Columbia River CROSSING

Meeting Agenda

MEETING TITLE: Project Sponsors Council

DATE: January 9, 2009

LOCATION: Washington State Department of Transportation, SW Region
1018 NE 51st, Vancouver, Washington 98662

TIME	AGENDA TOPIC
10:00 - 10:10 a.m.	Welcome and Introductions
10:10 – 11:30 a.m.	Add/Drop Lanes Decision Process (Cont.): • Overview • Recap of Engineering Issues • Response to Action Items from Last Meeting: - Travel Demand & tolling - Additional Operational Differences - Transit Impacts - Environmental Differences - Cost Related Issues - Induced Land Use • Presentation and Discussion on Greenhouse Gas Expert Panel Findings
11:30 – 11:45 a.m.	Discussion on Recommendation Process for Add/Drop Lanes
11:45 – 11:50 a.m.	Communications Update
11:50 a.m. – 12:00 p.m.	Next Steps and Next Meeting Topics
12:00 p.m.	Adjourn

TRANSIT DIRECTIONS from PORTLAND:
From Downtown Portland, take C-TRAN Express Bus #164 to the Fisher's Landing Transit Center. Transfer to Bus #80 (Van Mall/Fisher's) eastbound to 49th and 112th Avenue. WSDOT SW Region Headquarters is 2 blocks north of this bus stop.

TRANSIT DIRECTIONS from VANCOUVER:
From Downtown Vancouver take C-TRAN Bus #4 (Fourth Plain) eastbound to the Vancouver Mall Transit Center. Other buses to Vancouver Mall are #32, 72, 44 and 78. From the Mall Transit Center, transfer to Bus #80 (Van Mall/Fisher's) eastbound to 49th and 112th Avenue. WSDOT SW Regional Headquarters is 2 blocks north of this bus stop.

For detailed trip planning, please contact the two transit agencies: C-TRAN, www.c-tran.com, 360-695-0123, or TriMet, www.trimet.org, 503-238-RIDE

Meeting facilities are wheelchair accessible and children are welcome. Individuals requiring reasonable accommodations may request written material in alternative formats or sign language interpreters by calling the

project team at the project office (360-737-2726 and 503-256-2726) one week before the meeting or calling Washington State's TTY telephone number, 1-800-833-6388.

Draft Meeting Summary

MEETING TITLE: **Project Sponsors Council (PSC)**
DATE: December 5, 2008, 10:00 am – 12:00 pm
LOCATION: The Portland Building, 1120 SW Fifth Avenue, Room C, Portland, OR

ATTENDEES:

Dengerink, Hal (Chair)	Chancellor, Washington State University, Vancouver
Hewitt, Henry (Chair)	Past chair, Oregon Transportation Commission
Bragdon, David	Council President, Metro
Fritz, Amanda	Portland City Commissioner, on behalf of Portland Mayor-elect Sam Adams
Garrett, Matthew	Director, Oregon Department of Transportation
Hammond, Paula	Secretary, Washington State Department of Transportation
Hansen, Fred	General Manager, TriMet
Leavitt, Tim	Chair of the Board of Directors, C-TRAN
Pollard, Royce	Mayor, City of Vancouver
Stuart, Steve	Vice-chair, SW Washington Regional Transportation Council
Brandman, Richard	ODOT CRC Project Director
Wagner, Don	WSDOT SW Regional Administrator

Note: Meeting materials and handouts referred to in this summary can be accessed online at: http://www.columbiarivercrossing.org/ProjectPartners/PSCMeetingMaterials.aspx

Welcome and meeting summary approval

Chair Henry Hewitt welcomed members of the Project Sponsors Council (PSC), project staff, and the public. The draft summary of the November 4, 2008 meeting was approved with no changes.

Response to action items from last meeting

Public meeting laws

Don Wagner provided a brief overview of Oregon's and Washington's public meeting laws, referring to the handout memorandum titled "Oregon and Washington Public Meeting Laws." He summarized the memo by saying that CRC meets both states' requirements and noted that there is no requirement in the public meetings laws for public testimony. However, the project has a practice of sending meeting materials to the public and the media a week in advance of meetings.

Commissioner Steve Stuart asked for clarification that the project accepts written comment at the PSC meetings. Wagner confirmed this and added that the project accepts written comments on the project at any time.

Board/council resolutions

Chair Hewitt referred to the list summarizing sponsor agency resolutions on the CRC locally preferred alternative. The list has been amended since the last PSC meeting and represents a thorough summary of issues raised by project sponsor agencies. Any further additions should be sent to Don Wagner or Richard Brandman. No PSC members had additional items to add during the meeting.

Integrated schedule

Don Wagner said the project's assumed construction start date is 2012. He reviewed the project schedule included in the meeting handouts.

360/737-2726 503/256-2726 WWW.COLUMBIARIVERCROSSING.ORG 700 WASHINGTON STREET, SUITE 300, VANCOUVER, WA 98660

Add/drop lanes decision process

Overview

Richard Brandman provided an overview on the topic of number of through lanes and add/drop lanes (formerly referred to as auxiliary lanes). He said agreement exists on the inclusion of three through lanes, light rail, and tolls. Brandman emphasized that the project will not build new lanes in north Portland south of Marine Drive. The number of add/drop lanes decision has far more to do with highway operations and safety than with vehicle throughput. CRC based its assumptions on a nationally recognized model used by Metro, the same model used for other regional projects such as the Sellwood Bridge, Milwaukie light rail, and others. Project sponsor agencies asked, he said, for a peer review panel to examine the CRC project's assumptions and travel demand model. This review occurred and findings will be discussed by the panel's chair.

Presentation and discussion on travel demand expert panel findings

Maren Outwater, chair of the CRC travel demand expert review panel, gave a slide presentation summarizing the panel's work. A full summary of the panel's findings is in their report, found online in the PSC meeting materials.

The panel's mission was to address specific resolutions passed by sponsor agencies in July 2008 as part of the selection of the locally preferred alternative. Some resolutions asked for independent analysis of the induced automobile travel demand forecasts and the project's effect on vehicle miles traveled.

Outwater described the panel's membership, approach, and the seven key questions they addressed. These questions asked whether the CRC project's assumptions, methods, and findings were reasonable on a range of topics, listed below in bold text.

Outwater reviewed the panel's general findings that Metro's travel demand model is an advanced trip-based tool and is appropriate for the CRC project. The panel found that the results generated by the Metro regional travel demand model and other models for the CRC project are valid and comprehensive. The panel also provided long-term recommendations for regional consideration that are beyond the scope of the CRC project but that might provide long-term usefulness..

1. Vehicle operating costs and fuel prices: Outwater said the operating cost assumptions were reasonable and that the model assumed "worst case" (highest) fuel prices. Fred Hansen asked whether higher future fuel prices such as $6-$7 per gallon would alter the project's assumptions. He also wondered whether future improvements in fuel efficiency were taken into consideration. Outwater replied that they just did a range on operating costs – a combination of gas prices and the efficiency of cars -- which is a bundled cost. But it does take this into consideration.

Chair Hewitt and Commissioner Steve Stuart requested the range of gas prices that were modeled for them to see. Outwater said those numbers are available. CRC directors said they would provide these numbers at the next meeting.

2. Tolling methods: Outwater said treatment of tolls in the model's destination choice module is appropriate and tolling methods used for CRC are within standard practice. The Metro model is at the forefront of good practice, she said, but there is no "standard practice" because tolling models are changing nationally.

David Bragdon asked where the project should be looking nationally for best practices on travel demand models and tolling. Outwater said the best places to look are those with data collected before and after the tolled facility. Generally, places with observed data is the most useful tool to understand whether people will pay a toll or not. In the academic community, there is still a lot of research underway. Richard Brandman added that for the project's next round of analysis, one of the foremost tolling consultant firms in the United States has been hired, and they bring broad national experience.

3. Traffic projections: The panel found year 2030 traffic projections are reasonable because the CRC project would provide a high level of transit service, provide tolls on I-5, and not add lanes north or south of the project limits.

4. Vehicle miles traveled: The panel found the estimated decrease in I-5 corridor VMT and marginal increase in regional VMT is reasonable.

5. Bridge add/drop (auxiliary) lanes: Outwater explained that assigning reduced traffic capacity to auxiliary lanes is appropriate.

