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The New Sellwood Bridge: Promises Unfulfilled

by John A. Charles, Jr.

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Executive Summary

Portland has an international reputation for successfully integrating land-use and transportation planning. The primary goals of such planning are to limit the physical size of the city and reduce the daily use of private motor vehicles by encouraging alternative modes of travel.

Many transportation policies have been developed in support of these goals. One of the most visible has been the policy of slowing vehicle speeds through "traffic calming" and "road diets." Advocates claim that reducing road capacity for motor vehicles has only minor effects on travel time. They also assert that future demand for road space can be mitigated through mode-shifting from single-occupant driving to walking, biking and transit.

In the late 1990s the Sellwood Bridge and its eastside connector, Tacoma Street, provided a perfect opportunity to test both the concept of integrated planning as well as the strategy of implementing a road diet. The original Sellwood Bridge opened in 1925, and over the next 60 years it became the most heavily traveled two-lane bridge in the state. By the mid-1980s the Bridge was badly in need of either major remediation or replacement.

Multnomah County, which owned and operated it, imposed vehicle weight limits in 1985 and again in 2004. After the second reduction, all heavy vehicles (including transit buses) were prohibited.

With traffic levels continuing to rise, it was clear that Multnomah County needed to either build a wider replacement bridge or a two-lane replacement plus another bridge nearby to the south. Local planners, however, believed the Portland region to be overly reliant on the private automobile and decided to place a moratorium on any new Willamette River bridge capacity. They assumed that if the region simply stopped building bridges, they could persuade people to switch from driving to some other mode.

Soon thereafter, the City of Portland undertook a study of Tacoma Street in the Sellwood-Moreland neighborhood, with the goal of making it more pedestrian-friendly. The result of that process was a recommendation to downsize Tacoma from a four-lane collector to a two-lane "Main Street," even though Tacoma was already a two-lane road except for four hours each weekday – 7-9 a.m. and 4-6 p.m. – when street parking was disallowed so that traffic flowing to and from the bridge could move faster.

Tacoma Street was put on a "road diet" in 2002, in which two travel lanes in each direction became one travel lane each way along with a center turn lane. These changes meant the Sellwood Bridge replacement would also inevitably be limited to two traffic lanes. While the new bridge was designed to be more than twice as wide as the original, more than half the through-lane capacity was allocated to non-motorized uses. The County made this decision even though 98% of all peak-hour passenger-trips on the old bridge had taken place in motorized vehicles.

The new Sellwood Bridge opened for travel in February 2016. The north side cycling/walking facilities were open, but the south side bikeway and shared-use sidewalk did not open until 2017.

Now that the bridge has been fully operational for more than two years, it's possible to measure actual travel patterns and compare them with the forecasted results. It turns out that the transportation planners were wrong in their prediction of how future travel needs would be met.

Traffic congestion is worse than before. Cycling and walking levels have not gone up as predicted, and transit service is far below the levels promised in the planning documents. Moreover, peak-hour vehicle throughput on the bridge has been permanently reduced due to new traffic signals at either end of the bridge and lowered speed limits.

Since bridge "supply" was reduced but motorized travel "demand" went up with population growth, motorists have increasingly resorted to cutting through side streets north and south of Tacoma in order to gain access to the bridge. In fact, the Tacoma Street downsizing made this practice easier by creating a middle turn lane that creates shelter for motorists trying to enter the traffic queue from side streets. This has degraded the quality of life for nearby residents.

Although the new Sellwood Bridge was marketed as a cutting-edge example of the Portland commitment to "multi-modalism," the bridge itself is not even a multi-modal facility. Heavy trucks are prohibited, and there is no bus service most of the time. Average daily travel is actually more reliant on the private automobile than it was in 1993.

This paper examines the rationale for putting the Sellwood Bridge/Tacoma Street corridor on a road diet and compares actual travel data with pre-construction forecasts. It offers a cautionary note for city leaders who are planning for growth by shrinking important arterials such as Naito Parkway, Foster Road, and NE Broadway.

Introduction

In May 1882, a real estate company purchased 321 acres from Rev. John Sellwood about five miles south of Portland on the east bank of the Willamette River. The town of Sellwood was incorporated in 1883. A decade later the Sellwood Streetcar was completed, connecting Sellwood with downtown Portland.

In 1905 the John F. Caples ferry boat began servicing Sellwood, with 56 trips daily between SW Portland and Umatilla Street, one block south of present-day Tacoma Street.

After Henry Ford began mass producing automobiles, Portland needed to modernize its road system. This dramatically affected the Sellwood neighborhood when the Sellwood Bridge opened in December 1925. The Sellwood was one of four Willamette River bridges approved for funding by Portland-area residents during the 1920s, a Portland bridge-building spree never matched before or since. Three of the bridges were new – the Ross Island, Sellwood, and St. John's bridges – and the fourth was a replacement for the Burnside.

The Sellwood had the smallest budget and was the only bridge built with just two travel lanes. According to historian E. Kimbark MacColl, the bridge designers were advised to build a wider structure, but did not due to budget constraints. The bridge was built in less than one year at a cost of $541,000.

The Sellwood Bridge had two innovative features. First, it was built primarily for motorized vehicles. All prior Willamette River bridges had included streetcar tracks; the Sellwood did not.

Second, it was the first Portland bridge built as a fixed span crossing. The bridge had enough river clearance that it did not need to raise the middle section to accommodate large ships.

The Sellwood was 32 feet wide, with enough right-of-way for two 12-foot automotive travel lanes and a 4'3" sidewalk on the north side. The bridge is located in Multnomah County but is only one mile from the Clackamas County border. Over time it became a key link connecting HW 43 on the west side with HW 99E on the east side; the nearest bridge to the south was (and still is) 10 miles away in Oregon City. Each weekday morning, twice as many vehicles cross the bridge westbound as eastbound, because many Clackamas County residents commute to Multnomah or Washington counties.

By 1965 the bridge was carrying 50% more daily traffic than it was designed for. To better accommodate vehicles coming off the bridge onto Tacoma Street on the east side, Tacoma was widened in 1968 from 36 feet to 44 feet, curb to curb. After the widening, parking on both sides was prohibited during the peak driving periods of 7-9 a.m. and 4-6 p.m. on weekdays, which provided four travel lanes. This was especially helpful during the afternoon peak when vehicles driving eastbound on the two-lane Bridge at 40 MPH or more transitioned to the four-lane configuration on Tacoma Street at lower speeds.

The original Sellwood Bridge, looking east to west.

1968 was the last year that transportation officials would make an effort to accommodate motorists in the Sellwood Bridge corridor. The first Earth Day was held in April 1970, launching a new era of citizen activism around environmental quality and urban design. Controlling the negative impacts of auto use became a primary concern in Portland and elsewhere.

Many local policies were enacted to improve air quality and expand the use of public transit. The regional transit agency known as TriMet was created in 1969. A Portland vehicle inspection and maintenance program was created to reduce auto emissions. Portland imposed a cap on the number of downtown parking spaces, known as the "parking lid."

The Mt. Hood Freeway was canceled in 1974, and federal funds that had been previously appropriated for that highway were allowed to be transferred to many other regional transportation projects, including the first MAX line.

Another proposed highway – the Westside By-pass in Washington County - was canceled 15 years later. Some of the By-pass opponents, hoping to prevent future highway building, persuaded the Oregon Land Conservation and Development Commission (LCDC) to adopt a regulation known as the Transportation Planning Rule (TPR) in 1991. The TPR implements LCDC Goal 12, which seeks to "avoid principal reliance on any one mode of transportation."

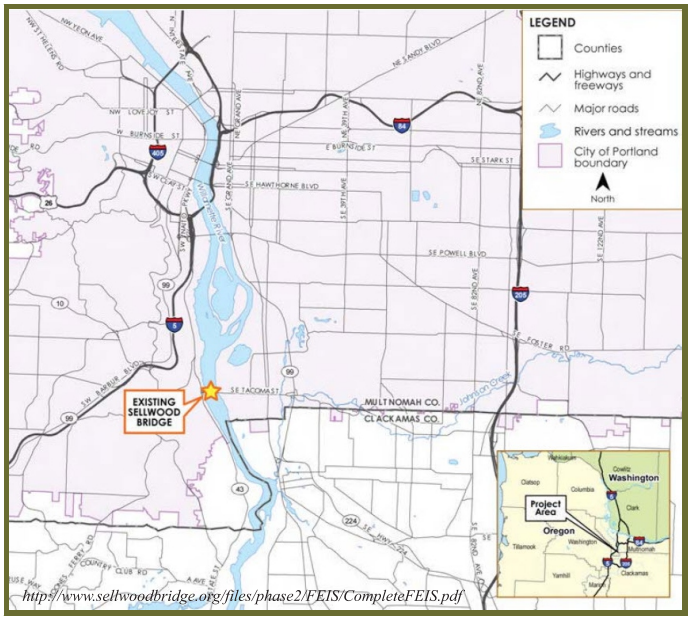
The TPR required Metropolitan Planning Organizations (which service the eight largest urban areas in the state) to reduce per-capita vehicle-miles-traveled (VMT) by 10% over 20 years, and 20% within 30 years after Transportation System Plans were adopted. It also required that the per-capita supply of parking be reduced by 10% over 30 years.

Because these mandates were arbitrary, difficult to measure, and largely unenforceable, they were amended multiple times in subsequent decades to address the failure of jurisdictions to reach the targets. Nonetheless, upon adoption the TPR became a regulatory hammer that required urban jurisdictions to reduce automobile reliance. One way to do that – in the minds of many planners – was to stop providing new highways or bridges, regardless of population growth.

In December 1995 Metro brought these and related land-use policies under one umbrella by adopting the 2040 Concept Plan, the official growth management strategy for the Portland region. The primary goal of the 2040 Plan was to constrain the physical size of the Portland metropolitan region, thereby gradually increasing population density. This was seen as an important way to encourage people to travel by transit, bicycle, or foot.

By the mid-1980s the Sellwood Bridge was servicing 31,000 vehicles/day, making it the busiest two-lane bridge in Oregon. Unfortunately, a slow-moving landslide on the west side was weakening the structural integrity of the bridge. In response, Multnomah County restricted the weight of vehicles to 32 tons in 1985.

The weight limit was dropped to 10 tons in June 2004, forcing most trucks to re-route to the Ross Island Bridge. This eliminated 1,400 vehicle trips/day, including two TriMet bus lines that had previously provided 94 daily weekday transit trips (a loaded bus weighs about 19 tons).



Project vicinity

Recognizing that the service life of the Sellwood Bridge was almost over and that the bridge was not designed to withstand earthquake force, Metro began studying how to best accommodate traffic demand for Willamette River bridge crossings in the southern part of the city. The first phase was known as the Southeast Corridor Study, which lasted from 1989 to 1994. In true bureaucratic fashion, the primary conclusion was that additional study was necessary.

In 1994 Metro launched the South Willamette River Crossing Study (SWRCS). The purpose of the SWRCS was to identify needed capacity improvements for motor vehicles, transit, bicycles, and pedestrians across the Willamette River between the Marquam Bridge in Portland and the Abernathy (I-205) bridge in Oregon City.

Traffic modeling done for the study estimated that by 2015 there would be 900,000 daily bridge crossings, 79% of which would take place in single occupant vehicles (SOV). As a result, Metro predicted that by 2015, all Willamette River bridges in the corridor would have ***"unacceptable or grossly unacceptable"*** levels of traffic at peak hours.

This implied that new bridge capacity was necessary somewhere – either with a four-lane replacement for the Sellwood, or by adding additional bridges. 17 such options were considered, including new bridges at the following locations:

- South of the Marquam Bridge at Caruthers Street on the east side
- Between Milwaukie and Riverwood
- Between Oak Grove and South Lake Oswego
- Between HW 43 and the Waverly Country Club, then via a tunnel to HW 224 in Milwaukie
- Between Avenue A in Lake Oswego and River Road in Oak Grove

Another proposed alternative, which did not involve an actual river crossing, was referred to as "Option G." This concept focused on reducing travel demand, rather than increasing road supply. Option G included the following elements:

- Increased transit service;
- More light rail;
- Development of commuter rail service;
- Strong implementation of the newly-enacted Commute Trip Reduction law, which requires Portland-area employers with more than 100 employees to provide incentives for employee use of non-SOV commuting such as transit or car-pooling; and
- "Other [unspecified] programs to reduce vehicular travel demands."

Option G was treated by planners as something that was functionally equivalent to a new bridge.

After two years of public hearings and various layers of bureaucratic approval, Metro published a final report in 1999. Despite the predicted gridlock, Metro recommended ***no new bridge capacity*** in the South Corridor for at least the next 20 years. Instead, Option G became the main focus of future transportation policy. The explicit goal would be to shift people from SOVs to other modes of travel. If motorists refused to cooperate, the result would be "grossly unacceptable levels of congestion" - except that now it was considered acceptable.

The decision to provide no new bridge capacity was formally included in Metro's Regional Transportation Plan in 2004. There was, however, an exception. The moratorium applied only to new bridge capacity for ***private motor vehicle travel***. The restriction did not apply to light rail. TriMet's "South-North Light Rail Project," which would have run from Oregon City to Vancouver, WA, always anticipated a new bridge. In 1995 regional planners decided that it would probably be built at Caruthers Street.[1]

In 2008 the Metro Council formally approved a "Locally Preferred Alternative" for what had become the Portland-Milwaukie Light Rail line, a downsized version of the South/North project. That line included a new Willamette River bridge, which opened in 2015 as the Tilikum Crossing. The rail bridge connects the South Waterfront district to Caruthers Street on the east side. The Tilikum serves light rail, transit buses, and the Portland streetcar, along with cyclists and pedestrians who share two, 14-foot wide sidewalks.

