

Policy Insight

Punishing North Portland, commuters & taxpayers:

**The hidden costs of the proposed
Interstate Avenue light rail line**

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Executive Summary

In March, 1999, a group of Portland business leaders proposed to build a 5.5 mile extension of the Portland, Oregon light rail system from the Rose Garden to the Exposition Center in North Portland. Several public agencies in the region are considering the \$350 million project: Tri-Met, Metro, and the City of Portland. This report analyzes the proposal's cost projections, ridership projections, and environmental impacts.

More than two-thirds of the projected riders of the North Portland light rail line are riders who are being diverted from a bus to a train. They would continue to use the Tri-Met bus system if this project is not built. For this reason, the author has focused on the cost of producing an additional transit passenger trip.

Assuming ridership reaches forecast levels, the North Portland light rail project is estimated to cost approximately \$31 per additional transit passenger trip, or \$62 per round trip. Ignoring costs borne by federal taxpayers reduces the cost per trip to \$13.45 per trip, or \$26.90 per round trip. By comparison, the average cost of a bus transit trip in North Portland is only \$1.61 per passenger boarding.

The proposed North Portland rail line would run up Interstate Avenue and eliminate two lanes of this main transit artery. Traffic congestion in North Portland neighborhoods and the I-5 corridor will increase both during the construction and after the light rail line is built, thereby casting doubt on the purported environmental and travel benefits.

I. Introduction

The transit agency in the Portland area, Tri-Met, currently operates an east-west light

rail line from Gresham to Hillsboro, Oregon. In November 1998, local residents rejected a ballot measure that would have borrowed up to \$475 million in bonds backed by local property taxes to build a south-north light rail line from Clackamas County to North Portland. The entire line would have cost \$1.2 billion.

In response to this initiative and the negative election results, Tri-Met developed a proposal for the North Portland line that would be shorter, cost less money and require no property tax bonds or voter referendum. The scaled-down proposal would extend the Portland, Oregon light rail system (known as MAX) from the Rose Garden to the Exposition Center. This line would go up Interstate Avenue and eliminate two of its four lanes.

The official cost estimate for the project is \$350 million, including \$79 million for engineering and administration; \$70 million for 17 light-rail vehicles, \$46 million for street reconstruction, and \$39 million for structures.¹

This \$350 million estimate, however, excludes a number of costs integral to the project: trains, contingency funds, land acquisition and right of way. Only partial estimates for these hidden and missing costs are available, so this analysis uses the \$350 million figure. This report will also focus primarily on estimates involving expenses paid by local taxpayers.

II. Ridership and cost

A. Calculating average cost per trip

In 2015 average weekday ridership on the line is projected at 14,100 rides per day, with no change in weekend ridership.² However, rail customers are often former bus customers and rail trips usually involve multiple

boarding rides, so the net increase in trips is actually much smaller. Tri-Met found that 56% of the riders on the Eastside MAX line were formerly bus riders who moved to the new rail line.³

Traffic congestion in North Portland neighborhoods and the I-5 corridor will increase both during the construction and after the light rail line is built.

The Supplemental Draft Environmental Impact Statement (SDEIS) does not appear to state an annual ridership figure. The figure can be estimated by multiplying weekday ridership by 312 equivalent days per year to identify an annual ridership. This assumes weekend ridership is 50% of weekday ridership, a figure which holds for the Tri-Met system as a whole. During discussion about ridership projections, Tri-Met used a 12% higher figure to reflect weekend airport demand. However, given many projected riders are diverted bus commuters, the more conservative calculation generates annual North Portland light rail ridership of 4.34 million rides per year, a more appropriate number. Because two-thirds of the projected ridership would occur anyway, the net increase in transit trips is only 1.4 million additional trips per year.

There are two components of costs: operating and maintenance (O&M), and capital costs. Tri-Met estimates the net increase in operating and maintenance costs of North Portland light rail as \$6.8 million/year.⁴ That's \$6.9 million for the light rail portion, less \$100,000 for reduced bus operations. This figure reflects (but may understate) the canceling of bus lines, as Tri-Met has done with Eastside MAX and Westside MAX.

Assuming ridership reaches forecast levels, the North Portland light rail project is estimated to cost approximately \$31 per additional transit passenger trip, or \$62 per round trip.

While the average operating cost per trip for North Portland light rail is \$1.76 (\$6.8 million/4.34 million rides per year), the increase in operating costs per net additional transit trip is \$4.86 per trip (\$6.8 million/1.4 million additional trips per year). That's an extremely high cost given that all of the bus routes in North and Northeast Portland currently cost only \$1.22 in operating cost per boarding. And when low operating cost is supposed to be light rail's big selling point, this increase seems surprising. In the best transit market in the region, we are considering the highest cost method of delivering new service.

