday ridership WES ever carried was 2,031 in 2015.<sup>38</sup> By 2019, weekday ridership had fallen below 1,500; and in 2021 it averaged just 331.<sup>39</sup> In February 2023 it carried 424 riders per weekday.<sup>40</sup>

TriMet planners could not have known about the COVID pandemic when they were planning the Westside Express, but they had to know that spending more than \$100 million on a transit line whose ridership was predicted to be mediocre was not cost effective. TriMet has a dozen bus lines that carried more than 6,000 weekday riders before the pandemic.<sup>41</sup> Many other lines carried more than the 3,000 daily riders predicted for WES. It made no sense to spend \$104 million, much less \$166 million, on a line that was predicted to carry no more than 3,000 weekday riders and actually carried far less.

In addition to higher start-up costs, WES costs far more to operate than buses. In 2019, WES cost more than three times as much per vehicle revenue-mile as TriMet buses. By 2021, it cost well over four times as much as buses.<sup>42</sup> WES has fewer than twice as many seats as a bus—73 per vehicle compared with 39 for a typical TriMet bus—and it doesn't come close to filling those seats.<sup>43</sup> In 2019, WES railcars carried an average of 19.9 people (that is, it carried 19.9 passenger-miles for every vehicle revenue-mile) and in 2015, its best year, it carried fewer than 25.<sup>44</sup> Regular buses can carry more than 50 people and articulated buses can carry 100 at far lower capital and operating costs than the WES railcars.

In 2014, WES's operating subsidy per rider was \$12.22, four times the subsidy to TriMet bus riders.<sup>45</sup> By 2021, WES per-rider subsidies increased to \$87.80, almost eight times buses.<sup>46</sup> Even \$12.22 per rider is ridiculous, but \$87.80 is insane.

Overall, WES lost \$5.9 million in its first year, more than \$6 million in every year since then, and nearly \$7.5 million in 2020 and 2021. In its best year, fares covered 8.1 percent of operating costs; in only one other year did fares cover more than 7 percent. By 2019 it was just 4.5 percent, and in 2021 it was less than 1 percent.

The WES debacle exemplifies how TriMet's fascination with Big-Box Transit—transit vehicles with high capacities but whose route capacities are often low—makes no sense in a 21st century decentralized urban area. With people going between hundreds of different residential neighborhoods to hundreds of different job and economic centers, the number of people going from any point A to any point B is too low to justify Big-Box transit vehicles. If light-rail cars sometimes seemed crowded at rush hour, that's more due to their inherent low capacity than to the large numbers of people riding those cars.

The federal government contributed \$69 million to WES capital costs. Terminating WES would lead the Federal Transit Administration to demand the return of a depreciated share of those costs, which might be around \$50 million today. Given that operating the WES line costs taxpayers well over \$7 million a year, the cost of terminating the line could probably be recovered by the operational savings in less than 8 years. TriMet should save taxpayers' money by terminating the line today.

## POPULATION VS. JOB DENSITY

Rather than design a transit system that meets the needs of the 21st century, TriMet and Metro, Portland's regional planning authority, have tried to redesign the Portland area to meet the needs of an early 20th century transit system. One way of doing so was limiting the expansion of Portland's urban-growth boundary to restrict the ability of homebuilders to meet the demand for new single-family housing.

Between 1980 and 2021, the Portland urban area's population more than doubled from 1.0 million to 2.1 million people.<sup>47</sup> Yet the area within the growth boundary, which was set in 1979 at 227,491 acres, has expanded by only 15 percent to 261,064 acres.<sup>48</sup> Part of the region's population growth took place in Clark County, Washington, which is outside of the boundary, but if a disproportionate share was in Washington, it is because the boundary made Portland a more expensive or less desirable place to live.

The increased densities that resulted from the slow growth of the boundary failed to boost transit ridership. The urban-growth boundary increased the population density of the Portland urban area from 3,340 people per square mile in 1980 to 4,050 people per square mile in 2020.<sup>49</sup> Over the same period, transit's share of commuting fell from 9.6 percent in 1980 to 7.7 percent in 2019 (and much lower in 2021).

Population density is the wrong variable to emphasize when trying to increase transit usage. The city of Portland had under 4,300 people per square mile in 1910, which isn't much denser than the entire Portland area is today.<sup>50</sup> The factors that made transit ridership high in 1910 were low rates of auto ownership and a high concentration of jobs downtown, not population density.

TriMet mainly serves downtown commuters today. According to the Portland Business Alliance's census of downtown employers, 102,630 people worked downtown in 2018 and 42 percent of them, or about 43,100, took transit to work.<sup>51</sup> But the Census Bureau's *2018 American Community Survey* found that in the entire Portland area just 76,682 workers commuted by transit out of a total of 1,088,646 workers.<sup>52</sup> That means that only 3.4 percent of workers who didn't work downtown took transit to work.



To boost downtown jobs and transit ridership, Oregon Governor Barbara Roberts ordered state agencies to locate their offices in downtown areas in 1994. This led, for example, the Oregon Department of Transportation to move its Region 1 executive offices from southeast Portland to downtown Portland.<sup>53</sup> In 1996, President Clinton issued a similar order to federal agencies, leading the Bureau of Land Management to move its Oregon state office from northeast Portland to downtown.<sup>54</sup> Yet, more than 90 percent of Portland-area jobs remained outside of downtown.

Downtown jobs plummeted during the pandemic, and many may never return. A recent report found that, in the first quarter of 2023, 25 percent of downtown Portland offices were vacant compared with 12 percent of suburban offices.<sup>55</sup> Another recent study found that, as of late 2022, economic activity in downtown Portland was only 37 percent of pre-pandemic levels, which was one of the lowest rates of any major city in the country.<sup>56</sup> Rioting, crime, and homelessness are all discouraging downtown recovery and it doesn't appear these problems will be solved anytime soon. Restoring ridership to 2019 levels will be difficult; returning to the conditions that led to high transit ridership in the early 20th century is simply impossible.

## TRANSIT-ORIENTED DEVELOPMENT

TriMet and Metro's other policy to promote transit by emulating the early 20th century has been subsidizing construction of high-density multifamily housing projects, often called transit-oriented developments (TODs). The typical TOD is four to five stories tall and sometimes has shops on the ground floor.