Privately-owned cars and trucks are ***excluded***, with the exception of emergency service vehicles.

Putting Tacoma Street on a Road Diet

Soon after the South Willamette River Crossing study was published, the City of Portland launched a separate process to look at changes to Tacoma Street, which connects to the Sellwood Bridge on the east side. The primary objective of the study was to develop and implement a vision of a more multi-modal, neighborhood-oriented "main street" to serve the needs of local residents and merchants rather than commuters just passing through.

At the time, Tacoma Street was considered a "District Collector" by the Portland Office of Transportation and had a 35 MPH speed limit. It had the highest daily traffic volume of any District Collector in Portland, with 31,000 average daily trips. The next closest was North Lombard Street, with 26,200. The busy Hawthorne Boulevard was a distant third at 23,300.

There were 3 capacity constraints on Tacoma Street: two signalized intersections at Southeast 17th and 13th; and the Sellwood Bridge. Traffic volumes were distinctly different traveling east to west on Tacoma. From HW 99E to Southeast 17th, vehicles per day averaged 14,000. From 17th to 13th, the average was 22,000. Between Southeast 13th and the bridge itself, traffic averaged 31,000 vehicles per day.

Many local residents resented the fact that so many commuters used the Sellwood Bridge. Some of them referred to Tacoma Street as the "Berlin Wall" or a "freeway for Clackamas County." They knew that most commuters had no other feasible option for crossing the river, but they didn't care. They just wanted the volume of pass-through vehicles reduced.

The process of considering alternative management regimes eventually culminated in a document called the "Tacoma Main Street Plan" (TMSP), which was published in October 2001. The draft Plan recommended ***reversing*** the street widening of 1968. This would mean reducing the number of through lanes on Tacoma from four to two at all

hours and widening the 8-foot-wide sidewalks to 12 feet (the original width) as redevelopment occurred. Between the bridge and SE 11th Avenue there would be a center turn lane, interspersed with some tree islands near 7th, 8th, and 9th Avenues to facilitate pedestrian crossings.

At that time the idea of reducing travel lane capacity was just emerging as a tool for urban planners to make streets more inviting for alternative modes. An influential paper published in 1999 used the term "road diets"[2], and this became something of a battle cry for Portland activists. As used in the paper, the term generally referred to the conversion of four-lane arterials to three-lane configurations. It was asserted by proponents that road diets would result in lower speeds, fewer crashes, and increased road use by alternative modes, without increasing traffic congestion.

However, there was an important caveat: Road diets were recommended only on low-volume roads. According to the authors, the "ideal roadway patient" for a potential diet was a four-lane road carrying between 12,000-18,000 average daily trips (ADT). A 1980s pilot project in Pennsylvania, funded by FHWA, had successfully reduced a four-lane arterial to three lanes for a one-mile stretch on a road carrying 13,000 ADT.

Such roads had excess capacity to begin with; Tacoma Street did not. The western segment of Tacoma was servicing 31,000 ADT, and it was not even a four-lane road. It only had two travel lanes for 20 hours each day.

Traffic consultants estimated that Tacoma Street would fail to meet peak period traffic demands adequately by 2015 even if left alone. Approximately 10 to 15 percent of demand, or 250 to 300 vehicles per hour in the peak direction, would have to divert to other bridge crossings. All of the road diet options would make this problem worse. Downsizing Tacoma Street to two travel lanes would increase the number of unserved vehicles to the range of 600-800 vehicles per hour at the peak. This was described as "very seriously congested conditions."[3]

One of the supposed benefits of the road diet for Tacoma was the provision of all-day parking along the street. However, a block-by-block parking survey conducted by PDOT showed that parking supply was already plentiful along Tacoma and only about 50% of the spaces were being used throughout an average day. The peak demand occurred between 12:30 p.m. and 2:00 p.m., when Tacoma was operating with just one travel lane in each direction.

In fact, the proposed road diet was not going to enhance parking: It was going to ***reduce the amount of parking*** because it would require adding turn lanes at the two signalized intersections. According to the traffic consultant,

> "...in order to make the lane reduction alternatives work from a capacity standpoint, the performance of the two signalized intersections need to be optimized. This comes at the expense of parking because this optimization is achieved through changing off-peak period parking into additional travel or turn lane capacity. Thus, not only is parking lost along the north and south legs of 13th Avenue (for a total loss of 19 spaces), but for varying amounts along the east and west legs of Tacoma Street at the 13th Avenue intersection and the west leg of the 17th Avenue intersection."

Elsewhere in the report, it noted that, "The parking removal impact will be particularly hard-felt on 13th Avenue, which relies on on-street parking for customers and employees."[4]

In summary, the 1968 widening had resulted in less congestion for motorists and more parking during the off-peak period for all segments of Tacoma. The road diet options being considered would create "relatively large losses of parking in comparison."[5]

When Portland held two open houses to discuss the draft TMSP, approximately 75% of the participants indicated a preference for the travel lane reductions. They were encouraged to take this position by Portland planners, who wrote:

> "A basic assumption carried into the planning process from the South Willamette Bridge Crossing Study was that providing adequate regional traffic capacity in the travel shed that Tacoma Street and the Sellwood Bridge serves is not the responsibility of Tacoma Street."

The question of whose responsibility it was to provide "adequate regional traffic capacity" was never answered. The Portland City Council approved the Tacoma Main Street Plan in 2002, and the street was re-striped shortly thereafter.

Portland planners knew that they were creating a traffic nightmare. As they wrote in the TMSP:

> "Because the preferred alternative will not provide an adequate amount of traffic capacity to meet the peak period demand, some of the traffic volume is expected to spill over onto the adjacent local street system. Complete mitigation of the diverted traffic to the local street network through traffic calming techniques is not seen as feasible...."

Planners used the term "mitigation" quite a bit, but never

defined it with any precision. They spoke vaguely of "improvements to other existing regional routes" (McLoughlin Blvd, Hwy 224, Ross Island Bridge and I-205), and "regional transportation demand management and transit based strategies."[6] Unfortunately, none of these ideas could actually help make up for the loss of road capacity.

The Ross Island Bridge and I-205 serve different markets, as the TMSP acknowledged numerous times. Few improvements were ever made to McLoughlin Boulevard. Instead, regional officials voted six years later to spend $1.5 billion on a 7.4-mile light rail extension in the McLoughlin corridor, which simply eliminated existing (and superior[7]) bus transit.

Improvements to HW 224 were eventually made when a 2.5-mile extension of that expressway opened in 2016, just east of I-205. But all that did was make it easier for Clackamas County travelers to reach Tacoma Street, where the traffic jams were getting worse.

Virtually the entire mitigation strategy was going to be "transportation demand management" (TDM), which is the application of strategies and policies to reduce travel demand (specifically that of single-occupancy private vehicles), or to redistribute that demand in space or in time. This later morphed into a program referred to as "Regional Travel Options" (RTO).

According to Metro, RTO is the "regional 'brand name' for transportation demand management (TDM), which aims to change people's travel behavior through programs and outreach. The RTO program's charge is to reduce demand for driving alone and to promote travel options."[8]

Program administrators attempt to do this by working with large employers to reduce SOV commuting; running ad campaigns on such themes as "Drive Less, Save More;" producing and distributing glossy materials to help educate people about alternative travel options; and sponsoring "bike to work" challenges.

Although there was little evidence that any of these activities would significantly affect mode share, TDM was assumed to have real potential. Once the elected officials at Metro, Portland, and Multnomah County embraced TDM as a mitigation strategy, the congestion problem was largely ignored.

After the Tacoma Street road diet went into effect, it dictated the level of throughput on the Sellwood Bridge. A decade later, the Sellwood Bridge Environmental Impact Statement (EIS) confirmed this:

> "SE Tacoma Street is presently capacity-constrained. It serves one through traffic lane in each direction and its signalized intersections at SE 13th Avenue and SE 17th Avenue are performing at near-capacity or at over-capacity conditions during peak periods."
>
> "By 2035, the SE Tacoma Street corridor will continue to function at congested conditions for several hours each day, thereby limiting the traffic that can travel in either direction across the Sellwood Bridge. Adopted City of Portland and Metro transportation policies indicate no changes will be made to the number of through travel lanes on SE Tacoma Street, so none of the Build alternatives for this project would be able to increase vehicle-traffic-carrying capacity along SE Tacoma Street (emphasis added)."[9]

Eventually, Tacoma Street capacity was reduced even further with the addition of a new traffic light at 6th; three striped crosswalks between the Bridge and 13th; and a pedestrian-activated crossing beacon at 19th. The speed limit was also reduced from 35 MPH to 25 MPH.

The known congestion impacts of this plan were generally glossed over by the news media. For example, in a November 2001 story by *The Oregonian*, readers were told that the plan would "add more street parking" and that the revamped Tacoma Street would handle the same traffic levels in the future. These claims were false.

The president of the Sellwood Moreland Improvement League was quoted as saying, "The response to the traffic plan has been pretty positive." That view was hardly unanimous. The TMSP listed many written comments from local residents or business owners who were concerned about the Plan, but those voices were ignored. The local neighborhood newspaper, *The Bee*, was also a strong supporter, editorializing in September 2007, "Traffic flow on Tacoma actually improved, as *The Bee* predicted it would...."

Sellwood Bridge construction looking southeast, 1925
Image: Oregon Historical Society

Aerial of Sellwood Bridge, Spring 2012

Designing the New Sellwood Bridge

Although Multnomah County did consider the option of simply repairing and strengthening the original Sellwood Bridge to buy some time[10], which would have been much less expensive, ultimately that option was rejected in favor of a new bridge. Responsibility for drafting a mission statement for the bridge replacement was delegated to an inter-governmental Policy Advisory Group (PAG), which was comprised of the following individuals:

- Chair – Maria Rojo de Steffey, Multnomah County commission
- Co-Chair – Ted Wheeler, Multnomah County Commission
- Sam Adams, City of Portland
- Robert Liberty, Metro Council
- Lynn Peterson, Clackamas County Commission
- Jim Bernard, City of Milwaukie
- Fred Hansen, TriMet
- Kate Brown, Oregon State Senate
- Carolyn Tomei, Oregon House of Representatives
- Jason Tell, ODOT
- Phil Ditzler, FHWA

The PAG adopted a "project need" statement on November 9, 2006. It stated that the proposed bridge construction would serve the following needs:

1. Provide structural capacity to accommodate safely various vehicle types, including transit vehicles, trucks, and emergency vehicles; and to withstand moderate seismic events.

2. Provide a geometrically functional and safe roadway design.

3. Provide for existing and future travel demands between origins and destinations served by the Sellwood Bridge.

4. Provide for connectivity, reliability, and operations of existing and future public transit.

5. Provide for improved freight mobility to and across the bridge.

6. Provide for improved pedestrian and bicycle connectivity, mobility, and safety to and across the river in the corridor.

Adoption of this needs statement was followed by six years of study and debate about the location, design, and cost of a new bridge. On July 19, 2012 the Multnomah County Commission voted to replace the original Sellwood Bridge with one in the same location, with no increase in through-lane capacity – although it would have shoulders (doubling as bike lanes) that would allow for improved auto passage to get around disabled vehicles or accidents. The new bridge would be more than twice as wide as the original, but more than half of the through-capacity would be reserved for non-motorized vehicles. This was unprecedented for a Portland Willamette River bridge.

Planning assumptions about the replacement bridge

Members of the PAG wanted the new Sellwood Bridge to be a shining example of multi-modalism. Therefore the consultants writing the Environmental Impact Statement (EIS) assumed that: (1) robust levels of transit service would be restored; (2) the spacious new sidewalks and bike lanes would result in greater mode shares for walking and

New Sellwood Bridge view from the south, January 2016

cycling; and (3) trucks would be allowed back on the bridge. These assumptions are explored in greater depth below.

Transit

By the time the "Project Need" statement had been adopted, weight restrictions in 2004 had removed all TriMet service from the Bridge. However, the Tacoma Main Street Plan documented the high quality of transit service in the Sellwood neighborhood as of 2001. Tacoma Street was designated as a Major City Street, meaning that concentrated transit services were provided to "connect and reinforce major activity centers and residential areas."[11]

There were two transit lines crossing the Bridge prior to 2004. One was the #40, which had stops every two blocks on Tacoma Street and provided service between downtown Portland and the Milwaukie Transit Center. The other was the #65X, which provided express service between Marquam Hill and the Milwaukie Transit Center. The service requirements for the two lines is shown in Table 1.

Since the 40 line was a local route it had many stops along Tacoma Street. TriMet had detailed records of daily boardings and alightings for the two routes, which totaled 773 (Table 2).

The Sellwood Bridge EIS stated that the two bus routes would resume after the replacement Bridge opened. Accordingly, this would result in:

> "…a lower percentage of automobile trips along these routes. This change in traffic mix is based on the assumption that greater accessibility to transit routes would trigger a slight mode shift from automobiles to transit, particularly considering the future congestion levels expected along connecting roadways, as discussed previously."[12]

It was reasonable to assume that TriMet would restore service on the new bridge because the legislature had recently approved a new rate increase for the payroll tax that TriMet imposes on most regional employers. The payroll tax is TriMet's largest source of general fund revenue. During legislative hearings, TriMet promised that all new revenues would be used to provide new or enhanced service. George Passadore, President of the TriMet Board of Directors, told a Senate committee:

> "I would like to reiterate the Board's commitment to using any money created by the rate increase to pay for new and improvedservice. This commitment will allow us to focus on providing more and better service throughout the TriMet service district."[13]

The rate hike was implemented in January 2005 and raised a cumulative total of $122.6 million in new revenue through FY 2013.[14] Since construction on the Sellwood Bridge replacement was just getting underway, the Multnomah

Table 1: Transit Service on the Sellwood Bridge in 2001

Route	Peak headway	Midday headway	Service
40-Tacoma	20 minute	30 minute	Everyday
65X-Marq. Hill/MilwTC	30 minute	n/a	Weekday Peak

Table 2: Average daily on/off counts East-West transit routes, Sellwood District 2001

Bus stop/location	40-Tacoma	65X Marquam Hill/MTC
Tacoma/7th	93	n/a
Tacoma/9th	42	n/a
Tacoma/11th	68	n/a
Tacoma/13th	217	n/a
Tacoma/15th	73	n/a
Tacoma/17th	107	9
Tacoma/19th	36	n/a
Tacoma/21st	50	n/a
Tacoma/23rd	35	2
Nehalem/13th	n/a	41
TOTAL on/offs	**721**	**52**

County Board of Commissioners could be confident that the new bridge would have a rich level of TriMet transit service.