Capital cost calculations are more complicated, given the problem of discounting and factoring in federal dollars. Here are three ways to approach this calculation.

1. Average local and federal cost

Begin with a 20-year amortization period at an 8% borrowing rate for the \$350 million price tag. This isn't the full cost because the opportunity cost of Interstate Avenue's inside traffic lane and other capital costs are not included, but it's the number in the SDEIS.⁵ The amount needed to support such bonds is \$35.70 million per year, or \$8.23 in capital cost per ride, for a total of \$9.99 per boarding ride (including operating cost). By comparison, Tri-Met reports operating cost per boarding ride for its North Portland buses at \$1.22 per boarding ride, with 39 cents in capital costs, or only \$1.61 total.

2. Average local cost

Assuming that the federal tax portion is entirely free to local taxpayers, the local share of capital costs falls from \$350 million to \$110 million. On an annual basis, this translates into \$11.22 million per year. Adding in operating costs and capital costs, North Portland light rail's average cost is \$4.35 per ride. Again, this is more than double the average cost of North Portland buses. Of course, bus purchases are also subsidized by the federal government, so the bus cost estimate is somewhat lower than stated.

3. Marginal cost

According to Metro's own analysis, more than two-thirds of the North Portland light rail line's ridership will be diverted passen-

Average cost per boarding ride Light rail versus bus*			Figure 1
	Operating Cost	Capital Cost	Total Cost
North Portland LRT — Total Costs	\$1.76	\$8.23	\$9.99
North Portland LRT — Local Costs Only	1.76	2.59	4.35
North Portland Buses	1.22	0.39	1.61

*20-year amortization at 8% interest, ridership estimates in year 2015

gers from the existing bus system. Therefore, the cost of attracting an additional passenger to the transit system, the marginal cost, is much higher than the average cost.

Factoring in all the costs of the project, including federally-paid expenses, the marginal cost of a single additional transit trip is \$30.93. Looking only at local capital costs, and assuming that the opportunity cost of capital is only the local tax-exempt borrowing rate of 6%, then the net transit trip figure falls to \$13.45 per trip.

Thus, using conservative assumptions, and ignoring federal taxpayer costs, the combined operating and capital costs come to \$13.45 per trip, or \$26.90 per daily round trip, challenging the assertion that this project has a bare bones budget. Surely, there are better ways to boost transit ridership, improve pollution, and support the North and Northeast Portland community.⁶

In the next two sections I will discuss some assumptions in this analysis.

B. The amortization assumption

In Section A, the annual payment required to retire a 20-year bond was used because of

the generally-accepted principle that government borrowing for a bond issue should not exceed the useful life of the project. After twenty years, Tri-Met will face substantial costs to replace cars and make other capital improvements.

Using longer term bonds to finance a project would reduce the annual carrying cost, but it does not cause trains or track to last longer or depreciate less. Tri-Met has already set 25 years as the optimal replacement period for its existing light rail trains and uses more rapid replacement schedules for other capital items associated with light rail.⁷

C. Taxable and tax-exempt borrowing rates

This analysis uses a borrowing rate that is high for tax-exempt, government rates, but low for a taxable, private rate. There are several good reasons for considering taxable interest rates.

First, public investment displaces private investment, so the true opportunity cost is the rate of return on private investment. Second, all local residents are federal taxpayers, so they pay part of the federal and state income tax portion of the project. Finally, this

Marginal cost per additional transit trip*			Figure 2
	Operating Cost	Capital Cost	Total Cost
North Portland LRT — Total Costs	\$5.44	\$25.49	\$30.93
North Portland LRT — Local Costs Only	5.44	8.01	13.45

*20-year amortization at 8% interest for total cost estimate, 6% for local cost estimate; ridership estimates in year 2015

project will be reviewed by the Federal Transit Administration. Current practice within the federal government requires applying a 10% discount rate to evaluate future and current costs and benefits.⁸

III. Ridership estimates

There are reasons to be skeptical about Metro's assumptions in its report. The SDEIS reports inconsistent numbers with respect to capital costs and ridership assumptions. The ridership forecast is based upon 24 trains in operation, but capital costs assume only 17 trains will be purchased. See Section IV, Part C, Hidden Vehicle Costs.