While planners often claim these are affordable, in fact they cost more to build, per square foot, than single-family homes, and only cost less per unit because the units tend to be much smaller than a single-family home. California developer Nicholas Arenson estimates that five-story TODs cost three to four times as much to build, per square foot, as single-family homes due to the need for elevators and more steel and concrete.<sup>57</sup>

These mid-rise buildings are meant to replicate the sort of housing that existed near downtown Portland in the early 20th century. But, as noted above, such housing was occupied by people who needed to live within walking distance of their jobs because they couldn't afford to ride transit. It wasn't transit oriented then, and it isn't particularly transit oriented today. Research by Cascade Policy Institute has shown that transit usage by people living in these developments is not significantly higher than people living elsewhere in Portland.<sup>58</sup>

Planners claim there is a pent-up demand for mid-rise housing because single-family zoning has made it difficult for developers to build higher densities. But, as developer

Arenson points out, such housing typically “sells at a discount” to single-family homes because people would rather live in a single-family home than a multifamily project.<sup>59</sup> With higher costs and lower demand, the only way to build it is to subsidize it.

In 1996, a decade after Portland's first light-rail line opened, Portland city planner Mike Saba informed the city council that, despite zoning the land around many light-rail stops for TODs, “we have not seen any of the kind of development—of a mid-rise, higher-density, mixed-use, mixed-income type—that we would've liked to have seen.”<sup>60</sup> In response, Portland began subsidizing such developments with property tax abatements, tax-increment financing, low-income housing tax credits, TOD grants provided by the Federal Transit Administration, and other subsidies. Such subsidies would not be necessary if there were truly a pent-up demand for dense housing.

Few transit-oriented developments were completed by 2000, when the Census Bureau reported that 7.7 percent of Portland-area workers took transit to work.<sup>61</sup> Since then, scores if not hundreds of such developments have been built throughout the Portland area. As of 2019, the share of Portland-area workers taking transit to work was still just 7.7 percent, indicating that TODs have failed to boost transit ridership.<sup>62</sup>

The pandemic reduced the demand for dense housing even further. Census data show that people are moving away from dense cities into low-density small towns, suburbs, and rural areas. The Census Bureau's 2022 population estimates, for example, show that dense cities such as Los Angeles, New York, Portland, San Francisco, and San Jose are losing population while low-density cities such as Atlanta, Phoenix, and San Antonio are growing.<sup>63</sup>

## TRIMET'S LIABILITIES

As of June 30, 2022, TriMet had more than \$1 billion in long-term debt, mostly money borrowed to pay for light-rail construction. TriMet also has more than \$1 billion in pension liabilities and about \$800 million in health care liabilities, all of which it is obligated to pay even if no one rides transit.<sup>64</sup>

No matter how many people ride transit, at least \$85 million of TriMet's pension and health care liabilities are unfunded, meaning TriMet doesn't know how it will cover those costs.<sup>65</sup> Moreover, this estimate of unfunded costs is based on possibly optimistic assumptions regarding interest rates, inflation, health care cost trends, and employment. If permanent ridership declines force TriMet to lay off large numbers of workers, for example, those workers won't be paying into pension and health care plans, which may increase TriMet's liabilities.

TriMet has already taken steps to reduce its unfunded pension and health benefit obligations. Due to uncertainties about the future of transit ridership, however, it is more imperative than ever that TriMet reduce these unfunded obligations to zero. Accelerating the repayment of its debt would also give TriMet more freedom to quickly respond to changes in transportation patterns.

## TRANSIT'S ALLEGED BENEFITS

On a per-passenger-mile basis, subsidies to transit are by far the highest of any mode of passenger transportation. In 2019, transit received total subsidies of \$58.6 billion and carried 54 billion passenger-miles for an average subsidy of \$1.08 per passenger-mile.<sup>66</sup> The only other mode that comes close is Amtrak, which received \$2.7 billion in subsidies and carried 6.5 billion passenger-miles for an average subsidy of about 42 cents per passenger-mile.<sup>67</sup> Airlines received about \$8.5 billion in subsidies and carried 754 billion passenger-miles for an average subsidy that was just over a penny per passenger-mile.<sup>68</sup>

Highway subsidies, mostly at the local level, were around \$57 billion in 2019, but highways carried nearly 5.6 trillion passenger-miles, for an average subsidy of just over a penny per passenger-mile.<sup>69</sup> However, this overstates subsidies to passenger travel as highways also hosted 2.3 trillion ton-miles of freight shipments.<sup>70</sup> Apportioning the subsidies to both freight and passenger travel would reduce passenger subsidies to well below a penny per passenger-mile.

During and following the pandemic, most businesses reduced their costs in response to declining patronage, but transit agencies such as TriMet kept operating trains and buses as if there were no pandemic. As a result, in 2021 subsidies per passenger-mile grew to more than \$3.00.<sup>71</sup> Meanwhile, subsidies to highway travel remained about the same as in 2019.<sup>72</sup>

Transit advocates justify these high subsidies by claiming that transit relieves congestion, saves energy, reduces greenhouse gas emissions, and promotes social justice by helping low-income people. Close scrutiny reveals that none of these arguments are valid, at least not in Portland.

In 2019, Portland-area transit carried 463 million passenger-miles. Meanwhile, Portland-area highways carried 38.3 million vehicle-miles per day.<sup>73</sup> At an average occupancy of 1.72 persons per vehicle, that totals to 24.1 billion passenger-miles per year.<sup>74</sup> Transit is less than 2.0 percent of that, which isn't enough to have a significant impact on congestion. It would be far more cost effective to spend money on things that actually reduce congestion, such as traffic signal coordination and fixing highway bottlenecks.