This assumption was also promoted in the media, helping to create the belief that transit could make up for the planned shortage of road capacity. For example, in August 2010, Sellwood architect Scott Thayer was quoted in the *Daily Journal of Commerce*, "From the standpoint of businesses in Sellwood and along (SW Macadam Avenue), we'll be happy to just have public transit back. On the west side, it'll hugely improve the flow of traffic. We won't have as many back-ups on Macadam every night at 5."

Bicycle and pedestrian use

As the EIS was being written, non-motorized use of the Sellwood Bridge was minimal. There were several reasons for this. One was the lack of any obvious destinations near the west end. Another was that the lone sidewalk was only 4'3" wide. Also, Sellwood Bridge users tended to have longer than average trip lengths, which were difficult to make by any mode other than a motor vehicle.

According to the EIS, about 90 walking trips and 440 bicycle trips were made across the Sellwood (530 total) on an average weekday in 2008. This constituted about 1.7% of all daily vehicle crossings, or 1.5% of all passenger-trips.

On a typical weekend day there were 210 pedestrian trips and nearly 600 bicycle trips, or 810 total non-auto trips.[15]

Although these were tiny numbers, transportation planners believed that there was substantial "latent demand" for non-motorized use of the new, wider replacement Bridge. In their words, latent demand meant that "some bicyclists and pedestrians would use the Sellwood Bridge but do not use it because the walking and bicycling environment is unsafe and uncomfortable."

First main river span deck pour, October 2015. Original Sellwood Bridge can be seen immediately to the north.

Based on this assumption, planners predicted that after the new Bridge was built, bicycling would account for 9% of all commute trips over the Bridge and walking would account for 6% by 2035.[16] In raw numbers, the EIS forecasted 1,590 pedestrian trips and 7,760 bike trips on an average weekday in 2035 (9,350 total); and 3,730 pedestrian trips and 10,620 bike trips (14,350 total) on a weekend.[17]

The Bicycle Transportation Alliance was strongly supportive of the new bridge design and was actively engaged in the planning process. In fact, at the same time the new bridge design was being negotiated, BTA released a "Blueprint for Better Biking: 40 Ways to Get There." Of the 40 desired projects, the Sellwood Bridge reconstruction was Number 1 on their list.

Heavy truck use

The original Sellwood Bridge was designed for heavy vehicles and was used by trucks for 79 years. The Bridge was important enough that it was designated as a Truck Access Street within the Portland Freight Master Plan in May 2006, even though trucks were re-routed to other bridges in 2004 due to the second round of weight limitations imposed by Multnomah County.

When Multnomah County approved the replacement bridge design, the Commissioners expected the new facility to restore freight access. This is evident from Finding #5 of the "Statement of Need" adopted by the County PAG. Throughout the EIS, in all the discussions of various bridge scenarios, a fundamental assumption was that the new Bridge would be open to heavy trucks.

Paying for the Bridge

Over the many years that the bridge design was debated, the budget was constantly revised, usually upwards. This was of great concern, especially to Multnomah County. Late in the process, at a July 2012 meeting of the project steering committee, county leaders proposed cutting roughly $2.3 million of cost by eliminating a multi-use path leading from the west end of the bridge down to the trail adjacent to HW 43. As part of this plan, the sidewalk on the south side of the bridge would be eliminated and non-motorized traffic would be routed to a barrier-protected bike lane and shared-used sidewalk on the north side.

According to the Bicycle Transportation Alliance, this concept was "[w]ildly different, but not wildly bad. The BTA believes this new design can work."[18] However, the group requested more time for stakeholders to consider the proposed change.

A week later when the proposal was discussed, committee members felt this was a last-minute change that they were not prepared to consider. Portland Mayor Sam Adams was

especially vocal in his criticisms. By the end of the meeting, it had died.

However, the budget concern was still very much alive. Multnomah County was not sure how the construction would be paid for. Aware of this concern, Cascade Policy Institute conducted traffic counts on the Bridge on a weekday July morning to better understand who was using it. Unlike previous estimates, our observations included every person traveling by every mode, including passengers in motor vehicles. The results would give us total "passenger trips," not just "vehicle trips."

The field counts showed that for the peak travel period of 7:00-8:30 a.m., 98% of passenger-trips (bi-directionally) took place in motor vehicles, and 2% were from cycling and walking. There were no transit trips due to weight limits on the bridge.

In September, Cascade published a short essay highlighting the fact that the proposed design was reserving 61% of the bridge right-of-way (at mid-span) for only 2% of the passenger-trips. It seemed apparent that the 12-foot sidewalks could be narrowed to six feet without the loss of any travel function, since bicycles had their own lanes on the road. A spokesperson for Multnomah County later confirmed that reducing the width of both sidewalks to 6' would have saved roughly $15-$17 million.

The Cascade essay was not intended to be an attack on non-motorized travelers, but it quickly became controversial. *The Oregonian's* Janie Har examined Cascade's assertions in her "PolitiFact" column. She wrote that "the bridge of today is apples to the oranges of the bridge of tomorrow," making the 98% automobile mode split "an inappropriate indicator of future use."

Ms. Har claimed that bike traffic on the Sellwood Bridge was so low because "the current bridge is outright hostile and dangerous to pedalers, walkers and runners, with one skinny sidewalk close to a bunch of cars. That's a significant detail missing from the [Cascade] statement."

She concluded her critique by stating since the bridge EIS predicted that cyclists and pedestrians would account for 19% of all average daily bridge traffic by 2035, the Cascade claim was only "Half True."

Since a travel forecast to 2035 is not, by definition, a "fact," this was an odd conclusion from a media fact-checker. It did, however, reveal how easy it is to manipulate public opinion through the use of computer-generated forecasts.

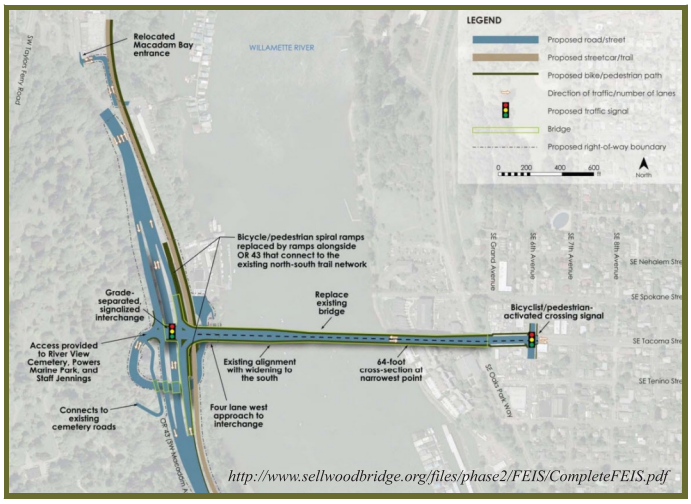
A short time later *Oregonian* writer Steve Duin dedicated an entire column to criticizing the concept of six-foot sidewalks, referring to it as "staged antagonism between cars and bicycles." He was not impressed with the possible cost savings of $17 million, calling the suggestion "nonsense" promoted by "zealots."[19]

With so many interest groups and media outlets cheerleading for huge sidewalks, Multnomah County was not successful in reducing the size of the bridge or its budget. The final bridge design included two 12-foot sidewalks, two 6.5' bike lanes, and two 12' travel lanes for motor vehicles. The stated budget on the day Multnomah County broke ground for the new bridge in late 2011 was $268 million. However, the budget published in the EIS was $330 million, apportioned to the following entities:

• Carry-over from project planning:	$11 million
• State of Oregon – HW 43 intersection	$30 million
• Agreement with Portland	$100 million
• Federal request	$40 million
• Mult. Co. Vehicle Registration Fee (VRF)	$127 million
• Clackamas County VRF	$22 million
TOTAL	**$330 million**

The actual construction costs turned out to be approximately $328 million. As of March 31, 2018, the tab was being paid by the following entities:[20]

• Multnomah County:	$22.7 million, vehicle surcharge of $19/year (collected)
• Multnomah County:	$152.3 million, vehicle surcharge still to be collected
• City of Portland:	$84.6 million
• State of Oregon:	$35.0 million, for HW 43 interchange
• Federal TIGER grant:	$17.7 million
• Federal government:	$15.7 million (previously secured)
TOTAL	**$328 million**



Preferred design

"TIGER" stands for Transportation Investments Generating Economic Recovery and is a grant program administered by the U.S. Department of Transportation. According to a DOT fact sheet, the new Sellwood Bridge was expected to "accommodate larger vehicles, improve freight and transit traffic flow, and travel times for drivers."

Although Clackamas County drivers are heavy users of the bridge, they did not contribute to the construction fund. A planned $5/year vehicle registration fee (VRF), approved by the Clackamas County Commission, was put on the ballet by VRF opponents and voted down in the May 2011 election by a 63%-37% margin. This outcome forced other jurisdictions to pick up more of the cost.

Tolling was considered as a finance mechanism, which would have made more sense since a toll is a user fee that directly links the cost of service to those who benefit. Many people and institutions supported that idea, including Multnomah County Commission Chair Ted Wheeler and Metro Planning Director Andy Cotugno. In fact, legislation was introduced in the 2009 session of the Oregon Legislature – SB 36 – authorizing the Multnomah County Commission to establish and collect tolls "for the use of any bridge across the Willamette River under its jurisdiction as a road authority." However, that idea was ahead of its time[21] and died.

Building the new bridge

The groundbreaking ceremony for the new bridge occurred at Sellwood Riverfront Park on the morning of December 16, 2011. The various political dignitaries all emphasized the multi-modal design of the bridge. Multnomah County Chair Jeff Cogen gushed that the new bridge will "Expand capacity for bikes, for pedestrians, for buses, and even for streetcars as well… We're proud that this project will significantly reduce our carbon footprint."

Local politicians were joined by U.S. Transportation Undersecretary Polly Trottenberg, who presented an oversized ceremonial check for $17 million from federal taxpayers to Multnomah County Commissioner Deborah Kafoury. According to Ms. Trottenberg,

> "The TIGER competition was fierce. USDOT received 848 applications requesting over $14 billion and we had only $511 million to award. We looked all over the country for the best projects, and I have to say, the application for the Sellwood Bridge project knocked it out of the park!"

There was no mention of reducing traffic congestion.

The replacement bridge that was approved was a three-span, Steel Deck Arch. It was 1,275 feet long and 64 feet wide at mid-span, wider at each end to allow turn lanes. One of the most challenging engineering aspects was on the west end, which was located within an ancient landslide that had moved about 4 feet since 1925. The new bridge was designed to limit seismic deformation to under 4 inches during a moment magnitude scale 9.0 Cascadia Subduction Zone earthquake.

The reconstruction of the interchange with HW 43 eventually affected more than a mile of HW 43 and included a regional walking/cycling trail between the bridge and Willamette Park, which is one mile north of the bridge. Extra costs of about $3.5 million were also incurred to make the ridge "streetcar ready," even though the bridge itself was not built with tracks or overhead wires.

The new Sellwood Bridge, looking east to west.

Upon completion the bridge was widely applauded and received multiple awards. It was honored for engineering excellence by the Oregon Chapter of the American Council of Engineering Companies as the "Project of the Year" in 2016. *The Daily Journal of Commerce* named the Sellwood Bridge a "Top Project" in 2017. The Bridge also received a Greenroads Silver Certification from Greenroads Foundation; it was the 39th such certification in the world and the top-ranked bridge to date.

Discussion: How the new Sellwood Bridge performs

The new Bridge opened on February 29, 2016, although it was not completely finished. Among other things, the south side bike lane and shared-use sidewalk were not open. In April, Cascade Policy Institute counted all trips (at mid-span) made in both directions during a 90-minute period. We then repeated the observations in 2017 and 2018 after the bridge was fully operational (Table 3).

The most obvious conclusion from the monitoring is that bridge design has had no effect on mode share. Bike and pedestrian use was insignificant on the old bridge, and it continues to be insignificant on the new bridge. In fact, non-motorized use was slightly lower in 2018 than it was in 2012, both in absolute terms and as percentages of total passenger trips.

Transit service was reintroduced on the new bridge, which explains why auto share is no longer 98% at the weekday peak. However, transit service was far superior on the old bridge, prior to the weight restrictions. TriMet buses ran all day and on weekends up until 2004. Today, the lone bus

Hwy 43 interchange with bridge, February 2016

crossing the bridge, the 99, is peak-hour only, just on weekdays.

Average vehicle occupancy (AVO) for cars and light trucks has remained almost identical since 2012 – roughly 1.13.

It's certainly possible that mode share differs at off-peak hours and on weekends. We therefore collected additional data during 2017 and 2018. The results are summarized in Tables 4-7.

