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convenience stores

Plaid Pantries, Inc. • 10025 SW Allen Blvd. • Beaverton, Oregon 97005 • Telephone: 503.646.4246 • Facsimile: 503.646.3071

M E M O R A N D U M

TO: Senator Peter Courtney, President of the Senate
Senator Richard Devlin, Senate Majority Leader
Senator Ted Ferrioli, Senate Minority Leader
Representative Dave Hunt, Speaker of the House
Representative Mary Nolan, House Majority Leader
Representative Bruce Hanna, House Minority Leader
Members Oregon Legislative Assembly

COPY: Mr. Ted Wheeler, Oregon State Treasurer
Columbia River Crossing Project Sponsors Council

FROM: Chris Girard, President & CEO, Plaid Pantries, Inc.

DATE: October 4, 2010

RE: Columbia River Crossing

Ladies & Gentlemen:

Enclosed is a professional analysis of the economics of the current proposed Columbia River Crossing Bridge Project. I commissioned this study, and as a small business operator, I am respectfully requesting that you invest the time to read and understand the information in this analysis. It is not just about the proposed Columbia River Crossing (CRC) itself, but the likely negative impacts for Oregon's overall finances, taxpayers, and businesses, especially small business.

The report documents the unfortunate fact that the proposed CRC project's real costs are more than double the widely-accepted figure of $3.6 billion. In reality the current design for the project will cost in the range of $8 billion to $10 billion, or more, and there is no available source of revenue to pay for it. The financing plan is a guess at best, and the revenue projections are significantly flawed with bad assumptions and unacceptable risk at every step. The numbers and analysis underpinning this project simply do not add up to a happy ending.

This report also includes new analysis relating to the Governors' Independent Review Panel Report. The realities of our situation demand additional critical analysis before we proceed past a point of no return. There is a very real danger that we will create an irreversible multi-generational financial disaster. The current proposal is a "debt-bomb" that blows up well after all the consultants, planners, and engineers have moved on to their next projects. Only the State and its taxpayers will be saddled with the ultimate responsibility, creating serious implications for Oregon's overall finances, small businesses, our customers, and all Oregon taxpayers.

There is no doubt that we need to address the congestion on the I-5 system, and the ultimate solution probably involves one or more new river crossings. But the plan must be realistic, affordable, financially sound, and phased to allow for financing contingencies. The current CRC proposal fails these criteria in every respect.

I initially became involved with the CRC Project due to potential impacts on three of our company's stores. As I learned more about the project, and realized the full scope and costs of this mega-project, I developed a broader concern because the economic analysis seemed flawed. In particular I began to doubt that we could pay for it. My research led me to others who shared my concerns, including Mr. Joseph Cortright of Impresa, Inc., who had conducted an earlier analysis of the project. Mr. Cortright is a widely-published leading economic analyst, an expert in regional economic analysis and development, and a Nonresident Senior Fellow at the Brookings Institution. I retained Mr. Cortright to update and expand on his earlier work, and the attached report is the result.

Please take the time to understand this report, and I urge you to take whatever action is within your power to help ensure that we avoid a very big mistake. We need to come up with an affordable, responsible, and buildable solution that works for Oregon and its taxpayers, especially small businesses, and all stakeholders who depend on a well-functioning I-5 system.

Respectfully Submitted,

William C. (Chris) Girard, Jr.
President & CEO
Plaid Pantries, Inc.
503-526-8300
chrisg@plaidpantry.com

IMPRESA
ECONOMICS

Financial Analysis of the Columbia River Crossing

Joseph Cortright,
Impresa, Inc.,
October 2010

Prepared for Plaid Pantries, Inc.

Executive Summary

This report analyzes the forecast accuracy, financial costs, and financial risks associated with the proposed Columbia River Crossing Project. It reaches three principal conclusions: 1) the traffic forecasts on which project finances are based are inaccurate and unreliable; 2) the thirty-year cost of building and operating the CRC will be at least double the $4 billion estimated and could reach $10 billion or more; 3) the project will necessitate a huge increase in bonded public debt and poses substantial additional financial risks including mega-project cost overruns.

1. CRC traffic forecasts are inaccurate.

CRC forecasts grossly over-estimate the traffic growth on the I-5 Columbia River Crossing. These forecasts are critical because they provide both the justification for the sizing of the project (number of lanes and size of interchanges), and because they underpin the financing of the project through toll backed bonds.

The CRC forecasts that traffic over I-5 will grow at an average of 1.3 percent per year from 2005 to 2030, from 135,000 vehicles per day in 2005 to 184,000 vehicles per day in 2030. But in fact, traffic on the I-5 bridges has declined every year after 2005.

Traffic levels in the nearly five years since CRC forecasts were completed have declined by about 7,000 vehicles per day, rather than increasing by about 7,000 vehicles per day as forecast by the CRC. In the five years prior to the CRC forecast (1999-2004) traffic increased on the bridges at only about 0.6 percent annually. The CRC forecasts assumed that traffic growth on the I-5 crossing would accelerate from 0.6 percent annually to 1.3 percent annually. But instead of growing at an accelerating rate, the volume of traffic crossing the bridges has declined every year after 2005, and the traffic growth rate has been decelerating systematically over the past 15 years.

The effects of this forecasting error are significant. In order to reach the 2030 predicted level of traffic in the no-build scenario, traffic growth rates would have to reverse their current decline and then accelerate to 1.8 percent per annum for the next 20 years.

1424 NE Knott Street
Portland, OR 97212
503.213.4443
www.impresaconsulting.com

CRC forecasts are flawed for a variety of reasons. Most importantly, they are outdated (based on 2005 estimates and a 1994 survey of travel behavior), they use estimates for the value of time that are inaccurate, thereby systematically underestimating likely diversion in the face of tolls. In addition, the estimates contain errors of arithmetic calculation, and were "post-processed"--a euphemism for CRC planners substituting their judgment about appropriate values in place of model outputs to produce higher levels of traffic on the I-5 crossing. The result of this one change was to raise forecast traffic (and associated toll revenues) 6 percent above those produced by unaltered Metro model results.

The inaccuracy of these traffic forecasts casts serious doubt on the findings contained in the environmental impact analysis, because these forecast traffic levels are used as the baseline for calculating the net environmental impacts of build alternatives. Inaccurate traffic forecasts also cast doubt on the financial analysis. If the bridge has less traffic than forecast, toll bonds will not produce the projected levels of revenue, and the project will experience significant revenue shortfalls that could produce bond defaults or require additional state subsidies. The overestimates also mean that both the DEIS traffic analysis and the URS traffic analysis (which uses the same forecast volumes) are leading to an oversized facility relative to likely demand.

2. Total 30-year CRC costs will total nearly $10 billion.

The total 30-year cost of the Columbia River Crossing is likely to approach $10 billion (measured in year of expenditure dollars). In addition to the construction cost of the project, currently estimated at upwards of $3.9 billion, the project will necessitate additional expenditures over the next 30 years estimated as follows:

$3,875 million in construction costs, plus:

$2,700 million in interest payments,
$1,700 million in toll collection costs,
$1,300 million in supplemental project costs,
$ 275 million credit card, sales tax and bond issuance costs
$ 175 million incremental transit operating costs

$10,025 million total 30-year cost

Because the financing for the project requires borrowing in advance of the receipt of federal, state and toll revenues, the CRC will have to borrow money to pay interest while the project is being constructed, and will effectively have to pay interest on top of interest. The scale of the project imposes major opportunity costs on the region—the loss of benefits from other projects that could be financed with this stream of revenue. In addition, because the region's commuters will be paying additional costs, through tolls and taxes to pay for the project, this will reduce consumer income available for spending in the local economy, resulting in a loss of jobs and tax revenues for state and local governments.

3. The CRC poses major financial risks

The Columbia River Crossing poses a major financial risk to transportation finance in the Portland metropolitan area, and to the state. For this type of project, there is a very high likelihood of cost overruns. The multi-billion dollar scale of the CRC qualifies it as a "mega-project." Given the history of similar scale projects, both nationally and internationally, the likelihood of cost overruns is on the order of 90 percent. Cost escalation for the two most recent large scale projects undertaken by ODOT exceed 200 percent from the DEIS stage (the current stage of the CRC) to current estimated completion cost. While responsibility for cost overruns has not been established, it is likely that these costs would have to be borne by Oregon and Washington, and could be on the order of additional hundreds of millions to billions of dollars. Once construction is commenced, there would be few ways to mitigate or reduce these risks.

The Independent Review Panel criticized cost estimates for the project, observing that the estimates were based on a now discarded design and that they don't address key risks. The panel labeled the cost estimates "problematic" and warned that unless corrected, they would have a "dramatic effect" on the ability of the project to obtain funding.

There is also a considerable risk associated with traffic and toll projections, which have regularly proved to be over-optimistic in practice. The CRC assumes that even with tolling, traffic on I-5 will increase dramatically faster than it has for the past decade. The project's debt service payments are "back-loaded" meaning that the project pays a higher and higher payment each year. As a result, the ability to pay for the project is highly dependent on a sustained high level of traffic growth and regular toll increases. If traffic growth is only half as fast as forecast—for example, 0.8 percent per year during the 2020s, compared to the 1.75 percent increase forecast by the CRC—the project would experience a $1 billion shortfall in net revenues available to pay debt service. There are interest rate risks as well; although current borrowing rates are relatively low, they may increase substantially when bonds are actually issued, three to five years from now.

There are major risks to accomplishing the Columbia River Crossing project according to the schedule proposed by project sponsors. Delay is significant because it is likely to increase the total cost of the project, both due to inflation in the cost of materials and labor, but also due to the interest cost associated with a longer construction period. Special factors—like the need to time in-water construction to avoid salmon migration—can have the effect of magnifying the impact of even minor schedule delays.