Commissioner Stuart commented that the panel had a recommendation to code the add/drop (auxiliary) lanes with lower free-flow speeds. He asked Outwater to explain that further. Outwater said the panel's finding was that for future evaluation it would be useful to review methods and determine whether a lower speed and capacity is appropriate.

Stuart said this suggests to him that the coding was too high. Outwater said there is no standard practice for this and that the panel's recommendation is to look at the highway practices manual for guidance, not that the assigned speed should be lower. Richard Brandman added that the model speed is not fixed, but varies with the number of vehicles on the facility.

6. Induced growth methodology: The panel found that the multiple methods used to evaluate induced growth were thorough and robust. These included national research and case studies, land use context and planned growth, travel demand modeling and microsimulation, and Metroscope analysis with "worst-case" scenario.

7. Induced growth results: Outwater said the findings that CRC would have a low impact to induce growth, or sprawl, is reasonable for a number of reasons, among them: the project is located in a mature urban area; the project is likely to promote increased densities around new transit stations; and a better jobs/housing balance in Clark County is expected in the future.

David Bragdon asked if the project will increase access to non-mature areas such as north Clark County. Outwater said the panel found that the project is not promoting induced demand because CRC doesn't really change the capacity for trips to north Clark County.

Purpose of add/drop lanes – safety and operations

David Parisi, consultant traffic engineering manager, gave a brief overview by discussing the project area's seven closely spaced interchanges, its travel patterns, the definition of add/drop lanes and where they can be found throughout the region, and illustrated highway merge and diverge conditions. He said the increase in truck traffic in the project area is expected to be twice that of cars.

Kris Strickler, deputy project director, continued by describing the big picture view using a "stick diagram" of add/drop lanes in the project area. Strickler discussed the number of vehicles exiting the highway at each interchange.

Commissioner-elect Amanda Fritz asked how the Rose Quarter bottleneck affects how vehicles have to merge during the peak hour morning commute. David Parisi said that by 2030, we do still expect a chokepoint at the Interstate 5 / Interstate 405 split. But looking at merging distances, many of the CRC project area's ramps have only one tenth the merging length they should according to design standards. ODOT director Matthew Garrett added that staff are talking about two key issues – safe interchange operations and flow of traffic.

Strickler used a full length project area map to describe how and where the add/drop lanes appear and peel away. He noted that the add/drop lanes are not continuous throughout the entire project area.

A couple of PSC members asked about the configuration of collector/distributor lanes in the project area. Strickler asked the audience to note that the stick diagram does not include all the collector/distributor lanes due to the more general level of detail. However, these lanes are shown on the aerial map.

Commissioner Stuart asked if staff have traffic volumes associated with the three prongs of lanes going north from SR-14 to get off at Mill Plain, Fourth Plain, and back onto I-5.

Councilmember Leavitt asked why he would support a 10-lane option if it compromises safety in the corridor. He wondered if this means that a 14-lane option would be even safer than the 12-lane option. Where is the line drawn between 12 lanes versus 10 lanes, he asked.

Strickler referred to diagrams in the meeting materials and replied that the 10-lane option has five "hot spots" that inhibit smooth, safe traffic flow. It's really a question of how much congestion and safety problems the region and stakeholders are willing to accept, he said.

Mayor Pollard said under today's conditions he sees significant impacts from traffic diverting off I-5 and onto downtown Vancouver neighborhood streets. The City has worked hard to minimize these effects. He expressed concerns that cut-through traffic would worsen in the future.

Regarding the number of vehicles that cut through on local streets to avoid I-5 congestion, Commissioner Stuart asked staff to provide numbers not just from a No Build option, but from existing conditions.

Richard Brandman referred to the matrix titled "Traffic effects of 8, 10 and 12 lane options." He said the fewer lanes we have on I-5 – such as under the 8-lane option – the more cars we have diverting to I-205. And when that happens, you see longer trips as a result of this diversion. When you increase the number of lanes to 10 or 12 lanes, you actually reduce the vehicle miles traveled. You also reduce congestion on the bridge, which is good for air quality, and you get safer highway conditions. Lastly, only the 12-lane option provides the future opportunity and space to create a regional high occupancy vehicle (HOV), or carpool, lane.

Commissioner-elect Fritz asked why the number of transit riders doesn't change based on different congestion levels.

Brandman said it's because the transit ridership is limited by peak hour ridership's park and ride capacity. The planned park and ride capacity is not enough to meet demand. The locally preferred alternative contains an alignment that stops at Clark College, which has a physical limitation on the number of cars that can access the parking lot. There wasn't a specific light rail analysis for each of these number of lane alternatives.

Fritz asked if that means there is a ceiling on the transit capacity. Brandman said it's due to a high preponderance of anticipated light rail users to be park and ride users. Secretary Hammond asked whether at some point the light rail trains become full, too.

David Parisi said his understanding is that there are some capacity constraints for light rail trains at Rose Quarter and the Steel Bridge in Portland. There would be space left on light rail trains in the future. The challenge, he said, is that we can't get riders *to* the light rail stations.

A few PSC members said surely that could be addressed with improved feeder bus systems expected as part of the high capacity transit system plan developed by C-TRAN and Clark County. Commissioner Stuart would like to see an analysis of how many people can fit on light rail trains versus how many people can get to the light rail stations to ride it.

David Bragdon listed four questions he would like addressed: (1) What physical or other concessions can be made to improve the flow of freight through the project area interchanges? (2) What is the role and use of ramp meters and what are effects? (3) A lot of justification for the project was based on interchange improvements, so what happens if the project has to be phased and those improvements need to be delayed? (4) Can light rail be accommodated with a 12-lane bridge on only two structures?

Don Wagner said light rail fits underneath the highway in the "stacked transit/highway bridge" option, with the 12-lane option working best. He said it can be done under the 10-lane option with some engineering fixes, but that it's not possible with the 8-lane option.

Mayor Pollard said he would like to know the cost difference between the 10 and 12 lane options and the tradeoffs to choose the most worthwhile investment. He said the project's analysis is based on the year 2030 but that construction won't be complete until about 2016.

Commissioner Stuart asked that the next version of the lanes matrix have an adequate comparison of existing vs. No Build by adding two more columns – so it's clear whether diversion is increasing or decreasing with No Build vs. existing. He would also like to see cost information associated with the number of lane options. Lastly, for regional vehicle miles traveled, were there any scenarios put forth that actually *reduce* vehicle miles traveled? Secretary Hammond said current Washington state law discusses reduction goals of vehicle miles traveled per capita.

Councilmember Leavitt said he feels like he is being asked to make a value judgment on whether 10 or 12 lanes is better. When talking about a project costing over $3 billion, he asked what is the difference in cost among these number of lane options?

Chair Hewitt said if staff does this, it would be helpful to take the detailed engineering roll map and show costs across the map and where those costs are geographically. He would also like the roll map to be made available in a handout form.

Recap of CRC project open houses, December 2-3

Due to time constraints, this agenda item was deferred to the next meeting, at which time a written summary will be available of public comments received at the open houses.

Next meeting

Friday, January 9, 2009 | 10:00 am – 12:00 pm

Washington State Department of Transportation
11018 NE 51st Circle, Vancouver WA 98682

Action Items from December 5 Project Sponsors Council Meeting:

Action Items	Response
Travel Demand	
• Range of gas prices and other costs used in the variance study of the Expert Review Panel	Fuel costs within the Metro travel demand model are considered as part of the vehicle operating cost, which consists of gasoline and oil, tires, and general vehicle maintenance costs on a per mile basis. Metro does not break down each element into a cost figure in determining the projected operating costs. Rather, they determine escalation factors for the operating costs as a whole. Vehicle operating cost is used instead of fuel prices because it reflects the long-term relationship between fuel price and vehicle fleet fuel efficiency (through technological changes, consumer preferences, and government regulations). As gasoline prices rise, fuel-efficiency tends to also increase and maintenance costs tend to drop. Vehicle ownership costs, such as insurance, license, registration, taxes, depreciation, and finance charges, are not included in the Metro travel demand model since these costs do not reflect operating costs. Given the recent spikes in the price of gasoline, Metro desired to ascertain the vehicle operating cost assumptions within the Metro model. The review was warranted because the increases in gas prices not only represented a deviation in past trends, but may potentially increase the vehicle operating costs within the model to a level that would have a significant impact on travel behavior. Metro researched projections from the federal government and other third parties to estimate future fuel costs before determining the range of gas prices used in the variance study for the Expert Review Panel. Information from the Energy Information Administration (EIA) was used. The EIA has prepared year 2030 fuel cost projections for three scenarios: a reference or base case, a lower cost case, and a higher cost case. In year 2008 dollars, the fuel cost projections translate to $2.51, $1.90, and $3.61, respectively. If inflated to 2030, the values are $3.57, $2.68, and $5.13. By 2030, passenger vehicle average fuel efficiencies are projected to be about 39.2 miles per gallon (compared to the current rate of 24.4 miles per gallon). When using EIA's highest cost fuel scenario, the average vehicle operating cost for year 2030 is estimated to be $0.13 per mile in year 2008 dollars. This matches current operating costs on a per mile basis and the value used for all year 2030 modeling. It should be noted that if EIA's reference or base case fuel costs were used, the year 2030 average vehicle operating cost would be $0.11 per mile, or 15 percent lower than was used for the travel demand modeling.