Table 3: Sellwood Bridge A.M. peak-hour counts Total throughput, bi-directionally

	8/2/12 7:00-8:30 a.m. Thursday, sunny OLD BRIDGE	4/19/16 7:00-8:30 a.m. Tuesday, sunny NEW BRIDGE	7/19/17 7:00-8:30 a.m. Wednesday, sunny NEW BRIDGE	4/10/18 7:00-8:30 a.m. Tuesday, drizzle NEW BRIDGE	12/4/18 7:00-8:30 a.m. Tuesday, clear/cold NEW BRIDGE
Motor vehicles	3,184	2,573	2,841	2,557	3,331
Veh occupants	3,584	2,794	3,221	2,935	3,762
Avg veh occupant	1.13	1.10	1.13	1.15	1.13
Bus passengers	0	0	98	90	80
Bicyclists	64	50	102	41	62
Pedestrians	10	11	23	3	8
Total pass-trips	3,658	2,870	3,444	3,069	3,912
Auto share	97.9%	97.4%	93.5%	95.6%	96%
Transit share	0%	0%	2.8%	2.9%	2.0%
Bicycle share	1.7%	1.7%	2.9%	1.3%	1.6%
Walking share	0.3%	0.4%	0.7%	0.1%	0.2%

Table 4: Sellwood Bridge traffic counts East-bound travel only 2017

	7/19/17 7:00-8:00 a.m. Wednesday Sunny	7/20/17 3:00-4:00 p.m. Tuesday Sunny	7/30/17 3:00-4:00 p.m. Sunday Sunny	11/14/17 3:00-4:00 p.m. Tuesday Cool/dry	7/25/17 4:30-5:30 p.m. Tuesday Sunny	11/8/17 5:00-6:00 p.m. Wednesday Cool/dry	11/16/17 Noon-1:00 p.m. Thursday 47/rainy
Autos	654	1,156	1,031	1,203	1,218	1,312	721
Occupants	716	1,415	1,461	1,389	1,427	1,439	793
AVO*	1.09	1.22	1.42	1.15	1.17	1.15	1.10
99 bus	2/7	1/7	0/0	3/56	2/25	4/65	0/0
Other bus	0	0	0/0	3/10	2/4	0	3/6
Bikes	8	23	48	23	55	21	5
Peds**	2	8	10	10	1	15	2
Veh/minute	10.93	19.28	17.2	20.15	20.3	21.8	12.0
Total PT	733	1,453	1,519	1,488	1,512	1,540	806
Auto share	97.7%	97.4%	96.2%	93.3%	94.4%	95.4%	98.0%
Transit share	1.0%	0.5%	0%	4.4%	1.9%	4.2%	0.7%
Bike share	1.1%	1.6%	3.2%	1.5%	3.6%	1.4%	0.6%
Ped share	0.3%	0.6%	0.7%	0.6%	0.1%	1.0%	0.2%

*Average vehicle occupancy **Mostly recreational joggers

Table 5: Sellwood Bridge trip counts East-bound travel 2018

	4/10/18 7-8 a.m. Tuesday Rain	12/4/18 7-8 a.m. Tuesday Clear/42	4/19/18 8-9 a.m. Thursday Sunny	12/4/18 8-9 a.m. Tuesday Clear/42	4/19/18 10-11 a.m. Thursday Sunny	5/3/18 3-4 p.m. Thursday Cloudy	4/24/18 4-5 p.m. Tuesday Sunny	4/24/18 5-6 p.m. Tuesday Sunny	4/23/18 7-8 p.m. Monday Sunny
Autos	627	690	675	710	600	1,238	1,273	1,255	549
PT	664	766	747	800	688	1,493	1,501	1,437	682
AVO	1.06	1.11	1.15	1.13	1.15	1.21	1.18	1.15	1.24
99 bus	3/12	3/15	1/1	0/0	0/0	2/24	4/47	4/39	0/0
Other bus	2/1	3/0	3/5	1/2	1/0	1/2	1/5	0/0	0/0
Veh/min	10/6	11.3	11.6	11.9	10.0	20.6	21.3	21.0	9.2
Bike-ST	2	3	2	2	3	16	14	17	8
Bike-SW	3	5	6	2	9	22	43	51	24
Runners	0	1	n/a	2	n/a	0	2	5	3
Walkers	0	0	9	0	0	8	6	6	5
Total PT	682	790	770	808	700	1,565	1,618	1,555	722
Auto sh	97.4%	97.0%	97.0%	99.0%	98.3%	95.4%	92.8%	92.4%	94.5%
Transit	1.8%	1.9%	0.8%	0.2%	0%	1.5%	2.9%	2.5%	0%
Bike sh	0.7%	1.0%	1.0%	0.5%	1.7%	2.4%	3.5%	4.4%	4.4%
Ped sh	0%	0.1%	1.2%	0.2%	0%	0.5%	0.5%	0.7%	1.1%

Table 6: Sellwood Bridge trip counts West-bound travel 2017

Mode	7/19/17 7:00 - 8:00 a.m. Wednesday Sunny	11/30/17 7:00 - 8:00 a.m. Thursday Clear and cold	7/20/17 3:00 - 4:00 p.m. Thursday Sunny
Autos	1,381	1,553	840
Occupant	1,533	1,706	1,042
Average veh. Occupancy	1.11	1.10	1.24
99 Bus	2/65	3/58	0
Other bus	0	1/0	3/0
Vehicles per minute	23.1	26.0	14.1
Bike-street	16	1	13
Bike-sidewalk	30	30	28
Runners	n/a	6	n/a
Walkers	5	1	8
Total passenger-trips	1,649	1,802	1,091
Auto share	93.0%	94.7%	95.5%
Transit share	3.9%	3.2%	0%
Bike share	2.8%	1.7%	3.9%
Walk share	0.3%	0.4%	0.7%

Table 7: Sellwood Bridge passenger-trip counts West-bound travel 2018

	4/21/18 6-7 a.m. Monday Sunny/48	4/10/18 7-8 a.m. Tuesday Light rain	12/4/18 7-8 a.m. Tuesday Clear/42	4/19/18 8-9 a.m. Thursday Sunny/44	12/4/18 8-9 a.m. Tuesday Clear/42	4/19/18 10-11 a.m. Thursday Sunny/54	4/21/18 5-6 p.m. Saturday Sunny/64	5/4/18 8-9 p.m. Friday Dusk/60
Autos	942	970	1,585	1,491	1,402	717	966	463
Passengers	72	171	210	210	200	118	425	205
Vehicle PT	1,014	1,141	1,795	1,701	1,602	835	1,391	668
AVO	1.08	1.18	1.13	1.14	1.14	1.16	1.44	1.44
Bus 99	4/96	3/42	3/43	2/10	1/12	0/0	0/0	0/0
TM mini	0/0	2/0	2/4	0/0	0/0	0/0	0/0	0/0
Other mini	1/0	2/0	2/4	0/0	0/0	0/0	1/15	0/0
Bike-SW	14	23	30	27	24	26	20	8
Bike-street	4	8	7	12	6	13	16	0
Pedestrians	4	2	4	13	4	20	18	2
Total PT	1,132	1,216	1,887	1,763	1,648	894	1,460	670
Auto share	89.6%	93.8%	95.1%	96.5%	97.2%	92.9%	95.3%	98.4%
Transit sh	8.5%	3.5%	2.7%	2.2%	0.7%	0.4%	1.0%	0%
Bike share	1.6%	2.5%	2.0%	2.2%	1.8%	4.3%	2.5%	1.2%
Ped share	0.4%	0.2%	0.2%	0.7%	0.2%	2.2%	1.2%	0.4%

Discussion

The field counts show that private auto travel is the predominant mode regardless of the time of day, direction of travel, day of the week, or month of the year. At the off-peak, the number of pedestrians tends to go up, but so does average vehicle occupancy (AVO). The difference is most pronounced on weekends, when there are more recreational runners and walkers, but AVO skyrockets to 1.44 and there are many vehicles with three, four, and even five occupants.

During weekday peak periods, AVO is lower early in the morning, when most motorists are commuters. After 7:30 a.m., AVO gradually increases due to "fam-pools" – parents driving kids somewhere. After 10:00 a.m., AVO increases again due to carpooling for social, recreational, and medical purposes.

During weekday peak periods, most pedestrians are joggers, not walkers. Within the walking group, few appear to be commuters.

Bicyclists prefer using the sidewalks over the bike lanes, by a wide margin. Many of them also cycle against the vehicle traffic flow, especially traveling westbound. It may be that where they want to go after leaving the bridge determines which side of the bridge they cycle on.

Transit use is minimal, largely because TriMet has failed to restore the promised service. During peak hours the bridge is over-subscribed in the peak direction, with long vehicle queues on either HW 43 or Tacoma Street.

Interestingly, peak vehicle throughput varies significantly by direction of travel. During the morning rush hour, the typical observed throughout for westbound traffic is roughly 25 vehicles/minute at mid-span of the bridge. The highest observed level over a one-hour period was 26.4 vehicles/minute, recorded on December 4, 2018.

Throughput levels were much lower for eastbound traffic in the afternoon peak. Maximum loads hovered around 20-21 vehicles/minute, with a high of 21.6. Since the bridge has two identical travel lanes, presumably the difference in vehicle throughput is caused by other factors such as the timing of the new traffic signals at either end of the bridge, and capacity constraints on Tacoma Street. These issues are discussed later.

The hourly monitoring results are converted to annual summaries in Table 8.

Private automobile use remains the preferred mode of travel, just as it was on the original bridge. Moreover, the majority of observations were made at the times most conducive to alternative modes: weekday peak-periods (when transit service operates), in daylight hours with good visibility, and during months with nice weather. If it were practical to measure all passenger-trips 24 hours a day for every day of the year, the annual auto share would probably rise to 99%.

Looking west on the Sellwood Bridge at 8:00 a.m.

The small percentage of non-auto trips should not be a surprise. As of 2011, Metro's transportation model showed that 72% of vehicle-trips across the bridge began or ended in Clackamas County. By 2030 that was expected to rise to 76%. For Clackamas County commuters using the Sellwood Bridge to get to their jobs west of the river, it was never likely that many of them would start commuting by bicycle or walking. The distances are too great.

Sellwood residents also had poor prospects for mode-shifting. In 2001, residents of the Tacoma Street study area had a relatively high median household income of $43,370, compared with $37,604 for the SE Hawthorne Boulevard neighborhood and $26,194 in the NW 23rd district. Auto use is highly correlated with income; as people earn more, they tend to drive more.

Also, 85% of Sellwood residents owned a car compared

Table 8: Sellwood Bridge Mode Split, 2017-18

Year	Total passenger-trips	Auto share	Transit share	Bike share	Pedestrian share
2017	13,593	95.1%	2.2%	2.2%	0.5%
2018	19,888	95.2%	1.9%	2.4%	0.6%

with 80% in the Hawthorne district and 60% in Northwest Portland. Only 3.6% of Sellwood residents walked to work.[22]

Two sidewalks or one: Does it matter?

Since TDM advocates believed that travel behavior is strongly influenced by the built environment, they pushed for two bikeways plus raised, shared-use sidewalks on both sides of the new bridge.

As it turns out, the phased construction schedule allowed the two-sidewalk hypothesis to be tested. As previously noted, the bridge opened in 2016 with the south side bike/pedestrian facilities closed. This provided an opportunity to conduct before-and-after counts to see if increasing the bike/pedestrian capacity by 100% would lead to commensurate increases in cycling and walking.

Cascade Policy Institute conducted both peak and off-peak counts in April of 2016 and again in April 2018. The results are displayed in Table 9.

Looking east on the Sellwood Bridge at the morning rush hour in May 2018. Note the cut-through traffic from 7th Avenue using the middle "shelter lane" to merge. This is a direct result of the road diet.

Table 9: Bi-directional counts 18.5' bike/pedestrian facilities (2016) vs. 35' facilities (2018)

	April 19, 2016 8:00-9:00 a.m. Tuesday, sunny	April 19, 2018 8:00-9:00 a.m. Thursday, sunny	April 19, 2016 10:00-11:00 a.m. Tuesday, sunny	April 19, 2018 10:00-11:00 a.m. Thursday, sunny
Motor vehicles	1,688	2,166	1,142	1,317
Total occupants	1,850	2,448	1,313	1,523
Avg veh occupant	1.10	1.13	1.15	1.16
Basic transit	0	3/13	0	0.0
Mini buses	0	5/10	1/4	6/7
Bicycles	36	55	50	54
Pedestrians	10	22	9	23
Vehicles/minute	14.1	18.1	9.5	11.0
Total passenger-trips	1,896	2,548	1,376	1,607
Auto share	97.6%	96.1%	95.4%	94.8%
Transit share	0%	0.9%	0.3%	0.4%
Bike share	1.9%	2.2%	3.6%	3.4%
Walk share	0.5%	0.9%	0.7%	1.4%

When the new bridge opened in 2016, it had the original design of two, 12' travel lanes separated by a 1.5' median; one 12' sidewalk; and one 6.5' bike lane. By the time we came back to do the counts again in 2018, the original design had been altered. In order to promote bicycle safety, in September 2016 the County changed the alignment to create two, 11' travel lanes separated by a 2' median; 5.5' bike lanes on each side; and 2' "buffers" between the auto lanes and the bike lanes.

Therefore, the opening of the sidewalk and bike lane on the south side expanded the right-of-way for cyclists and pedestrians by 88% instead of 100%. But auto users saw their right-of-way ***decrease*** by 8%.

In absolute terms, non-auto use went up by 49 passenger-trips (47%) after the addition of the second set of bike-pedestrian facilities. However, motor vehicle use also increased by 808 passenger-trips (26%), even though automotive lane capacity had been reduced.