Transit only saves energy if transit vehicles are full, but they

rarely are. In 2019, the average car on the road used less than 2,800 British thermal units (BTUs) per passenger-mile while the average light truck used less than 3,300 BTUs per passenger-mile.<sup>75</sup> TriMet's light rail used more than 2,800 BTUs, its buses used nearly 3,400 BTUs, and WES used more than 4,400 BTUs per passenger-mile in 2019. Overall, TriMet used 3,248 BTUs per passenger-mile, more than the average of cars and light trucks.<sup>76</sup>

Because it is powered by electricity that, in Oregon, comes mainly from renewable sources, TriMet's light rail does produce fewer greenhouse gas emissions than the average car. In 2019, the average car emitted just under 200 grams of carbon dioxide per passenger-mile and the average light truck emitted 285 grams. Based on the average emissions from Oregon electrical power plants, powering light rail emitted only 48 grams. However, TriMet buses emitted 245 grams per passenger-mile, approximately the same as the average of cars and light trucks, and WES emitted 320 grams per passenger-mile.<sup>77</sup>

These numbers are from before the pandemic. In 2021, TriMet's energy consumption per passenger-mile shot up to 6,000 BTUs for buses, more than 6,000 for light rail, and 16,800 for WES. Greenhouse gas emissions increased to 94 grams for light rail, 432 for buses, and more than 1,200 for WES. Overall, TriMet used more than 6,400 BTUs and emitted nearly 300 grams per passenger-mile. Energy consumption and emissions per passenger-mile will remain high unless TriMet can restore ridership, reduce vehicle-miles of service, replace all Diesel-powered vehicles with electric power, or some combination of all three.

TriMet plans to eventually reduce greenhouse gas emissions by completely converting its bus fleet to electric buses. However, electric buses cost roughly twice as much as Diesel-powered buses, so TriMet can afford to buy just 24 electric buses in 2024 and doesn't plan to complete the conversion until 2040.<sup>78</sup> Considering low ridership, it would be more cost effective to reduce greenhouse gas emissions by giving people incentives to buy electric cars.

There is also no guarantee that electric-powered vehicles will remain as climate-friendly as they have been. In the late 1990s, Oregon electrical generation plants emitted 250 to 280 pounds of carbon dioxide per megawatt-hour.<sup>79</sup> By 2019, however, this had grown to 390.<sup>80</sup> While it fell to 314 in 2021, as the economy recovers from the pandemic and electricity demand grows, the construction of new natural gas power plants could increase emissions still further.<sup>81</sup>

The claim that transit helps low-income people is just as dubious. If low-income is defined as people earning under \$25,000 a year, only 10.2 percent of Portland-area low-income workers rode transit to work in 2019. More people whose incomes were above \$50,000 a year commuted by transit than those whose incomes were below \$25,000.<sup>82</sup>



The 90 percent of low-income workers who didn't commute by transit had to pay taxes to support TriMet riders who were more likely to earn above \$50,000 than below \$25,000, which is far from socially just.

In 2021, the number of low-income people in the Portland area taking transit to work fell by 56 percent. Only 5.8 percent of people earning under \$25,000 a year commuted to work by transit. Workers whose incomes were below \$25,000 a year were more likely to drive alone to work than those whose incomes were above \$50,000 a year.<sup>83</sup> Thus, policies favoring transit over autos, such as by giving transit priority at traffic signals, have the greatest negative impacts on low-income workers.

## WHY PEOPLE DRIVE

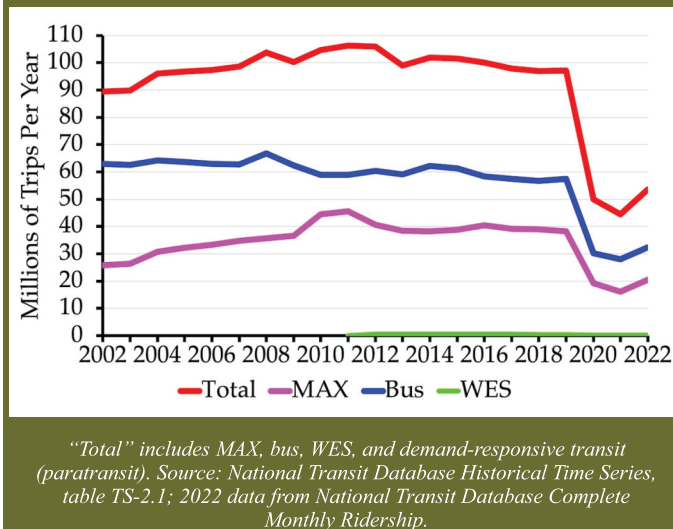
TriMet and Metro's relentless promotion of density and transit-oriented developments is based on a cargo-cult mentality: They hope that making Portland look like it did in 1910 will lead people to ride transit as much as they did in 1910. But density and TODs don't change the fundamental factors that led people to reduce their dependence on transit after 1913: the decentralization of jobs and other economic centers; increased auto ownership; and the inherent advantages of autos over transit in almost any urban setting.

Gasoline prices dropped in 2014, which led to a significant increase in automobile ownership. According to the Federal Highway Administration, from 2014 to 2019 the total number of motor vehicles in Oregon grew by 14.7 percent.<sup>84</sup> The state's population during this time grew by only 6.4 percent, meaning there was a 7.7 percent increase in the number of motor vehicles per capita.<sup>85</sup> Before the pandemic, Portland-area residents traveled at least 50 times as many passenger-miles by auto as by transit, so even a small increase in automobile ownership can mean a significant decline in transit ridership.

Nationally, transit carried 7 percent fewer riders in 2019 than in 2014.<sup>86</sup> TriMet was no exception to this trend. Overall ridership peaked in 2014 and fell 9 percent by 2019. Light-rail ridership peaked in 2011 and fell 16 percent by 2019. Bus ridership peaked in 2008 and fell by 14 percent by 2019. WES ridership peaked in 2014 and fell 27 percent by 2019.<sup>87</sup> Spending large amounts of money on rail infrastructure has not protected TriMet from long-term trends that lead people to drive more and ride transit less.

