



Date: March 21, 2023

To: Shailen Bhatt, Administrator
Federal Highway Administration
US Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Cc: Keith Lynch, Division Administrator
Federal Highway Administration
530 Center Street NE, Suite 420
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From: Joe Cortright, No More Freeways

RE: I-205 INFRA Grant: Benefit Cost Errors

No More Freeways is writing to ask that Federal Highway Administration (FHWA) take no further action to advance the proposed I-205 Freeway widening project until it has made the necessary determination, as provided in its own regulations, that funding for the project is effective, as indicated by a valid benefit-cost analysis.

The Oregon Department of Transportation (ODOT) has submitted an application to the FHWA requesting \$125 million in federal funds for the I-205 freeway widening project in Clackamas County just south of Portland, Oregon.

As you know, federal law requires that FHWA determine that any project receiving funds under the INFRA law must demonstrate cost-effectiveness. As the federal statute creating INFRA ([23 U.S.C. 117](#) (g) (2) provides:

(g) Project Requirements.-The Secretary may select a project described under this section (other than subsection (e)) for funding under this section only if the Secretary determines that-

...

(2) the project will be cost effective,

The Oregon Department of Transportation has submitted a Benefit-Cost Analysis purporting to show that the proposed project is cost-effective.



No More Freeways has prepared a detailed evaluation of the ODOT Benefit Cost Analysis. This evaluation shows that the material submitted by ODOT has replete with errors, and does not comply with USDOT guidance for the preparation of such studies.

A correct evaluation of this project shows that its costs exceed its benefits by a wide margin. What this means is that the proposed freeway widening is not cost-effective; not only is it not something that qualifies for federal funding, it also is a demonstrably wasteful, value-destroying expenditure of public funds. The amount of money that the federal government, the State of Oregon, and highway users would pay in tolls, exceeds by a factor of seven the actual economic benefits that would accrue to a subset of highway users. This is a project that would make us worse off economically--exactly the kind of project that the cost-effectiveness standard is established to prevent.

City Observatory's analysis of the ODOT Benefit-Cost Study shows that it is riddled with errors and unsubstantiated claims. It dramatically understates the actual cost of the project, both by mis-stating initial capital costs, and by entirely omitting operation and maintenance and periodic capital costs. In addition, the study also omits the toll charges paid by road users from its definition of project costs, in clear violation of federal benefit-cost guidelines. In addition, the ODOT study dramatically inflates estimated benefits. It uses an incorrect occupancy estimate to inflate the number of travelers benefiting from the project. It offers, without substantiation, claims that the improved reliability and congestion cost savings, over and above time savings. The ODOT analysis also presents inflated estimates of safety benefits, based an incomplete and un-documented crash analysis, amplified by a large math error in its calculations. In addition, ODOT's study fails to separately present the benefits and costs of the project's tolling and lane expansion components, and omits an analysis of the distribution of benefits and costs among different demographic groups.

Benefits are overstated

ODOT claims that the present value of benefits from the I-205 project amount to \$566 million; nearly all of these benefits are attributed to travel time savings, congestion cost reductions and improved reliability, and reduced crash losses. ODOT's estimates of both travel related savings and crash reductions lack documentation, and are plagued by math errors.

Travel Benefits: ODOT claims that the project will save travelers 2 to 8 minutes per trip during peak hours. It computes the value of these time savings, and then adds to them an undocumented estimate that traveling during congestion adds 12 to 31 cents per mile to motorist costs. It also asserts (without documentation) that improved reliability of travel creates an additional benefit roughly equal to travel time and congestion reduction savings.

- ODOT's estimates are plagued with errors and a lack of documentation



- The estimates use the wrong value for peak hour vehicle occupancy, exaggerating peak travelers by 13 percent.
- There is no documentation to support a claim that travelers save 12 to 31 cents per mile—in addition to travel time savings—due to lessened congestion.
- There is no documentation to support a claim that travelers value improved reliability—over and above travel time savings—in the amount equal to travel time savings.
- A corrected estimate of the value of travel time savings would reduce these benefits to a present value of about \$121 million, rather than then \$380 million claimed by ODOT.

Safety Benefits: ODOT claims that the project will reduce crashes on I-205 and will produce benefits with a present value of approximately \$150 million. ODOT asserts that it has used the ISATe model to predict a 21 percent decline in crashes on I-205 as part of the project. But its spreadsheet calculates the value of a 79 percent decline in crashes. Also, it has not documented what features of the project produce the supposed ISATe benefits, and it has failed to calibrate the ISATe model for I-205, and the ISATe methodology can't be used to accurately compute crash reduction on highways with ramp-metering, which I-205 has. ODOT's analysis also fails to estimate the value of increased crashes on other roadways due to traffic diversion, which may be as large, or larger than reductions on I-205. Finally, ODOT's estimate of the value of crash savings is more than 30 times larger than a similar estimate prepared by its contractor (WSP), which it cites as the source of its crash reduction estimates.