For mode share, biking/walking combined only increased from 2.4% at the peak hour and 4.3% at the off-peak hour in 2016 to 3.1% and 4.8% respectively in 2018. The biggest beneficiaries of the wide sidewalks have been cyclists, not pedestrians.

Again, this should not have surprised anyone. The EIS stated that among all the bridge alternatives then under consideration, motorized traffic was not projected to vary. It didn't matter how many bike lanes Multnomah County added or how wide the sidewalks were; cycling and walking use "were considered as an addition to automobile traffic, not a substitute for it."[23] Virtually every advocate of multi-modalism failed to grasp this important point.

Declining peak-hour throughput

For both the original Sellwood Bridge and the replacement bridge, the design capacity for each travel lane was 1,800 vehicles/hour. However, vehicle throughput has probably never reached those levels due to bottlenecks on HW 43 and Tacoma Street. Unfortunately for motorists, it now appears that peak-hour bridge throughput is ***actually declining*** even though demand is rising.

Tables 10 and 11 include peak-hour travel data from various years. If we take all "before construction" years, create one average value for those years, and compare with the "after construction" years, we see a drop in peak-hour throughput of 17% in both directions.

The reason PM throughput is constrained is due to the timing of the lights at the west end of the bridge. On Thursday, June 14, 2018, Cascade Policy Institute monitored the traffic turning onto the Sellwood Bridge from HW 43 during the afternoon peak hours of 4:00 p.m. – 6:00 p.m. Southbound HW 43 traffic turns left onto the bridge via two turn lanes. Northbound traffic turns right in one lane, as space is available. There is often no place for vehicles to move because the intersection is blocked. Vehicles entering from the three lanes have to merge to one lane almost immediately.

Vehicles turning onto the bridge were counted in 10-minute increments over two hours. The total number of vehicles turning right onto the bridge was 1,074, or 8.95/minute. The total turning left onto the bridge was 1,491 vehicles, 12.45/minute for the two turn lanes combined.

This means that traffic entered the Bridge east-bound at the rate of 1,284 vehicles/hour, very close to the 1,269/hour observed mid-span earlier in 2018 and in 2017.

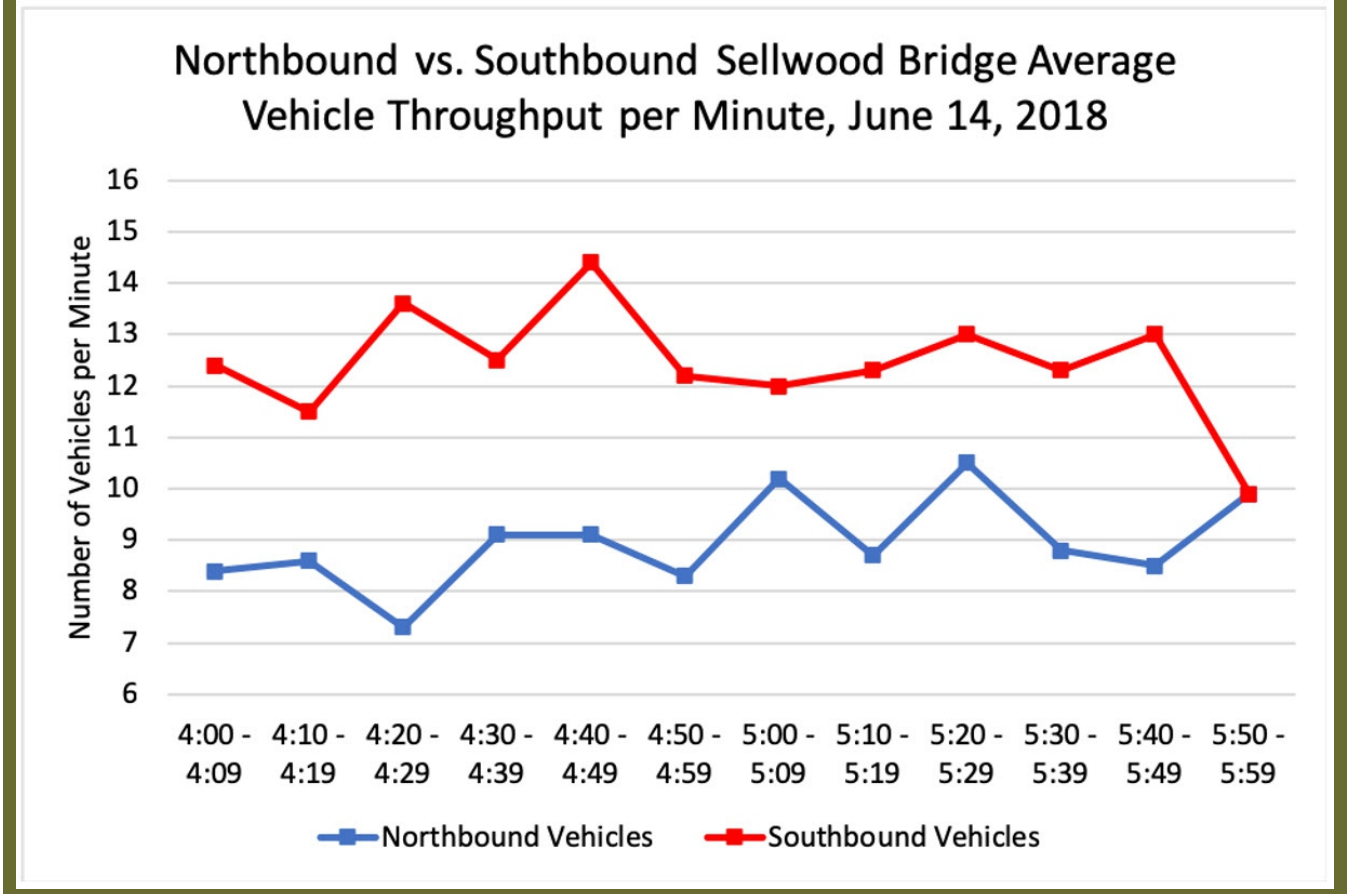
Vehicles turning left from HW 43 would often stop in the middle of the intersection due to congestion. When the light turned green for vehicles turning from the NB lanes, they had to wait to merge onto the bridge until the SB vehicles finished driving through the intersection. By the time they were able to do this, the green light cycle was often ⅓ to ½ over.

In one instance, only three vehicles turned right onto the bridge during a 44-second green light. Many illegal turns on red were also observed. The queue of NB vehicles waiting to get on the bridge was so long that the observer stationed at the west end of the bridge could not see the end of the line when looking south on HW 43. This was the case for the entire two-hour observation period.

Table 10: Average daily East-bound PM peak-hour throughput 1994-2018[24]

Year	Direction and time	Vehicle/hour
1997	East-bound PM peak	1,513
2001	East-bound PM peak	1,605
2010	East-bound PM peak	1,475
2017	East-bound PM peak	1,269
2018	East-bound PM peak	1,269
2018	East-bound PM peak	1,284

Graph 1



Time (p.m.)	Number of Northbound Vehicles/10 minutes	Vehicles Per Northbound Vehicles/minute	Number of Southbound Vehicles/10 minutes	Average Southbound Vehicles/minute
4:00 - 4:09	84	8.4	124	12.4
4:10 - 4:19	86	8.6	115	11.5
4:20 - 4:29	73	7.3	136	13.6
4:30 - 4:39	91	9.1	125	12.5
4:40 - 4:49	91	9.1	144	14.4
4:50 - 4:59	83	8.3	122	12.2
5:00 - 5:09	102	10.2	120	12
5:10 - 5:19	87	8.7	123	12.3
5:20 - 5:29	105	10.5	130	13
5:30 - 5:39	88	8.8	123	12.3
5:40 - 5:49	85	8.5	130	13
5:50 - 5:59	99	9.9	99	9.9

While traffic throughput can fluctuate based on weather, size of vehicles, driver behavior, and traffic congestion on the other end of the bridge, the traffic lights at HW 43/Bridge interchange do place a physical limit on the flow of vehicles. That limit appears to be 1,300 vehicles/hour or less. Therefore, the new bridge moves about 17% fewer eastbound vehicles at peak hours than did the 1925 original, despite being more than twice as wide.

Peak-hour counts for the westbound peak-hour traffic show similar results, as seen in Table 11. For the three measurements taken on the old bridge, the average throughput was 1,593 vehicles/hour. For the four taken on the new bridge, the average was 1,325, once again a 17% drop.

Traffic flowing westbound at the morning peak is not controlled directly by timed signals at the bridge. There is a new light at the intersection of SE 6th and Tacoma, but it is activated by either left-turning vehicles exiting the bridge, or pedestrians. Therefore, peak-hour travel on the bridge is more a function of how Tacoma Street is operating and how much cut-through traffic is entering the queue from side streets – a topic discussed at length later in this paper. Also, traffic back-ups at the HW 43 interchange can affect westbound traffic on the bridge.

As seen in Table 7, there is quite a bit of variation in peak-hour vehicle throughput, especially since the new bridge opened. However, the average of counts on the original bridge was 1,593/hour, while the average of counts since 2016 is 1,325 – a drop of 16.8%.

It was acknowledged in the TMSP that actual travel demand in both peak-hour directions was well over 1,800 vehicles/lane and would be closer to 3,000 if increased capacity were provided. The EIS stated that planners expected a 33% increase in travel demand in the Sellwood Bridge corridor for both the no-build and the build alternatives by 2035.[26] Therefore, it's not plausible that the drop in average daily peak-hour traffic counts is due to decreased demand. It's the result of conscious decisions made by planners to reduce vehicle use of both the Sellwood Bridge and Tacoma Street.

This has been confirmed by PDOT's own evaluation of the Tacoma Street road diet.[27] The Bureau found that average daily traffic on Tacoma dropped by 13.5 percent after implementation of the Main Street Plan. This was portrayed by PDOT as one of the benefits of the road diet, along with lower travel speeds and reduced crash rates.

However, for all benefits there are usually costs, and since ADT on Tacoma Street before the Plan had been 31,000 vehicles, the traffic reduction of 13.5% meant that 417 drivers were forced off the road. Faced with a loss of peak-hour lane capacity, their options were: (1) avoid Tacoma Street by cutting through residential neighborhoods; (2) re-route to another bridge such as the Ross Island; (3) switch modes of travel; or (4) cancel their trips.

For most drivers, it's doubtful that options (3) or (4) were realistic; it's more likely that they simply traveled down a side street to reach the Sellwood Bridge via 7th or 6th Avenues, or traveled out of direction to cross a different bridge. Neither strategy reduces the negative social impacts of driving; they just re-arrange them.

Comparing bridge predictions with reality

The FEIS predicted that by 2035, biking and walking would account for a combined 15% of daily trips across the Sellwood Bridge. While Cascade Policy Institute has not tried to measure 24-hour mode share, the hourly sampling suggests that 15% daily share for walking and biking is unlikely to ever occur.

In absolute terms, the EIS predicted that average weekday use of the new bridge by cyclists and pedestrians would total 9,350. Actual counts for 2018 for seven different hours (eastbound) totaled 308; for westbound (six different hours) the total was 230.

Table 11: Average AM peak-hour travel, West-bound 2001-2018[25]

Year	Direction and time	Vehicle/hour
2001	Westbound, AM peak	1,400
2008	Westbound, AM peak	1,700
2013	Westbound, AM peak	1,680
2016	Westbound, AM peak	1,100
2017	Westbound, AM peak	1,469
2018	Westbound, AM peak	1,233
2018	Westbound, AM peak	1,497
2018	Westbound, AM peak	1,498

The EIS also predicted that about 1,600 heavy trucks would use the new bridge, and the TriMet 40 and 65X lines would be restored. Assuming this happened, trucks and buses were expected to comprise about 4% of all vehicles using the bridge each day.[28]

In fact, while transit buses are now allowed back on the bridge and it was designed to be "streetcar ready," transit service today is ***significantly lower*** than it was when weight limitations forced TriMet to stop running buses in 2004.

Prior to that year, TriMet was operating bus service across the Bridge ***96 times/day***. Today, the number of transit trips is ***32/day***. The Bridge is serviced by one line, the 99, which only operates in the morning and afternoon peak hours of weekdays. There is no transit at all on weekends.

In 2001 the number of daily transit boardings and alightings along Tacoma Street was 721, with another 52 on Nehalem Street. Today the total is 146, a drop of 81% (Table 12). The primary reason is that service has not been restored. The one line now serving Tacoma Street only stops in three locations in Sellwood, and only at peak hours.

It's possible that in 2004, when TriMet was forced to suspend transit service over the Sellwood Bridge due to weight restrictions, some riders switched to the 70 line, which bisects Tacoma at 13th. It's also possible that some former bus riders began taking the Orange MAX line when it opened in 2015, since it has a park-and-ride stop at Tacoma and 99E.

For the purpose of this analysis, it doesn't really matter. This is a before-and-after study, focusing on what the planners predicted when they decided to downsize Tacoma Street and limit the Sellwood replacement bridge to two travel lanes. At every decision point, they promised to "mitigate" the planned-for congestion through TDM, including significant increases in transit service across the Sellwood Bridge. That service has not been provided.

Over the 20-year period from 1998 to 2018, TriMet's operating budget increased by 83% in real terms (Table 13). There is no reason why bus service should have been permanently reduced on the Sellwood Bridge.

According to Kerry Ayres-Palanuk, Director of Planning and Policy at TriMet, there actually is a reason for the drop in transit service: traffic congestion. Increasing traffic makes the buses less reliable, so TriMet refuses to run them.