• Vehicle miles traveled (VMT) data	As the number of add/drop lanes on the I-5 Bridge decrease, (a) the number and mileage of vehicle trips diverted from I-5 to I-205 increase, and, (b) the volume of trips crossing the Columbia River decrease. Because the VMT due to diversion to I-205 increases more than the river crossing VMT decreases, the fewer the lanes the greater the overall VMT. • 8-lane: 56.770 million regional VMT, 0.21 % increase over No-Build • 10-lane: 56.750 million regional VMT, 0.18% increase over No-Build • 12-lane: 56.746 million regional VMT, 0.17% increase over No-Build
• Tolling sensitivity	Higher tolls on I-5 have two material impacts: 1) the number of trips crossing the Columbia River decrease as the toll rates increase and 2) the amount of trips diverted to I-205 increase. The baseline toll rate structure applied in the Draft EIS assumes a $2 peak-period toll (2006 dollars), $1.50 in the periods at either side of the peak, and $1.00 in the evening/early morning hours. These rates are applied in each direction (so round-trip is twice the rates shown) and increase at the Consumer Price Index (2.5% per year). These rates are in line with many similar toll bridges in the US. Analyses have found that toll revenues can be increased (i.e. higher toll rates offset lower traffic volumes) by raising the toll rates up to a point; the toll revenues begin to decline at toll rates about twice the baseline rate structure. However, when toll rates are raised, the largest percentage reduction in trip volumes occurs in off-peak hours and off-peak directions, and for non-work trips. Thus, the reduced volumes associated with higher rates do not translate into a reduced need for capacity on I-5. If both I-5 and I-205 are tolled, traffic volumes on I-5 increase compared to the baseline volumes that were used in the Draft EIS when only I-5 is tolled. Trips that diverted to I-205 to avoid the toll will shift back to I-5.
• Travel demand management, (TDM) strategies and impact on VMT	CRC proposes an aggressive TDM program that includes existing regional strategies and new initiatives that can be implemented during construction and upon completion of the project. Key TDM strategies currently include light rail, tolling, express bus service, bicycle and pedestrian connections, and continuation of current carpooling and other TDM programs. A sponsor agency TDM Working Group is developing further TDM recommendations for a preferred alternative and will provide the PSC with updates on their recommendations.
Additional Operational Differences between 8, 10, and 12 Lanes:	
• Freight effects/options for various lane configurations and other opportunities to improve freight movements	By year 2030, truck freight traffic across the I-5 bridge and in the project area is expected to increase at about twice the rate of non-truck freight traffic. Most truckers try to avoid high periods of congestion; such that a great deal of freight movement occurs in the off-peak hours. The critical freight-related problem being addressed by the CRC project is the duration of the period of congestion on I-5. Under the No-Build alternative, congestion would last about 15 hours, essentially eliminating the peak midday freight hauling period. The CRC project will help reduce these impacts to varying degrees, in part depending on the

	number of lanes on the bridge: • Under the 8-lane corridor option, congestion on the I-5 Bridge would last for seven to nine hours each weekday, which still would have a substantial impact on the peak midday freight-hauling periods, but to a lesser extent than the No-Build alternative. Key freight traffic routes and interchanges including Mill Plain Boulevard, SR 14, and Marine Drive would be affected. • The 10-lane corridor option provides a more substantial benefit to freight movement than the 8-lane option; I-5 Bridge congestion would last for five to seven hours, with congestion affecting Mill Plain Boulevard, SR 14, and Marine Drive, but to a lesser extent than the 8-lane option. • With the 12-lane option, the period of delay at the I-5 Bridge would be reduced to 3.5 to 5.5 hours, with all of the congestion occurring during peak commute periods and not during midday freight peaks. Thus, the 12-lane option provides the greatest benefit to freight movement. Trucks are currently involved in over twice as many collisions on a per vehicle basis, than other vehicles. Compared to the 12-lane option, the 10-lane option would result in 20 percent more collisions and the 8-lane option would result in 50 percent more collisions. The CRC's Freight Working Group consists of freight representatives from throughout the metropolitan region. This group supports the basic highway and interchange improvements recommended as part of the Replacement Bridge alternative - including add/drop (auxiliary) lanes, collector-distributor roads, and interchanges with truck-friendly ramp grades and intersections. **Truck-Only Lanes:** Based on extensive analysis, the Freight Working Group did not recommend separated truck-only lanes for the CRC project. Merging into and out of a separated truck-only lane would be nearly impossible to achieve given the high number of trucks entering and exiting I-5 within the project limits.
• Feasibility of stacked transit/highway bridge based on number of lanes	In addition to the segmental concrete box bridge types shown in the Draft EIS, there are other bridge types that would allow for a stacked transit/highway design for all the lane configurations. For a pre-cast or cast-in place segmental concrete box with transit inside the box, only the 10 and 12-lane options have enough room inside the box to accommodate light rail transit vehicles.
• Project phasing and construction staging issues related to number of lanes options	CRC does not view phasing various elements of the project as a number of add/drop lanes issue, but rather a potential finance issue for future discussion. CRC has sought advice on construction staging by independent experts and in general they have determined that when more lanes are available for traffic use, it allows increased staging flexibility for handling traffic during construction.

• Add No-Build to the matrix	Revised per request. See the new matrix included in the handout materials.
• Describe the traffic volumes associated with the three lane options going north from SR-14 to get off at Mill Plain, Fourth Plain, and back onto I-5	PM peak hour volumes: • SR 14 total northbound traffic = 2195 vehicles per hour (vph) • SR-14 traffic exiting to Mill Plain = 145 vph • SR-14 traffic exiting to Fourth Plain = 100 vph • SR-14 traffic entering I-5 = 1950 vph • I-5 traffic exiting to Mill Plain = 625 vph • I-5 traffic exiting to Fourth Plain = 420 vph
• Quantify effects of traffic on city streets for the various options	For existing conditions, approximately 500-600 vehicles during the peak hour and 1000 vehicles during the 4-hour AM peak period cut through local streets to avoid I-5 congestion by exiting I-5 at the Main Street off-ramp and travel south on Main Street to downtown Vancouver destinations, or before re-entering I-5 in downtown Vancouver at Mill Plain Boulevard and City Center entrances. Similar impacts could be expected for PM peak impacts in Oregon. Models have not been run to compare the amount of cut-through traffic for the various lane options, but the 12-lane option will have the least amount of cut-through traffic and an 8-lane option would have the most. Impacts from the 10-lane option would fall in between.
• Describe the effect of ramp meters on lane options	Ramp meters are traffic signals on highway entrance ramps that regulate the frequency of vehicles entering the highway. By metering the flow of traffic onto the highway, ramp meters break up large platoons of vehicles and make it easier and safer for motorists to merge onto the highway, allowing traffic to flow smoother. The 8-lane, 10-lane and 12-lane options all include ramp meters at all on-ramps except for highway-to-highway connections (e.g., SR 500 to I-5). Ramp meter rates would need to be slowed under both the 10-lane and 8-lane options compared to the 12-lane option in order to facilitate safe highway operations in constrained merging and weaving areas. Considering the high traffic demands and the close interchange spacing of the seven interchanges within the project limits, the lower metering rates would result in higher congestion levels on the ramps and subsequently traffic back-up onto some local streets.
Transit Effects of 8, 10, and 12 Lanes:	
• Explain why ridership numbers are similar regardless of the number of lanes. If congestion increases, doesn't transit ridership increase?	Transit ridership would be affected by the number of lanes (8, 10, or 12) across the river, but as modeled, by a relatively small amount. Assumptions were made in the model that there are reasonable limits to the number of park and ride spaces in downtown Vancouver; bicycle/pedestrian access would be the same regardless of number of lanes; and, increasing bus service to light rail stations, beyond what is proposed, would be constrained by funding and operational characteristics. (See the responses below for more detail.) Because of the above constraints used in the ridership model, there was a small effect on ridership in the range of 1 to 5 percent.
• How can transit ridership be increased?	The number of lanes would have some small effect on ridership, but the effect is constrained by factors described in the previous answer.