Corrected Benefit Estimates (Millions)

<u>BENEFITS</u>	<u>ODOT Claimed</u>	<u>Corrected</u>
Travel Time Savings	\$139.0*	\$120.9
"Congestion Reduction Benefit"	\$47.8	0.0
Reliability Savings	\$190.0	0.0
Safety	\$150.0	\$4.3
<u>All Other</u>	<u>\$48.9</u>	<u>\$48.9</u>
Total Benefits	\$575.7*	\$174.1

* - These figures are corrected for ODOT math errors.



Costs are understated

ODOT claims that the present value of the initial capital costs of this project are \$224 million. That is a significant understatement. The project's construction cost, according to other ODOT documents is \$300 million (present value). The ODOT study omits the costs of capital construction for tolling (\$117 million), operating and maintenance costs of the project (\$300 million), and periodic capital costs (\$67 million). At a minimum, ODOT will spend almost \$800 million on this project.

Alternative Corrected Cost Estimates ("Uses" Basis)(Millions)

<u>Use</u>	<u>ODOT Claimed</u>	<u>Corrected</u>
Bridge & Roadway Capital Cost	\$224	\$300
Toll Collection Capital Cost		\$117
Toll Collection O&M Cost		\$300
<u>Periodic Capital Costs</u>		<u>\$67</u>
Total Cost	\$224	\$793

Alternatively, the cost of the project can be estimated by summing the financial contributions of federal, state, and private partners. According to ODOT estimates, the federal government will contribute \$81 million, the state government \$79 million and private road users will pay \$970 million in tolls. (All amounts are present values computed at a 7 percent discount rate per USDOT guidance). This "sources" based cost estimate suggests that the project will cost approximately \$1.1 billion. ODOT's failure to comprehensively account for project costs violates federal benefit cost guidance which requires that costs include "the full cost of the project. . . regardless of who bears the burden . . . including state local and private partners . . ." The higher amount in the "sources" estimate than the "uses" estimate reflects the fact that ODOT may collect more in tolls than the present value of the project.



Alternative Cost Estimate ("Sources" Basis)(Millions)

<u>Source</u>	<u>Contribution (PV)</u>
Federal	\$81
State (Non-Toll)	\$79
<u>Private (Tolls)</u>	<u>\$970</u>
Total	\$1,130

Costs Exceed Benefits by a Wide Margin

After we correct ODOT's study for math errors, spreadsheet errors, under-counted costs, and unsubstantiated benefit claims, the project's benefit-cost ratio falls to dramatically less than one, which is the minimum standard for meeting the statutory requirement that the project be cost-effective. Our corrected estimates show that the actual cost of the project ranges from about \$800 million (on a uses basis) to \$1.1 billion (on a sources basis). The actual benefits of the project, are roughly \$175 million. This means that the project has a benefit-cost ratio of between 0.15 and 0.22, well below the minimum threshold of 1.0. The correct analysis shows that the I-205 project is a value-destroying endeavor: it costs users and taxpayers far more than it provides to the public in benefits. It is not cost-effective, and should not be approved by FHWA.

Failing to disaggregate benefits and ignoring distributional impacts

Federal regulations require that a benefit-analysis separately report the benefits and costs of independent elements of a project. This is to prevent a prospective applicant from combining an in-eligible project (with costs that exceed benefits) with an eligible project (with a positive benefit-cost ratio) in order to get a larger amount of federal funds. The I-205 project consists of two elements with independent utility: a plan to toll I-205, and the proposed widening of the freeway. Nearly all of the travel time benefits associated with the project result from tolling, according to ODOT's own analysis. Appraised separately, the tolling would have a far more favorable benefit-cost ratio than the highway expansion. To comply with federal requirements, ODOT should produce separate benefit cost estimates for each component of the project.

Federal regulations strongly encourage applicants to examine the distribution of benefits and costs among different segments of the population. ODOT included no distributional analysis in its benefit-cost study. According to ODOT, nearly all of the travel time, congestion reduction and reliability benefits accrue to peak hour travelers. Yet a majority of the the cost of tolls are paid by travelers who use the I-205 during off-peak hours; these off-peak travelers get no benefits.



In effect, they are made worse off: they have to pay a toll even though they get no better service than under the no-build scenario.

Conclusion

After correcting ODOT's study for math and spreadsheet errors, understated and omitted costs, and exaggerated or un-justified claims of benefits the benefit cost ratio for the proposed project falls to well below 1. ***This means that the project does not comply with the statutory requirement that it be cost effective. More concretely, this means that in economic terms this is a wasteful, value-destroying project:*** roughly speaking it costs \$5 to deliver just \$1 in value to users of the facility.

No More Freeways calls on FHWA to carefully examine the benefit-cost ratio of this project, and to reject the proposed application for federal funds.