Table 12: Daily transit on/offs East-West routes in the Sellwood District Before-and-after counts

Bus stop/ location	40-Tacoma 2001	40-Tacoma 2018	65X-M. Hill 2001	65X-M. Hill 2018	99-Macadam 2018
Tacoma/7th	93	n/a	n/a	n/a	30
Tacoma/9th	42	n/a	n/a	n/a	n/a
Tacoma/11th	68	n/a	n/a	n/a	n/a
Tacoma/13th	217	n/a	n/a	n/a	80
Tacoma/15th	73	n/a	n/a	n/a	n/a
Tacoma/17th	107	n/a	9	n/a	36
Tacoma/19th	36	n/a	n/a	n/a	n/a
Tacoma/21st	50	n/a	n/a	n/a	n/a
Tacoma/23rd	35	n/a	2	n/a	n/a
Nehalem/15th	n/a	n/a	41	n/a	n/a
TOTAL	721	n/a	52	n/a	146

Table 13: TriMet Operating Budget 1998-2018 (000s)

	1998	2008	2014	2018	% change* 1998-2018
Passenger fares	$35,786	$80,818	$114,618	$118,950	+116%
Tax revenue	$143,369	$215,133	$275,357	$361,862	+64%
Total operating resources	$212,150	$404,481	$522,155	$596,830	+83%

*After adjusting for inflation

Ms. Ayres-Palanuk blames the bridge design for this problem; she said, "To make the Sellwood Bridge a truly multi-modal showpiece, transit would need to have priority over single occupant cars and that did not happen."

She also asserts – without proof – that with the opening of the Orange MAX line, "many transit riders have chosen to take the option that provides them good reliability irrespective of auto congestion."

TriMet's five-year plan does propose to increase the Sellwood Bridge bus service from peak-only to midday as well, but "at this time and until we can move buses through the peak hour congestion more reliably, we don't think it's a wise choice to add more bus service across the Sellwood Bridge."

The TriMet response is fascinating for what it reveals about bureaucratic decision-making. First, TriMet was intimately involved with the South Willamette River Corridor Study, and signed off on the recommendation to deliberately worsen congestion on the Sellwood Bridge by prohibiting any new cross-river auto capacity for 20 years. If they were concerned about buses getting stuck in traffic, they should have insisted on one or several new bridges south of the Sellwood Bridge.

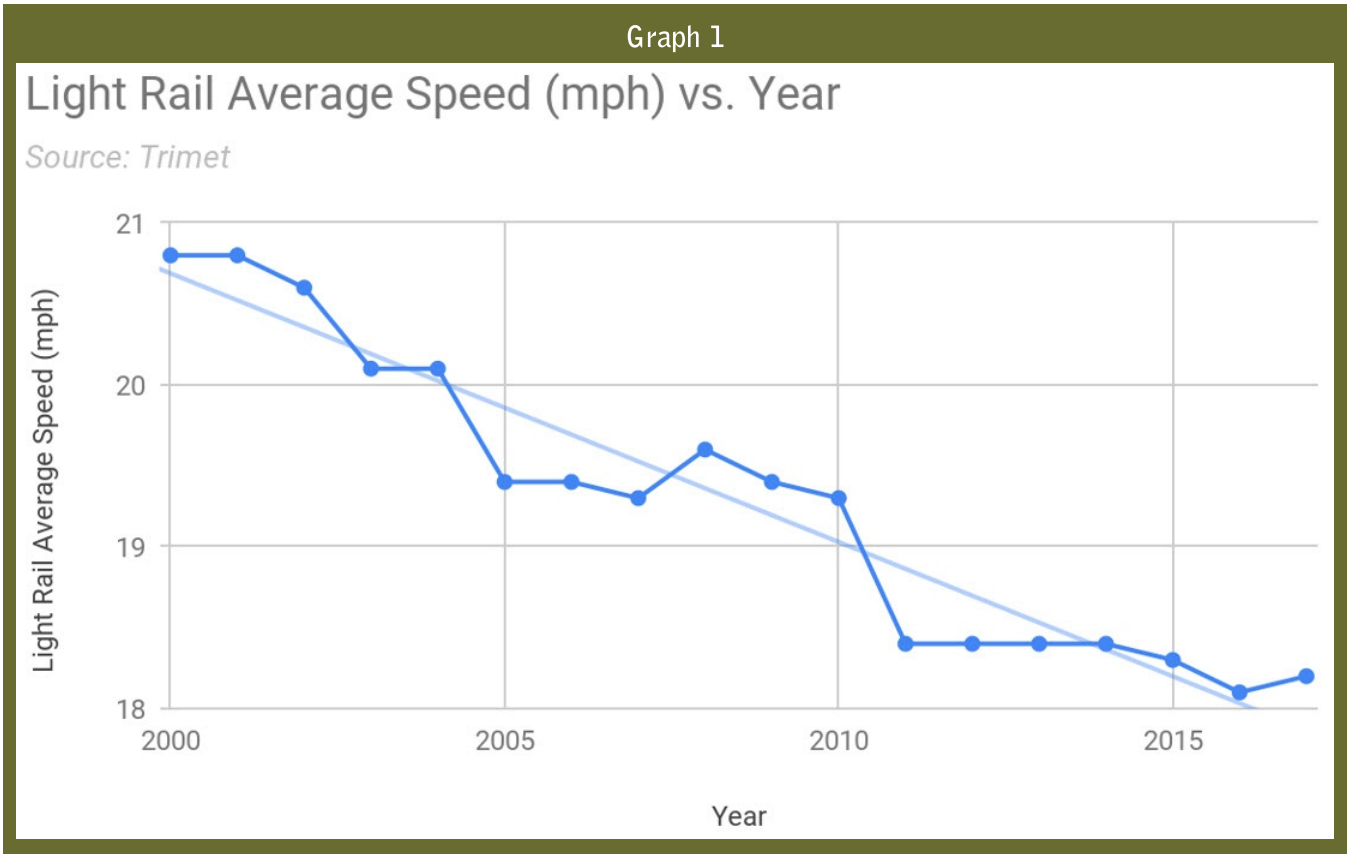
Then, TriMet and Metro used their control of the regional planning process to force the construction of a $1.5 billion light rail line to Milwaukie, requiring $750 million in scarce local matching dollars that could have gone to actual traffic relief projects. The Orange Line was a poor substitute for the canceled Sellwood Bridge bus service because it served north-south travel heading primarily to downtown Portland or the South Waterfront.

Now, when congestion on the new bridge slows down buses, TriMet blames poor bridge design because buses didn't get their own lane – which was impossible to provide since the bridge was limited to just two travel lanes. Moreover, the bridge itself is not the problem for buses; it's the congestion on Tacoma that makes travel speeds so unpredictable.

The argument that light rail is inherently superior to bus transit because it is not subject to traffic congestion overlooks other sources of delay for TriMet rail lines. The Steel Bridge crossing is a well-known bottleneck, and when switches malfunction, delays are imposed system-wide. Other delays are caused by power outages, collisions, standing water, ice, and hot weather. For these (and probably other) reasons, the average speed of light rail has been steadily declining for decades, as seen in Graph 1.

If light rail service were truly as reliable as TriMet claims, all the trains would run as they were projected to in the Environmental Impact Statements produced prior to construction. Unfortunately, TriMet rail service consistently over-promises and under-performs. The disparity between forecasted service and actual service for the Orange Line is shown in Table 14.

Graph 1



The light rail dysfunction is so obvious that even *The Bee*, a decades-long supporter of the Portland-Milwaukie light rail project, vented in February 2019:

> "The very day that the new MAX line opened, it forever cancelled Buses 31, 32 and 33, North of Milwaukie. That ended fast and direct access downtown to/from this increasingly populated part of Westmoreland. The surprising bottom line is that the new Orange MAX line has resulted in a considerable DECREASE of public transit options for those in North Westmoreland."

At every step of the Sellwood Bridge re-construction planning process – soliciting the federal TIGER grant, writing the EIS, and asking Multnomah County voters to pay for the new, multi-modal Sellwood Bridge through a vehicle registration surcharge - promises were made that full bus service would be restored. It does not seem to bother TriMet management that those commitments are unlikely ever to be fulfilled.

Mode share for trucks: When Multnomah County adopted the list of essential service needs for the replacement bridge in 2006, restoring freight use was a key element. Modeling indicated that trucks would account for 4% of all trips on the new bridge.

However, the Jobs and Transportation Act, a major transportation bill passed by the state legislature in 2009, included authorization for Multnomah and Clackamas Counties to impose special vehicle registration fees to help pay for the Sellwood Bridge replacement. During negotiations on that section, truck lobbyists succeeded in removing their members from the obligation to pay the annual surcharges. In exchange, heavy trucks were prohibited from using the replacement Sellwood Bridge.

Thus, trucks today are restricted to a maximum of 13 tons, except for publicly owned vehicles, and the truck share of trips is 0% rather than 4%.

Impacts of the new Bridge on the Sellwood-Moreland community

As predicted, the new Sellwood Bridge has insufficient road capacity to service the demand, resulting in bridge queuing. This has led to an increase in motorists cutting through nearby residential streets in the morning peak hours to bypass Tacoma, between 11th and 6th. The installation of a new traffic signal at 6th and Tacoma (part of the replacement bridge project) actually encourages this practice, since it stops traffic on Tacoma. As soon as the light at SE 6th turns red for east-west traffic, cut-through drivers (and a growing number of local residents) pour onto

Table 14: Forecasted Level of Service versus Actual, 2018

Orange Line			
Distance	South Corridor EIS Predicted Travel Time in 2030	Actual PM Peak Period Travel Time in 2018	Scheduled Stops (PM Peak-hour)
Pioneer Square to Milwaukie Park Ave	26	32	5:04 - 5:36
PSU to Milwaukie Park Ave	20	26	5:10 - 5:36
South Waterfront to Milwaukie Park Ave	16	21	5:15 - 5:36
Pioneer Square to Lake Rd	24	29	5:04 - 5:33
PSU to Lake Rd	19	23	5:10 - 5:33
South Waterfront to Lake Rd	15	18	5:15 - 5:33

Tacoma to gain access to the bridge. Although it is illegal to make a left at the light onto the bridge from the south side, some motorists do it anyway.

Cut-through traffic is particularly intense between SE 6th and 11th, both south and north of Tacoma. The streets are narrow, and since residential parking occurs on both sides, commuter traffic frequently makes it impossible to move for several minutes at a time. Even then, they become *de facto* one-way streets with all traffic headed towards Tacoma.

Before the road diet was implemented, Tacoma was a four-lane collector during the weekday peak hours, so motorists had few incentives to cut through residential neighborhoods to avoid it. Even if they did try, it was difficult to turn left onto Tacoma from the south, since doing so required simultaneous openings across three lanes of traffic. As noted in the TMSP, "Few left-turns or through movements are made from the unsignalized cross-streets during the peak hours."

Cars lining up Southbound on 7th Avenue, waiting to cut to the head of the line on Tacoma Street in May 2018.

This changed dramatically after the road diet was implemented. The middle turn lane, which did not exist prior to 2002, became a refuge for northbound motorists trying to turn left onto Tacoma from side streets, especially on 7th, 9th, and 11th Avenues.

Drivers have become quite aggressive, quickly turning into the refuge lane and then merging into the main traffic lane heading towards the bridge. Since this occurs multiple times per minute during the morning peak, it slows down traffic behind the aggressive mergers heading west on Tacoma Street.

Regular bridge users understand what is going on, so this induces a noticeable level of anger across the entire motoring population. Horn honking, refusal to let others merge, illegal turns, and other forms of rude behavior are

Cut-through traffic heading Southbound on SE 6th at Spokane, trying to get on to Tacoma Street (one block ahead) in the morning at the east end of the Sellwood Bridge.

now the norm along the Tacoma Street corridor in the early morning.

A long-time resident told us, "Ordinarily I'm polite to people wanting to turn onto a main street, but you can't do that on Tacoma or you'll never get anywhere."

The most common phrase we heard from drivers was "road rage." One woman told us, "You can't even imagine the level of rage that comes from crossing that bridge every day. It literally changed my life. I finally became a bicycle commuter. Yes, I understand that most people can't do that; I have a short commute and a progressive employer who provides locker rooms and showers. But I couldn't bear any more driving on that bridge."

Some planners might consider this story exactly the outcome they had hoped for. If so, it does not seem like a strategy that is likely to work on a mass scale.

The biggest traffic disaster is at the intersection of SE 13th and Tacoma. The road diet runs on Tacoma from SE 11th to the Sellwood Bridge, so as the two lanes of westbound traffic cross 13th they have to begin merging. That by itself slows down travel.

But when the traffic light at 13th is red for Tacoma Street drivers, bridge-bound motorists traveling north or south on 13th turn onto Tacoma, which uses up all available lane capacity. This means that when the light turns green again for Westbound travelers, the motorists on the east side of the Tacoma Street-13th Avenue intersection frequently have nowhere to go.

On a May 2018 weekday morning at 8:10 a.m., westbound traffic in the right-hand lane of this intersection (just outside Starbucks) sat for four minutes without moving, although a

few cars in the left-hand lane did get through. Over a 14-minute period only 28 cars advanced – an average of 2 vehicles/minute. A TriMet #99 bus took six minutes to travel from 15th to 13th.

On another morning at 7:20, the #99 bus was stopped at the same location, just outside Starbucks. There were 11 peoplewaiting to board at the next bus stop, which is on the other side of the intersection (adjacent to OnPoint). For three entire green light cycles the bus was unable to move. Every time the queue advanced on the other side of the intersection, the available space was immediately taken up by vehicles turning west onto Tacoma from 13th. By the time the bus finally picked up its passengers, it was far behind schedule.