The pandemic saw another uptick in automobile ownership. Between 2019 and 2021, Oregon's population grew by less than 1.0 percent, but the number of motor vehicles grew by more than 2.3 percent, for a 1.4 percent increase in vehicles per capita.<sup>88</sup> In 2021, only 3.7 percent of Portland-area workers lived in a household that has no automobiles, down from 4.3 percent in 2019. Of automobile-less workers, 29 percent nevertheless drive alone to work (mostly in

Figure 2: TriMet Ridership



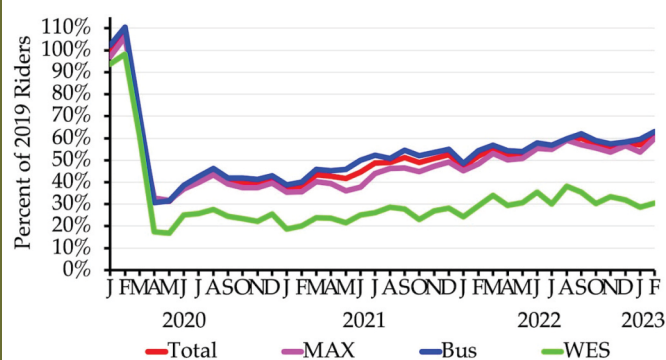
in employer-supplied vehicles) while only 22 percent commuted by transit in 2021.<sup>89</sup> TriMet doesn't even work for the vast majority of people who have no cars.

An even bigger effect of the pandemic has been the increase in the number of people working at home. Between 2019 and 2021, the number of Portland-area telecommuters grew by 253 percent. This had an outsized impact on transit: While the number of people driving alone to work dropped by 19 percent, the number taking transit to work dropped by 66 percent.<sup>90</sup> Even if many of those people eventually return to other work locations, that won't help transit if most of those locations are no longer in downtown. Increased auto ownership, increased telecommuting, and a declining downtown mean that TriMet's current system will likely never again carry the already diminished number of riders that it carried in 2019.

Nationally, driving has fully recovered to pre-pandemic levels. Oregon is slightly behind: As of February 2023, Oregonians drove 97 percent as many miles in urban areas as they did in February 2019.<sup>91</sup> TriMet's February ridership, however, was only 62 percent of ridership in February 2019. TriMet's bus ridership was 63 percent, light rail was 60 percent, and WES was 31 percent of 2019 numbers. TriMet ridership as a share of 2019 levels has been hovering around 60 percent since at least August 2022, indicating that the overall trend is increasing only slowly if at all.<sup>92</sup>

Americans don't drive because they have an irrational love affair with autos but rather because autos give them better access to jobs and other economic opportunities than any other mode of urban travel. Researchers at the University of Minnesota estimate that in 2019 the typical resident of the Portland area could reach 42 times as many jobs in a 20-minute auto drive as in a 20-minute transit trip, and 50 percent more jobs in a 20-minute auto drive than in a 60-

Figure 3: TriMet's Slow Recovery from COVID

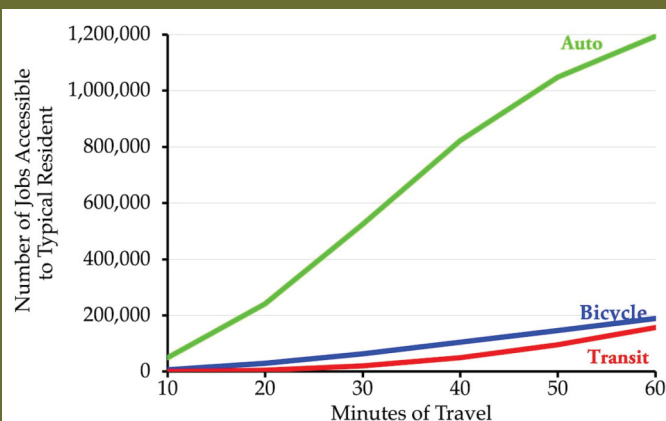


Source: National Transit Database Complete Monthly Ridership.

minute transit trip.

TriMet transit is so slow that people can reach five times as many jobs in a 20-minute bicycle trip as in a 20-minute transit trip and more jobs on a bicycle trip of any length of time (up to 60 minutes, the longest time period studied) than a transit trip of the same amount of time.<sup>93</sup> One reason for transit's lack of access to the region's jobs is TriMet's focus on Big-Box Transit to a few destinations rather than a small-box transit model that could serve more people.

Figure 4: Job Accessibility in the Portland Urban Area



Portlanders can reach far more jobs by auto and more jobs on a bicycle than by transit. Source: University of Minnesota Accessibility Observatory.

In addition to providing access to far more jobs, autos cost less, per passenger-mile, than transit. In 2019, TriMet collected 27 cents per passenger-mile in fares. Americans spent \$1.225 trillion buying, operating, repairing, maintaining, and insuring automobiles in 2019.<sup>94</sup> They traveled 4.9 trillion passenger-miles by automobiles, for an average cost of 25 cents per passenger-mile.<sup>95</sup> This 25 cents is just the average, and people can spend less by buying used cars or new cars that cost less than average, paying cash or

otherwise minimizing finance charges, driving cars that get more than the average miles per gallon, and/or carrying more than the average of 1.67 people per car.

Urban transit thus has significant disadvantages when compared with automobiles, which is why auto ownership continues to rise. The world is not going back to 1910 no matter how much TriMet wishes it would. Rather than trying to rebuild Portland like it was in the early 20th century to serve transit, TriMet needs to reinvent transit to serve Portland in the 21st century.

## DESIGNING A 21st-CENTURY TRANSIT SYSTEM FOR PORTLAND

To compete with automobiles, transit needs to cost-effectively move people from any point A to any point B as rapidly as possible. This means it needs to be less oriented around downtown Portland and more oriented to Portland's other major job centers. It also means that buses make more sense than rails because they can move more people per hour to more destinations for far less money. This paper will compare several possible alternatives to TriMet's current business model to see which one might work best.

1. The current direction including adding light rail to southwest Portland and Vancouver, Washington plus several bus rapid transit routes.
2. A polycentric bus system to replace the current downtown-centric bus routes.
3. An on-demand, microtransit system to replace most fixed-route, using minivans in low-transit-use areas and larger vehicles in high-transit-use areas.
4. Vouchers to target subsidies to low-income riders and give TriMet better information about changing transportation patterns.

The WES line and most of TriMet's light-rail lines were built with the assistance of federal funding. If TriMet were to terminate those services, the federal government would demand at least a partial refund of its support until the rail lines were fully depreciated. While this is worth considering for WES, most of the alternatives considered here assume that the rail lines keep operating until fully depreciated. The bus routes, however, are open to significant changes.