The Columbia River Crossing runs the real risk of a financial collapse because it relies on over-optimistic traffic and revenue projections, and downplays the real risks of cost overruns, revenue shortfalls and project delays. There is a significant likelihood of concurrent problems resulting in a situation in which project costs exceed the amounts now estimated, federal and state contributions are less than hoped, and traffic volumes are dramatically less than forecast. Because such a significant portion of the cost of the bridge must be borrowed, these fiscal shortfalls would lead to a cascade of events: the project would deplete borrowed project reserves and would be forced to further increase tolls, which is likely to have the effect of driving traffic levels lower. When reserves are exhausted bond covenants would likely require that the two states make good on any toll revenue shortfalls, either by diverting money from other projects or raising taxes.

This report was prepared by Impresa, Inc., based on documents obtained from the Columbia River Crossing, and other pertinent information identified in the reference section of this document. Analyzing the financial status of the project is complicated because the CRC is behind schedule in completing important financial planning tasks, and because it has provided some key documents only in response to formal public records requests. We have relied on several documents obtained through a public records request filed by the Pacific Environmental Advocacy Center. Among other things, these documents identify the dollar amount of total interest costs, toll collection costs and pay by plate surcharges that are revealed nowhere in the public presentations of project costs by the CRC. While the project's official schedule (dated November 30, 2009) called for several key financial documents, including a Financial Plan, Financial Risk Analysis and State Funding Documents to be completed in January and February of 2010, we were told by project officials in July that copies of these documents could not be produced because they had not been completed. The fact that significant portions of project costs have been largely unavailable for public review, and key financial planning documents remain incomplete underscores the concerns raised in this report about the level of risk and uncertainty surrounding this project.

1. CRC Traffic Forecasts Are Inaccurate.

Both the need for the CRC and the financing plans for the CRC depend directly on the accuracy of the traffic forecasts for the I-5 river crossing. The Draft Environmental Impact Statement projects that between 2005 and 2030, traffic crossing the I-5 bridges would rise from about 130,000 vehicles per day to 184,000 vehicles per day. If these traffic forecasts are incorrect, then there would be less need for the capacity provided by the CRC, and the financial contribution estimated to be provided by tolls will not be realized. The CRC traffic projections are directly contradicted by recent trends in traffic in the I-5 corridor.

1.1 CRC traffic forecasts have already proven to be inaccurate

The base year for the forecasts of future traffic for the Columbia River Crossing is 2005. The CRC forecasts that traffic in the no-build scenario on the I-5 bridges will be 184,000 vehicles per day in 2030.

We now have nearly five years of experience—about 20 percent of the planning period--since the base year of the CRC traffic forecasts. How well have their estimates been born out by actual experience?

The Oregon and Washington Departments of Transportation collect data that track the average level of traffic volumes on I-5 across the Columbia River. These data are reported by the Southwest Washington Regional Transportation Council. Data are from the council website: http://www.rtc.wa.gov/data/traffic/brdgawd.asp "Columbia River Bridges." The following table shows average annual traffic over the I-5 Columbia River Bridges for the past 15 years. It also displays the annual growth rate of traffic each year, compared to the preceding year, and the average annual growth rate for three five-year periods.

Average Daily Traffic, I-5 Bridges,

Year	Average Daily Traffic	Annual Growth Rate
1994	112,988	
1995	116,589	3.2%
1996	118,558	1.7%
1997	120,644	1.8%
1998	124,516	3.2%
1999	126,589	1.7%
2000	126,903	0.2%
2001	125,652	-1.0%
2002	128,162	2.0%
2003	129,657	1.2%
2004	130,279	0.5%
2005	132,603	1.8%
2006	131,916	-0.5%
2007	130,389	-1.2%
2008	126,278	-3.2%
2009	125,436	-0.7%
Annual Average Growth (Five-year Periods)		
1994-1999		2.3%
1999-2004		0.6%
2004-2009		-0.8%

This data shows several key trends. First, for the past four years, average traffic levels on the I-5 bridges have been declining, not increasing. Second, the growth rate in traffic on the I-5 bridges has been decelerating for the entire period shown in this table. Growth rates averaged 2.3 percent per year during the late 1990s, only 0.6 percent per year in the next five year period through 2004, and traffic decreased at an average rate of 0.8 percent per year for the past five years. Third, the slowdown in traffic growth rates and the annual decline in traffic clearly preceded the recession that began in December 2007.

It is apparent that the baseline forecast for growth of I-5 traffic included in the Draft Environmental Impact Statement assumed a very dramatic acceleration in traffic growth from historical trends. To grow from a 2005 level estimated at 134,000 to a projected 2030 level of 184,000 in the DEIS base case, I-5 traffic would need to increase 1.3 percent per year over the 25-year period, 2005 to 2030. That would require more than doubling the rate of growth actually observed in the 1999-2004 period (0.6 percent). And as illustrated above, the historical data show that the rate of traffic increase has been decelerating (and now declining) and not increasing, as forecast in the DEIS. The DEIS and the traffic projections offer no explanation as to why the rate of increase of traffic should more than double from this long term trend.

Figure 1 shows the actual level of traffic reported by the Regional Planning Council (from the table above), and the forecast level of traffic growth required to achieve the 2030 projection of 184,000 vehicles per day. The actual level of traffic recorded in 2009 was roughly 14,000 vehicles less than the more than 140,000 vehicles per day implied by the

CRC traffic forecasts. Whereas the CRC forecast implied that traffic over the I-5 bridges (in the no build scenario) would increase by almost 7,000 vehicles per day; in reality, the number of vehicles crossing the bridge declined by 7,000.

Figure 1: I-5 Bridge Traffic: Actual v. Predicted

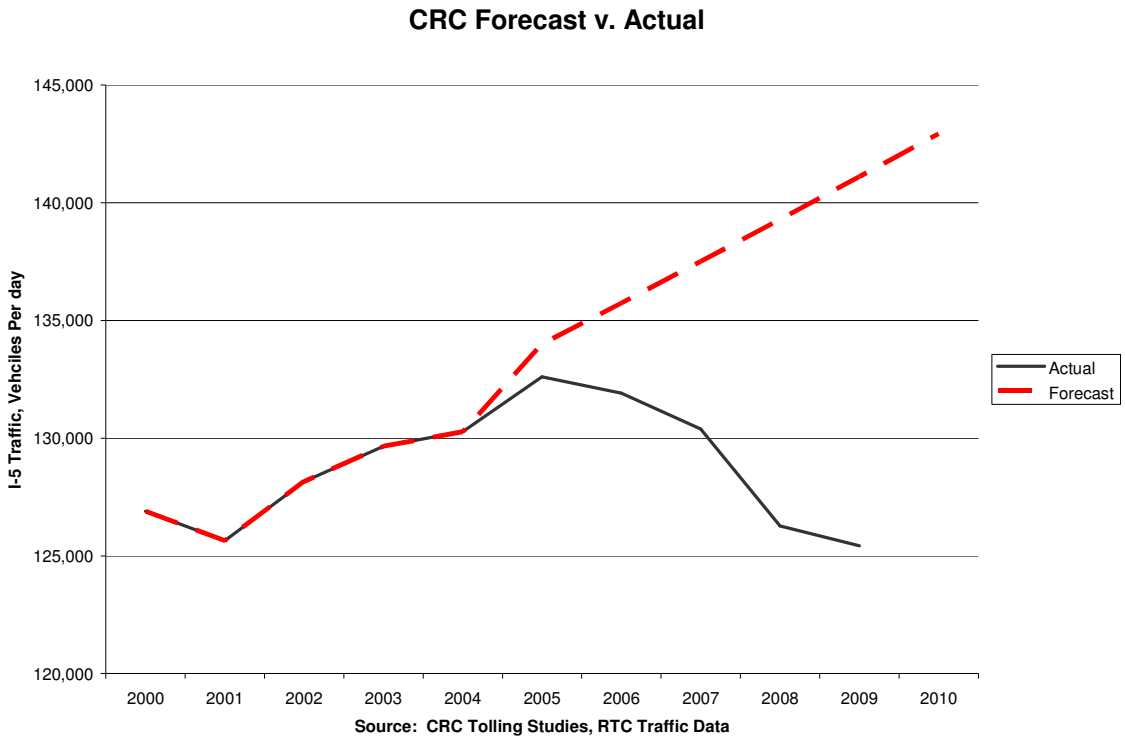
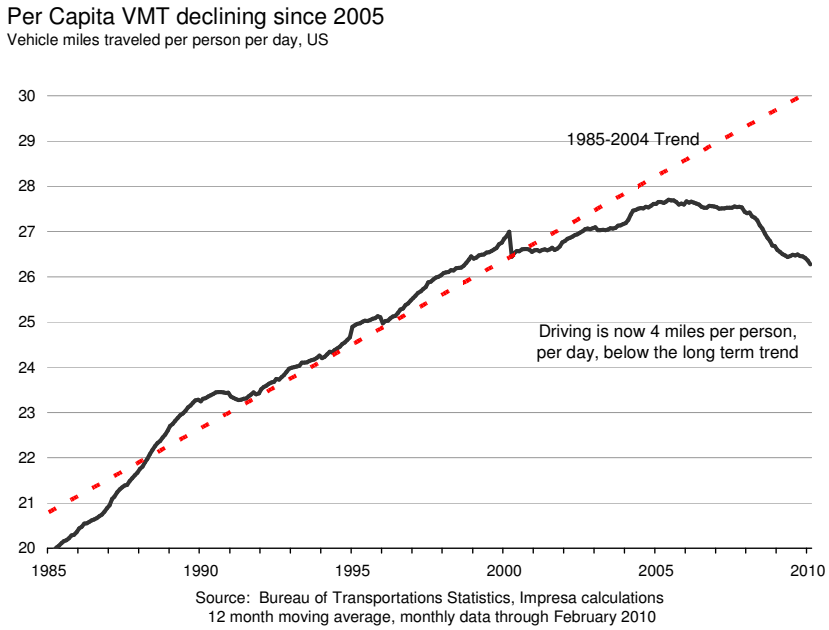


Figure 2: National Trends in Vehicle Miles Traveled



As Figure 2 makes clear, travel demand estimates based on pre-2005 trends are very likely to overestimate travel demand growth. Following the big increase in gas prices after 2004, American citizens began driving less. That trend has persisted over the past five years.