	Park and ride: Adding more park and ride spaces would increase ridership but may also create additional impacts including increases in local traffic and intersection congestion. Future line extensions would expand the capability to add park and ride spaces outside downtown Vancouver. **Walk and bicycle access**: The number of bus riders that walk to light rail/bus is generated by surrounding land uses and densities. Walk to transit ridership does not increase with the number of lanes on the bridge. Land use near stations and stops is based on the adopted Vancouver downtown plan densities. **Bus service affect on light rail/bus transfers**: The C-TRAN bus system included in the modeling assumes adequate bus to light rail connections in downtown Vancouver. The model results indicate that transfers from buses to rail will occur in downtown. Increasing the frequency of bus to light rail service could increase the number of bus to light rail riders who walk to the bus. However, the level of bus service has already been adjusted to meet the growth of demand. Additions in service beyond the increase due to growth would achieve diminishing returns in both ridership and reductions of the CRC project cost/benefit ratio due to the cost of increased bus service. **Light rail frequency**: Increasing light rail frequency could slightly increase ridership across the river. However, because the park and rides are already full, bus service levels have already been adjusted for projected growth, and the amount of growth does not change; it is unlikely that ridership would increase by more than 1 to 5 percent.
• If additional park and ride spaces would increase transit ridership, why not add more?	Park and ride capacity was determined by balancing needs for increased ridership potential with the impacts of park and ride facilities on project cost, traffic, and downtown character. The number, size, and location of the proposed park and rides were determined to meet reasonable transit demand without overwhelming roadways, overwhelming the character of downtown Vancouver, or increasing capital and maintenance costs to a level that reduces the cost effectiveness criteria of the project.
Environmental Differences between 8, 10, and 12 Lanes:	
• Provide a comprehensive analysis showing the differences between the lane options for key environmental issues for the different footprints	See attached matrix. In general, the 10 and 12-lane options have similar impacts because their overall right-of-way footprints are relatively the same, with the 10-lane option having a slightly smaller impervious surface area. The 10 and 12-lane options better meet the project Purpose and Need, and have improved air quality, less cut-through traffic into neighborhoods, a slight reduction in greenhouse gases, and improved access to public services compared to the 8-lane option. The 8-lane option has a smaller environmental footprint resulting in less impact to archeological and historic resources, a slight reduction in impacts to ecosystems and stormwater, and fewer property acquisitions.
Cost Related Issues:	
• Capital cost difference between 8, 10, and 12 lanes	The difference in capital costs between the 10 and 12-lane options is estimated to be approximately $100 million (2008 mid-year costs). The 8-lane option would be approximately $85 million less than the 10-lane. These numbers would increase by about 35-40% when

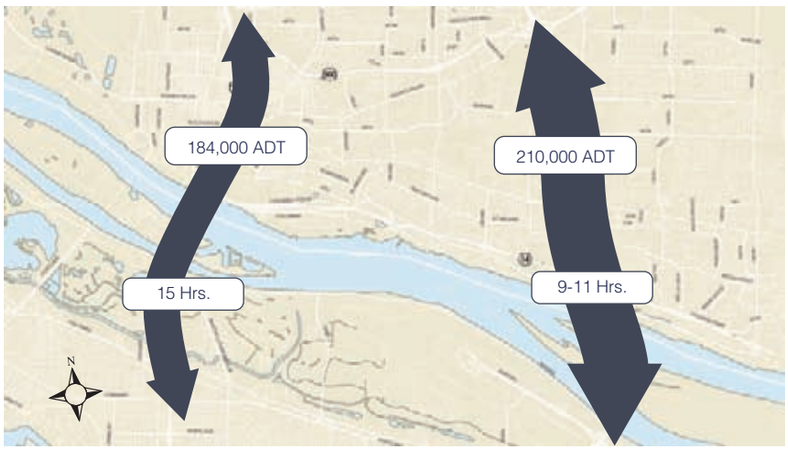
	inflated to the mid-year of construction.
• Show costs for various segments of proposed improvements, such as interchanges and lane options	CRC is in the process of updating costs for an early February risk-based project estimate. We will share this information at a future PSC meeting.
• Cost of congestion report…can it help with quantifying the need for the number of lanes?	***The Cost of Congestion to the Economy of the Portland Region*** Prepared for: Portland Business Alliance, Metro, Port of Portland and Oregon Department of Transportation Prepared by: Economic Development Research Group, Inc., Boston, MA, December 2005 **Conclusion** Action is needed to remain competitive with other regions that are planning large investments in their transportation infrastructure. This report finds that: • Being a trade hub, Portland's competitiveness is largely dependent on efficient transportation, and congestion threatens the region's economic vitality. • Businesses are reporting that traffic congestion is already costing them money. • Failure to invest adequately in transportation improvements will result in a potential loss valued at of *$844 million annually by 2025 – that's $782 per household -- and 6,500 jobs.* It equates to 118,000 hours of vehicle travel per day – that's 28 hours of travel time per household annually; • Additional regional investment in transportation would generate a benefit of at least $2 for each dollar spent.
• Value of truck freight traffic on I-5	Between I-5 and I-205, 59 percent of truck freight tonnage crosses the Interstate Bridge compared to 41 percent across the Glen Jackson Bridge. In 2005, 22.5 million tons of freight crossed the Interstate Bridge. According to the *Commodity Flow Forecast Update and Lower Columbia River Cargo Forecast* report, commissioned by the Ports of Portland and Vancouver, Metro, RTC and ODOT, the estimated value of truck freight was $1,800 per ton, averaged across all commodity classifications. In other words, the value of freight crossing the Interstate Bridge in 2005 was $40.6 billion ($40,600,000,000). About three-quarters of trucks crossing the Interstate Bridge enter and/or exit an interchange in the I-5 project area. This means approximately $30.5 billion worth of commodities crossing the bridge enter or exit a CRC project interchange each year. Truck freight across the I-5 Bridge is estimated to increase at almost twice the rate of automobile traffic between 2005 and 2030. Truck freight is expected to grow by 77 percent during this 25-year period. By 2030, the value of freight crossing the I-5 bridge will increase to $71.7 billion (year 2005 dollars). $53.8 billion worth of this freight will originate or exit from an interchange in the I-5 project area. CRC estimated truck-specific benefits for the Columbia River Crossing project, recognizing that FHWA had not yet issued final guidance on the calculation methodology. The analysis was done only for the 12-lane supplemental bridge option, but provides an estimate of the

	scale of project benefits related to trucks. The present value (2007$) was estimated at $170 million with about 75% of the total related to travel time savings. Accident cost savings was 13% of the total and remaining savings were attributed to vehicle operating costs, emission costs, and bridge lift time savings. The inflated values of the truck-specific benefits through year 2040 were estimated at $350 million. Although no estimates were made for the 8 and 10-lane options, since travel time savings represents the greatest savings, the benefits would be less for these options.
Green House Gases:	
• Effects of greenhouse gases (GHG) on the number of lanes decision	A presentation of the findings of the Greenhouse Gas Panel Report from the GHG expert review panel will be provided at the January 9, 2009 PSC meeting.
Induced Growth and Land Use:	
• Review of Memorandum on Induced Growth and Land Use prepared by CRC.	Summary Memorandum from Draft EIS, et al, on induced land use findings
Materials	
• Provide an engineering aerial map of the lane options in handout form	Layouts of the 10 and 12-lane options will be provided in the January 9, 2009 PSC meeting materials.
Communications Recap (Carry-over from December 5)	
• Brief summary of open houses • Communications update	• Presentation and communications summary report • Handout of monthly communications summary