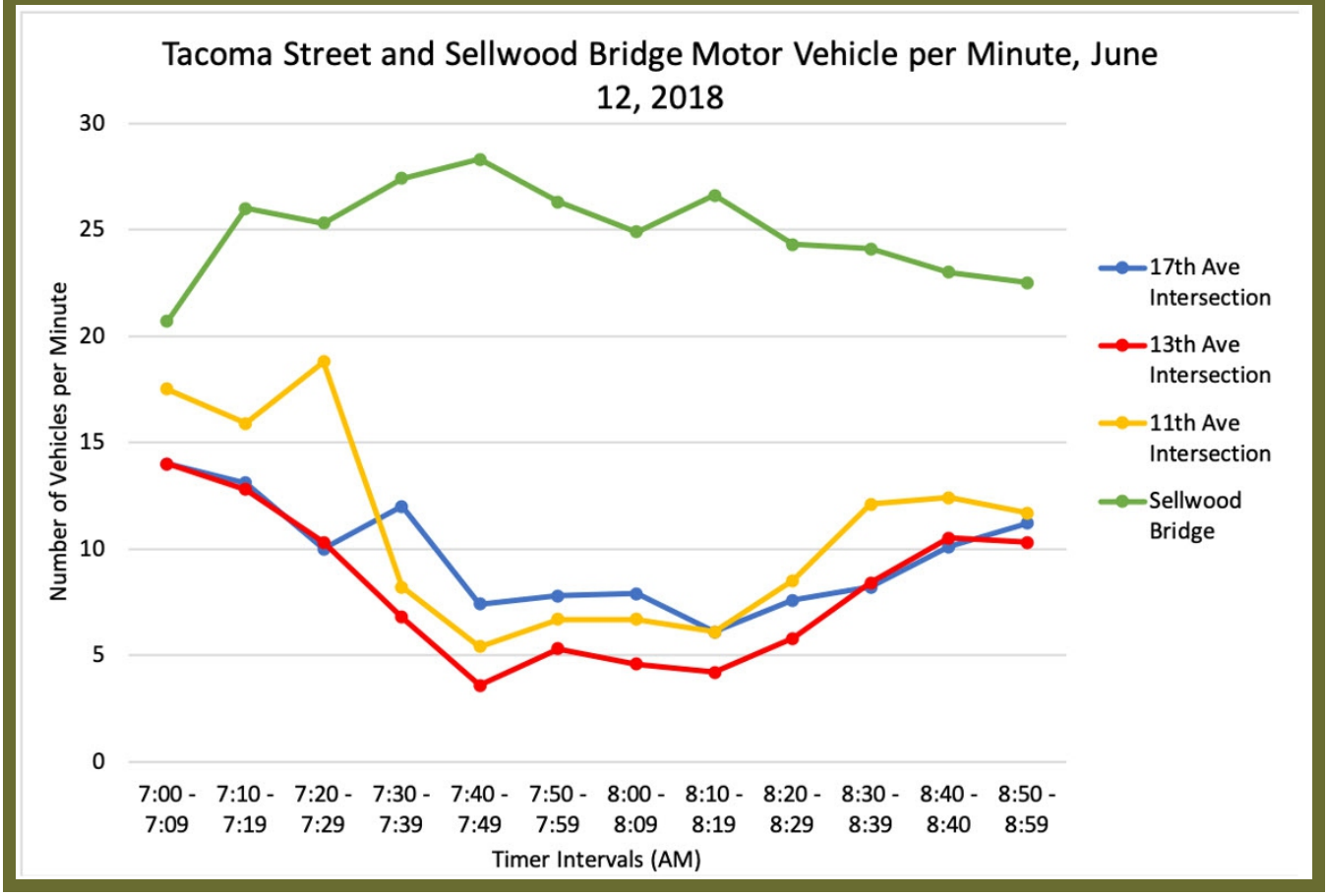
Tacoma Street looking west at the intersection with 13th in May 2018. The two lanes ahead have to merge prior to 11th due to the road diet. Traffic on the east side of the intersection has nowhere to go even though the light is green.

In order to systematically observe the cascading effect of cut-through traffic on Tacoma Street throughput, we placed researchers along Tacoma at SE 11th, 13th, and 17th, and on the Sellwood Bridge at mid-span. The observations clearly show that cut-through traffic near the bridge slows everyone else down further to the east (Graph 1). Traffic throughput starts out at around 15 vehicles/minute, but steadily degrades after 7:15 a.m., dropping to a crawl at nearly three vehicles/minute at the worst intersection.

Meanwhile, traffic flow on the Sellwood Bridge actually increases at that time and remains high, never falling below 23 vehicles/minute for the entire two-hour period.

As with most problems in the corridor, this was foreseen long ago. The EIS stated, "Improving opportunities for vehicles to cross SE Tacoma @ 6th [with a new traffic light,

Graph 2



which was installed as part of the bridge reconstruction] would be a tradeoff because it would relieve the frustration of local traffic trying to cross Tacoma, but at the same time would attract cut-through traffic trying to avoid congestion on SE Tacoma Street."[29]

Cascade interviewed more than 25 local business owners or employees near the Tacoma Street-13th Avenue intersection. The congestion is a daily struggle. "I've almost been run over several times on my own street," one man said. It is frequently a challenge just to leave his own driveway.

Even the sidewalks have risks. Frustrated drivers will occasionally mount the curb in an attempt to shave seconds off the clock. A Key Bank employee recalled a time when a truck escaped traffic by driving onto the sidewalk, nearly striking her. One side street resident recounted the day when a commuter cut through her neighborhood and crashed into her house.

Many stores located on Tacoma Street have parking lots for customers and employees; the "private parking" signs do little to discourage cut-through drivers from using them for other purposes. Commuters driving west on Tacoma frequently cut through the Starbucks parking lot, turn left on 13th, then right on Tacoma to bypass the traffic light at 13th and Tacoma.

A local business owner mentioned that as many as fifty vehicles use his lot as a turn-around site each day. Another retail store with a large parking lot routinely watches as customers of other businesses use the lot as a park-and-walk destination, making it difficult for customers and employees to find space of their own. Lack of parking is a common complaint heard by business owners from their customers.

Cascade's observations and interviews are corroborated by the Portland Bureau of Transportation, which has conducted extensive monitoring of travel patterns around the east end of the Bridge. The Bureau made a presentation to the Transportation Committee of the Sellwood-Moreland Improvement League (SMILE) in August of 2017, a summary of which is presented in Table 15.

A new apartment complex one block south of the Sellwood Bridge at 6th. The steady densification of the neighborhood, per city policy, will only make driving conditions on Tacoma worse in the coming years.

These data show that vehicular throughput has dropped on the new bridge compared with the old bridge, both at peak hours and for the entire morning period. According to the Bureau, bridge traffic spills back beyond 6th and Tacoma 26 times in the A.M. peak hour. The queue spillback is due to:

- The new HW 43/Bridge signal at the west end of the bridge
- The SE 6th and Tacoma signal at the east end of the bridge
- Stop-and-go conditions of traffic on Tacoma Street
- Side-street traffic that is allowed to enter Tacoma Street west of 13th

With fewer vehicles making it over the new bridge, more drivers are attempting to cut to the head of the line by using side streets. As noted by the Bureau, "Many vehicles are entering Tacoma from side streets thereby reducing the flow of traffic on Tacoma for morning commuters."

At this point there is little that the City can do about it

Table 15: Tacoma Traffic Analysis Portland Bureau of Transportation 2017

Location	Date	6-9 a.m. EB	A.M. Total EB	6-9 a.m. WB	A.M. Total WB
Tacoma/W of 6	May 2017	1,761	4,276	3,264	6,071
	Sept 2007	1,923	4,442	4,016	6,981
	Oct 2006	2,025	4,517	4,068	6,999
Change in throughput, 2006-2017	–	-13%	-5%	-20%	-13%

because of previous policy decisions. The Bureau of Transportation presented an "Options Matrix" to SMILE in the fall of 2017, but few of them would make a real difference. Many of the options propose tweaking the timing of traffic lights at either end of the new bridge, while others are potentially more drastic, such as putting up traffic barriers.

"Option E" would reconfigure bridge lanes to create a third travel lane and make the lanes reversible, which would provide "more storage space across the bridge, and allow capacity to be adjusted with directional demand."

The Bureau noted in dry understatement that adding vehicle lane capacity on the bridge would involve approvals by multiple agencies and that a "significant amount of evaluation" would be required.

This was not a new idea. In fact, Chuck Martin, an unsuccessful candidate for Metro Council position 7 in the 1998 election, had a letter published in *The Bee* in May of that year regarding the proposed no-growth recommendations of the South Willamette River Crossing Study, arguing: "You need a third lane [on a new Sellwood Bridge] which can be signal controlled for Westbound in the morning and Eastbound in the afternoon."

Reversible lanes have been used in other cities for decades, but that option was rejected by the Metro Council.

A more palatable option would be to "replace the 6th and Tacoma signal with a pedestrian hybrid beacon," as now functions at Tacoma and 19th. Such a signal would have to be pedestrian-activated, which would discourage cut-through auto travel trying to enter Tacoma from 6th Avenue.

The Bureau plans to implement simple signal timing changes at HW 43 and SE 6th while evaluating the more difficult options.

Traffic at the east end of the Sellwood Bridge. The school bus and two automobiles in the background are trying to enter the traffic queue from side streets. This slows all vehicles on Tacoma further to the east.

Evaluating the Sellwood Bridge replacement

The size of the Sellwood Bridge replacement was determined as early as 1997 during the development of the South Corridor Bridge Crossing Study, when Metro adopted a no-growth policy. This was cemented by the Tacoma Street road diet that was approved by Portland in 2001.

Nonetheless, the authors of the Sellwood Bridge EIS tried to spin the plan as a win for travelers when they wrote:

> "…[T]he Build alternatives would provide substantially increased person-throughput in the project corridor because the Build alternatives [including the option chosen by Multnomah County] could serve mass transit and dramatically increase pedestrian and bicycle trips."[30]

This prediction was simply wrong. Since the new bridge has become fully operational, total peak-hour vehicle (and passenger) throughput has dropped, bike and pedestrian mode shares have remained miniscule, transit service is only offered 15% of the time, and heavy trucks are prohibited.

The speed limit has also been lowered to 30 MPH. This was another bait-and-switch for drivers. The EIS stated that the "assumed design speed" for the Sellwood Bridge was 35 MPH.[31]

Perhaps the simplest way to judge the success of the new Sellwood Bridge is to compare the official "project need" statement adopted by the County's Policy Advisory Group in 2006 with the bridge that was built, and give each component a grade:

Official Project Need	Evaluation
Provide structural capacity to accommodate safely various vehicle types, including transit vehicles, trucks, and emergency vehicles; and to withstand moderate seismic events.	**Grade: A** The bridge was designed to safely accommodate various vehicle types and to withstand seismic events.
Provide a geometrically functional and safe roadway design.	**Grade: A**

Official Project Need	Evaluation
Provide for existing and future travel demands between origins and destinations served by the Sellwood Bridge.	**Grade: F** The bridge was deliberately underbuilt for both existing and forecasted travel demand.
Provide for connectivity, reliability, and operations of existing and future public transit.	**Grade:** **A for design, D for results** The bridge itself is adequate; but transit service on the bridge is far below the level of service that TriMet was offering in 2001.
Provide for improved freight mobility to and across the bridge.	**Grade:** **A for design, F for results** The bridge is capable of carrying heavy loads; the ban on trucks is a matter of politics.
Provide for improved pedestrian and bicycle connectivity, mobility and safety to and across the river in the corridor.	**Grade:** **A for design, D for results** The Bridge is luxurious for cyclists and pedestrians; but planners should have known that non-auto use would be minimal.

Money well-spent?

The new Sellwood Bridge is a wonderful engineering achievement that is much safer than the original, but in terms of its utility as a transportation facility, it does not compare well. The first Sellwood Bridge was built for $541,000 in 1925, or $7.74 million in today's dollars. Despite this bargain-basement price, it was a true multi-modal bridge that carried automobiles, heavy trucks, emergency service vehicles, transit buses, bicycles and pedestrians. In 1995 it was still carrying about 3,500 vehicles in the afternoon peak hour.

The new Sellwood Bridge cost 43 times more than the old bridge and is more than twice as wide, but it's not 43 times more useful. It moves fewer people per peak hour, is not open to trucks, offers minimal transit service, and traps motorists in levels of traffic that government planners knew all along would be "grossly unacceptable."

For $327 million, voters should have received a true multi-modal bridge with increased capacity for all modes of transportation.

It's not difficult to find better-performing bridges in Portland (Table 16). The Ross Island Bridge is narrower, yet carries more than double the number passenger-trips per hour because it is a four-lane bridge. Some of those are truck trips that should have gone to the Sellwood, if politicians had allowed it.

Sadly, the design decisions made for the Sellwood signaled a new era of no-growth road planning by Portland officials. The Tilikum Crossing, which opened in 2015, is far and away the least-useful bridge in Portland because it has such a large footprint yet accomplishes so little in the way of passenger or freight movement. It primarily serves as a monument to the hubris of Portland planners.

Problems with transportation planning in Portland

Metro planners knew in 1999 that all Willamette River bridge crossings from Portland to Oregon City would be oversubscribed by 2015, yet they refused to authorize more bridge capacity. Instead, they promoted the concept of reducing capacity on Tacoma Street and prohibiting any new bridge crossings for at least 20 years. They assured the public that future traffic problems could be mitigated through the Pixie Dust of Transportation Demand Management. Neither strategy worked.

This is simply a subset of a much bigger problem within the planning profession in Portland, namely an over-reliance on computer models and long-range forecasts. The flaw is serious enough that Metro's own Auditor has repeatedly criticized the practice, to no avail.

In a February 2010 audit entitled, **"Tracking Transportation Project Outcomes,"** the Auditor stated:

> "We found that Metro's processes to plan transportation projects in the region were linear when they should have been circular. After a plan was adopted, the update process began anew with little or no reflection about the effectiveness of the previous plan or the results of the performance measures they contained."