It might be argued that the past four years of declining traffic are a temporary aberration, and that in the longer term, forecast growth will make up for these declines. This is unlikely to be true for three reasons. First, as noted above, the trend has been for a decelerating rate of growth over the past 15 years. Second, as discussed below, changes in gas prices and consumer behavior that are very long term in nature are behind the decline in CRC traffic. And third, the departure from forecast experienced so far means it is likely impossible to make up the shortfall over the remaining time in the forecast period. In order to reach the expected No-Build 2030 traffic volumes of 184,000 from the actual 2009 level of traffic, traffic would have to increase by 1.85 percent per year for each of the next 20 years. That is a growth rate about forty percent faster than the 1.30 percent forecast in the DEIS, and two and a half times faster than the 0.7 percent growth rate actually observed over the fifteen year period 1994 to 2009. The CRC project materials provide no basis for believing such a dramatic increase in driving will occur.

The tendency to overestimate future traffic levels in mature travel corridors is also apparently an endemic problem with the current methodology used to predict future transportation demand. After a careful review of the literature, the Government Accountability Office found:

> . . . current travel demand models tend to predict unreasonably bad conditions in the absence of a proposed highway or transit investment. Travel forecasting, as previously discussed, does not contend well with land-use changes or effects on nearby roads or other transportation alternatives that result from transportation improvements or growing congestion. Before conditions get as bad as they are forecasted, people make other changes, such as residence or employment changes to avoid the excessive travel costs.
> (Government Accountability Office, 2005)

The weakness of transportation models in accurately predicting future traffic levels is a continuing problem. So it is not merely the CRC traffic projection model that is problematic; rather the entire class of four-step models (trip generation, assignment, mode, routing) have proved inaccurate in practice. After an exhaustive review of the state of the art, the Transportation Research Board of the National Academies wrote:

> "In 2005, as has been true for the past four decades, these models could not provide accurate information to inform decision making on many transportation and land use policies or traffic operation projects."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007)

While technology has allowed for faster computation, and more detailed mapping, they conclude:

> "The practice of metropolitan travel forecasting has been resistant to fundamental change. Every 10 years or so there begins a cycle of research, innovation, resolve to put innovation into practice, and eventual failure to affect any appreciable change in how travel forecasting is practiced."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007) pages 123-124.

As a result of over-forecasting, the size of the CRC may be much larger than needed. Traffic volumes are falling, even without tolls. If the I-5 crossing were tolled, many fewer vehicles would cross, depressing traffic levels still further and revenue would be correspondingly less than forecast.

The no-build scenario serves as the base case for evaluating all of the other alternatives—to the extent that the no-build scenario is flawed, the traffic estimates for the build alternatives are also similarly flawed.

Even the traffic analysis by URS, which served as the basis for a recommendation to reduce the bridge from 12 through lanes to 10, is predicated on the flawed DEIS forecasts. A more accurate forecast of future travel volumes would indicate that much less capacity is needed over the Columbia River.

1.2 CRC traffic forecasts do not account for higher gas prices

CRC traffic forecasts appear to be badly out of date, and there is no evidence that they have been adjusted to deal with current gasoline prices or development trends. The CRC traffic forecasts are poorly documented, and don't indicate what baseline data were used, what assumptions were made, and what error and uncertainty factors are associated with these estimates. It appears from the documents included in the Draft Environmental Impact Statement that traffic projections were made in 2007, based on 2005 data. The key measures of traffic activity (184,000 crossings of the I-5 bridge in the no-build, and 178,000 in the build alternatives), have remained essentially unchanged for several years. (See for example, Draft Environmental Impact Statement, Summary, Exhibit 26 Summary of Transportation Effects and Cost for Each Alternative, Page S-30). The forecast documents, including those released in 2010, use the same numbers (184,000 in the no-build, and 181,000 for the LPA) as the project has publicly quoted since the DEIS was released in 2008. The forecast documents refer to the "current year" for traffic purposes as "2005." The modeling was based on Metro's transportation model (Columbia River Crossing, 2010f). The Metro model was calibrated based on behavioral data collected in 1994 and assumes that real gasoline prices would not increase at all, i.e. that gasoline prices increase no faster than the rate of inflation (Higgins, 2008).

There is clear evidence that the persistently much higher level of gas prices since 2005 has produced a sea change in consumer behavior. Nationally, per capita driving has been in decline since 2004, and is now at 1999 levels. (See Figure 2 on page 6.)

Consumers are not only driving less, but are scrapping cars faster than they are buying new ones. Nationally, the number of vehicles in operation declined by four million in 2009 (Brown, 2010). In Oregon, vehicle registrations have declined by 30,000 compared to the previous year (Har, 2010).

The rise in gasoline prices and a growing interest in alternatives to car-dependent living has triggered a shift in housing markets within metropolitan areas. The biggest price decreases in housing and the highest foreclosure and default rates have been recorded in outlying suburban locations (Cortright, 2008).

The CRC's transportation model is based on observations made in 2005, and assumes the consumers will continue to behave as they did in 1994 (when gasoline cost $1.10 gallon). As a result CRC predicts the rate of increase of vehicle travel will be double that of the previous decade. This is highly suspect in a world where gasoline prices have more than doubled, where driving is in decline, and consumer behavior patterns are obviously changing.

1.3 CRC traffic forecasts are outdated

The traffic forecasts used to justify the need for the project, estimate its environmental impacts, and develop its financial plan appear to be significantly outdated.

The materials documenting these forecasts do not clearly reveal the dates on which they were prepared, or the vintage of the data used to estimate key variables. The base year for the forecasts in the DEIS and in subsequent financial planning documents is 2005. It is apparent that the toll revenue forecasts relied on the same forecasts shown in the DEIS, i.e. total levels of traffic in the no-build scenarios match the forecasts in the DEIS, exactly: 184,000 vehicles per day in the no-build replacement bridge scenario. Data for 2010: Traffic Effects for Tolling Scenarios, (Columbia River Crossing, 2010f); data for 2008: Traffic Technical Report, Exhibit 4-1 (Columbia River Crossing, 2008b). The traffic technical report is dated January 2008, and the text of the report indicates that many technical reports were completed in "late 2007." Again, this report describes 2005 as the "current year" for traffic comparison purposes.

Neither the DEIS, the traffic technical report to the DEIS, or the subsequent documents available for this review indicate the year in which traffic forecasts for the project were undertaken. It appears from these documents that the forecasts were made in 2006, using a base year of 2005. The forecasts also appear to rely on a Metro regional transportation model that was calibrated based on the household travel survey conducted in 1994 .

1.4 CRC forecasts inflated I-5 traffic estimates using "post processing"

While the CRC traffic forecasts based their initial estimates on the regional transportation model, they adjusted these estimates to shift some forecast traffic from I-205 to I-5. The authors of the study labeled this manual adjustment "post-processing"—but it simply means that they used their own judgment to select higher values for I-5 than those produced by the regional transportation model. The reasonableness of this adjustment is debatable. The CRC claims that an analysis of 2005 actual traffic data shows that actual traffic on I-5 was underestimated, relative to I-205 by the regional model. The authors made no apparent attempt to see if their adjustment was supported by data in any subsequent year. But each year after 2005, traffic volumes have been proportionately higher on I-205 than I-5, undercutting the stated basis for this "post-processing" adjustment.

According to the report, the effect of the "post-processing" adjustment was to increase traffic volumes assigned to the I-5 bridges by 6 percent over the levels predicted by the regional transportation model without this modification.

The report concedes:

> However, the post processing methodology forecasts less traffic diversion from I-5 to I-205; forecasted 2030 average weekday volumes on the I-5 Bridge are about 6 percent higher with the post-processing methodology than with the regional travel demand models.
> (Columbia River Crossing, 2010b).

The effect of this adjustment is to understate the amount of diversion that will occur to I-205, even with the relatively high value of time estimates used in the travel demand model.

Despite its technical sounding name "post-processing" really represents a judgment on the part of the CRC to disregard the outputs of the Metro travel demand model, and to manually choose the values for traffic.

1.5 CRC forecasts over-estimate the value of travel time, under-estimating toll diversion, and over-estimating revenues

The toll revenue forecasts estimate traveler response to tolls by estimating the value that travelers attach to time savings, and then translating the cost of tolls into a time equivalent penalty. For example, the toll study estimates that travelers value their time at about $18.89 per hour, meaning that a toll of $2.00 has the same effect on travel behavior as a 6 minute delay. (Here's the math: at $18.89 per hour, each minute saved is worth about 31 cents. At this rate, two dollars would be equal to about 6.3 minutes of time). Since travel models are used to predict traveler behavior based on travel time between

points, these delay values can then be incorporated into travel demand models and used to predict changes in travel behavior.

Use of a single amount for the value of time for all commuters is inappropriate and underestimates the effect of tolls especially on lower income households. At least 7,000 Clark County residents who commute to Oregon, according to the Census Bureau, earn less than $1,250 per month at their primary job. Most of these persons earn $10 per hour or less. The transportation literature suggests that most such workers value travel time at one-half their wage rate. For these low paid workers, their value of travel time is likely to be $5 per hour (or less) and not $19 per hour. Consequently, tolls are much more likely to reduce commuting (and Oregon job holding) by lower income residents. This is not analyzed in the financial projections or the DEIS.

This shortcoming has both financial and equity considerations. For lower income travelers (and those who place a lower value on their time), the toll has a much larger impact on travel behavior. For travelers who value their time at $5 per hour, a toll of $2.50 is the equivalent of 30 minutes delay in terms of shaping travel behavior. The CRC analysis assumes that all travelers treat the toll as having a six minute time penalty.

The estimate of $18.89 per hour as the value of time for all commuters is shown in *Description of Revised Toll Model and Traffic and Gross Revenue Projections for Tolling Scenarios* (Columbia River Crossing, 2010b).