Columbia River CROSSING

Tolling Scenario Comparison

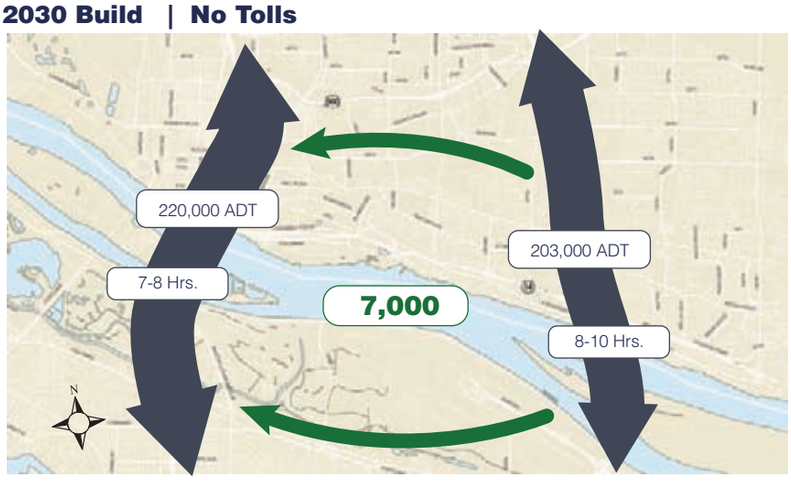
2030 No Build



Daily cross-river traffic: 394,000

Regional vehicle miles traveled (VMT): 56,650,000

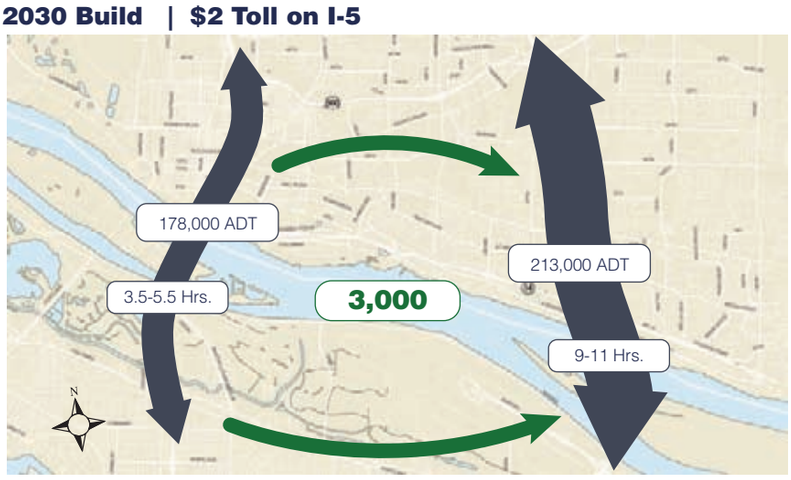
2030 Build | No Tolls



Daily cross-river traffic: 423,000

Increase in regional VMT: +370,000 (+0.67%)

2030 Build | $2 Toll on I-5



Daily cross-river traffic: 391,000

Increase in regional VMT: +100,000 (+0.16%)

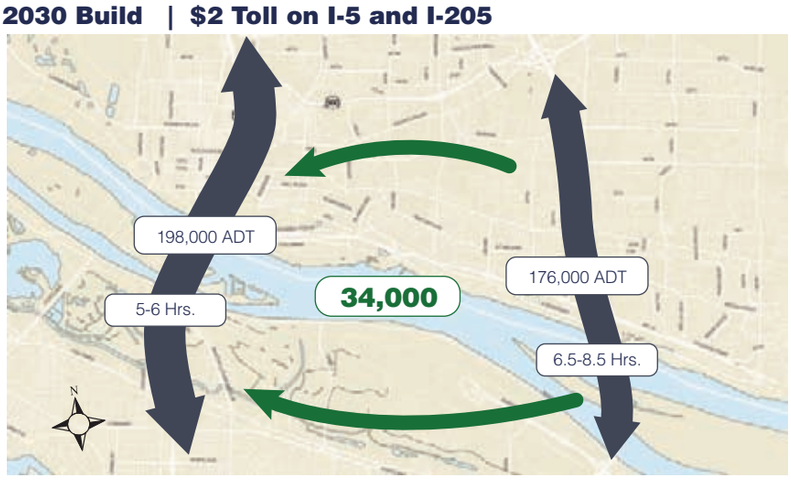
KEY

ADT= Average Daily Traffic

Hrs.= Hours of Congestion

Green arrows and numbers= Direction and volume of daily traffic shifting between I-5 and I-205

2030 Build | $2 Toll on I-5 and I-205



Daily cross-river traffic: 374,000

Decrease in regional VMT: -110,000 (-0.21%)

Columbia River CROSSING

Oregon Department of Transportation
Washington State Department of Transportation

US Department of Transportation: Federal Transit Administration • Federal Highway Administration
City of Vancouver • City of Portland • SW Washington Regional Transportation Council • Metro • C-TRAN • TriMet

Columbia River CROSSING

Traffic effects of 8, 10 and 12 lane scenarios

	No Build	8 Lanes	10 Lanes	12 Lanes
Locations of Unsafe and Poor Service Level Conditions on I-5	Northbound I-5: 1. Denver/Victory Blvd. on-ramp merge area 2. Marine Drive on-ramp merge area 3. Hayden Island on-ramp merge area 4. SR-14 off-ramp diverge area Southbound I-5: 5. SR 500 on-ramp merge area 6. 4th Plain on-ramp merge area 7. Mill Plain on-ramp merge area 8. SR-14 on-ramp merge area 9. Hayden Island off-ramp diverge area	Northbound I-5: 1. Hayden Island off-ramp to Marine Drive on-ramp 2. Hayden Island on-ramp merge area 3. SR 14 off-ramp diverge area 4. Mill Plain/4th Plain off-ramp to SR 14 on-ramp Southbound I-5: 5. 4th Plain off-ramp to SR 500 on-ramp 6. SR 14 off-ramp to Mill Plain on-ramp 7. Mill Plain on-ramp merge area 8. North of Hayden Island off-ramp 9. Marine Drive off-ramp to Hayden Island on-ramp	Northbound I-5: 1. Hayden Island off-ramp to Marine Drive on-ramp 2. Mill Plain/4th Plain off-ramp to SR 14 on-ramp Southbound I-5: 3. 4th Plain off-ramp to SR 500 on-ramp 4. SR 14 off-ramp to Mill Plain on- ramp 5. North of Hayden Island off-ramp	None
Local Streets Impacted by I-5 Backups	Due to northbound I-5 impacts: 1. Denver/Victory 2. Marine Drive 3. Hayden Island Due to southbound I-5 impacts: 1. SR 500 and Main Street 2. 4th Plain 3. Mill Plain 4. SR 14 and City Center 5. Hayden Island	Due to northbound I-5 impacts: 1. Marine Drive 2. Hayden Island 3. SR 14 4. Mill Plain Due to southbound I-5 impacts: 1. SR 500 and Main Street 2. 4th Plain 3. Mill Plain 4. SR 14 and City Center 5. Hayden Island	Due to northbound I-5 impacts: 1. Marine Drive 2. SR 14 Due to southbound I-5 impacts: 1. SR 500 and Main Street 2. 4th Plain 3. Mill Plain 4. SR 14 and City Center	None
I-5 AM and PM Hours of Congestion	15 hours	7 to 9 hours	5 to 7 hours	3.5 to 5.5 hours
Annual Collisions	750	300	240	200
I-5 Traffic	184,000 vehicles (No tolls)	165,000 vehicles (Includes tolling I-5)	174,500 vehicles (Includes tolling I-5)	178,000 vehicles (Includes tolling I-5)
I-205 Traffic	210,000 vehicles	219,000 vehicles	214,500 vehicles	213,000 vehicles
Total River Crossing Traffic	394,000 vehicles	384,000 vehicles	389,000 vehicles	391,000 vehicles
Diversion to I-205 from No Build	-	9,000 vehicles	4,500 vehicles	3,000 vehicles
Regional Vehicle Miles Travelled (VMT)	56.658 million regional VMT	56.770 million regional VMT 0.20% increase over No Build	56.750 million regional VMT 0.16% increase over No Build	56.746 million regional VMT 0.15% increase over No Build
I-5 Transit Riders	8,800	+1-5% over 12 lane	+1-3% over 12 lane	18,200* (15,800 on light rail)
HOV Lane Potential?	Very unlikely based on current history in corridor	Unlikely as two of the four lanes will act as merge lanes	Possible with more impacts for lane conversion	Highest potential for future lane conversion

Note: All figures are for the year 2030

Revised December 29, 2008

**Ridership is based on DEIS Alternative 3 Light Rail Transit Efficient Operations with a Clark College Terminus. Currently more park and ride spaces are planned as part of the Locally Preferred Alternative, therefore ridership will be somewhat higher. However, differences due to number of lanes will not change substantially.*

Columbia River CROSSING

Comparison of environmental and community effects between an 8, 10, and 12 lane bridge

The following table highlights how changing the number of add-drop lanes on the river crossing, and between subsequent interchanges, could result in different environmental impacts. *This table does not describe environmental impacts that would be the same regardless of the number of lanes. Also, the 12-lane information is based on the DEIS findings, not the refined design of the LPA that will be evaluated in the FEIS.*

Summary

None of the differences in impacts is significant. However, the primary differences include:

• The 10-lane option would have lower property impacts on the Vancouver National Historic Reserve than the 12-lane, but would have no meaningful difference in impacts to other properties. The 8-lane option would have only slightly lower impacts than the 10-lane.