Attachment: *City Observatory Analysis of I-205 Benefit Cost Study*

March 20, 2023

TO: Federal Highway Administration

FROM: Joe Cortright, City Observatory

RE: Analysis of ODOT I-205 Benefit Cost Study

City Observatory has reviewed the ODOT Benefit Cost Study for the I-205 project submitted in connection with ODOT's application for Federal INFRA funding in the amount of \$120 million.

Our review shows that there are numerous errors, omissions and undocumented assumptions in this study, and that the true benefit cost ratio for this project is much less than one. This is important because the benefit cost analysis is used by FHWA to determine whether a project is cost-effective. ODOT's study claims that this project will have a benefit cost ratio of 2.5 to 1, therefore meeting the requirement that it demonstrate that this project is cost-effective. USDOT may approve an Infra Grant request only if it is shown to be cost-effective:

As federal statute creating INFRA provides:

[23 U.S.C. 117](#) (g) (2):

(g) Project Requirements.-The Secretary may select a project described under this section (other than subsection (e)) for funding under this section only if the Secretary determines that-

...

(2) the project will be cost effective,

As USDOT responded to GAO audit of the program,

... DOT clarified that it would determine a project to be cost-effective if its benefit cost ratio was greater than or equal to one.

GAO, DISCRETIONARY TRANSPORTATION GRANTS DOT Should Clarify Application Requirements and Oversight Activities, April 2022.

<https://www.gao.gov/assets/gao-22-104532.pdf>, page 1

This requirement is clearly laid out by USDOT in its public application materials explaining the INFRA program.

What are the requirements for large projects that receive INFRA grants?

The Department may select a large project under the INFRA Grant Program only if the Department determines that:

...

- the project will be cost effective,

...

<https://www.transportation.gov/policy-initiatives/infra/infra-grants-faqs>

The materials submitted by ODOT in support of this claim contain significant and material errors and omissions which exaggerate benefits and understate costs. After correcting ODOT's calculations for these errors, the proposed project has a benefit cost ratio of less than one, meaning that it is not economically cost effective.

This memorandum details the errors in ODOT's estimates of project benefits and costs, and also identifies other issues in the benefit cost analysis that fail to comply with USDOT guidance.

Benefits

ODOT has overstated the benefits of this project

Roughly 90 percent of the calculated benefits of this project are attributed by ODOT to two sources: travel time, congestion reduction and reliability benefits and safety benefits. Travel time and reliability benefits are estimated to have a present value of \$370 million, safety benefits are estimated to have a present value of \$150 million. (As we explain below, the \$370 million is a spreadsheet aggregation error, correcting for this error means ODOT is actually asserting the project produces \$380 million in travel and reliability benefits).

Travel Time and Congestion Cost Benefits

ODOT claims that the I-205 project will reduce peak hour travel times by 2 to 8 minutes between 7AM and 9AM and between 4PM and 6PM, and that these savings are valued at almost \$30 per car. This leads them to claim that the present value of time savings in congestion is \$185 million. (ODOT Benefit Cost Spreadsheet, TAB: '7% Discounting' CELLS \$I65:\$AD65). This estimate also includes a purported "congestion reduction benefit" which is supposedly in addition to travel time savings.

1. Travel time benefits are miscalculated

ODOT uses a passenger vehicle occupancy estimate of 1.67 persons per passenger vehicle to compute the number of hours of delay. The FHWA guidance directs that benefit cost analyses use factors more narrowly appropriate for the time period of travel. Specifically: for peak hour travel, FHWA directs agencies to use a factor of 1.48 persons in peak hour travel (USDOT Benefit cost Guidance, Table A-4). This factor alone would reduce benefits associated with

travel time reduction (and reliability) by 13 percent. This error also inflates the purported reliability benefits (see below).

There is a math error in the ODOT spreadsheet. In TAB "PVSummary7%, Cell G26," the spreadsheet mistakenly sums 18 years, rather than 20 years of present value estimated time savings (the formula reads, in part "(SUM('7% Discounting'!\$I65:\$AB65))" when it should read "(SUM('7% Discounting'!\$I65:\$AD65))." Correcting this error, means that ODOT is really asserting that travel time savings (inclusive of the occupancy error cited above), are actually 186.8 million, not 176.4 million. The spreadsheet also includes an estimate of \$4 million in the present value of time lost due to crashes.

2. Additional Congestion reduction benefits are not documented.

ODOT also claims that travelers will also get "congestion reduction benefits" over and above travel time savings and improved reliability on a per mile basis. The report claims that peak hour travelers will save 12.4 cents per mile traveled in peak hours due to less congestion and that trucks will save the 31 cents per mile. These benefits are asserted to have a present value of \$48 million. No basis is provided for these figures, nor is there an explanation of how these estimated benefits are somehow distinct from and purely additive to, travel time savings. Consequently, these claimed benefits should be disregarded. This has the effect of reducing benefits by \$48 million.