### 1. THE CURRENT DIRECTION

Even though light rail has not significantly boosted Portland transit ridership and may even have reduced

transit's share of commuting, TriMet and Metro want to spend more than \$3 billion building another light-rail line to southwest Portland as well as more than a billion dollars building light rail across the Columbia River bridge into Vancouver.<sup>96</sup> TriMet also wants to build infrastructure-heavy bus rapid transit projects.

Plans to build a light-rail line across the Columbia River are particularly short-sighted because a bridge with grades gentle enough for light-rail trains will not be high enough to allow passage of Columbia River ship traffic, which means transportation agencies have a choice of buying off all potential shippers or installing a lift on the bridge, creating delays for highway traffic.<sup>97</sup> Since getting rid of the lifts on the current bridges is one of the justifications for replacing them, this is an undesirable option.

TriMet also wants to supplement light rail with bus-rapid transit lines. At its most basic, which means frequent running of buses that stop only about once per mile instead of five or six times a mile, bus-rapid transit can be an efficient way of increasing speeds and ridership without significantly increasing costs. But TriMet spent \$175 million on the new FX bus rapid transit line on Southeast Division Street, yet it's not clear that it significantly increased speeds.<sup>98</sup> Since the new line replaced the previous conventional bus route, many bus stops were eliminated, forcing many riders to walk several blocks to get to a stop, offsetting the time savings from making fewer stops.

Bus rapid transit can move a lot of people more efficiently than rail transit. But it doesn't have to cost \$175 million, and it doesn't have to replace local service. It also seems unlikely that the larger buses purchased by TriMet for this route will ever get filled up, meaning the extra cost of those buses has been wasted. Once again, it appears that TriMet was more interested in spending dollars on Big-Box Transit than in actually improving transit service.

The problem with TriMet's current plan is that it focuses on heavy investments in new infrastructure. Such new infrastructure is inflexible and cannot respond to changes in transportation patterns. The benefits of that new infrastructure are questionable, and the costs are high.

Compare this with the intercity bus industry, which once relied heavily on bus stations with ticket offices and baggage and parcel facilities. That industry, like the transit industry, had been in decline for decades. In the mid-2000s, however, a company called Megabus reinvented the industry by shedding its reliance on private infrastructure. Instead of ticket offices, the company sold tickets over the internet. Instead of bus stations, the company parked its buses at curbsides in the cities it served. Instead of baggage facilities, baggage was loaded and unloaded at curbside by drivers and passengers. Ending the reliance on infrastructure allowed Megabus and companies that

imitated this model to reduce costs and offer trips at far lower prices than traditional bus companies such as Greyhound. TriMet needs to emulate this infrastructure-lite model.

## 2. POLYCENTRIC BUS ROUTES

Another Megabus innovation was that most of its buses operated in non-stop service. Instead of having a bus that went from, say, New York to Washington, stopping in Newark, Philadelphia, Wilmington, and Baltimore along the way, Megabus and its imitators offered non-stop buses between New York and Philadelphia, New York and Wilmington, New York and Baltimore, New York and Washington, and so forth. TriMet could follow this model by running non-stop buses between major economic centers in the Portland area, thus recognizing that downtown Portland is no longer the only major job center in the region.

Portland's major job centers include downtown Portland, with about 102,000 jobs before the pandemic, Vancouver (106,000 jobs in 2021), Hillsboro (83,000 jobs in 2021), Beaverton (64,000 in 2021), Tigard (37,000), Gresham (37,000 in 2021), Tualatin (30,000), Lake Oswego (22,000), Milwaukie/Oak Lodge/Gladstone (24,000), Wilsonville (19,000), Oregon City (16,000), and Fairview/Troutdale (12,000).<sup>99</sup> Getting job numbers for centers within the city of Portland is more difficult, but Gateway, Clackamas Town Center, and the north Lombard area may be the biggest job centers outside of the greater downtown area (including Lloyds).

The polycentric model would run non-stop buses from every transit center to every other transit center. To provide service to people who don't live or work next to a transit center, after arriving at each transit center the buses would spend the next 40 to 50 minutes on local routes radiating away from the transit center, which means they could travel an average of 5 miles beyond the transit center before returning. They would then operate non-stop back to another transit center and circulate in a neighborhood around that transit center.

In 2019, TriMet buses operated about 3,700 hours per weekday. I ranked the above list of centers for both job numbers and geographic distribution and used Google maps to estimate the miles and minutes of travel from each transit center to every other transit center, then added 48 minutes to each trip to account for neighborhood circulation. I assumed that buses would operate five times per hour during 6.5 rush hours, four times per hour during 6.5 off-peak hours, and three times per hour during 5 late night hours each weekday for an average of about 77 trips per weekday on each route.

Based on these frequencies, I calculated that non-stop service between nine geographically distributed economic centers—downtown Portland, Orenco, Beaverton,