• Regional air emissions would be essentially the same among all of the add/drop lane options. However, the 8-lane and 10-lane options, with fewer vehicle trips on I-5, would have slightly lower emissions in the immediate project area. However, this could be offset by higher congestion, and by added emissions in the I-205 corridor.

• With fewer add/drop lanes and much higher I-5 congestion, the 8-lane option would have more cut-through traffic on local streets and thus greater neighborhood impacts.

Environmental Discipline	12-lane bridge vs. No Build	10-lane bridge vs. 12-lane	8-lane bridge vs. 12-lane
Air quality	Slight reduction in regional emissions, and in 3 of 4 subareas due to decreased congestion from 15 hrs/day to 3.5 - 5.5 hrs/day, and fewer vehicles crossing the river (391,000/day vs. 394,000/day under No Build).	Same regional emissions, and perhaps very slight reduction in emissions for project subareas due to slightly fewer vehicle trips.	Same regional emissions, and perhaps very slight reduction in emissions for subareas due to slightly fewer vehicle trips.
Archaeological and Historic resources	High probability of finding archaeological remains in earth disturbance on the VNHR property. Impact on 6-8 historic resources.	High probability of finding archaeological remains in earth disturbance on the VNHR property, but reduced impact on VNHR property: approximately 2-30 feet less encroachment around the SR-14 loop, 15-20 feet further from FHWA building, and 5-10 feet further from Post Hospital. Impact on 6-8 historic resources.	High probability of finding archaeological remains in earth disturbance on the VNHR property, but reduced impact on VNHR property: approximately 2-30 feet less encroachment around the SR-14 loop, 20-25 feet further from FHWA building, and 5-10 feet further from Post Hospital. Impact on 5-7 historic resources.
Neighborhood Quality/Cohesion	Reduction in traffic diversion would reduce cut-through traffic in neighborhoods.	Increased congestion (+35%) on I-5 could lead to more traffic diversion onto local streets	Increased congestion (+75%) on I-5 could lead to more traffic diversion onto local streets
Economics	Substantial improvement to truck-hauled freight due to reduced congestion and improved highway design. Improved mobility would increase economic attractiveness for businesses to locate and/or grow in this region.	Increased congestion (+35%) and fewer auxiliary lanes would provide less benefit to truck-hauled freight mobility.	Increased congestion (+75%) and fewer auxiliary lanes would provide less benefit to truck-hauled freight mobility.
Ecosystems & stormwater	- Fewer, though larger, piers in the water could improve conditions for listed fish. - Greater highway impervious surface would increase runoff volume, but this runoff would now be treated whereas most I-5 runoff currently flows untreated into receiving waterbodies.	- Very slight reduction in size of bridge pier foundations in the Columbia River. - Slightly reduced impervious surface could allow comparable reduction in capacity of treatment facilities, but would not result in changes in treatment or discharge quality.	- Very slight reduction in size of bridge pier foundations in the Columbia River. - Slightly reduced impervious surface could allow comparable reduction in capacity of treatment facilities, but would not result in changes in treatment or discharge quality.

Columbia River CROSSING

Comparison of environmental and community effects between an 8, 10, and 12 lane bridge

Environmental Discipline	12-lane bridge vs. No Build	10-lane bridge vs. 12-lane	8-lane bridge vs. 12-lane
Greenhouse gases	River crossing highway emissions would be about 9.5% lower than No-Build.	Similar GHG emissions to 12-lane. Fewer vehicle crossings (-2,000) would reduce emissions, but higher congestion (+35%), more accidents (+20%) and more diversion to I-205 (+1,500 trips) would increase emissions.	Similar GHG emissions to 12-lane. Fewer vehicle crossings (-6,500) would reduce emissions, but higher congestion (+75%), more accidents (+80%) and more diversion to I-205 (+4,500) would increase emissions.
Induced growth	Unlikely to induce sprawl, but likely to encourage transit oriented development and some increased concentration of employment and housing demand in I-5 corridor. Approximately 1% regional redistribution of jobs to north Portland and Clark County. Up to 3% (over 20 year period) greater increase in north Portland and Clark County home values near I-5.	Less highway travel time improvement between Clark County and Portland would likely mean slightly less redistribution of jobs from broader region to I-5 corridor, and slightly less upward pressure on home prices near I-5 in north Portland and Clark County. A slight increase in transit ridership could provide a slight increase in pressure for transit oriented development to occur around LRT stations.	Less highway travel time improvement between Clark County and Portland would likely mean slightly less redistribution of jobs from broader region to I-5 corridor, and slightly less upward pressure on home prices near I-5 in north Portland and Clark County. A slight increase in transit ridership could provide a slight increase in pressure for transit oriented development to occur around LRT stations.
Noise	With rebuilt or new sound walls along I-5, impacts to residents would be dramatically reduced (~70% fewer residences impacted than No-Build or existing conditions).	Same or very similar impacts as the 12-lane design (project mitigation would reduce the number of impacts below No-Build).	Same or very similar impacts as the 12-lane design (project mitigation would reduce the number of impacts below No-Build).
Parks & recreation	Approximately 2.7 acre acquisition of VNHR along SR 14 loop, and at I-5 widening between Hospital and Cinemas.	Decrease in area required from Vancouver National Historic Reserve.	Decrease in area required from Vancouver National Historic Reserve.
Property acquisitions	- Approximately 20 acres of acquisition on Hayden Island, and displacement of up to 29 businesses - About 2.7 acres acquisition of VNHR	- Very minor decrease in property required on Hayden Island; no change in number of business or residential displacements - Very minor decrease in property required at touch down of bridges in Vancouver; no change in number of displacements - Decrease in property required from Vancouver National Historic Reserve; approximately 2-30 feet less encroachment around the SR 14 loop, 15-20 feet further from FHWA building, and 5-10 further feet from Post Hospital - Minor decrease in area acquired from Cinema, no property acquisition required from Academy - Minor decrease in area acquired north of Mill Plain Blvd	- Minor decrease in property required on Hayden Island; no change in number of business or residential displacements - Minor decrease in property required at touch down of bridges in Vancouver; no change in number of displacements - Decrease in property required from Vancouver National Historic Reserve; approximately 2-30 feet less encroachment around the SR 14 loop, approximately 20-25 feet further from FHWA building, and 5-10 feet further from Post Hospital - Decrease in area required from Cinema, no property acquisition required from Academy - Minor decrease in area acquired north of Mill Plain Blvd
Visual	The new river crossing would be wider and higher than the current bridges, increasing their prominence from many viewpoints in downtown Vancouver and North Portland; aesthetic affect could be adverse or beneficial.	Slightly smaller facility would slightly lessen visual mass and prominence from viewpoints in downtown Vancouver and North Portland.	Smaller facility would lessen visual mass and prominence from viewpoints in downtown Vancouver and North Portland.

Columbia River CROSSING

January 6, 2009

TO: CRC Project Sponsors Council

FROM: CRC Staff

SUBJECT: **Impacts of the CRC Project on Land Uses in Oregon and Washington**

Summary Conclusions of the CRC Project on Land Uses in Oregon and Washington

Studies of "induced travel demand" have found that under certain conditions improvements in highway capacity lowers the cost (time and money) of travel, resulting in additional traffic and vehicle miles of travel. These studies also found that improved highway access may lead to greater levels of urban development on the fringes of the metropolitan area, influencing urban sprawl.