> Two different VOTs, peak and off-peak, were assumed for passenger cars in the Metro modeling:
> Peak periods (AM and PM): $18.89 (2009 $) which equates to $13.33 (1994 $)
> Off-Peak periods: $12.57 (2009 $) which equates to $10.38 (1994 $)

Value of time estimates are a critical part of tolling assumptions. Independent analysts of toll revenue forecasts routinely call for a deep discount to value of time estimates in evaluating the credit-worthiness of toll forecast estimates. Fitch's criteria for stress testing toll revenue forecasts call for re-computing revenue estimates after reducing the estimated value of time 50 percent to 75 percent (Seattle-Northwest Securities Corporation & Montague DeRose and Associates, 2007). Such a stress test is an integral part of preparing what is referred to as an "investment grade" revenue forecast. In the case of the Columbia River Crossing, this would require reducing the value of time to between $4.72 and $9.45 for peak hours and $3.33 and $6.67 for non-peak hours.

The Independent Review Panel noted that an investment grade analysis has not been undertaken, and that one will be required:

> It is clear that if tolling is to be part of the investment package, where tolls are the source for paying back revenue bonds, an investment grade analysis will have to be conducted. Such an analysis will have to be at a much higher level of specificity, for example, knowing what the tolling schedule will be. This investment grade analysis will include another travel demand analysis, most likely requiring a more up-to-date database upon which to calibrate the model. Project financiers typically

> will only accept as investment-grade quality work that is performed by certain entities who typically have proven experience in conducting such studies. Independent Review Panel 2010, page 176.

Using a lower value of time has a direct effect on the traffic and toll revenue estimates prepared for the Columbia River Crossing. A lower value of time would mean fewer trips over the I-5 bridge and more diversion to alternative routes, especially in the event that the I-205 bridge is not tolled. It would also mean that the I-5 bridge tolls would produce lower levels of revenue.

In addition to the problems in the estimation of travel times overall, and for low income travelers, there is also an obvious math error in the computation of the inflation-adjusted value of time. The value of time calculations are adjusted to different year's dollars based on two different indices: at least one is in error. On pages 3-1 through 3-3, the report claims that a wage of $18.86 in 2009 dollars is worth $10.38 in 1994 dollars and that a wage of $12.57 2009 dollars, is worth $10.38 in 1994 dollars. The first calculation implies a 1994 dollar is equal to .71 2009 dollars, the second implies a 1994 dollar is equal to .83 2009 dollars. One must be wrong.

1.6 Inaccurate toll forecasts threaten CRC financial viability

Traffic forecasts underpin both the rationale for building a larger capacity crossing over the Columbia River and the financial plan for paying for the project. If traffic levels are less than forecast, as is already apparent, then a key part of the plan for financing the project is compromised.

The CRC toll bonds are planned to have a highly back-loaded amortization schedule (Columbia River Crossing, 2010c). This means repayment depends heavily on sustained annual increases in traffic and regular toll increases. If traffic levels do not increase as fast as projected, it would trigger a significant revenue shortfall. To calculate the sensitivity of toll revenue estimates we modified the CRC forecasts to assume a 50 percent lower rate of traffic growth than that used by CRC. (From 2020 to 2030, CRC assumes that traffic will increase about 1.75 percent each year, and 1.0 percent thereafter). We examined the effect of annual increases of half that amount, starting from the opening year (2018) estimate used by CRC. Reducing the growth rate (in the 2020's, for example to 0.875 percent per year), has the effect, over the 30-year life of the bonds, of reducing gross toll revenue by about $1.24 billion, and reducing net toll revenue (the amount available after collection costs available to make debt service payments), by slightly more than $1 billion.

This is not merely a theoretical problem. Predicting net revenues for tolled facilities, especially when there is no recent history of tolling in the area, is even more difficult than predicting future traffic volumes. Experience in Washington State shows that faulty forecasts can easily and quickly produce revenue difficulties for toll bridges. In 2007, WashDOT completed a second Tacoma Narrows bridge, and imposed tolls to finance the

cost of construction. In 2007, just prior to opening the Tacoma Narrows Bridge, WSDOT forecast that revenues in FY 2010 would be $62,937,827 (Washington State Department of Transportation, 2008). In a more recent forecast, updated through April, 2010, however, WSDOT forecast that FY 2010 revenues would be about 25 percent less, $45,207,519 (Washington State Department of Transportation, 2010a). The toll revenue shortfall was a result of lower than anticipated traffic and slower than anticipated increases in toll levels. Political opposition to higher tolls prompted the state to defer the toll increases that were assumed in the project's original financial plan.

One way forecasters attempt to deal with uncertainty is to develop alternative scenarios. The CRC has failed to undertake any serious sensitivity or alternatives analysis. They applied a "15 percent bandwidth" to their estimates, i.e. computing the effect of a 15 percent smaller volume of traffic and a 15 percent higher volume of traffic than called for in their forecast. They provide no basis for assuming a 15 percent error factor is sufficient. It is already the case, as illustrated in Figure 1 that the forecast for the year 2010 has an error of more than 10 percent in total traffic volumes in just four years. And, as indicated above, the Tacoma Narrows Bridge experienced a 25 percent shortfall in revenue from forecast over a period of just two years.

The CRC financial plans assume that the authority setting the tolls for the Columbia River Crossing is willing and able to increase tolls each year by at least the rate of inflation (assumed to be 2.5 percent per year). If the authority fails to increase tolls by this amount, or delays the increases, the project will experience a shortfall in revenue. Indeed, this has been a contributing factor to revenue shortfalls for the Tacoma Narrows project.

2. Total 30-year CRC Costs will total nearly $10 billion.

How much will the Columbia River Crossing project cost? Widely distributed public materials circulated by the Oregon and Washington Departments of Transportation state the project will cost between $2.6 billion and $3.6 billion . (See for example "Project Fact Sheet" (Columbia River Crossing, 2010d). That number is just the up-front construction cost and does not include the cost of financing, including interest, or the cost of operations, especially toll collection. Many of these costs will be incurred over a period of decades, rather than being paid "up-front." This memorandum compiles the additional costs not included in the construction-only cost estimate.

The actual cost of the Columbia River Crossing is difficult to portray because many of the costs will be paid over a number of years. To provide a fuller and more complete picture of project costs, we have developed a set of estimates of the 30-year costs associated with constructing and operating the Columbia River Crossing.

This task is further complicated because the financial plans for the Columbia River Crossing have not been fully worked out. Project sponsors are assuming that most of the money will come from state and local governments, and the remainder from toll-backed bonds. About $400 million would need to come from earmarked federal funds from a yet-to-be-enacted federal transportation bill, and related federal gas tax increase.

CRC documents show plans to borrow $1.3 billion over 30 years, to be repaid by future toll revenues. When we compute the total cost of the project over the next 30 years, the total price tag will more than double.

Thirty-Year Estimate of Columbia River Crossing Costs

Category	Thirty Year Cost, Millions, Year of Expenditure Dollars
Construction Cost	3,875
Interest Cost	2,700
Toll Collection Cost	1,700
Credit Card Cost	142
Sales Tax	117
Bond Issuance Cost	16
Transit Operating Cost	175
Added Project Costs	1,300
TOTAL	10,025

The $2,700 million is the interest (excluding principal repayment) over the 30-year life of the $1,300 million bonds; the $1,700 million is the cost of building and operating an electronic transponder and billing system to collect tolls. Credit card fees are what CRC will pay banks to process electronic payments. The bond issuance costs are the fees (and discount) the bankers will charge for preparing and issuing bonds.

One technical note: These figures are in terms of year of expenditure dollars (i.e. not adjusted for future inflation). These amounts are taken directly from budget and amortization schedules that estimate these costs in the dollars of the year in which they will be spent.

Toll bonds might appear to some to be inexpensive up front, but roughly speaking, each $1 of the project financed by toll bonds results in an additional 30 year cost to bridge users of more than $3.00, about $2.00 for interest and about $1.00 for toll collection costs. In other words, bridge users will have to pay a total of $4.00 in tolls for each $1.00 of bridge construction costs that are financed by toll bonds.

2.1 Construction Cost

No one is certain how much the Columbia River Crossing will cost to build. There is still considerable debate over what form the project will take.

Publicly, the CRC promotional materials claim that the cost of constructing the Columbia River Crossing, as currently proposed, is between $2.6 billion and $3.6 billion (Columbia River Crossing, 2010d). Specifically, CRC states:

> Based on fall 2009 design refinements and additional engineering, construction is expected to cost $2.6 to $3.6 billion (in year of expenditure dollars). Funding is expected from federal and state sources and tolling.

These estimates are subject to considerable uncertainty and risk. The project scope may be changed—discussions are currently underway to dramatically alter the project's profile on Hayden Island—and there are a series of other sources of risk—described in Section 3. It is also clear from the wording of the fact sheet "construction is expected to cost $2.6 billion to $3.6 billion" that these numbers do not include costs for financing, collecting tolls, and operating the project.

However, the $3.6 billion cost estimate is based on a bridge design (closed-box segmental girder) that has now been discarded in favor of a double-decked open web design. The new design has not been subjected to a detailed Cost Estimate Validation Process. According to the Independent Review Panel, because the open web design has never been built at this scale, the cost could be much higher than the box girder design (Independent Review Panel, 2010).

According to materials presented to the Independent Review Panel, the project may cost as much as $3.877 billion. These estimates are based on the so-called 90 percent probability that costs will not exceed this amount and are for the "full" project. See Independent Review Panel, 2010, page 173. We adopt this figure as our baseline estimate of construction costs.

2.2 Interest Cost

Neither Oregon nor Washington have $3.9 billion on hand for this project, and as a result will have to borrow a significant portion of the funds needed to finance construction. Both states will incur significant interest and finance charges to borrow the money needed

to pay for the bridges. These interest and financing costs are not included in the CRC's estimate of a $2.6 to $3.6 billion price tag for the bridge.

This is disclosed in the report on toll financing:

> The use of toll bonds will increase the total costs paid during and after construction due to the added interest and issuance costs. However, these financing costs are treated separately from the project capital cost during construction.
> (Columbia River Crossing, 2010e)

The CRC's need for borrowing—and the attendant financing and interest costs—will be driven by the mismatch between the time it receives its revenue (from tolls and from federal and state sources) and when it needs to pay contractors who will build the project. The project will need to pay its construction costs prior to the time the bridge opens.