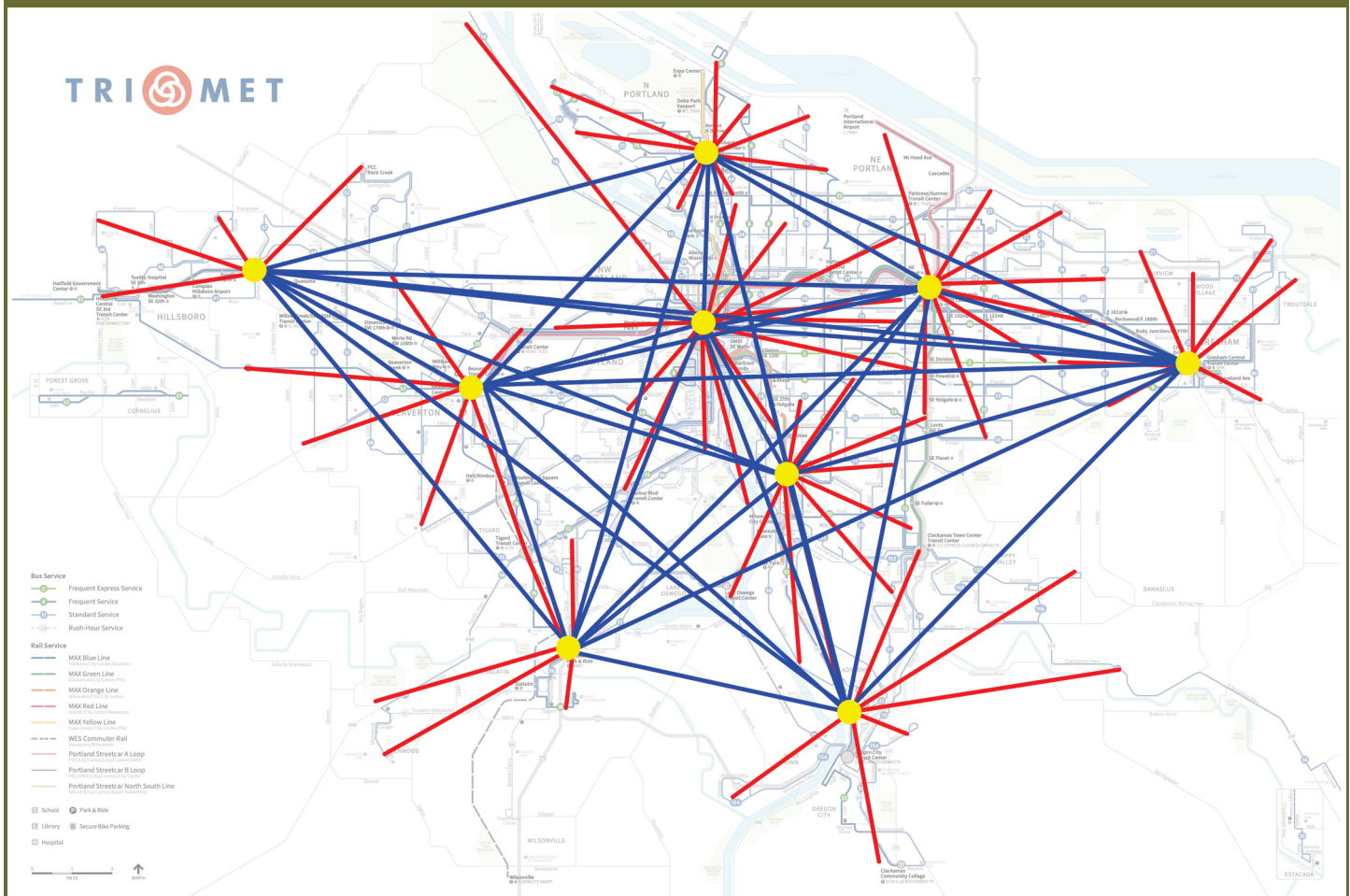
Tualatin, Lombard, Sellwood, Gateway, Gladstone, and Gresham—and an average of eight local bus routes radiating from each center would require about 3,400 hours of service per weekday and thus could be done without an increase in TriMet operating funds. When I picked these nine centers, I excluded Vancouver and Wilsonville because they are served by C-Tran and SMART transit, but these two agencies could easily piggyback on the plan.

The centers listed above provide good geographic coverage. While there may be arguments for choosing other centers, total costs would be roughly the same no matter which nine centers are selected. My goal was to determine how many centers could be served and stay within TriMet's current bus operating budget. Increasing the number of centers from nine to ten would add 25 percent more non-stop routes and increasing from nine to eleven would add 53 percent more non-stop routes, though the cost of doing so might be partially offset by the reduction in the average length of local radial routes because centers would, on average, be closer together.

On average, non-stop buses would travel at nearly 40 miles per hour, a significant increase from TriMet's current average of under 11 miles per hour. Presuming the buses continue to operate at around 11 miles per hour in local service, the system-wide average would be nearly 20 miles per hour. This is faster than TriMet's light-rail system, which averages under 15 miles per hour, and nearly as fast as WES, which averages 21.5 miles per hour.<sup>100</sup>

With nine transit centers, each center would see 40 non-stop arrivals and 40 non-stop departures per hour during rush hours. That also means 40 possible arrivals and departures of local buses per hour, thus providing comprehensive services of the areas that are tributary to each transit center. If each transit center serves eight neighborhood bus routes, for a total of 72 local routes, then the local routes would have just as frequent service as the non-stop routes. Some transit centers may have more and some fewer local bus routes, but the total number of hours of service would be about the same.

Figure 5: Polycentric Bus Routes



*Yellow dots indicate the economic centers; blue lines show non-stop routes between each pair of centers; and red lines indicate local routes radiating from each center. The lines don't follow the exact routes but merely indicate approximate end points. A few of the lines, such as Lombard-Gladstone and Sellwood-Gladstone, overlap.*

TriMet could use some of its existing transit centers, but transit centers should be located as close to a highway on- or off-ramp as possible so buses can spend minimal time in non-stop service. In keeping with the infrastructure-lite orientation of this model, transit centers should be little more than glorified bus stops, with a rain shelter and curbside room for three or four buses at one time. One bus stop can serve more than 40 buses per hour.<sup>101</sup> Given nine centers and rush-hour frequencies of five buses per hour, each center would need curb space for at least two buses, one for buses arriving from non-stop routes and one for buses arriving from local routes. A third and possibly a fourth space should be included for the times when buses happen to arrive together.

Many people could get one-seat rides by picking the right local bus from their neighborhood that would then proceed to a transit center, go non-stop to another transit center, and then serve a neighborhood near that transit center. Most trips would probably be two-seat rides and some would be three-seat rides. Just as people tolerate two- and three-seat rides resulting from the multiple hub-and-spoke systems used by major airlines because air travel is so fast, the time savings from buses traveling 40 miles per hour or more in non-stop service would reduce the objections to making transfers in a polycentric system.

WES effectively duplicates the Beaverton-Tualatin non-stop route in this proposal, though it does so at a much higher cost. TriMet's light-rail lines also parallel some of the routes in this plan, though the light-rail trains are slower than non-stop buses would be. In the long run, replacing rail with buses would free up enough operating funds to add two more transit centers with non-stop service to every other transit center. In the short run, using WES and Max in place of buses on a few of these routes might make it possible to add a tenth transit center.