The conditions that create significant induced demand, including urban sprawl, are not present for the CRC project. Consequently, significant induced demand is not anticipated for any of the lane configuration options being considered by the PSC.

Specifically, this analysis found:

- The CRC Project, including all of its lane configuration options, would not provide additional through capacity on I-5 outside the bridge influence area or any new access to fringe development areas. The improved accessibility benefits of the project would be derived from the travel time savings in the bridge influence area.

- Drivers consider the total cost of a trip, both the value of travel time and the cost of the trip, when determining if, when, how, and where to travel. Trip-making is particularly sensitive to a toll because it is a direct, out-of-pocket expense.

- Tolling the I-5 Bridge would offset the limited induced demand that would otherwise be generated by the modest increase in highway capacity provided by the add/drop lane options within the bridge influence area:

    - Because of tolls, the modeling shows all bridge configuration options exhibit lower volumes of cross-river trips (3,000 -10,000 daily trips depending on the option) compared to the No Build.
    - The number of add/drop lanes on the I-5 Bridge have only a minor impact on the volume of river crossing trips. The 12-lane option exhibits only 2,000 more daily trips than the 10-lane option; the 10-lane option 4,500 more than the 8-lane option.

    - The higher the number of add/drop lanes on the I-5 Bridge, the less diversion of trips to I-205, and the lower the VMT. The 12-lane option diverts 3,000 daily trips to I-205; the 10-lane diverts 4,500; and the 8-lane 7,500. As a result, the 12-lane option

360/737-2726 503/256-2726 WWW.COLUMBIARIVERCROSSING.ORG 700 WASHINGTON STREET, SUITE 300, VANCOUVER, WA 98660

exhibits 4,000 less daily vehicle miles of travel than the 10-lane option, and 24,000 less than the 8-lane option.

- The form of urban development in the I-5 Bridge impact area will be largely dictated by adopted land use plans and policies; the traffic impacts of the I-5 Bridge options are not sufficiently large to have a major affect.

- Land use plans are in place on both sides of the river that ensure that the urban development effects of the CRC Project would occur within urban growth areas, would not create urban sprawl, would support urban densities, and would be consistent with adopted 20-year plans that provide for efficient and sustainable use of land and resources.

Impacts of the CRC Project on Land Uses in Oregon and Washington

Background

Issues and concerns have been raised about the relationship between land use and the number of lanes associated with the CRC project and the potential to increase sprawl on the fringe of the urban area. In order to understand this relationship, it is important to understand the context for the discussion in terms of how the proposed add/drop lanes would affect the capacity and function of the through lanes. This relationship is key to determining whether the improved accessibility provided by the CRC project would be sufficient to increase demand for land at the periphery of the region or induce more travel compared to the No-Build condition.

There are many factors that influence the demand for more land at the edge of adopted urban growth boundaries in the metropolitan area. They include the supply of land available to be urbanized inside currently adopted urban growth boundaries; the policies regulating growth inside these boundaries; the cost and the market for a given set of land uses as well as transportation mobility and accessibility; and other infrastructure costs. No one factor in isolation can cause urban growth to occur.

As an integral link in the Interstate highway system, the CRC project area is vital to the movement of freight and people up and down the west coast, as well as within the Portland/Vancouver region. The CRC project is analyzing the appropriate number of lanes to safely and efficiently move the very high number of auto and truck trips that are entering and exiting I-5 in a very short congested area, as well as accommodating the high overall number of trips on the Interstate itself.

There are seven high volume interchanges within the project area. The area warrants a standard two-mile spacing to accommodate the heavy traffic volumes; however, these seven interchanges have an average spacing of less than the minimum standard of one mile. The merging and weaving created by these closely spaced interchanges creates unsafe and congested conditions. This section of I-5 has the highest accident rate of any Interstate highway in the entire state of Oregon. In 2030 it is projected to be congested for as much as 15 hours a day if no improvements are made.

The add/drop lanes being considered are new lanes that would connect the closely spaced interchanges with the heaviest on/off volumes. They would provide better access to areas that have reduced development capacity, such as the Marine Drive corridor and Hayden Island; as well to improve safety and manage the operation of the freeway. Their primary purpose is not to add new capacity.

Overview of Analysis

The CRC project team evaluated whether and how this project could change travel behavior and consequentially influence land use patterns. The evaluation was presented in the May 2008 Draft Environmental Impact Statement (EIS) and subsequently reviewed by an independent panel of experts.

As noted in the Draft EIS, the project's analysis concluded that the CRC project is unlikely to induce growth around the region's urban periphery ("sprawl"). However, CRC is likely to promote transit-oriented development around new light rail stations on Hayden Island and in downtown Vancouver, and to promote additional density of jobs and housing near the I-5 corridor. An evaluation summary can be found in the Draft EIS (Section 3.19.4, pages 3-427, 3-428) and additional details are presented in the Land Use Technical report. Both documents are available online: www.ColumbiaRiverCrossing.org.

In October, 2008, the project convened a panel of national experts to review the travel demand model methodology and conclusions, including a land use evaluation. The panel unanimously concluded that CRC's methods and the conclusions were valid and reasonable. Specifically, the panel noted that CRC would "have a low impact to induce growth…because the project is located in a mature urban area," and that it would "contribute to a better jobs housing balance in Clark County…a positive outcome of the project" (page 16).

Land Use Evaluation

The CRC project's evaluation of the potential to induce land use changes included four analytical methods, which are summarized in the Draft EIS and described below.

1. A survey of national research and case studies on how transportation infrastructure can indirectly impact land use,
2. An analysis of growth management techniques in Washington and Oregon land use planning,
3. The results of travel demand modeling and operational analysis for the CRC project alternatives, and
4. Integrated land use/transportation modeling that estimates how the CRC project might or might not influence the location of future growth in housing and employment.

1. Survey of research and case studies

National research and case studies revealed a variety of important factors that influence whether and how transportation investments change travel and land use patterns. In general, some transit projects tended to promote higher density development, particularly around new transit stations, while some highway projects increased automobile use when adding through capacity and could have the potential to induce low-density, auto-oriented development further from urban centers. At the same time, other transit projects and highway projects did not have these effects. The most relevant findings from the national research were the answers to the following two questions:

- What factors were associated with highway projects that tended to increase auto use and low density development, and
- What factors were associated with high capacity transit projects that tended to increase transit-oriented and higher density development?

The answers identified in the national research are summarized on the left side of the following two tables. The right side of each table identifies the extent to which each of those factors is or is not included in the CRC project and project area.

TABLE 1: Factors associated with highway projects that influence induce auto travel and sprawl	**Does the CRC project exhibit these factors?**
Does the project provide new access to areas previously un-served or greatly underserved by highways?	**No.** CRC is entirely within an urbanized area, and I-5 has been an Interstate corridor since 1958. Project adds no new interchanges.
Does the project provide new highway access to land on the urban edge?	**No.** CRC improvements are located 7 miles inside Vancouver Urban Growth Area boundary to the north, and over 13 miles inside Metro Urban Growth Boundary to the south.
Does the project substantially improve highway travel times?	**Yes but induced demand impacts from travel time savings are offset by the higher cost of tolls.** Drivers consider both the value of travel time and the cost of the trip, when determining if, when, how, and where to travel. Compared to the No Build, the 12-lane bridge configuration has a 23-minute travel time savings for a round trip between 179th and I-84 during peak periods. Applying a travel time penalty to offset the cost of the toll negates almost 3/4ths of the trip-making effect of this travel time savings. The net effect of these countervailing factors is equivalent to a 6% decrease in travel time; which does not have a material impact on induced demand or access to fringe areas.
Does the project reduce auto travel costs?	**No**. CRC adds a toll on the highway that increases auto travel costs relative to No Build alternative.
Are local and regional land use regulations ineffective at managing growth?	**No**. Effective growth management controls backed by state law exist in the I-5 corridor on both sides of the river that require; • the vast majority of future growth to occur within urban growth areas that reduce sprawl and that are sized to meet population and employment forecasts; • comprehensive plans that implement efficient and sustainable urban development within urban growth areas; • minimum densities in urban areas; and, • protections for rural, agricultural, and environmentally sensitive areas.
Are there real estate markets supporting low density development?	**Yes, but these areas are extremely minor and distant from the Project's influence area.** The minimum average densities required to be achieved in Vancouver growth management areas is notably higher than that required in Metro's "Inner Neighborhood" designation. In certain locations densities as high as those targeted for Town Centers, Station Areas, and Main Streets are anticipated. The minimum densities required in the urban growth areas of Washougal, Battle Ground, Camas, and Ridgefield are similar to the densities required in Metro's "Outer Neighborhoods." The two urban growth areas that allow low densities are Yacolt (20 miles from Vancouver) and La Center (15 miles from Vancouver). These growth areas are distant and quite small, representing only 0.9% of the County's population in 2004, and 1.7% of the County's projected population in 2024; no material urban sprawl is anticipated in these areas from the CRC Project.