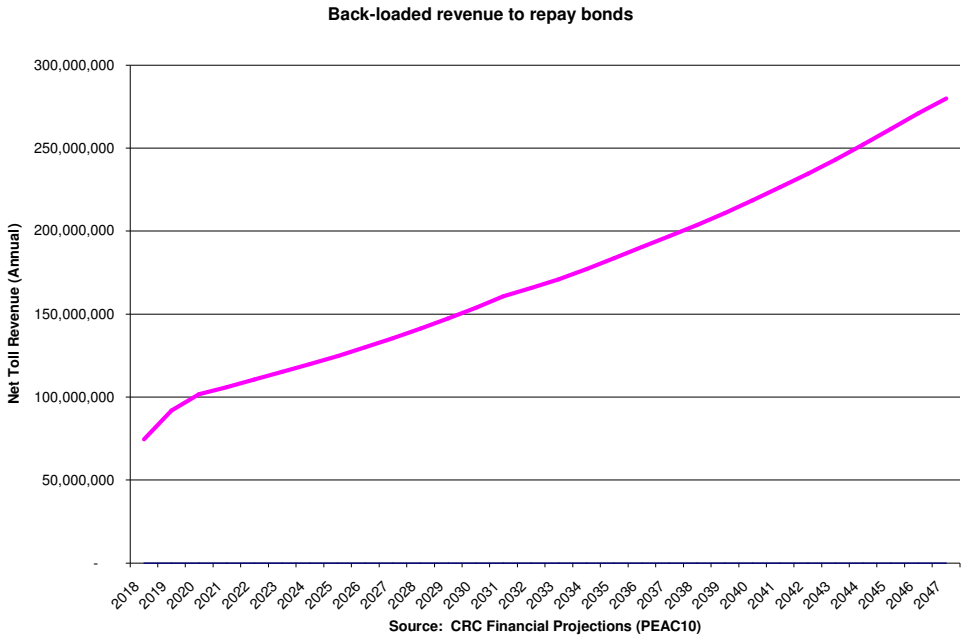
At a minimum, the CRC will pay interest on the bonds that are to be repaid from future toll revenues. It is also possible that the project will have to borrow additional money against future payments of state and/or federal revenues earmarked for the project. Project funding has not been approved by either state or by the federal government, and as a result, the payment schedule and amounts of funding to be provided from state and federal sources are unknown. It is likely that construction will commence before all projected federal and/or state revenues are in hand, so in order to finance construction it would be necessary for Oregon and Washington to issue bonds, and pay interest, in order to build the project. The Draft Environmental Impact Statement anticipates the possible use of so-called "GARVEE" bonds (grant anticipation revenue vehicle bonds). These bonds would enable the state to spend money now against anticipated future federal grants (Columbia River Crossing, 2008a). Oregon has also bonded money from vehicle registration fee increases in order to be able to accelerate timing of its bridge repair program. In all of these cases, the amounts paid in interest on bonds reduce the amount of money available to pay for transportation projects.

Our baseline estimate of interest costs is $2.7 billion, based on the project's own estimates of thirty-year interest payments on toll-backed bonds (Columbia River Crossing, 2010c).[1] This estimate is based on issuing $1.4 billion dollars of bonds, in three series. This high interest cost is the product of a complex financing structure. First, money has to be borrowed several years in advance of completion of the bridge, so the project has to borrow additional funds to cover "capitalized interest"—i.e. an additional $112.6 million to pay interest on the bonds during the period before toll revenues are expected to start flowing. Second, the amortization and payment schedule for the bonds is "back-loaded"—rather than having the same payment each year, the bond repayment amounts increase each year (based on the assumption that both traffic and toll rates will increase each year). Debt service payments start out (following bridge opening) in 2018

[1] The total amount of interest payments associated with toll-backed revenue bonds has not been disclosed in any publicly available reports issued by the Columbia River Crossing. These statistics were obtained from a report released in response to a public records request, and identified by CRC as PEAC-54.

at less than $60 million annually and escalate steadily to more than $250 million per year at the end of the repayment period in 2047.

Figure 3: Debt Repayment Schedule



The combination of carrying capitalized interest during construction and back-loading amortization dramatically increases the total amount of interest paid compared to the kind of garden variety borrowings with which most consumers are familiar. In effect, the CRC borrows money to make interest payments while the project is under construction, and ends up paying interest on top of interest. For example, if one could borrow $1.3 billion over 30 years, with a level repayment schedule (like a home mortgage) this would necessitate annual payments of about $93.5 million per year for a total of $2.8 billion in repayments over 30 years (30 * 93.5 = 2,805). Over the life of the bonds, $1.3 billion would be attributable to principal, and the remainder--$1.5 billion—represents interest costs. In rough terms, the additional interest associated with construction period financing and back-loading amortization works out to an added cost of $1.2 billion over the cost of a simplified mortgage like borrowing arrangement.

In addition, depending on the timing of payments from state and federal governments, the project could need to borrow larger sums to finance construction, and incur additional interest costs as a result. The CRC financial analysis assumes that federal and state contributions are available, in full, in the early years of project construction, and that issuance of toll-backed bonds (and accruing interest costs on these borrowings) can be postponed to later years.

> Toll bond proceeds are assumed to be received in the middle and latter years of construction to maximize their funding contribution, and other funding sources are assumed to cover construction costs in the initial years.
> (Columbia River Crossing, 2010e)

If federal and state money is available later, or spread over a period of years (as is likely) this will further increase interest costs. In addition, the two states may issue bonds to finance their portions of the project costs against future revenues (such as gas taxes or vehicle registration fees), and these sources will also involve additional interest costs beyond those calculated here.

Interest costs could be considerably higher, and bond funding proceeds could be lower, for a variety of reasons. First, the interest rate charged on bonds could be higher than 6 percent, the amount assumed in the toll revenue analysis. The toll revenue analysis examined the effect of 7 percent interest, plus a higher level of debt service coverage, if the bonds were issued solely as revenue bonds, guaranteed by the tolls, with no state guarantee. In this case, the net amount of revenue likely to be lent declined by almost half. The non-recourse debt structures yield only between 50 percent and 55 percent of the amount yielded by state-backed debt (Columbia River Crossing, 2009b).

2.3 Toll Collection Cost

The CRC will need to build and operate a system for collecting tolls from bridge users. The CRC anticipates building a barrier-free tolling system. Most users would buy electronic transponders (small radio receiver/transmitters) that record travel across the bridge and bill users automatically. Those who didn't have a transponder would have their license plates photographed and would be billed through the mail using a system called "pay by plate." This system will require motorists to buy transponders, and for the states to build and operate a system for monitoring and billing transponder users, and for reading license plates, preparing and mailing bills, and collecting bills. All of these costs would be passed on to bridge users through the toll system. Transponder users would pay a standard toll rate (that would include the cost of operating the transponder system), and pay-by-plate users would pay the standard toll, plus a surcharge of $1.00 to 1.25 to cover the added costs associated with billing. The costs of operating this toll collection system are not included in the $2.6 to $3.6 billion construction cost of the CRC.

According to documents released by the CRC, the annual costs of operating the collection system would be $27 million in 2018 rising to $90 million in 2047 (Columbia River Crossing Toll Bond Program, Scenario 1 - Base (DEIS) Toll on I-5 Only: (Baseline (Post Processed) Forecast) State-Backed Bonds - 30 Year Term, (Columbia River Crossing, 2010c)). Over the first 30 years of project operation, the estimated total cost of operating the toll collection system would be $1,695 million. This is our baseline estimate of toll collection costs.

2.4 Bond Issuance Cost

The states of Oregon and Washington will have to issue bonds to raise the funds needed to pay for the construction of the CRC. In addition to the interest costs associated with repaying the bonds, the two states will have to pay financial and legal costs associated with bond issuance. According to documents released by the CRC, the costs of such

issuance are estimated at 0.8 percent of the face amount of bonds issued (Columbia River Crossing, 2007). This reflects the bond underwriters discount and the costs of legal and other work in association with bond issuance.

In its analysis of bond financing costs, the CRC estimates a cost of $15.6 million for issuance expenses in the DEIS base case scenario. Columbia River Crossing Toll Bond Program, Scenario 1 - Base (DEIS) Toll on I-5 Only: (Baseline (Post Processed) Forecast) State-Backed Bonds - 30 Year Term, (Columbia River Crossing, 2010c). We use this as our baseline estimate of financing costs. As with interest costs, the amount could be higher depending on the timing of state and federal payments for the project.

2.5 Credit Card Cost

It is anticipated that a majority of those who use the CRC will pay for tolls by using debit or credit cards. The CRC will have to pay processing fees to banks and credit card companies associated with accepting these payments. According to documents released by the CRC, (Columbia River Crossing, 2010b), the annual costs of credit/debit card processing would be $2 million in 2020 rising to more than $5 million in 2035. Over the first 30 years of project operation, the estimated total cost of processing credit and debit card payments would be $142 million.

2.6 Sales Tax Cost

Washington construction projects are subject to state sales taxes. It is not clear from the DEIS that the project sponsors have made any allowance for the cost of paying these sales taxes to the state of Washington. Sales taxes do not appear to be included in the cost estimate. A search of the Columbia River Crossing website found no references to sales taxes to be paid on the construction of the bridge itself (Google search for "sales tax" site:www.columbiarivercrossing.org).

In the case of other major projects, such as the proposed 520 bridge in Seattle, the state has allowed for a sales tax deferral, i.e. allowing the sales tax to be paid after the bridge is constructed, out of toll revenues. For the 520 bridge, with a total price of $4.6 billion, the amount of the sales tax deferral is $300 million (Washington State Department of Transportation, 2010b). This works out to 6.5 percent of the cost of the project. If 50 percent of the CRC is in Oregon and not subject to the tax, then sales tax would apply only to the Washington portion. With a total construction cost of $3.6 billion, the Washington sales tax liability would be (.065*.5*3,600 million) or $117 million.