The polycentric bus plan would provide faster, more frequent service to nearly all potential transit customers in the region and as such it is likely to attract far more riders than TriMet's current routes. The real question is not whether this plan is better than TriMet's current direction but whether the plan could generate enough riders to justify the proposed frequencies. In 2019, fares from TriMet bus riders covered almost 20 percent of bus operating costs, but in 2021 it was less than 8 percent. The service improvements should increase ridership but can't be guaranteed to increase it enough to return farebox recovery to 20 percent.

### 3. MICROTRANSIT

In fiscal year 2021, TriMet spent \$814 million but collected less than \$60 million in fares and other transportation revenues for less than an 8 percent recovery rate, down from 19 percent in 2019. In 2022, ridership grew by less than 25

percent, resulting in transportation revenues of \$78 million compared with expenses of \$817 million, meaning transport revenues still covered less than 10 percent of costs. Some of these "transportation revenues" included "grants and operating assistance from other local governments," so actual farebox recovery rates were even lower.<sup>102</sup>

TriMet's 2022 ridership was 55 percent of 2019's. In the first eight months of fiscal year 2023, TriMet ridership grew by 16 percent over the same eight months in FY 2022.<sup>103</sup> If ridership keeps growing at this rate, it could return to 2019 levels in 2027. However, the growth in ridership appears to be slowing as monthly ridership has been hovering around 4.5 million trips since March of 2022.

Given such low ridership, one alternative would be for TriMet to give up on most fixed-route transit and instead to offer an on-demand system like Uber Pool. TriMet already provides on-demand service for seniors and disabled passengers and a few transit agencies in the United States and Canada are using similar services for all their riders.

In September 2020, the city of Wilson, North Carolina completely replaced its fixed-route bus system with on-demand transit using minivans, sometimes called microtransit. As of mid-2022, the minivans were carrying more than two-and-one-times as many riders, for fares of \$1.50 per trip, as the buses carried before the pandemic.<sup>104</sup> As of 2021 the subsidy per ride was only slightly more than it had been in 2019, when the buses were running before the pandemic began.<sup>105</sup>

Wilson is a city of fewer than 50,000 people, and it only had five bus routes before replacing them with microtransit. Moreover, those buses had only been running for about five years before Wilson replaced them with microtransit. Many transit advocates argue that the problem with microtransit is that there are no economies of scale for carrying more people: While the marginal cost of adding one more rider to a half-full bus is nearly zero, the marginal cost of adding one more microtransit rider can be just as much as all previous riders.

For example, Innisfil, Ontario, another town of under 50,000 people, hired Uber to take care of its transit needs in 2017. The system proved to be popular but the subsidies the city had to give to Uber grew so large that it increased fares by \$1 and also began to ration the number of subsidized rides residents could take to 30 a month.<sup>106</sup> As Portland transit consultant Jarrett Walker says, an Uber-like service "works best when not very many people are using it, because when people start using it in any numbers, it devours the entire budget."<sup>107</sup>

The argument about microtransit's lack of scalability would be more persuasive if TriMet were doing anything to take



advantage of the scalability of the transit services it provides. Instead, it has replaced and wants to replace popular bus routes with high-cost, low-capacity light-rail lines whose scalability, due to its low capacity, is nil.

In 2019, the average TriMet bus had 39 seats but carried an average of just 9 passengers (that is, it carried 9 passenger-miles for every vehicle-mile in revenue service). Yet, TriMet spent \$935,000 per bus, about twice as much as that of an ordinary bus, so it could have buses whose capacities were about 50 percent greater than that of a regular bus on its FX-2 bus rapid transit line. That is extra capacity that will probably never be needed, and it is a further demonstration of TriMet's disinterest in the scalability of transit.<sup>108</sup>

Microtransit can be scalable if it is done right. It appears that Innisfil and Wilson are using their microtransit systems the same as an UberX ride rather than Uber Pool rides, in which drivers give each rider a less-than-direct ride to carry as many as four riders at a time. A shared system could use minivans in low-demand areas and larger vehicles in high-demand areas, thus creating the same opportunities for economies of scale as fixed-route transit systems.

Trips on such a microtransit system would be far faster than trips on fixed-route transit as the typical trip would only make a few intervening stops to pick up or drop off other riders. If fares were the same as current bus fares, which averaged about a dollar in both 2019 and 2021, the system would probably attract far more riders than TriMet buses.

Given TriMet's current operating budget, however, it will not be able to provide microtransit services at fares of just \$1 per trip. TriMet spends well over \$300 million a year on operating subsidies for non-rail transit.<sup>109</sup> If those subsidies were spread out to 60 million riders—roughly the number carried per year before the pandemic—they would average about \$5 per trip. If spread out among 32 million riders, the number of bus riders carried in 2022, they would average nearly \$10 per trip.

A typical TriMet bus ride is about 4 miles long, and a four-mile Uber Share ride typically costs about \$12 to \$13.<sup>110</sup> If an Uber-like microtransit system replaced buses carrying 32 million riders, the fare to the riders would be \$2 to \$3. If a microtransit system replaced buses carrying 62 million riders, the fare to the riders would be \$7 to \$8. If it attracted even more riders, the rider fares would have to be even higher, which is why Jarrett Walker thinks microtransit won't work in a large city or urban area.

If transit ridership remains low, it might not be possible to justify continuing to spend \$300 million a year subsidizing TriMet's current bus system. Still, on-demand transit might be the best way to provide transit in low-density parts of the Portland area. TriMet should experiment with microtransit as feeders to light rail or major bus routes in low-density

portions of the region it serves.

## 4. VOUCHERS

One of the main problems with urban transit today is that transit agencies get the vast majority of their funds from taxpayers rather than from transportation users. This makes the agencies more responsive to politicians than to transit riders. TriMet maintains an early 20th century business model in the 21st century because politicians continue to give it money even though it no longer provides good service to 90 percent of people in the Portland area.

The simple solution to this is to fund transit exclusively out of fares and related transportation revenues, with no taxpayer subsidies. Transit advocates resist this idea because transit is supposedly vital for low-income people who might not be able to afford market-based fares.

