Columbia River CROSSING

Memorandum

November 26, 2008

TO: Project Sponsors Council

FROM: Doug Ficco, P.E.

SUBJECT: Summary of December 5th Presentation on Add/Drop Lanes

COPY: CRC Web Site

Add/Drop Lanes

At the December 5th PSC meeting we will focus most of our time on the determination of the number of add/drop lanes to be carried forward into the Final Environmental Impact Statement (EIS). This memorandum is intended to summarize several of the issues that go into determining the appropriate number of lanes. The advance materials and presentation at the December 5th meeting will provide additional information. It is not the intent of this memorandum to provide a recommendation for the decision, only to provide the context.

This project is on a path to deliver a Final EIS by Fall 2009 and receive a Federal Record of Decision (ROD) by Spring 2010. In order to meet these timelines, there are several critical path decisions needed, the first of which is the number of add/drop lanes. The ultimate recommendation for project footprint will influence bridge type, environmental impacts, and development of the Biological Assessment and Opinion. The project will need a Biological Opinion from the National Marine Fisheries Service prior to receiving a ROD from the Federal Transit Administration and the Federal Highway Administration. Biological Opinions typically take 6-9 months to receive, which is why the timing of this decision is so important.

Number of Add/Drop Lanes - Background

The CRC project, in the Draft EIS published in May 2008, analyzed up to 3 add/drop traffic lanes for short segments of the project, including 12 total lanes (three through lanes and three add/drop lanes in each direction) on the replacement bridge across the Columbia River.

In July 2008, the project sponsors recommended a Locally Preferred Alternative (LPA) that included replacement of the I-5 Bridge with three through lanes in each direction and tolls, light rail as the high capacity transit mode, and a light rail terminus at Clark College. Resolutions adopted by the sponsor agencies Boards and Councils requested the add/drop lanes be analyzed to determine the number needed for safe operations and functionality.

Why did CRC analyze up to 3 add/drop lanes (total of 12 lanes on the Interstate Bridge) in segments of the project?

Operational safety is the primary emphasis required by the State DOTs and FHWA standards and policies when determining the appropriate number of lanes for a new project on the Interstate. The number of add/drop lanes for CRC is also influenced by the number of closely spaced interchanges and high traffic volumes entering and leaving within the bridge influence area. Today there are three lanes in each direction across the river. Due to the close spacing of the interchanges at the north and south sides of the Columbia River, the three lanes are unable to function as true through capacity for the Interstate.

Following are key steps in developing the number of add/drop lanes:

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- **Determine Travel Demand:** FHWA and State criteria requires that projects be designed for travel demand that will occur 20 years beyond the start of construction, even though they require the new Interstate Bridge be designed with a 100 year life. CRC used 2030 as the design year and will be preparing the Final EIS based on traffic projections for 2035. Metro's travel demand model was the basis for the projections. An independent analysis of the travel demand forecasts was conducted by a nationwide expert panel and has confirmed the results. The full report of the expert panel is included in the December 5 PSC meeting materials.

- **Determine number of lanes that are needed for safe operation of the Interstate:** CRC applied State and Federal design criteria in determining the optimum number of add/drop lanes for the replacement bridge alternative. A base assumption was the need for maintaining three general purpose lanes ("through lanes") in each direction. Methodologies included applying Interstate design and safety standards, performing operational analysis through use of traffic modeling software, and considering environmental and physical constraints. The number of add/drop lanes is heavily influenced by the impact of closely spaced interchanges and achieving lane balance from the on-off connections. A brief presentation on the operational analysis of 8, 10, and 12 lane scenarios will be made at the December 5 meeting.

What happens if one add/drop lane is added to the project?

The Draft EIS included an analysis of a supplemental bridge option that was restricted to four lanes in each direction across the river. Reducing the number of add/drop lanes creates "hot spots" where traffic must merge with through traffic rather than having a dedicated receiving lane for safe entry onto the freeway. "Forced" merges, similar to those required today for the on-ramps located at either end of the Columbia River Bridge, increases the potential for accidents and reduces general purpose through lane capacity.

Both the 8 and 10-lane bridge options create more impacts on connecting city arterials and state highways connecting with the Interstate. Reduced freeway connectivity and throughput encourages cut-through traffic to use city arterials and results in back-ups entering and leaving the freeway, adding to local street congestion.

Major operational impacts are:

- Results in 7 to 9 hours of I-5 Bridge congestion per day
- Increases accidents by 50 percent over the 12 lane option
- Increases number of forced merge and weaving sections (9 traffic "hot spots") compared to the 12-lane option
- Increases the cut-through traffic on Vancouver and Portland arterials for trips that belong on the Interstate (more impact than the 10 lane option)
- Eliminates the potential for a future regional HOV system across the river

What happens if two add/drop lanes are added to the project?