Because the opening year train purchase is significantly less than the number of trains needed by 2015, all the advertised headway estimates for the line are misleading. The SDEIS claims a service rate of 8 trains per hour to downtown or a train every 7.5 minutes.⁹ By comparison, bus lines like the 14-Hawthorne actually run more often than one every 7.5 minutes. However, because only 17 trains will be bought, rather than 24 trains, the number of trains per hour falls from 8 trains to 5.7 trains, which will come every 10.6 minutes.

So, the plan for North Portland calls for four years of construction and increased traffic congestion on Interstate 5 and all the major arterial roads in North Portland. When it's all over, train service in 2004 would not even be an improvement on bus service already in place.

IV. Pollution and congestion impacts

A. Pollution

The SDEIS claims a reduction in vehicle miles of travel (VMT) will reduce pollution.

The report offers no evidence of this except to allege that system-wide transit ridership will increase 1.4%.¹⁰ Further, according to the report, traffic levels in North Portland would increase on every major arterial. Local environmental conditions would actually get worse for the average resident of North Portland.

B. Automobile congestion

Traffic would worsen on parallel streets in North Portland neighborhoods and on I-5. Interstate 5 highway traffic would increase 1% compared to the No Build option.¹¹ The most affected streets in North Portland are Denver (+58%), Albina (+33%), Greeley (+25%), Vancouver (+9%), and Martin Luther King Boulevard (+2%). The only improvement is Interstate Avenue (-50%), but that comes from the elimination of two of its four lanes.

C. Train congestion

The SDEIS suggests that the downtown MAX line will become a branched line with service either going to Gresham or the Expo Center, and possibly also to the Airport.¹² The report describes rush hour train frequency rising from 11 trains per hour (5.45 minute headways, or time between trains) to 19 trains per hour (3.15 minutes) and possibly to 23 trains per hour (2.61 minutes), should through route service on Airport MAX be implemented.

This may be impossible: Tri-Met has never successfully operated more than 10 trains per hour.

When Tri-Met tried to operate 12 trains per hour (5 minute headways) during the Interstate 5 Bridge closure, delays occurred in the downtown portion of the MAX line. Due to short blocks, traffic signal patterns, dwell times, loading times, and handicapped pas-

Tri-Met has never successfully operated more than 10 trains per hour.

sengers, Tri-Met's goal of 12 trains per hour could not be consistently achieved.

Suppose Tri-Met cuts train frequency on the Banfield MAX line to Gresham. With cuts, riders on this line would experience deterioration of service, which would lead to deterioration of ridership. Yet, Tri-Met officials have assured residents in East Portland and Gresham that their service will not be reduced. Another possibility is that Tri-Met will spend more than described in the SDEIS to build a new downtown distribution system. Whatever adjustment has to be made, this error in logistics is an extreme form of the ridership forecast problem.

V. Hidden costs

There are a number of critical issues of cost and distribution of burdens that cannot be answered without further data and investigation. The size of these hidden or understated costs is sufficient to raise serious questions about the adequacy and accuracy of the SDEIS.

A. Contingency fund vagaries

To protect local taxpayers, the 1998 South-North light rail project (and others before it) routinely included an 11-12% contingency for each of the capital cost items in the project. For South-North as a whole, contingency allowance was \$100 million. For the Eliot and North Portland segments of the project, the contingency allocation was 12% of the capital costs.¹³

In the North Portland SDEIS, the specific line item for a contingency fund has been eliminated.¹⁴ This line has been replaced, according to Metro's *Final Environmental Impact Statement* (FEIS), by factoring contingencies of between "5 - 25%" into each line item expenditure.¹⁵ Though an improvement over the previous single line item method, we cannot gauge the accuracy of Metro's estimates for cost overruns without

The SDEIS reports inconsistent numbers with respect to capital costs and ridership assumptions. The ridership forecast is based upon 24 trains in operation, but capital costs assume only 17 trains will be purchased.

a breakdown of the projected contingency amounts for each individual line item. For a project with \$350 million in capital expenditures, which voters have not approved, the public would be better served to have more detailed contingency information.