Reliability

ODOT claims that the project will produce \$190 million in travel reliability improvements (present value). ODOT produces this estimate by arbitrarily assuming that reliability benefits are exactly equal to calculated travel time travel time benefits plus congestion reduction benefits. This has the effect of essentially doubling the claimed value of travel time savings. No citation is provided as a basis for this. (ODOT Benefit Cost Spreadsheet, TAB: '7% Discounting' CELLS \$I67:\$AD67)

Improved peak hour reliability: Equivalent to the reduction in peak vehicle hours of delay (VHD). Source: Estimates of the value of reliability have a wide range, vary around values of VHD, and are highly correlated with congestion. Note that no benefits are assumed for off-peak reliability or congestion improvements (excepting off-peak crashes). While quantifying the value of the benefit is difficult, travel time reliability studies from WSD[sic] USA showed significant reductions in travel time variability relative to the No Build Alternative.

ODOT Benefit Cost Narrative, page 5

US DOT benefit cost guidance requires applicants to document their reliability estimates, and specifically, to show how those estimates are distinct from travel time savings estimates.

At this time, USDOT does not have a specific recommended methodology for valuing reliability benefits in BCA. If applicants should choose to present monetized values for improvements in reliability in their analysis, **they should carefully document the methodology and tools used, and clearly explain how the parameters used to value reliability are separate and distinct from the value of travel time savings used in the analysis.**

USDOT Benefit Cost Guidance, page 16 (Emphasis added).

ODOT has failed to provide any documentation for its valuation of reliability improvements. It has simply taken its (inflated) value of travel time savings added in its undocumented claims about additional per mile congestion reduction benefits, and then doubled this amount, claiming this is a legitimate estimate of “reliability” benefits. These underlying estimates also incorporate other errors (like an exaggerated occupancy factor) meaning this undocumented procedure further multiplies the overstatement.

While ODOT claims that the WSP Report (which it incorrectly calls “WSD USA”) showed significant reductions in travel time variability, WSP’s Economics Technical Report estimated the value of those travel time reliability improvements as being worth an average of \$3.9 million in annually, or about \$78 million over twenty years. Like ODOT, however, WSP did not provide any explanation of its basis for determining the value of travel time improvements, instead claiming it employed unspecified “industry standard practices.” Absent any clear documentation on providing a basis for determining the extent and value of improved reliability, these claimed benefits are invalid, and should be ignored.

Safety Benefits

ODOT claims that the I-205 project will produce \$150 million (present value) in safety benefits.

1. Safety benefits are miscalculated. ODOT asserts that the project will produce a 21 percent decline in crashes on I-205. There is a math error in its spreadsheet: instead of a 21 percent reduction in crashes, the spreadsheet calculates the effect of a 79 percent reduction in crashes. Cells H60:L60 on Sheet “Inputs_Worksheet” of the ODOT spreadsheet “2022_INFRA_BCA_I-205 FINAL.XLSX,” calculates the benefits of reduced crashes as equal to .79 multiplied by the total estimated crashes on I-205.
2. The source 21 percent crash reduction figure is not documented. The ODOT benefit cost spreadsheet attributes the reduction to an analysis by WSP that the project will reduce crashes 21 percent. According to the WSP produced Transportation Technical Report, this estimate is in turn based on the purported application of the ISATe methodology, but the attached report doesn’t document how the 21 percent crash reduction was calculated using ISATe. Appendix X of the Transportation Technical Report “**Attachment X Future 2045 Enhanced Interchange Safety Analysis Tool (ISATe) Results**” simply contains the “results” of the ISATe calculation (with undefined terms), and provides no information on the inputs, assumptions or intermediate calculations

that supposedly generated these outputs. The narrative contains no analysis explaining which features of the I-205 project are supposed to generate this reduction in crash levels.

In addition, the ISATe methodology does not apply to freeways with ramp-metering. The ISATe Manual (page 3) states:

The predictive method for freeways does not account for the influence of the following conditions on freeway safety: . . .

- Ramp metering. . . .

The existing I-205 freeway has ramp-meters which mean that the ISATe methodology does not accurately predict the effect of safety improvements.

Also, to be valid, the ISATe model has to be calibrated to the roadway in question: There is no evidence indicating that the ISATe model has been properly calibrated to predict future year crashes on I-205. The ISATe model was developed based on data from other locations and time periods. According to the ISATe documentation, the model has to be adjusted or “calibrated” to reflect the level of crash risks when applied to other locations. The ISATe documentation says:

Modifying Calibration Factors and Distributions

The predictive models in ISATe have each been developed with data from specific jurisdictions and time periods. **Calibration to local conditions** will account for any differences between these conditions and those present at the sites being evaluated. It **ensures that the evaluation results are meaningful and accurate** for the jurisdiction.