Before the pandemic, however, TriMet was not primarily serving low-income people. As previously noted, in 2019 more Portland-area workers who earned \$50,000 or more took transit to work than those who earned under \$25,000. This was the result of specific TriMet policies aimed at attracting (at heavy subsidies) higher-income riders. Research has shown that rail transit riders tend to have significantly higher incomes than bus transit riders.<sup>111</sup>

Since the pandemic, however, most of the high-income workers who were commuting by transit are now working at home. Census data show that the number of Portland-area telecommuters whose incomes were more than \$50,000 a year more than tripled between 2019 and 2021, while those whose incomes were under \$25,000 a year less than doubled. This had the effect of reducing transit commuting in the over \$50,000 income class by 81 percent, while transit commuting in the under \$25,000 group fell by only 56 percent. This left two-and-one-half times as many transit commuters in the under \$25,000 class as in the over \$50,000 class in 2021.<sup>112</sup>

One way to make TriMet more responsive to changes in transportation patterns while assisting low-income people is to target subsidies to those low-income people. The city of Portland has a “transportation wallet” program that gives selected groups of people transportation vouchers that they can use on various forms of transportation. The beneficiaries of the program include low-income people, people moving into certain new multifamily buildings, and people living in Northwest and Central Eastside parking districts, where parking is limited and open to residents by permit only. Residents who meet these qualifications have a choice of vouchers that they can add to their “wallets.” These vouchers can be used to pay for rides on Portland's streetcars or TriMet in general, bike sharing in the city's Biketown program, renting Bird, Lime, or Spin scooters, or trips on Uber, Lyft, or taxis.<sup>113</sup>

One of Portland's goals is to reduce traffic in the city center, which is why some of its vouchers are aimed at residents of neighborhoods or multifamily housing projects that have limited parking. TriMet's goal would be to better serve the entire urban area, so its voucher program would work a little differently.

One way would be to give free transit passes to anyone below a certain income threshold. Since this would cost TriMet transit fares of about a dollar per ride, fares would have to be increased for people whose incomes were above that threshold to make up the difference.

Another way would be to increase nominal fares to the full cost of service and give every potential rider a discount pass whose value would depend on the recipient's income. The discounts for low-income people might reduce their fares to less than current fares, while discounts for high-income people would only cover, perhaps, half the cost. Discounts for medium-income people might cover enough of the cost so that the resulting fare would be about the same as it is today.

The result would be a more equitable system as most of the subsidies would be targeted to low-income riders. But, more importantly, the use of the passes would give TriMet valuable information about the best way to improve its service, including which routes are most valued by users and how well users respond to different kinds of service such as express buses, bus-rapid transit, and microtransit.

The main drawback of this system is that it would still take time for TriMet to revise its business model, time that TriMet may not have if it can't significantly increase ridership at least to pre-pandemic levels. The voucher system would promote incremental improvements in TriMet's structure, but it is difficult to imagine a scenario by vouchers would lead to an entirely different business model such as the polycentric or microtransit models.

## **RECOMMENDATIONS**

This paper has not addressed the question of why TriMet, or any transit agency, deserves hundreds of millions of dollars in annual operating subsidies. While this question deserves to be debated, the main point of this paper is that those operating subsidies have enabled TriMet to maintain an obsolete business model that poorly served the 90 percent of Portland-area workers who didn't work downtown before 2020. The billions of dollars in capital spending on a downtown-centric light-rail system have only made this problem worse, while the tens of millions spent on the WES commuter-rail line and the purchase of giant buses for a bus-rapid transit line that will probably never fill those buses further demonstrate that TriMet is irrationally wedded to a Big-Box Transit model no matter what the cost.

Instead of questioning transit, this paper focuses on how transit can remain relevant in a Portland whose downtown is a shadow of its former self, where two-thirds of former transit commuters are now working at home, and where TriMet plans to spend billions of dollars on new light-rail lines to southwest Portland and across the Columbia River make even less sense than they did before. Based on the information presented in this report, the following recommendations appear reasonable.

1. Metro, TriMet, and the city of Portland should immediately cease all planning for infrastructure-heavy transit projects, whether light rail, streetcar, or bus-rapid transit. Bus-rapid transit may make sense in a few corridors, but it can be done without spending a lot on fancy stations or other infrastructure.
2. TriMet should make every effort to reduce unfunded pension and health care obligations to zero, and make sure they will remain zero even if there are major changes in interest rates, inflation, transit ridership, or transit employment.
3. TriMet should immediately terminate the WES commuter-rail line, even if it means repaying a depreciated share of the federal government's costs back to the feds.
4. TriMet should operate its light-rail lines until they are fully depreciated and then replace them with buses.
5. TriMet should change its current, downtown-centric bus system into a polycentric system with nine or ten transit centers that includes non-stop bus service between every center and every other center. The increased speeds provided by such a system, combined with its improved service to numerous job centers, may be critical to restoring transit ridership without increasing TriMet's operating costs.
6. TriMet should test a microtransit system instead of scheduled bus service as feeders into one or more of its light-rail lines or major bus routes in low-density portions of the region. If TriMet adopts a polycentric bus model, it could experiment with microtransit near one or more of the polycentric transit centers. Microtransit probably cannot replace TriMet's entire system, but it might make sense in certain communities such as, perhaps, Oregon City or Tualatin.
7. Metro, TriMet, Portland, and/or other cities in the region should test a discount voucher program for low-income riders on a small scale—more than is provided by Portland's wallet program but less than would be provided by rededicating all TriMet's operating subsidies to vouchers. The tests would determine if such discount vouchers truly helped low-income people and whether the use of such vouchers would give TriMet better information

about changing transportation patterns.

8. Metro, TriMet, Portland, and other cities in the region should stop subsidizing transit-oriented developments, which have done little to boost transit ridership and, due to their high construction costs, make little contribution to improving housing affordability.

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1. Compare TriMet's system map at <https://trimet.org/maps/pdf/trimetsystem.pdf> with a 1915 streetcar map at TransitMap.net, <https://transitmap.net/maps/portland-1915-fullscreen.html#2/-96.0/128.0>.

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