B. Hidden station costs

The North Portland light rail project purports to save running time and capital costs by reducing the proposed number of stations in the North Portland and Eliot segments of the line from 11 to 10. However, the project has a much greater than proportional reduction in station costs. In the DEIS for the South-North project, station cost estimates in the North Portland and Eliot segments were \$5.8 million, or \$527,000 per station in 1994 dollars.¹⁶ Using the same 1994 dollars, stations in the North Portland light rail SDEIS cost \$3.5 million or \$350,000 per station.¹⁷ The FEIS explains this difference by noting that the Convention Center Station will not need as much reconstruction with the North Portland rail line as the voter-rejected South-North light rail line would have required. However, the FEIS states, “Station designs are still being developed in response to community input and costs per station are likely to rise.”¹⁸

C. Hidden vehicle costs

The official \$350 million price tag for the North Portland light rail project relies on an estimate in the South-North DEIS of \$223.4 million in 1994 dollars. Since construction of the North Portland light rail project would occur in 2000-2004, it is appropriate to make all cost calculations in year-of-expenditure dollars, which are 57% higher due to inflation and finance costs. One of the largest cost items of the project are the trains themselves. The cost of those trains is severely underestimated.

First, Table 2.4-1 of the SDEIS lists individual components of the capital costs,¹⁹ including \$44.8 million for light rail vehicles and \$8.8 million for operating and maintenance facilities. These figures are in 1994 dollars, so the year-of-expenditure dollars for those cost components are more accurately described as \$70.2 million for vehicles and \$13.8 million for O&M facilities. Second, footnote 2 of this table says, “Transit vehicles and O&M facility are sized for opening year network.”²⁰

This is important. Compare that information to Table 2.3-1, which describes ridership and service characteristics. Footnote 2 of Table 2.3-1 says, “2015 operating plan would require 24 LRV [light rail vehicles]. Opening year service would require 17 LRVs.”²¹

In other words, the \$70.2 million would only buy some of the vehicles needed to achieve the ridership claims of 4,500 additional trips per weekday. Therefore, the true cost of acquiring 24 vehicles (upon which all the ridership numbers are based) is really \$99.1 million. And absent additional information, it is possible that the operating and maintenance facility costs of the extra vehicles will be proportionately higher as well: \$19.5 million instead of \$13.8 million.

“Station designs are still being developed in response to community input and costs per station are likely to rise.”

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Hence, all the cost per trip calculations that are previously estimated in this analysis are missing about \$34.4 million in expenses. Initially one might say that given the \$350 million price tag, that means we should inflate this author’s previous estimate by 10%. However, by not putting these costs in the SDEIS, the federal government will not pick up its usual share of the cost of these additional 7 trains. Therefore, the local share of per trip costs will rise by more than 10%. If local taxpayers bear the entire expense, local capital costs would rise by 30%.

Estimating capital costs of a low-service rail line with ridership of a high-service rail line in the same environmental impact statement is deceptive. It suggests that one of the compromises needed to make this project appear affordable was to limit the level of service in the first decade of its operation to a level

below that advertised. Tri-Met needs to increase its stated project cost by at least \$34.4 million.

D. Hidden park and ride costs

In the 1998 South-North DEIS, park and ride lots were planned for the north and south termini of the light rail lines, including a 3,500 space lot in Vancouver costing \$35.1 million.²² However, with the North Portland light rail project, no money was allocated for park and ride lots, either in the Kenton neighborhood or at the Exposition Center.²³ Instead, an existing parking lot of 500 spaces at the Exposition Center would become a shared park and ride facility. The need to build a parking lot has been left out of the SDEIS, and this would cost somewhere between zero dollars and \$35.1 million.

E. Hidden right-of-way costs

Tri-Met and Metro have not included the cost of the right of way on Interstate Avenue the MAX line would occupy. Interstate Avenue would be reduced from 4 lanes to 2 lanes, creating spillover traffic on numerous parallel routes in North Portland. In the DEIS, the total allocation for right-of-way capital costs is \$3.6 million.²⁴ The cost of widening existing arterial roads to compensate for this loss of road space would be an appropriate amount to add to the total cost of the project, which certainly would be much more than \$3.6 million.

VI. Tri-Met’s weakened financing position

A. Exaggerated revenue forecasts

A troubling assumption in the SDEIS comes in the financing section. The report discusses whether Tri-Met can afford to operate the train system they are purchasing. After discussing how much money would be put forward by Tri-Met, the City of Portland, and Metro, the report makes a simple statement:

“System revenues are based on the assumptions similar to those described in the South/North Corridor DEIS. The key assumption is that payroll tax revenue growth will average 7.2 percent beginning in FY 2003.”²⁵

First, that statement is misleading. The South/North DEIS assumed that the original payroll tax would increase 6.8% per year.²⁶ The financial assumptions in the North Portland SDEIS are even rosier than the previous study.