A calibration factor is applied to each predictive model. **It is important that each model be calibrated for application in the jurisdiction in which the sites being evaluated are located.** A procedure for calibrating these models is described in Appendix A.

(ISATe User Manual, Page 14, emphasis added).

There is no indication in the traffic technical report that the ISATe values were calibrated to I-205. (The entirety of the description of application of the ISATe model is a single paragraph—page 144 of the Transportation Technical Report). It makes no mention of calibration, to the contrary, the number of crashes predicted for future years using the ISATe tool is about 5 times higher than the level of crashes reported in ODOT’s own current crash data. Table 5.41 says that ISATe predict 2,875 crashes and 20 fatal crashes on I-205 in the No Build in 2045. ODOT’s own data (Tables 4.11 and 4.12) says that I-205 averaged fewer than 350 crashes per year between 2015-19 and 2 fatal crashes over five years (0.4 crashes per year). Given that traffic levels are only expected to increase by about 10-20 percent above current traffic levels over the next 25 years, this suggests that the ISATe

estimates may not have been calibrated to reflect conditions and crash rates observed on I-205. ODOT's purported ISATe analysis predicts vastly more crashes on I-5 than have actually occurred which is a strong indication that the model has not been correctly calibrated.

3. The 21 percent crash reduction figure applies only to traffic traveling on I-205, and not to traffic on other roads in the corridor. Consequently, this doesn't represent the net change in crashes. According to the project's own traffic technical report, the effect of the project will be to shift traffic from the freeway to local and arterial streets, which have higher crash rates. The benefit cost analysis documents higher predicted numbers of crashes on other corridor roads in the build scenario, but omits any calculation of the number and value of losses due to increased crashes on other roads. The safety "benefit" of the project can only be established by including the effects of increased crashes elsewhere.

The project's transportation technical report estimates that non-highway mileage will increase by about 100,000 miles per day or about 30 million miles per year (Table 5-4, page 66). Non-highway roads in the project area have higher crash rates than I-205, so shifting traffic to these other roadways will increase crashes on these other roads. Crash rates on I-205 in project area average about .43 crashes per million miles. Crashes on the major segments of two main arterials in the area (Highway 43 between Lake Oswego and West Linn, and Highway 99 between Milwaukee and Oregon City) average about 1.8 to 2.8 crashes per million miles (respectively). (ODOT, 2019 Crash Rate Data). This suggests that shifting traffic from I-205 to these other roads increases crash likelihood by about 1.3 to 2.3 crashes per million miles. Because the project would increase traffic on these roads by about 30 million miles per year, it would likely result in about 40 to 70 more crashes per year than if those same miles were traveled on I-205. For reference, this is roughly the same order of magnitude as the estimated 21 percent reduction in crashes on I-205 attributed to the project (this section of I-205 averages about 350 crashes per year, a 21 percent reduction in crashes would be about 70 to 75 crashes annually). However, because non-freeway roads have both bike and pedestrian traffic, the probability of serious injuries or fatalities, particularly to vulnerable road users is likely greater than had those same trips been taken on I-205.

4. The ODOT estimate of the value of crash cost savings is directly contradicted by the estimates prepared for ODOT by its contractor WSP. In its economics technical report, WSP reports that it estimates the net economic value of crash reductions associated with the project are valued at \$346,000 per year, which have a net present value of \$4.3 million. This is less than one-thirtieth of the value of crash losses included in ODOT's benefit cost analysis. Significantly, the ODOT crash reduction estimate cites WSP as its source for the 21 percent figure. But ODOT's report neither acknowledges that WSP found savings were vastly smaller than ODOT claims, nor does it explain this discrepancy.

Summary of Corrected Benefit Estimates (millions)

BENEFITS	ODOT	Corrected
Travel Time Savings	139.0*	120.9
"Congestion Reduction Benefit"	47.8	0.0
Reliability Savings	190.0	0.0
Safety	150.0	4.3
All Other	48.9	48.9
Total Benefits	575.7*	174.1

See Text for Details

Note: ODOT estimated travel time savings and total benefits corrected for spreadsheet error.

Costs

ODOT has understated the actual cost of the project. ODOT's benefit cost analysis asserts that the present value cost of the project is \$224 million. A more correct and complete analysis, based on figures produced by ODOT, shows that the actual cost (on a present value basis) of the project ranges between \$800 million (use-basis) and \$1.1 billion (sources-basis).

FHWA guidelines provide

- Cost data used in the BCA should reflect the **full cost** of the project(s) **necessary to achieve the benefits** described in the BCA. Applicants should include all costs **regardless of who bears** the burden of specific cost item (including costs paid for by State, local, and private partners, as well as the Federal government).
USDOT Guidance, page 27, (Emphasis added).

ODOT has failed to correctly state initial capital costs, has omitted operating and maintenance costs and periodic capital costs.

1. Capital costs of highway and bridge construction are understated. ODOT claims that the cost of Phase 2 capital construction is \$224 million in present value terms.