Based on this analysis, we use $117 million as our estimate of the cost of sales taxes due to the State of Washington for the CRC. This number could be higher or lower depending on the portion of the project built in Washington.

2.7 Supplemental Project Cost

In addition to the direct cost of constructing and operating the Columbia River Crossing,

it is likely that the traffic generated by this project will necessitate further expansions of the freeway system in Portland. The Oregon Department of Transportation has already identified the need for capacity expansion between the Fremont Bridge and I-84, a need that will be substantially increased by the construction of the Columbia River Crossing. ODOT estimates that such a project would cost between $780 million and $1.3 billion over and above the cost of the CRC (Tindall, 2008). In addition, since this would have to be financed exclusively by Oregon (i.e. no toll revenues, federal earmarks or Washington contribution), it would require a financial contribution from the State of Oregon in addition to the state's share of the CRC project.

The need for this expansion was confirmed by the URS analysis of the Columbia River Crossing—the effect of building the CRC is to move the traffic bottleneck on I-5 from the existing Columbia River Bridge, to the Rose Quarter area. The URS report concludes that without a change to the Rose Quarter, the effect of the CRC project will be to reduce travel times only one minute compared to the no-build.

> Compared with the No-Build conditions, the LPA Full Build and Phase 1 would reduce the average travel time during the two-hour peak period within the bridge influence area (BIA) from 19 minutes to 18 minutes (A.M. peak) and on I-5 northbound from 14 minutes to 6 minutes (P.M. peak). The relatively small travel time reduction on I-5 southbound is mostly due to the bottleneck around the I-5/I-405 split. (URS, 2010).

The Independent Review Panel convened to examine the project reached the same conclusion. Unless the chokepoint at the Rose Quarter is fixed, the utility of the entire CRC investment is jeopardized. They write:

> "Questions about the reasonableness of investment in the CRC bridge because unresolved issues remain to the south threaten the viability of the project." (Independent Review Panel Report, 2010, page 112).

The panel recommends a new set of traffic studies to test whether the CRC will simply shift the bottleneck south, and call for ODOT and the City of Portland to "fully develop a solution for I-5 from I-405 to I-84" and to program that solution in conjunction with the phasing of the construction of the CRC (page 113).

The Chokepoints report published by TRIP, a Washington DC based road advocacy organization, identified the I-5/I-405/I-84 exchange, that portion of the I-5 system between the Fremont Bridge and I-84, as the second most severe bottleneck in the Portland metropolitan area (TRIP, 2010). It actually carries more traffic than the I-5 bridges (135,000 vehicles per day vs. 127,000 for the I-5 bridges). According to the Chokepoints report, this project will require $800 million to $1.3 billion and $300 to $350 million for improvements to Broadway-Weidler and widening I-5 to 3 lanes in each direction (TRIP, 2010).

Based on the information in the 2008 ODOT report and the 2010 Chokepoints report we use a figure of $1.3 billion as the cost of supplemental projects that will be necessitated to

improve traffic flow on I-5 in the wake of the CRC project. The actual cost could be higher or lower depending on the scope of supplemental projects actually undertaken to address traffic congestion in this corridor.

2.8 Negative Economic Impact Costs

In addition to tax revenues, the project assumes that a portion of the project revenues will come from tolls levied on traffic using the I-5 bridge. The toll payments are estimated to be $120 million annually when the bridge opens to traffic, and rising to $220 million annually in 2030. These amounts include both the direct amount of tolls, as well as the $1.22 (2015) surcharge that will be levied on bridge users who do not purchase transponders. Money spent on tolls will largely be from local households and businesses, and represents money that would otherwise be spent elsewhere in the local economy. Again, the DEIS does not consider the economic or environmental impacts of shifting $100 million or more annually from consumer and business spending to toll payments. These impacts are likely to include lower levels of purchases of goods and services from local businesses, an associated reduction in employment at such businesses, and a loss of tax revenues from a lower level of business activity.

There will be significant economic impacts to the region from spending this $4 billion in construction costs, plus toll payments of $100 million or more annually indefinitely. The DEIS does not consider the impact of these diversions of money from other uses, and therefore omits a significant impact.

We have not undertaken an input-output analysis to compute the exact impact on sales and jobs, but we use as a rule of thumb that each $1,000,000 in consumer and business income diverted to pay for tolls produces a loss of ten jobs. This means that the project would result in the loss of 1,200 jobs initially rising to 2,400 jobs by 2030. While the project would result in temporary job creation during construction, this long term job loss would continue over the life of the project.

2.9 Transit Operating Costs

CRC's proposed Columbia River Crossing includes a light rail transit line extending the existing Max Yellow Line from the Expo Center in North Portland to a northern terminus in Vancouver. A portion of the costs of this line would be paid from fare box revenue, but in general, operating costs of light rail facilities exceed passenger fares. According to the Draft Environmental Impact Statement, the net incremental increase in operating costs for light rail above transit service that would be provided in the no-build case would be $2.96 million annually in 2010, with that amount expressed in 2007 dollars. The DEIS does not provide a year-by-year breakdown of net incremental operating costs. To estimate the 30-year cost of transit operations, we use the $2.96 million per year figure for each year, and convert it to year of expenditure dollars. The total 30-year incremental cost of transit is approximately $175 million.

2.10 Opportunity Cost

Opportunity cost is a term used by economists to describe the idea that if resources are used for one purpose, they cannot be used for some other purpose. Resources used to construct the Columbia River Crossing, for example, cannot be used for other transportation projects in the Portland metropolitan area. In the specific case of the Columbia River Crossing, there are opportunity costs for all of the transportation funds that would be shifted to pay for this project that could otherwise be used for other transportation projects in the Portland metropolitan area. There are three specific areas in which the region would be likely to experience significant opportunity costs in association with the Columbia River Crossing: federal earmarks, federal new starts funding, and state funding allocations.

Earmark Opportunity Costs. Federal earmarks or allocations for the CRC will reduce revenue available for other projects in the region. Like most other states, the State of Oregon used its political clout to get a special allocation of federal funds, or earmark. Virtually every state's delegation seeks and receives similar earmarks based on their delegation's priorities.

If the state makes the CRC its priority, it forgoes its opportunity to seek funding for other eligible projects that would provide statewide benefits. For example, in the last round of federal transportation funding, the state relied on earmarked federal funds to underwrite a significant portion of the cost of repairing state highway bridges. If the state seeks earmarks for the CRC, it will not be able to obtain those same earmarked funds for other projects.

CRC proponents have claimed that CRC earmarks will not reduce funding for other projects because the CRC is a "project of national significance" that would qualify for a separate source of funding. But in fact, the legislation that would allocate the next round of transportation funding has not been passed by either house of Congress, so no such program or source of funding now exists. And the leading proponents of transportation reauthorization such as Representative James Oberstar have specifically rejected the idea of earmarking funds in the next transportation bill. And while the proponents of the project regard it as having national significance, there is no evidence that anyone outside the region shares their view. Every region regards its projects as having national significance.

New Starts Opportunity Costs. The CRC anticipates that some $750 or $850 million of the project cost will come from federal "new starts" rail funding. But there is a limited amount of such funding, and historically, the Portland metropolitan area has gotten a disproportionate share of such funding. The region has another major project underway—the Milwaukie light rail line—which would also be funded from this same New Starts program. Funding for the light rail portion of the CRC project will compete for a limited pool of funds for new rail starts from which the region is asking for funding for the Milwaukie light rail.

State Funding Opportunity Costs. The project will jeopardize state funding for other projects in the Portland metropolitan area. The Columbia River Crossing will be perceived by state policymakers as a project benefiting the Portland metropolitan area, and will jeopardize the ability of the region to get state funding for other projects in the region. In 2009, when the State Legislature identified a list of projects to be funded with increased gas taxes and vehicle registration fees, the Portland metropolitan area got a far smaller share of total funding than its share of population. It is likely that any state earmarks of funding for the CRC would reduce the likelihood that state funds would be allocated to the Portland area for other projects.

In the funding plan provided to the Independent Review Panel on June 17, 2010, the CRC makes it clear that it is counting on diverting funds from existing state and federal programs to pay for the costs of the project. The document "Funding Report" shows that federal money from "Safety-LU and federal interstate maintenance funds (both of which could be invested in other projects) have been used to pay for Columbia River Crossing planning (Columbia River Crossing, 2010a). Similarly the Oregon Transportation Commission allocated $30 million from House Bill 2001 to pay for Oregon's share of transportation planning costs, reducing funding available for other projects in Oregon.

3. The CRC Poses Major Financial Risks

The preceding section identifies the costs of the Columbia River Crossing, assuming that everything goes as currently planned. But there are considerable risks and uncertainties associated with the cost estimates outlined above. It is possible that a number of factors could cause the project costs to be considerably higher than the baseline estimates presented in Section 1.

3.1 Cost Overrun Risk

The project is at risk for substantial cost overruns. These costs would have to be met by the states.

The Independent Review Panel expressed grave doubts about the reliability of the current cost estimates. While the CRC has subjected the project to a "Cost Estimate Validation Process (CEVP)", the review looked at a different design from that now proposed. In addition, there have been other significant changes to the project features since the last detailed cost estimates were prepared. In the view of the IRP, uncertainty about the constructability of the novel open web design, the much more restrictive in-water work windows, changes to the alignment across Hayden Island, and the delay in deciding the number of lanes to be built, together effectively invalidate the cost analysis done to date, and mean that cost estimates can't be relied on in putting together a funding plan.

> Until these changed conditions are considered in conjunction with the other risks included in the CEVP, the credibility of the cost basis for the project as a means for communicating the needed funding and financing is problematic.
> Using data and information in the Base Estimate and funding/finance models that are not current and accurate can lead to potential delays in the review and approval process and receipt of a ROD. However, more serious is the concern that the Base Estimate and completion dates could be potentially so significantly different from that currently incorporated into the Final EIS, that seeking the necessary financing may be complicated and/or hindered since the confidence level would be significantly lower than would otherwise be expected with a risk based estimate that is based on the conceptual design and proposal included in the Final EIS. To the extent that the Base Estimate upper range potentially increases when the inputs and assumptions are revised to reflect information contained in the rest of the package, this could have a dramatic effect on the ability to finance the project and may also seriously impact the tolling policies under discussion. (Independent Review Panel, 2010, page 168).