Second, payroll tax revenue growth comes either from expansions in the employment base or growth in wages. The SDEIS assumes the current economic expansion will last for 15 more years. Yet, payroll tax revenue declined and transit service cutbacks occurred during the 1980's. In a revealing comment, the report states:

While a system revenue shortfall is not projected by the year 2015, conditions could change. Given that reasonable levels of beginning working capital are projected to exist, it is very likely that any deficit would be of a magnitude that could be met by standard management techniques, such as adjusting fares or altering the rate of service increases.²⁷

When tough choices have to be made, Tri-Met will certainly view the light rail line as "too big to fail" and neighborhood bus service will be cut.

Though this statement may reassure New York bondholders and officials in Washington, D.C., that Tri-Met's indebtedness from the North Portland light rail project could eventually be paid off, to ordinary passengers the phrase "standard management techniques" means unexpected fare increases and reductions in service. When tough choices have to be made, Tri-Met will certainly view the light rail line as "too big to fail" and neighborhood bus service will be cut.

B. Abandoning the operating

capital target

The Financial Analysis of the 1998 South-North DEIS illustrates how Tri-Met would fund its capital investment through the year 2015 and announced an official target of having 3 months of operating capital on hand.²⁸ With the North Portland proposal, the amount of operating capital falls below Tri-Met's three month target in six fiscal years (2004-2009) just as the North Portland light rail project begins operations. This suggests that the project is being under-financed.

To build up capital funds to their target level, Tri-Met would have to borrow more and seek additional taxpayer support. Thus, by minimizing the financing costs of the North Portland project, Tri-Met has allowed its financial target of three months of operating capital to slip. This gives further evidence that Tri-Met's long term financial health is being endangered by the North Portland light rail project.

VII. Conclusions

Building the North Portland light rail extension is a waste of resources that the Portland region cannot afford. Taxpayer resources could be used for better alternatives. With Tri-Met's \$50 million contribution alone, bus service on the entire system could be expanded by 25%. By comparison, the North Portland light rail project offers only a 1.4% ridership increase.²⁹ Before deciding whether to subsidize light rail trips at \$31 each, we must consider whether reducing bus service for inner-city passengers is an acceptable outcome.

This region is in danger of believing its own public relations. In national publications, local government officials (correctly) promote our scenery, our commitment to environmental protection, and our quality of life. In return, we get a lot of national attention for our farmland preservation policies and our transit system. But we have to live with the system we build, and we should choose a system that is efficient, affordable, and realistic.

Recall the infamous Russian noble, Grigori Potemkin, who sought to impress an Em-press by building fake villages along the

route she traveled. The buildings looked charming and prosperous, but didn't function. From this ploy comes the term "Potemkin villages."

In Portland, we are building Potemkin transit. It's new, it looks pretty, but it's very costly to build and operate, and may not function as advertised.

If we keep taking resources away from our inner city buses, which get faithful ridership at low operating cost, what kind of transit system will remain? Will we become like Los Angeles, where bus riders and the NAACP sued under civil rights laws to stop their transit agency's unrealistic rail construction projects and to stop the diversion of revenue from the bus system?

Portland's best course of action is to stop the diversion of mass transit money from buses to light rail. To increase mobility and access, we must focus on developing a truly balanced transportation system that maintains our bus service, removes property tax subsidies for road construction, and opens up transit markets for taxis and van shuttles.

About the author

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Endnotes

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2. *Ibid.*, p.16.
3. Jonathan Richmond, *New Rail Transit Investments: A Review*, Cambridge: Taubman Center for State and Local Government, Harvard University, June 29, 1998, p. 34.
4. SDEIS, p.43.
5. *Ibid.*, p. 41.
6. For alternatives to light rail, see Anthony M. Rufolo and John A. Charles,

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9. SDEIS p. 17.

10. *Ibid.*, p. 28.

11. *Ibid.*, p. 21.

12. *Ibid.*, pp. 17-18.

13. Metro, *South/North Corridor Project. Draft Environmental Impact Statement* (DEIS), Portland, OR, February 1998, p. 2-46.

14. SDEIS, p. 11.

15. Metro, *South/North Corridor Project. Final Environmental Impact Statement* (FEIS), Portland, OR, October 1999, p. 6-20.

16. DEIS, p. 2-46.

17. SDEIS, p. 11.

18. FEIS, p. 6-20.

19. SDEIS, p. 11.

20. *Ibid.*

21. *Ibid.*, p. 9.

22. DEIS, p. 2-46, p. 4-45.

23. SDEIS, p. 11.

24. *Ibid.*

25. *Ibid.*, p. 44.

26. DEIS, p. 7-10.

27. SDEIS, p. 44.

28. DEIS, p. 7-9.

29. SDEIS, p. 28.

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