Reducing the total number lanes to 10 (three general purpose plus two add/drop lanes in each direction) creates five merge/weave "hot-spots" compared to the 12-lane bridge option. With two add/drop lanes in both directions instead of three, northbound traffic bottlenecks would be expected between Hayden Island and Marine Drive and between SR 14 and Mill Plain Boulevard. Southbound traffic bottlenecks would be expected between SR 500 and Fourth Plain Boulevard, between Mill Plain Boulevard and SR 14, and between Hayden Island and the I-5 Bridge.

Major operational impacts are:

- Results in 5 to 7 hours of I-5 Bridge congestion per day

- Increases accidents by 20 percent over the 12 lane option
- Increases number of forced merge and weaving sections (5 traffic "hot spots")
- Increases the cut-through traffic on Vancouver and Portland arterials for trips that belong on the Interstate (less impact than the 8 lane option)
- Reduces the potential for a future regional HOV system across the river

What happens if up to three add/drop lanes are used at select interchange locations?

The addition of three add/drop lanes in short sections of the project, allowing six lanes in each direction (12 total) on the river crossing is similar to the 10 lane option, except it adds short add/drop lanes in the hot spot areas of the 10 lane option. This concept adds one additional add/drop lane across the river, with the added lanes ending at their connections with SR 14 and Hayden Island off ramps. This concept also adds an add/drop lane between the Fourth Plain and SR 500 interchanges in order to provide a safer transition to and from SR 500, a major state route. This concept eliminates all of the hot spots identified in the 8 and 10 lane options.

Major operational impacts are:

- Results in 3.5 to 5.5 hours of congestion per day (No-Build estimated at 15 hours per day)
- Provides improved balance for high traffic volumes entering and leaving the highway
- Reduces the number of forced merges and weaves, reducing accidents by 50 percent
- Serves as a surrogate for arterial traffic between Marine Drive, Hayden Island and Vancouver
- Provides better connections for freight from I-5 to the ports
- Results in less spillover traffic to city streets in Vancouver and Portland
- Provides a better option for implementing a future managed lane system

What are the impacts of congestion pricing and other aggressive travel demand strategies for reducing peak hour demand?

The local agencies, project partners and the project are committed to and supportive of aggressive Travel Demand Management (TDM) strategies that are designed to allow more efficient use of the region's transportation system. The project will continue to evaluate the effectiveness of TDM measures throughout the project, even after construction. Congestion pricing by increasing tolls during peak travel periods and implementing other aggressive TDM measures will reduce daily travel demand, but would have less impact on reducing peak hour travel and would have less impact on the add/drop lane decision because of the safety and operational issues.

Tolling, or more specifically congestion pricing, has been discussed as a tool that may have a significant effect on the number of trips that cross the river. CRC recently conducted sufficient tolling analysis to determine the impacts to I-5 and I-205 for varying toll rates. By tolling I-5 only, higher toll rates than were assumed in the Draft EIS would slightly reduce trips crossing I-5, but most of this reduction would be achieved by shifting trips to I-205. With the higher toll, the shift of traffic from I-5 to I-205 would result in unacceptable levels of congestion on I-205 and connecting systems and would increase regional VMT because of the out of direction travel caused by the diversion.

If both I-5 and I-205 are tolled, total vehicle trips across the Columbia River would drop, but a significant portion of traffic would shift back to I-5, resulting in higher traffic levels on I-5 than achieved by tolling I-5 only at the rate assumed in the Draft EIS. Analyses conducted to date suggest tolling does not provide enough of a reduction in trips crossing I-5 to warrant elimination of an add/drop lane because they are primarily for the safe movement between the interchanges.

Many other transportation demand management (TDM) methods will be added to the project aimed at reducing project and regional travel demand. In addition, Oregon and Washington will be implementing strategies to reduce per-capita VMT. Materials and presentation will be made available on these subjects at the January 9 PSC meeting.

What is the effect of providing up to 3 add-drop lanes in selected locations in induced travel, change in land use, and greenhouse gas emissions?

At the December 5th PSC meeting, the presentation on the report from the Travel Demand Expert panel will touch on model assumptions and results relating to induced travel and impacts to land use. (See the Travel Demand Model Review Panel Report summary sent in the materials for the December 5th meeting.) A more detailed analysis of induced travel and land use relating to the number of lanes will be provided at the January 9th PSC meeting.

A Greenhouse Gas Expert Panel met November 20, 2008, to review model results and validity of findings included in the Draft EIS. The panel report will be included in materials for the January 9th PSC meeting, along with a presentation of findings. Initial findings support the information presented in the Draft EIS that the replacement bridge alternative would result in slightly lower CO_2 emissions (tons per day) than the No-Build alternative, and perform much better than the supplemental bridge alternatives designed for 8 lanes.