There are substantial risks that construction cost estimates will be exceeded. ODOT's track record in estimating the cost of large highway construction projects suggests that the actual costs of the Columbia River Crossing may be much higher than the current estimates. Consider the two largest projects underway or in the late planning stages in Oregon: the Highway 20 widening in Lincoln County, and the Newberg-Dundee Bypass.

ODOT's largest current project—a 7-mile long rebuild of U.S. Highway 20 between Corvallis and Newport—is more than 100 percent over budget. When it was planned in 2003, the project was supposed to cost about $110 million. The original design-build contract awarded in 2005 was valued at $129.9 million. After construction problems emerged, ODOT subsequently agreed to add $47 million to the contractor's compensation. Costs have continued to increase and the project is still incomplete.

By comparison, the amount the Oregon and Washington Departments of Transportation have spent on planning the CRC (roughly $130 million) is the same order of magnitude as the original budget for the U.S. 20 widening. The construction budget for the CRC—about $3.8 billion—is more than ten times larger than the U.S. 20 widening. Despite entering into a public private partnership that was supposed to insulate it from the risks of cost-overruns, the US 20 project, originally budgeted for $110 million, is currently budgeted for more than $230 million, and will take about two years longer to complete than originally planned.

In 2003, the forecast cost of the US 20 project was $110 million.

> "The estimated cost of the Pioneer Mountain to Eddyville project is $110 million dollars (2003 dollars). Construction is anticipated to begin in 2005 and take about 4 years to complete."
> (Federal Highway Administration and Oregon Department of Transportation, 2003)

Today, the project is not complete and has expended more than $234 million—more than double the original estimate (AASHTO, 2010).

And the effect of these overruns has been to take money that would otherwise be used for other transportation projects.

> Will the cost overruns of the Highway 20 project at Pioneer Mountain affect future state highway projects? It's possible, but it's too early to tell, said a spokesman for the Oregon Department of Transportation.
>
> "The fiscal effect is unknown at this time, but we know we're going to go above the $130 million construction budget," said Joe Harwood, an ODOT spokesman in Springfield. "We have a finite amount of money. Depending on how big a hit we take … there's a very good likelihood we'll see projects delayed. In extreme circumstances, we might see projects canceled."
> (Rollins, 2007).

The next large project in ODOT's pipeline is the Newberg-Dundee bypass. Its cost has also more than doubled as it has moved through the planning process. At the time of the Draft Environmental Impact Statement on the proposed Newberg-Dundee bypass (2003), total project costs were estimated at $222 million. Just two years later, after additional, more precise engineering analyses, the cost had ballooned 40 percent, to more than $311 million (Oregon Department of Transportation, 2005). Today, it is estimated that

completing this project may require between $752 and $880 million (Federal Highway Administration and Oregon Department of Transportation, 2010).

Cost overruns would jeopardize future transportation investments. It has not been determined who would be responsible for cost overruns on the Columbia River Crossing.

> "WSDOT, ODOT, C-TRAN, TriMet, and possibly the Cities of Vancouver and Portland, must prepare agreements on roles and responsibilities for project development, construction, and capital funding that address such issues as project management and decision-making, capital cost sharing, how potential cost-overruns are managed, and contracting procedures."
> (Draft Environmental Impact Statement, page 4-42)

Cost overruns are a real concern in major transportation projects in the Pacific Northwest. For the proposed deep bore replacement for Seattle's Alaskan Way Viaduct, the State Legislature required the City of Seattle to pay for any cost overruns. In the case of the Columbia River Crossing, it is clear that the additional resources would be diverted from other transportation priorities in the state and the region. And once ODOT and WSDOT have embarked on bridge construction, it is clear that completing this project—regardless of its final cost—would absorb resources that would otherwise be available for other transportation projects.

3.2 Mega-project Risk

The sheer scale of the Columbia River Crossing increases the likelihood that actual costs will be much higher than currently forecast. The CRC is a mega-project. Mega-projects are defined as major investments that cost several hundred million to several billion dollars. Careful studies of such projects around the world show that in ninety percent of such projects costs are underestimated. For bridge and tunnel projects, average cost overruns were 33.8 percent (Flyvbjerg, 2009) Mega-projects have been consistently shown to suffer from "optimism bias": the tendency of project sponsors, operating in a political environment, to overestimate benefits, and underestimate costs and risk to build public support for a massive undertaking. The CRC modeling has not considered mega-project risk.

With its official price tag of $2.6 to $3.6 billion, the CRC is more than ten times larger than ODOT's current largest construction project (the Highway 20 project mentioned above). If ODOT had a well-established track record of building multi-billion dollar highway and transit bridge projects, one could look at past experience, and estimate the probability of realizing projected costs levels (and as the Highway 20 and Newberg Dundee Bypass histories show, costs are likely to be under-estimated). The much larger size of the CRC makes it even more likely that the project will experience substantial cost overruns.

Given the scale of the project, a typical mega-project cost overrun of about 33.8 percent would work out to more than a billion dollar cost overrun.

3.3 Housing Market Distortion Risk

Tolling will dramatically shift the demand for housing in Clark County. The DEIS contains no analysis of the impact of tolls on housing markets in the metropolitan region. The DEIS uses the same land use patterns (distribution of households and businesses in 2030) in all scenarios, and only varies the trip distribution of these households, given that land use pattern. But imposing peak hour tolls will shift the demand for housing in Clark County and also on the Oregon side of the river.

In effect, for workers who must cross the bridge on a daily basis for work, the value of the tolls is the equivalent of a financial penalty or tax on housing on the opposite side of the river. The capitalized value of the toll penalty associated with commuting to Portland from Clark County will be equal to between $30,000 and $40,000 in housing value: a person working in Oregon could afford a house worth $40,000 more than they could afford in Clark County, once one adjusts for income lost to tolling. The same is true of the much smaller number of workers living in Oregon and working in Washington; they will find it much more attractive to buy a house in Washington, than live in Oregon.

The effect of tolling will be two-fold. First, it will tend to lower housing values in Clark County, affecting both the home equity of Clark County home owners, and tax revenues paid to local governments in Clark County. Second, it will tend to reduce the amount of commuting between Oregon and Washington. These long term effects of the "toll penalty" are not explicitly addressed in the traffic modeling for the Columbia River Crossing, which assumes a fixed distribution of households and trip attractions. Over time the toll penalty will change both the location of households and trips, and the rate of travel between the two states.

3.4 Competing Bridge and Cross Subsidy Risk

The presence of the I-205 crossing greatly complicates plans to finance the I-5 bridge with tolls. It is an open question as to whether it is financially viable or practical to only toll one of the two crossings. Because this issue has not been resolved, it constitutes a risk to successfully completing the project.

The tolling plan for the CRC has not been finally determined. One set of alternatives involves tolling both the I-5 and I-205 crossings. For traffic management and financial reasons, it may be necessary to toll both bridges. If one bridge is tolled and the other bridge is not, there is a substantial danger of very significant diversion of traffic to the non-tolled bridge, with consequent increases in congestion. In its testimony on the project, Clackamas County has formally objected to tolling only I-5 because of the negative consequences for I-205 (County Chair Lynn Peterson Letter to Independent Review Panel, May 20, 2010).

Resolving the tolling regime for I-205 is essential to finalizing financing plans for the CRC. One factor that bond underwriters consider in evaluating toll-backed bonds is the presence of competing, non-tolled facilities (Seattle-Northwest Securities Corporation &

Montague DeRose and Associates, 2007). The presence of a non-tolled I-205 bridge poses a significant financial risk to the holders of bonds backed by tolls on the I-5 bridge. The dangers are that the I-205 bridge would encourage substantial diversion of traffic that would otherwise cross the I-5 bridge and pay tolls, and would also greatly limit the ability to increase toll rates in the future (because increasing I-5 tolls would simply divert more traffic to I-205). These considerations prompted one Independent Review Panelist, Dr. Michael Meyers, to candidly label the failure to toll both bridges as "stupid." (Independent Review Panel Meeting, June 17, 2010). For these reasons, it is likely that bond underwriters will push strongly for tolls on I-205 as well as I-5. In the absence of tolling both bridges, bond underwriters are likely to deeply discount the amount of debt that can be issued against future I-5 toll revenues. The financial analyses prepared by the Columbia River Crossing do not address this issue.

It may not be legal for the CRC to use toll revenues from the I-205 bridge to retire debt for the construction of a new I-5 bridge. According to the Federal Highway Administration, it is not legal for a state to use toll revenues from an interstate project to pay for a different project. According to FHWA, "The Interstate System Reconstruction and Rehabilitation Pilot Program requires that revenue from tolls be used only to improve the tolled facility . . . FHWA rejected Pennsylvania's request to use the money for other projects, because ". . . the application did not meet the federal requirement that toll revenues be used exclusively for the facility being tolled" (Federal Highway Administration, 2010).

As noted in section 1 of this report, there are serious flaws in the traffic projections prepared to date. In particular, the over-estimation of traffic under current non-tolled conditions, the very high value assumed for travel time, and the decision to manually adjust traffic model outputs to shift more vehicles to the I-5 crossing all inflate estimates of toll revenue. In reality, total traffic volumes may be much less, and diversion to the I-205 bridge is likely to be much higher than CRC projections estimate.

Tolling I-205 will require specific permission from the Federal Government, and may be illegal under federal law. And if I-205 is tolled, toll revenues from that bridge may not be legally available to pay costs associated with construction of the CRC. The uncertainty surrounding the toll regime, and potential revenues available for the CRC is a major risk to the project.