TABLE 2: Factors associated with high capacity transit projects that tend to promote higher density and/or transit oriented development	**Does the CRC project exhibit these factors?**
Would the project increase transit ridership?	**Yes**. Transit mode split is projected to be about 17 percent with the project, compared to 7 percent with the No Build alternative.[1]
Does the project provide new access to developable/redevelopable land previously unserved or underserved by transit?	**Yes**. The project area is not currently served by high capacity transit and there is substantial latent demand for cross-river transit service
Are there real estate markets supporting such development?	**Yes**. The majority of the recent and planned developments in downtown Vancouver are high density and/or mixed use.

1 PM Peak period transit mode split for I-5 crossings

Is there positive public perception of transit?	**Yes**. Over 70 percent of residents polled support extending light rail across the river to Vancouver.[2]
Do local and regional land use regulations effectively manage growth?	**Yes**. Comprehensive plans and implementing regulations, including zoning, exist on both sides of the river that (a) require minimum densities in urban areas, (b) encourage compact nodal and mixed-use development, and (c) encourage transit-oriented development.

As evident from the tables, and supported by the independent expert review panel, the CRC project is far more likely to encourage compact, higher density development in established urban areas than promote auto-oriented, lower density development on the urban fringe.

This project would decrease travel times, improve travel reliability and reduce congestion. However, tolling the river crossing offsets much of the potential for inducing auto travel. It serves to reduce total auto trips and increase transit mode share. The light rail extension into Vancouver further increases transit ridership and promotes transit-oriented development around the new stations on Hayden Island and downtown Vancouver. Ultimately, the transit and highway improvements are more likely to help realize long-term, regional land use visions by supporting concentrated growth in established urban centers.

2. Analysis of Washington and Oregon growth management

The national research and case studies emphasized the importance of local land use regulations for influencing the type and magnitude of effect from transportation improvements. Metro has a long history of effective growth management, and the City of Portland has a sophisticated zoning code with provisions for focusing growth where desired and encouraging compact mixed-use development around transit facilities. The land use regulations in the City of Vancouver and Clark County also have robust growth management policies and regulations. The Vancouver Comprehensive Plan targets growth in designated urban centers and corridors connecting these centers in a growth management approach comparable to Metro's 2040 Growth Concept. Vancouver also has a Transit Overlay District allowing for "higher densities and more transit-friendly urban design" than afforded by base zoning. This overlay zone is similar to Portland's Light Rail Transit Station Zone that is an overlay zone allowing for "increased densities for the mutual re-enforcement of public investments and private development". Also, in preparation for the construction of the CRC project, the City of Vancouver has recently made changes to the downtown plan (the Vancouver City Center Vision) and is implementing regulations that encourage complimentary development along the light rail alignment.

In 1990, the Washington Growth Management Act (GMA) established requirements for counties to plan for and manage growth. The GMA requires local governments to identify and protect critical and natural resource lands, designate urban growth areas, and prepare comprehensive plans to be implemented through capital investments and development regulations.

A comparison of urban growth area expansions by Metro and Clark County since 2000, shows Metro and Clark County added approximately 21,000 and 16,400 acres respectively. Clark County and the City of Vancouver have planned residential densities of approximately 16 and 20 persons per acre. This compares favorably to Metro's "inner neighborhood" and "outer neighborhood" areas that target 14 and 13 persons per acre, respectively. Metro has other significant goals applied throughout its jurisdiction, tied to designations such as Regional, Town Centers and Main Streets with much higher density targets. The City of Vancouver does have policy and regulations encouraging higher densities in planned sub-areas, downtown, and along transit corridors that are comparable to the densities anticipated in Metro's Town Centers and Main Streets.

[2] Riley Report / Portland-Vancouver Area Survey. Riley Research Associates. June 18, 2008. A scientific telephone poll of 504 randomly selected households in Multnomah, Washington, and Clackamas Counties in Oregon, and Clark County in Washington.

3. Travel demand modeling and traffic operations analysis

Travel time and resulting accessibility can influence the demand for land at both the urban fringe and in established urban areas. Travel demand modeling and traffic micro-simulation could provide valuable information about how the CRC project might change travel behavior and, in turn influence land use patterns. Significant improvements in travel time from areas along the urban periphery to key destinations such as downtown Portland could increase pressure for suburban residential development in northern Clark County. At the same time, increases in transit ridership could promote higher density development around transit stations the central Vancouver area. The modeling results presented in the Draft EIS indicate this project has a far greater effect on transit ridership than I-5 travel times. Though CRC would substantially reduce congestion within the project area compared to the No Build alternative, travel times are not as dramatically changed because this project improves a relatively small portion of the region's highway system, and because the toll on the I-5 crossing would add a perceived penalty to auto travel[3]. In fact, because of the toll and the introduction of a reliable and efficient transit alternative, modeling shows that the project would actually lower the number of vehicles using the I-5 crossing each day by about 3 percent[4]. In contrast, transit ridership would increase over 250 percent during the p.m. peak hour.[5]

4. Transportation-land use modeling (Metroscope)

The fourth method for evaluating this project's potential for inducing land use changes entailed evaluating a Metroscope model analysis that included transportation improvements in the corridor similar to the CRC locally preferred alternative (LPA). The analysis included a replacement bridge with four through lanes and light rail to Clark College. Metroscope is an integrated land use and transportation model designed by Metro to predict how changes in several factors, including transportation infrastructure, could change the future distribution of employment and housing throughout the region. In 2001, as part of the I-5 Partnership Study, Metro used its Metroscope model to estimate land use changes if I-5 were to increase to four through-lanes between Going Street in Portland and 134th Street in Vancouver, and light rail were extended to Clark College. This scenario had the same transit improvements as the LPA, but added capacity to a significantly longer portion of I-5, and did not include a toll on the bridge. These differences resulted in greater travel time savings and increased vehicle use compared to the project's LPA.

Under this scenario, Metroscope showed only minimal changes in employment location and housing demand compared to the No Build alternative. Metroscope estimated a one percent regional redistribution of jobs to the I-5 corridor with 4,000 more in North and Northeast Portland and 1,000 more in Clark County. The model estimated very modest changes in residential values (a proxy for residential demand), with the highest increase in some Clark County and North Portland areas experiencing up to three percent greater values by 2020, equating to about 0.12 percent growth per year. This analysis also concluded the land-use policies in the Metro boundary and in Clark County were far more likely to influence growth patterns than the CRC project.

Conclusion

Rigorous analysis and independent review suggest that CRC is more likely to encourage compact, higher density development in established urban areas, than promote auto-oriented, lower density development

3 Modeling the toll entailed incurring a 9 minute time penalty to simulate drivers' response to paying this fee. Travel time savings on I-5 between I-84 and 179th Street during the PM peak (3pm to 7pm) period shrink from 18 minutes without accounting for the toll to 9 minutes with the toll.

4 184,000 cars would travel over the I-5 bridges under the No Build alternative versus 178,000 with a replacement crossing, a toll on I-5, and light rail.

5 With a replacement crossing, a toll on the I-5 bridges, and light rail, 7,250 people would ride transit during the PM peak period compared to 2,050 people for the No Build alternative.

on the urban fringe. These findings were in the Draft EIS analysis, and they have been confirmed by the independent panel of experts that reviewed this analysis in October 2008.

As the research indicates, there are many land use and economic policy factors beyond the scope of the CRC project that would have a much larger impact on the urban growth pattern of the bi-state region than the CRC project alone.