ODOT claims that the cost of the project is \$224 million in present value terms based on total construction costs of \$384 million in year of expenditure dollars. This estimate is not accurate or complete and is inconsistent with other cost estimates presented by ODOT. For example, ODOT's INFRA Application says the cost of the project is \$531 million (year of expenditure), which is almost \$150 million or 40 percent higher than the figure used in the Benefit Cost Analysis.

FY22 INFRA GRANT APPLICATION

I-205 Improvements Project Phase 2

Solutions for Safety, Reliability, and Economic Vitality

Submitting Agency:
 Oregon Department of Transportation
 355 Capitol St NE
 Salem, OR 97301



ODOT INFRA Application

Was a INFRA application for this project submitted previously?

Yes: I-205 Improvements Project Phase 1
ODOT applied for INFRA funding for Phase 1 of the I-205 Improvements Project that has since been funded

PROJECT COSTS	
Request:	\$120,000,000
Other Federal Funding:	\$20,000,000
Total Federal Funding:	\$140,000,000
Non-Federal Funding	\$293,000,000
Future Eligible Project Cost:	\$433,000,000
Previously Incurred Project Cost:	\$20,000,000
Total Project Cost:	\$453,000,000

Are matching funds restricted to a specific project component: No

- PROJECT ELIGIBILITY**
- The I-205 Improvements Project Phase 2: \$453,000,000
- A highway widening project on the National Highway Freight Network
 - A highway and bridge project carried out on the National Highway System (NHS)
 - Adds capacity to the Interstate System to improve mobility, enhance safety, and seismically retrofit the structure

On a present value basis, this \$531 million initial capital expenditure for highway construction is equal to roughly \$300 million.

2. Capital costs of toll system construction are omitted

ODOT’s project budget omits funding to construct the tolling system and purchase tolling equipment (gantries, cameras, transponder readers, computers, offices, etc). ODOT proposes to toll I-205 both as a way to raise funds to pay for this project and to manage traffic congestion (indeed, as we described above, all of the projects travel time savings stem from tolling). ODOT reported to the Oregon Legislature that the construction of the tolling system would require a \$200 million capital cost investment in year of expenditure dollars. Discounted at the same rate as other capital construction expenditures for the project, this cost would be equal to \$115 million in present value.

3. Operating and maintenance and periodic capital costs of toll system are omitted.

ODOT's "cost" estimate for the I-205 project includes only initial capital costs. This is contrary to USDOT guidance:

"The O&M costs of the new or improved facility throughout the entire analysis period should be included in the BCA, and should be directly related to the proposed service plans for the project." (USDOT Benefit Cost Guidance)

ODOT's Level 2 Toll and Revenue Forecast reports that ODOT will spend between \$30 and \$60 million annually operating the toll collection system, including, including contracting for toll assessment and collection, bank fees, and maintenance and staffing of the toll operation. The present value of these costs is \$300 million.

In addition, over the next two decades, ODOT's Level 2 forecast includes expenditures for periodical capital improvements to the roadway and replacement of the capital invested in the toll collect infrastructure. (The computer equipment and other technology for tolling has a physical or practical life of 10-15 years). These expenditures have a present value of \$67 million.

4. Toll revenue collections in excess of paying capital and operating costs are omitted.

ODOT's Level 2 Revenue forecast indicates that the agency will collect more than \$2.5 billion in tolls over the next 20 years. While some of those funds will be used to repay capital costs, or pay operating and maintenance costs, some will also be used for financing costs, which are not included in ODOTs estimates. In addition, it is likely that ODOT will cross-pledge revenue from the I-205 project to other projects and may use surplus revenue from I-205 to subsidize other projects. In this case, I-205 users will have to pay additional costs to use this facility, over and above its construction and operating costs.

If the capital costs are accurately estimated, the present value of the project's costs are on the order of \$800 million on a "uses" basis.

Alternative Corrected Cost Estimates ("Uses" Basis)(Millions)

Use	ODOT	Corrected
Bridge & Roadway Capital Cost	\$224	\$300
Toll Collection Capital Cost		117
Toll Collection O&M Cost		300
Periodic Capital Costs		67
Total Cost	\$224	\$793

Source: See text for details

5. An alternative "sources" calculation of project costs. We can also estimate the project's true cost by recognizing that in the long-run the project's income will be equal to its

costs. In contrast to ODOT’s estimate of costs based on the “uses” of funds, this is an estimate based on ODOT’s estimates of the sources of funds. ODOT has said that the project will be paid for by a combination of three sources: state tax revenues, federal grants and toll revenues paid by private citizens. All of these contributions count as “costs” under the USDOT guidelines. If we add up all of the state and federal funds spent on the project, and add to them the tolls charged to project users, we have an estimate of the “full costs of the project” regardless of who has paid them (the USDOT BCA standard).