3.5 Unconditional Guarantee Risk

The states of Oregon and Washington would likely be required to offer an unconditional guarantee to bond holders, exposing the states to the risks of revenue shortfalls and cost-overruns. For example, if the cost of the project exceeded the $3.6 billion now estimated for the revised project, the two states would be liable for these costs. If the toll revenues from the project were insufficient to repay the bonds and interest, the two states would be legally bound to divert other revenues or raise taxes to repay bond holders. The financial plan does not estimate the costs to the states from these guarantees.

The likelihood is that additional funds will be needed. As noted earlier, 90 percent of mega-projects experience cost-overruns. Other sources of revenue may fall short of targeted contributions to the project either initially or over time. Bond rating agencies are likely to say that the project will support a smaller level of borrowing than the amounts estimated by the CRC. In addition, if traffic levels fall short of forecasts, it may be impossible to generate additional toll revenues by raising toll rates, because toll increases will trigger additional diversion of traffic, and lower traffic volumes will more than offset revenue gained from higher rates. It is also possible that federal funding may be less than expected, or may arrive more slowly than anticipated. All of these events have the effect of triggering additional liability for project guarantors.

The likelihood that the states will be called upon to guarantee bond purchasers against the effects of cost-overruns and revenue shortfalls has an added negative effect on the due diligence bond purchasers would otherwise provide for the project. If their financial return is guaranteed by the full faith and credit of the two states, investors have no reason to insist on a careful review of project forecasts. Under normal circumstances, lenders will provide a valuable service by independently evaluating key project assumptions. A guarantee undercuts this added review, and in effect represents a moral hazard in the construction and operation of the project, as bond holders have no incentive to offer strong oversight of the project because they are guaranteed repayment by the state whether or not the project succeeds.

3.6 Foregone Road Pricing Revenue Risk

Establishing tolls for the I-5 bridge may foreclose the opportunity to apply road-pricing to other segments of the highway system in the Portland metropolitan area. One reason that travelers will be willing to pay a toll to use a new I-5 bridge is that they are not charged a toll for using any of the highways that lead to I-5.

For the past several years, Oregon has been investigating comprehensive systems of road pricing. The 2009 Legislature adopted HB 2001 that requires a pilot congestion pricing program in the Portland metropolitan area not later than 2012 (Section 3). As gas prices rise, and as vehicle fuel efficiency improves and as alternative fuel vehicles emerge, it is

apparent that the gasoline tax may need to be replaced as a means of financing the transportation system.

Tolls assessed for crossing the I-5 bridges do not solely reflect the value travelers attach to the bridge, but reflect the value of the other infrastructure that enables travel to the bridge. Once the two states start collecting in excess of $100 million per year from travelers crossing the bridge, they will find it extremely difficult to persuade users to pay additional fees for using other parts of the highway system that function as bridge approaches. Those who purchase bonds secured by toll-revenues on the I-5 bridge may want assurances that the two states do not establish tolls or road pricing on the approaches to the bridge, because this would have the effect of lowering traffic on the bridge, and also lowering the willingness of travelers to pay higher tolls over time to use the bridge.

3.7 Federal Earmark Shortfall Risk

The CRC financing plan assumes a massive and politically uncertain level of federal earmarks. The CRC has asserted that the region can expect $400 million in federal earmarks for this project, and that because of the project's alleged unique characteristics these monies will be over and above federal revenue that the region could expect to get in the future.

But this level of earmarks dwarfs what has gone to any single project. And the climate for earmarks has changed dramatically from the last transportation bill in 2005. Senator Patty Murray—chair of the transportation subcommittee of the appropriations committee—has warned against expecting big funding for this project (Hamilton, 2008).

While the public statements of the CRC imply that this project can expect some special funding, the reality is quite different. The "Corridors of the Future" program which CRC implies is a special category, is defined to include freeway mileage that carries fully one-third of the nation's traffic, and is a bureaucratically created program of the Bush Administration, funded at a total of only $66.2 million nationally (U.S. Department of Transportation, 2008).

It is apparent that that the CRC will compete for virtually every federal dollar flowing into the region. In the text of the DEIS, the CRC makes it clear that every other source of federal money flowing to Oregon and Washington for transportation is fair game for the CRC, including monies dedicated to preservation and maintenance of the highway system (DEIS, Section 4-3).

In documents released to the Independent Review Panel, it is apparent that the Columbia River Crossing will compete for existing "formula" funds that are distributed to the states, and that are available for a wide range of transportation projects (Columbia River Crossing, 2010a).

3.8 New Starts Funding Shortfall Risk

The project's financing plan assumes that the federal government will provide $850 million in federal transit administration funding for the construction of light rail as part of the project.

There is a $100 million discrepancy between the project budget reviewed by the Federal Transit Administration and the amount of funding projected to be received from FTA. The FY 2011 New Starts report indicates that the CRC has requested $750 million for transit (Federal Transit Administration, 2010). The funding plan CRC submitted to the Independent Review Panel indicates that the project will receive $850 million in New Starts Funding from FTA (Independent Review Panel 2010, page 173).

The project assumes a very high rate of federal match, which may not be realistic. According to the FTA, the CRC project funding assumes that federal funds will cover 79 percent of the cost of the transit portion of the CRC (Federal Transit Administration, 2010). This is the second highest level of federal match anticipated by any project; most projects are asking for federal funding of 50 percent or less. The project competes with projects in other regions, and locally, including the Portland-Milwaukie Light Rail line, which has a higher priority in the New Starts evaluation process, and which is being funded at a 50 percent level of matching.

According to the IRP, it is uncertain whether the project will successfully compete for new starts funding, and if it does, whether it will receive the requested level of funding. In its evaluation, the FTA questioned the project's local funding support and its operating cost support. As a result, the IRP concluded:

> In the FY2011 New Starts Report, FTA noted concerns relative to the assumptions affecting the capital finance plan and the operating finance. Should the New Starts ratings decrease as a result of changes in assumptions, or as a result of economic conditions, or as a result of changes in project definition, or escalation of project costs, the project's ability to maintain the Medium rating needed to advance through the New Starts process [to] secure a recommendation for a FFGA (full funding grant agreement) could be at risk.
> (Independent Review Panel, 2010, page 181).

3.9 Schedule Delay Risks

Many of the costs associated with the Columbia River Crossing are influenced by how well the project can execute scheduled tasks. There are a variety of cost risks associated with delay. In the event of price inflation, a delay can produce higher prices, for labor or for materials. Delays also have a financial cost; if project completion is delayed, then interest expense rises and net revenue from tolling will be reduced.

The size and complexity of the Columbia River Crossing makes it difficult to accurately estimate project schedules. The record of the project's planning stages clearly illustrates these difficulties. The project has repeatedly fallen behind its stated schedule in achieving key planning milestones. For example, in December 2006, the CRC predicted it would issue a Final Environmental Impact Statement in September 2008 (Columbia River Crossing, 2006).

In May, 2009, the CRC schedule indicated that the Final Environmental Impact Statement would be issued in February, 2010 (Columbia River Crossing, 2009a).

Other special considerations make the project vulnerable to delays. Not only does the project involve managing construction in a heavily traveled interstate highway corridor, it also takes place in an environmentally significant area. The seasonal migration patterns of Columbia River Salmon—some of them listed as threatened or endangered species—require that in-water work be done only at certain times when fish are unlikely to be present. Small delays can be magnified if the project misses an opportunity to do construction in one of these available "in-water windows." According to the Independent Review Panel, the existing project schedule assumes that construction will be able to take place year-round, with no requirements to suspend in-water work during migration periods. However, it now appears that Endangered Species Act protections will require that in-water work take place only in four-month windows, rather than year-round. This seriously jeopardizes the ability of the project to be completed according to the current schedule.

> The IRP also understands that upon completion of the ESA draft that the in-water time period to perform work is a specific four-month window and there is no probability that it can potentially be eight months or even the entire year, thus severely restricting when in-water works can be performed. (Independent Review Panel, 2010, page 168).

Construction delays are a regular occurrence in such projects, as the experience with ODOT's largest current construction project, the U.S. 20 Pioneer-Mountain to Eddyville project indicates. The project is years behind schedule, having been delayed by previously unidentified geological problems, and a contractor's failure to adequately protect salmon habitat. Most recently, ODOT announced that construction is being suspended on four of the bridges that are part of the project because of concerns about geological stability. A routine examination found two bridge columns out of plumb in February, 2010, leading ODOT to suspend construction in June. It is not known when construction will resume on these bridges (Oregon Department of Transportation, 2010).

Conclusion

As currently proposed, this project faces three broad areas of very significant risk.

The cost of the project, as determined from CRC documents, is more than double the widely-publicized $3.6 billion construction-only costs. CRC's financial projections indicate that over thirty years, total costs of building and operating the project will exceed $8 billion dollars. Supplemental costs for related improvements, as recommended by the Independent Review Panel, will push costs to $10 billion, possibly more. Yet additional costs from potential and probable "mega-project" cost-overruns are unquantifiable.

The projected revenue from tolls is significantly overstated due to errors in the underlying traffic assumptions. These errors exaggerate expected cash-flow, and overstate the project's ability to service debt. Because no serious, independent investment grade analysis of tolling has been undertaken, the project's ability to secure favorable bond ratings and obtain the amount of debt needed is highly doubtful.

The project relies on funding from multiple federal programs, and it is highly improbable that all programs will be available, or that they will produce the optimistic levels of funding projected for each program, for the period of time that the funds will be required.

Each factor separately poses significant risk for Oregon's finances, since only the two states can fill the gaps caused by increased costs, toll revenue shortfalls, and unfavorable federal funding actions and timing. Together these risk factors compound to create virtually certain additional demands on the states' finances that have not been adequately addressed or analyzed.

Proceeding with this project based on the unreliable and highly over-optimistic work done to date exposes the region to enormous financial risks. Just as one would insist on an independent certification that the bridge's physical design was sound, decision-makers should insist that the financial plan for the Columbia River Crossing is not one which is so poorly designed that it is liable to collapse. Before taking any further steps which would commit to this risky course of action, the region's leaders should insist on a careful, professional and completely independent review of the project's financial plan.

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