Elsewhere, it was noted, "Metro relied almost entirely on modeled data to estimate the impact of the regional transportation plan rather than on actual data."

In 2013, this topic was revisited in an audit entitled (again), **"Tracking Transportation Project Outcomes."** The conclusions were not surprising: "Recommendations made in a 2010 audit had not been implemented. The Planning Department was not organized or equipped to ***measure progress*** toward those outcomes" (emphasis added).

A December 2018 audit of the Portland Green Streets program by the City Auditor found that the Bureau of Environmental Service had no system in place to monitor results, despite promises going back a decade to do so.

These habits are continuing with the South Willamette

Table 16: Portland Willamette River Bridges Bi-directional passenger-trips at weekday peak hours 7:00 a.m. - 9:00 a.m.

Bridge Name	Width at mid-span	Total passenger-trips, bi-directionally	Ratio of passenger throughput to width
Ross Island*	52′	9,635	185.3
Hawthorne	72′	9,294	129.1
Steel	71′ + 8′	8,538	108.0
Morrison	86′	8,129	94.5
New Sellwood	64′	4,431	69.2
Burnside	86′	5,394	62.7
Broadway	70′	3,800	54.3
Tilikum**	75.5′	2,985	39.5

*Counts done in 2012, when TriMet bus routes 9 and 17 crossed the Ross Island. They were diverted to the Tilikum Crossing in 2015.
**Includes 817 passenger-trips from TriMet buses 9 and 17, which formerly ran on the Ross Island Bridge.
Bus passengers equal 27% of all passenger-trips at peak hours on the Tilikum.

River corridor. As far as elected officials are concerned, the new Sellwood Bridge was built, so it's time to move on. There has been little interest in learning from the experience. The City is now engaged in a new planning process called the River Plan/South Reach project, which will update the Willamette Greenway Plan of 1987. The geographic scope of the project runs from the Ross Island Bridge south to Dunthorpe, which includes the Sellwood Bridge-Tacoma Street corridor. According to promotional documents, the plan will establish a "renewed vision for the area, update existing policies and regulations, identify the implementation actions, and prioritize future investments for the South Reach of the Willamette."

Among other things, planners will identify fish and wildlife habitat, address river-based recreation and viewpoint opportunities, and develop an "urban design concept that establishes a vision for the area."

The planning process had its kickoff in the spring of 2018, and promises final adoption by the City Council in early 2020. In between, there will be the usual array of open houses, online surveys, advisory committees, and public hearings. Nowhere in the planning documents does it state a need for additional Willamette River bridge capacity. All emphasis is on additional facilities for pedestrians, cyclists, and recreational users of the river.

In fact, the only feasibility study underway for a new bridge in the South Reach is one co-sponsored by the Clackamas County Commission and Lake Oswego to examine a new bridge exclusively for cyclists and pedestrians connecting Oak Grove with Lake Oswego. Both jurisdictions have recently approved funding for preliminary engineering and public engagement.

In April 2019, PDOT announced that it will install speed bumps on six streets near the Sellwood Bridge to discourage cut-through traffic. There will be one speed bump per 200-foot block. Construction will begin during the summer of 2019, and the budget is estimated to be $100,000 or less.

Since peak-hour traffic near the bridge currently moves at glacial speed, it's unlikely that speed bumps will have any material effect on traffic travel patterns. If anything, they will simply move cut-through traffic from those six streets to other nearby streets. The fundamental imbalance between traffic demand and bridge supply will not be addressed, because policymakers won't allow it.

Recommendations for improving mobility in the South Willamette River Corridor

Metro should begin planning for at least one new motor vehicle river crossing south of the Sellwood Bridge. The TMSP indicated that 23% of the Sellwood Bridge trips originated from or were destined to the West Linn, Lake Oswego and Milwaukie areas.[32] If that is still true, it justifies at least one new bridge connecting the Lake Oswego region with Milwaukie (possibly an extension of HW 224) or Oak Grove.

It need not and probably shouldn't be a mega-bridge. A simple two-lane bridge with modest bike lanes and sidewalks would move a large volume of freight and passengers without overwhelming adjacent neighborhoods. This would immediately solve most congestion problems on Tacoma Street and the Sellwood Bridge.

The City of Portland should consider reversing the Tacoma Street road diet. Although many individuals and

organizations celebrated the TMSP as a great step forward for neighborhood livability, it was a Pyrrhic victory. The "Berlin Wall" of traffic hasn't abated. Neighborhood cut-through traffic has become worse. The peak hours of congestion have expanded and will continue to grow because motor vehicles have nowhere else to go. And the most significant adverse consequences of congestion – increased noise, air pollution, and threats to pedestrians – are borne almost entirely by local residents, not commuters.

The only real solution is more bridge capacity elsewhere. In the meantime, the Sellwood neighborhood might be better served by reversing the TMSP, increasing the speed limit on Tacoma Street to 30 MPH, and working with Multnomah County to create a third, reversible lane on the Sellwood Bridge to improve the flow of traffic.

Many local residents obviously would oppose this, but they may also have unrealistic expectations about the role Tacoma Street needs to play in regional mobility. Many pedestrian-friendly town centers have four-lane arterials, because they are necessary. For instance, Orenco Station in Hillsboro has been heavily promoted by both Metro and TriMet, and is one of the most famous Transit-Oriented Developments (TODs) in the entire country. Yet the main thoroughfare, Cornell Road, has four through lanes and a 40 MPH speed limit as it bisects Orenco Station Parkway.

TriMet should restore transit service to the Sellwood Bridge. This should be an easy fix given that the new transportation tax authorized in HB 2017 last year will increase general fund revenues for TriMet by an estimated $35 million - $55 million per year, and that money must be spent on improved bus service. If planners are serious about increasing the transit share of travel on the Sellwood, they should restore all-day service and some level of weekend service.

State legislators should reverse the 2009 decision that keeps heavy trucks off the Sellwood Bridge. It should be embarrassing to Portland civic leaders that the two newest Willamette River Bridges – the Sellwood and the Tilikum Crossing – prohibit truck traffic, even though virtually every consumer product sold in a Portland store arrives by truck.

Since the new Sellwood Bridge was built to handle heavy loads, the County should open negotiations with trucking interests and other affected parties with the goal of "getting to yes" on restoring truck traffic on the bridge. The Sellwood Bridge cannot be considered a multi-modal success story if trucks are forced to re-route to the Ross Island Bridge.

Portland should put a halt to future "road diet" projects unless average daily traffic per lane is exceptionally low. A road diet can make sense if an arterial is over-built for the traffic it carries. However, that was clearly not the case with Tacoma Street, and it's not the case with road diets currently being implemented on Foster Road and Naito Parkway. All three projects have been promoted on ideological grounds, namely, to enhance Portland's reputation as a "green city" where automobile use is discouraged.

But those are just the warm-up acts. In September 2018, the Portland City Council approved a $73 million "Central City in Motion" plan that would remove travel lane capacity and parking spaces on 18 key thoroughfares. Although this is likely to become the "Central City Slow Motion" plan due to increased congestion, Portland planners are using their computerized graphics to sell the vision of improving traffic flow through road diets. The city's colorful displays indicate that the "capacity" for moving people on a given right-of-way is higher with a road diet because more people can move by foot or bike per unit of road space when compared with motor vehicles.

This is likely to be another forecasting fiasco. The mere fact that increased road "capacity" is set aside for alternative modes is not the same as having people actually use that capacity for walking, cycling, or skateboarding.

Accepting responsibility for past decisions

The first step towards improving mobility in the Sellwood Bridge corridor is for Portland transportation planners to admit that placing a moratorium 20 years ago on new road capacity was a mistake. Unfortunately, public officials don't seem interested in that conversation. In the process of writing this paper, we contacted more than a dozen regional leaders who were associated with the South Willamette River Crossing Study of 1999 or the Sellwood Bridge replacement project. The names included Sen. Rod Monroe, who was Metro Presiding Officer in 1999; Portland Mayor Ted Wheeler, who was Multnomah County Chair when the Sellwood Bridge replacement plan was being approved; Deborah Kafoury, current Multnomah County Chair; and State Rep. Susan McLain, who was Deputy Presiding Officer of Metro in 1999.

We also contacted new Metro President Lynn Peterson, who was a Metro traffic modeler on the South Willamette River Crossing Study; and Martha Bennett, who represented the City of Milwaukie on the SWRCS project management group and is now the Chief Operating Officer at Metro.

We asked them to reflect on the 1999 decision to prohibit any new motor vehicle capacity in the South corridor and to offer opinions about what should be done going forward. None of them responded.

The one person who did consent to an interview, a former planning supervisor at Metro, was unapologetic. He defended the Tacoma Street road diet on the grounds that "most of the travel benefits of Tacoma Street go to Clackamas County commuters, while local residents bear the burdens. There is no reason for Tacoma to be four lanes."

When asked whether Metro should initiate a new study to identify a site for another Willamette River bridge, he said, "We did that in the 1990s and people opposed it. If residents don't want it, then we shouldn't build another bridge."

If this reflects the prevailing view of Metro's role in planning, then there is no point in having Metro. The agency was formed to do things for the region that local governments would not or could not do for political reasons. If Metro is now unwilling to lead regional initiatives, the agency should be disbanded.

But that's not what local planners believe. They are happy to use Metro's vast regulatory powers to impose regional priorities on local neighborhoods, as long as the project does not benefit motorists. The track record on that point is very clear.

Over the past 30 years, Metro has successfully advocated for many controversial projects including a subsidized hotel for the Convention Center, a regional greenspaces program, a stringent Urban Growth Boundary, a regional rail transit program, the Portland Streetcar, the transit-oriented development program, and now a low-income housing construction program.

Nonetheless, we are still limited to just two bridges over the Columbia River from Portland to Vancouver. No new highways have been built since I-205 opened. Washington County residents still have to travel through downtown Portland just to get to Washington State. And the official growth management strategy for the region, the Metro 2040 Plan, guarantees that traffic congestion will get much worse between now and 2040.

The voting public gave regional planners everything they wanted on the new Sellwood Bridge, on the promise that multi-modal design would change travel behavior. It hasn't happened. The first order of business for new Metro President Lynn Peterson should be a serious re-set of the Metro planning assumptions.

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Notwithstanding the assistance from those named above, I am solely responsible for any flaws in the paper.

John A. Charles, Jr.
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ENDNOTES

1. South/North Transit Corridor Study, Major Investment Final Report, Metro, November 1995.

2. Dan Burden and Peter Lagerwey, "Road Diets: Fixing the Big Roads," Walkable Communities, 1999; www.walkable.org/download/rdiets.pdf.

3. City of Portland, Office of Transportation, "Tacoma Street Main Street Plan," Appendix C-11, 2001.

4. Tacoma Main Street Plan, Portland Office of Transportation, Streetscape Alternative Evaluation, 16.

5. TMSP, Appendix C-24.

6. TMSP, i.

7. Prior to the Orange Line construction, McLoughlin Boulevard was served by the #33 Bus (a local) and the #99E, which provided express service to downtown Portland via the Hawthorne Bridge. After the MAX line opened, the #33 was canceled, the new local service was provided by MAX, and the 99 stopped running as an express route. Today it is a local bus serving McLoughlin Boulevard and crossing the Sellwood Bridge to reach Portland.

8. "Regional Travel Options Strategy," Metro, May 2018, 1.

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10. David Evans and Associates, "Sellwood Bridge Evaluation and Repair Study: Executive Summary," October 2005.

11. Alta Transportation Consulting et al, Appendix A, 14, TMSP.

12. Sellwood Bridge EIS, 3-13.

13. George Passadore, TriMet Board President, testimony before the Senate Revenue Committee on SB 549, March 11, 2003, 1.

14. TriMet, *CRC August 2011* New Starts Submittal, Table 1.

15. Final Technical Report, Sellwood Bridge EIS, October 2008, ES-9.

16. Sellwood Bridge EIS, 3-27.

17. Sellwood Bridge EIS, Table 3.2-3, 3-38.

18. Bicycle Transportation Alliance blog, July 12, 2012.

19. *The Oregonian*, "A bridge too wide in Sellwood?", Steve Duin, November 17, 2012, http://www.oregonlive.com/news/oregonian/steve_duin/index.ssf/2012/11/steve_duin_a_bridge_too_wide_i.html.

20. Email communication from Mike Pullen, Multnomah County, May 23, 2018.

21. By 2017 the political acceptance of tolling had changed dramatically. The Oregon Legislature not only authorized tolling but mandated it on parts or all of I-205 and the Portland segment of I-5.

22. TMSP, Appendix C, 7.

23. Sellwood Bridge FEIS, 812.

24. 1994 counts from the TMSP, 2001, 11; 2001 counts TMSP, average of two reported values in Appendices A and C; 2008 counts, SW Bridge Final Technical Transportation Report, 13; 2010 counts from the Sellwood Bridge EIS; counts for 2017 and 2018 collected by Cascade Policy Institute, average of two peak-hour counts for each event.

25. 2001 counts from TMSP, Appendix A, 8; 2008 from Sellwood Bridge Final Technical Transportation Report, ES-3; 2013 from PBOT, presentation to SMILE, August 2017; 2016-2018 from Cascade Policy Institute field counts, average of two peak hours.

26. Selwood Bridge EIS, 3-246.

27. Portland Bureau of Transportation, October 7, 2014; https://www.portlandoregon.gov/transportation/article/505257.

28. Sellwood Bridge FEIS, 3-13.

29. Sellwood Bridge EIS, 4-26.

30. Sellwood Bridge FEIS, 3-12.

31. Id., 3-14.

32. TMSP, Appendix A, 2.