In materials submitted to the Oregon Legislature, ODOT has indicated that it will use \$135 million in state funds for the project (\$109 million from HB 2017, and \$26 million from other state funds for tolling). In its INFRA application, ODOT has indicated it will use \$120 million from an INFRA grant and \$20 million from other federal funds allocated to Oregon by formula. This is a total of \$275 million. (We include in this calculation only state funds from gas taxes, not funds from borrowing, which are anticipated to be repaid by toll revenues). Using the discount factor applied to other construction expenditures, this amount has a present value of \$160 million. Over the next 20 years, ODOT projects in its level 2 toll study that it will charge users \$2.46 billion in tolls with a present value of \$970 million. This means that collectively, federal and state governments will pay \$160 million, and private parties (via tolls) will pay \$970 million, for a total of \$1.13 billion in present value)

Alternative Cost Estimate (“Sources” Basis)(Millions)

Source	Contribution (PV)
Federal	\$81
State (Non-Toll)	79
Private (Tolls)	970
Total	\$1,130

Source: See text for details

Corrected Benefit Cost Analysis

The following table summarizes our analysis of the errors in ODOT’s benefit cost analysis. Data are drawn from the preceding text. The ODOT analysis overstates the actual documented benefits of the project by about \$400 million in present value. The ODOT analysis understates the costs of the project by \$550 million to \$900 million in present value. As a result, the project has a negative benefit cost outcome: The costs of the project exceed its benefits by \$620 to \$960 million dollars in present value. The benefit cost ratio is well below one (the minimum for meeting the statutory requirement of cost-effectiveness). Each dollar this project costs produces only 15 to 22 cents in benefits for society. This is a value-destroying project that makes us worse off.

Corrected Benefit cost Analysis (Millions)

	ODOT	Corrected
Benefits	\$575.7	\$174.1
Costs (Low)	224.7	793.0
Costs (High)	224.7	1,130.0
Net Benefit	351.0	-618.9
	351.0	-955.9
Benefit/Cost Ratio	2.56	0.22
	2.56	0.15

Failure to separately analyze different project components.

The benefits are attributable only to the tolling portion of the project. ODOT has combined a freeway expansion (which produces few if any benefits, and which accounts for most project costs) with a tolling project (which accounts for nearly all of the benefits, and little of the project's capital costs). Each of these components of the project have independent utility as transportation investments, and should be assessed separately, rather than combined.

The USDOT rules governing the INFRA grant program call for separately reporting the eligibility, including cost-effectiveness, of each of the independent parts of a proposed project.

VIII. Statutory Project Requirements

To select a project for award, the Department must determine that the project—as a whole, as well as each independent component of the project— satisfies statutory requirements relevant to the program from which it will receive an award. The application should include sufficient information for the Department to make these determinations for both the project as a whole and for each independent component of the project. Applicants should use this section of the application to summarize how their project meets applicable statutory requirements and, if present, how each independent project component meets each of the following requirements.

Federal Register/Vol. 87, No. 58/Friday, March 25, 2022/17108 at 17122.

This requirement is echoed in the US DOT Benefit Cost Guidance.

1. USDOT discretionary grant programs often allow for a group of related projects to be included in a single grant application. In many cases, each of these projects may be related, but also have independent utility as individual projects. Where this is the case, each component of this package should be evaluated separately, with its own BCA.

Highlight the results of the benefit cost analysis, as well as the analyses of independent project components if applicable. The Department will base its

determination on the ratio of project benefits to project costs as assessed by the Economic Analysis Team.

USDOT Benefit Cost Guidance, page 11: (Emphasis supplied)

Congestion pricing has independent utility from the reconstruction and widening of the roadway. The Oregon Legislature directed that tolling be applied to this and other portions of I-205, irrespective of whether I-205 was widened. The Federal Highway Administration represented in its initial NEPA evaluation of the I-205 project that tolling was so unlikely as to be regarded as “not reasonably foreseeable.” Elsewhere in this region, ODOT has separately analyzed the implementation of road pricing and freeway widening. The tolling and highway widening/bridge reconstruction portions of the project have independent utility and therefore should be evaluated separately under FHWA guidelines.

ODOT has combined two distinct projects—road pricing and freeway widening—into a single project. Nearly all of the supposed benefits from the project stem from the congestion reducing aspects of road pricing. In its Benefit Cost Narrative, ODOT notes:

Demand management through **tolling significantly improves congestion outcomes . . .**

Value of Travel Time savings, or Vehicle Hours of Driving (VHD) benefits are calculated from traffic studies on pre-pandemic traffic levels and modeled traffic volumes **under the addition of tolling**. These traffic figures are provided by WSP USA and their Transportation Engineering team. Volume growth under the baseline is limited by congestion and lack of additional lanes, while **volume growth under the Build scenario sees slower growth over time due to the ability of tolling to manage demand**.

ODOT, Benefit Cost Analysis Narrative, 2022 (Emphasis supplied)

Most of the costs are associated with the road widening. If ODOT were to correctly analyze these two project components, each of which has independent utility, it would show that tolling alone has a much more favorable cost-benefit ratio than tolling combined with construction. What ODOT has done is to combine tolling (which produces the lion’s share of benefits) with additional costs which produce few benefits.

ODOT should re-submit its benefit cost analysis, showing separately the benefits and costs for the tolling component and the road-widening component. Based on the figures presented above, the tolling-only project would have a much more favorable benefit cost ratio than the Road expansion/bridge reconstruction portion of the project.

Failure to Analyze Distribution of Benefits and Costs

FHWA’s Guidance on Benefit Cost Analyses recognizes that projects can impose undue costs on some groups and encourages applicants to submit an analysis of the distributional effects of any project:

Projects may even result in some parties being made worse off, even in cases where the proposed project would deliver positive net benefits in the aggregate. While these distributional impacts would not affect the overall evaluation of benefits and costs, applicants are encouraged to provide information (such as the demographics of the expected users or by distinguishing between public and private benefits) that would help USDOT better understand how the project can meet these other public policy goals. (USDOT, Benefit Cost Guidance Page 31).

ODOT’s benefit cost analysis provides no information on the distributional effects of the I-205 project.

ODOT’s report contains no analysis of how the benefits and costs of the project inure to different demographic groups. According to the ODOT Benefit cost Analysis, all of supposed the travel time benefits of the project are received by peak hour travelers. Off-peak travelers have to pay tolls to finance the project, even though the bulk of benefits go to peak hour travelers.

ODOT’s own level 2 study shows that peak hour travelers will reap 100 percent of the travel time benefits of the project, but will pay only about 46 percent of the tolls charged to weekday users. Conversely, off-peak hour travelers will get zero travel time benefit (their travel times will remain unchanged from No-Build conditions), but they pay the majority (54 percent) of the tolls to finance the project. This imbalance would be even wider if we were to include tolls paid by weekend travelers who are also expected to get no travel time savings, but pay the same tolls as weekday travelers.

Distribution of Benefits & Costs, Weekday Travelers

Annual Weekday Traffic, Toll Collections and Travel Time Benefits, 2027			
	Daily Vehicles	Annual Tolls	Travel Time Benefits
Peak	54,000	\$ 29,800,000	\$ 18,400,000
Off-Peak	94,000	\$ 44,300,000	\$ -
Total	148,000	\$ 74,200,000	\$ 18,400,000
Vehicles include counts of numbers of vehicles crossing Tualatin and Abernethy Bridges. Source: ODOT I-205 Traffic & Revenue Study data.			

Roughly 60 percent of all toll revenue will come from off-peak travelers (on weekdays). Off-peak users are more numerous (about 64 percent of users). Yet all of the travel time benefits of the project accrue to peak hour users. Notably: even peak hour users have to pay more in tolls (\$29.8 million) than they get in travel time benefits (\$18.4 million). These calculations omit tolls paid by weekend travelers, who would also pay according to the hourly toll schedule, but according to ODOT’s analysis, would also get no travel time benefits.

Census journey-to-work data indicate that higher income workers are much more likely to travel during the peak hour than lower income workers. Workers commuting to work by automobile who leave their homes during peak hours (6:30 AM to 8:30AM) have median household incomes that are about 9 percent higher than all commuter households. Those who leave for work during the off-peak hours (9:30 AM to 3:30 PM) have median household incomes that are about 21 percent below the average for all commuter households

Time Left for Work	Median Household Income, Difference from All Commuters
Before 6.30	-3%
630 to 830	9%
830 to 930	4%
930A to 330P	-21%
330 to 530	-13%
530 to 630	-2%
After 630	-12%
American Community Survey, IPUMS, 2015-19	

In effect, the toll financing structure chosen for this project taxes lower income commuters (who disproportionately travel during off-peak hours and get no travel time savings) to pay for time savings for higher income commuters.

Conclusion

ODOT’s submitted benefit cost analysis is plagued with errors and mistakes that systematically overstate benefits and understate project costs. Calculated correctly, this project has a benefit cost ratio well below one, which means that it is not cost effective as required by 23 USC 117. As a practical matter, this is a value destroying project: It costs more in economic resources than it provides in economic benefits. ODOT’s cost benefit analysis fails to follow the guidance issued by USDOT for determining cost-effectiveness. USDOT cannot rely on this document as

an accurate assessment of compliance with federal law. Approving a grant for this project relying on the ODOT Benefit Cost study would be arbitrary and capricious.

Moreover, the systematic and consistent nature of the omissions and false assumptions presented in the ODOT application serve to represent an unqualified project as qualified for federal funding. These materially false statements constitute a fraudulent attempt to qualify a project for federal funds for which it is not eligible.

References

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