

August 5, 2010

TO: Project Sponsors Council
FROM: Integrated Project Sponsors Council Staff
SUBJECT: Integrated Project Sponsors Council Staff Recommendations

Introduction

The purpose of this report is to present a comprehensive package of Integrated Project Sponsors Council Staff (IPS) recommendations that address several areas of interrelated work advanced over the past 20 weeks. These recommendations follow items in the IPS Work Plan approved at the April 23 PSC workshop and are the result of a collaborative approach that considered combined effects and benefits to the Columbia River Crossing (CRC) project, the surrounding transportation system, and to the region as a whole.

IPS process

Project Sponsors Council (PSC) members decided at their March 12 meeting that a timely, credible, and collaborative process was needed to discuss and resolve outstanding issues. PSC members and the Ports of Portland and Vancouver each appointed a staff delegate to meet on a regular basis and produce findings related to some of the project conclusions to-date as well as several additional alternatives. IPS members include the following individuals:

Henry Hewitt, Co-Chair	Alan Lehto, TriMet
Steve Horenstein, Co-Chair	Jeff Hamm, C-TRAN
Susie Lahsene, Port of Portland	Paul Smith, City of Portland
Katy Brooks, Port of Vancouver	Thayer Rorabaugh, City of Vancouver
Andy Cotugno, Metro	Richard Brandman, ODOT
Dean Lookingbill, SW Washington Regional Transportation Council	Don Wagner, WSDOT

Work groups were established around the following topics¹:

- Remove Hayden Island Interchange
- Alternative Access/Redesign Hayden Island Interchange
- Remove Vancouver City Center Access
- Alternative Lane Configurations on the Bridge
- Post-Completion Transportation Demand Management
- Managed Lanes
- Performance Measures
- Metroscope Modeling

The IPS met twelve times to establish a work plan, assign elements of the work plan to IPS work groups and discuss progress made by the work groups. IPS members met jointly in workshops with PSC

¹ Adjustments were made to the list as the work evolved. The item for "Remove Vancouver City Center Access" was reported on at an April 23 workshop between PSC and IPS and subsequently dropped from consideration after PSC members agreed that findings warranted no further discussion of the concept. The presentation provided to PSC is included in Appendix B. In addition, the Managed Lanes item was merged with the Transportation Demand Management work group after it was determined there was sufficient overlap between topics for a combined effort.

members on April 23, May 14, June 11, June 25, and July 16 to report their preliminary findings. A copy of the *IPS Work Plan* is attached in *Appendix A*.

Discussion and Recommendations

The IPS has reached agreement on the following package of recommendations related to the several tasks outlined in their work plan. Future work for each of the work plan items is outlined in the *Next Steps* section, below.

Metroscope

IPS recommendation: Use Metroscope results to support the overall set of IPS recommendations.

The purpose of using the Metroscope model was to expand the analysis completed by the CRC project on the potential for the project having an unintended consequence of inducing growth and determine whether the CRC project will affect the ability of the region to meet land use goals. The Metroscope land use allocation model for the seven-county region maintained by Metro provides a basis for forecasting where market trends would tend to drive household and employment growth taking into account changing demographic and economic profiles, local zoning and investment decisions, changes over time in accessibility based upon implementing long range transportation plans and the market feasibility of different types of commercial and residential development. This framework provides a platform upon which to test several scenarios relating to the CRC project to better understand the potential for growth inducing effects. The results will be used only to compare alternative Metroscope scenarios. They cannot be used to compare to previous Environmental Impact Statement (EIS) runs, as Metroscope is used primarily to inform land use impacts. The approach that holds constant all other variables around the region provides the ability to understand the effects of the change that the CRC project would produce.

PSC members agreed on a comparison of 12-lane configurations for Metroscope scenarios including no build, 12-lane with tolls, and 12-lane without tolls. Members decided that results of travel time analysis by the Performance Measures work group comparing 10-and 12-lane configurations would help inform whether a fourth scenario (10-lane no tolls) should be run. The similar nature of these results, discussed in the *Performance Measures* section below, indicated that a 10-lane scenario was unnecessary.

Metro found that the project would have negligible impact on population and employment growth in Clark County when comparing the projected growth that would occur with the project compared to no change to the existing bridge and highway. The project's most significant land use effect would be to boost North Portland employment by about 1.5 percent. This analysis takes into account the effect of tolls and light rail in reducing vehicle trips across the bridge compared with the no-build scenario.

The results of the Metroscope model support other recommendations of the IPS and will also help inform a conversation between local decision makers about issues of a bi-state nature that are outside of the scope of this project.

Further discussion of the Metroscope results are included in the *Appendix C*.

Hayden Island Access

IPS recommendation: Further refine the LPA to replace the Hayden Island interchange design with “Concept D”.

The original charge to IPS was to develop concepts for a refined “on-island” Hayden Island interchange and an alternative access or “off-island” interchange that would reduce impacts on Hayden Island (particularly the overhead structure and elevation at Tomahawk Island Drive) while retaining all basic traffic movements and operations presented in the Locally Preferred Alternative (LPA).

Work commenced on these items in a single IPS work group. The City of Portland retained URS to develop concepts for an off-island interchange that fed into the work group. A Hayden Island Design Group (HIDG) was also convened to incorporate the perspectives of island residents and business owners; the HIDG has met up to twice weekly to discuss evolving design concepts. Feedback from the HIDG was provided to the work group and IPS to inform ongoing discussions.

Off- and on-island interchange concepts (Concepts 1 and 2, respectively) were presented to PSC members at their June 11 workshop with IPS. An evaluation of these options revealed operational issues and other community impacts. A public meeting held on Hayden Island on June 14 confirmed significant community concerns with these design concepts.

The IPS work group explored several “hybrid” designs, incorporating elements of Concepts 1 and 2 and other alternatives suggested by the City of Portland, Hayden Island residents and other interested parties. The “hybrid” designs (Concepts A, B, C, and D) each represents a combination of access from I-5 as well as local arterial access. Concepts A and B were shared at a public meeting on June 29 where further feedback was gathered from the community. Concepts C and D also emerged as a distinct design that could address many of the concerns expressed regarding the other Concepts. Concept D will be shared with the community at a public meeting on August 5. “Concept D” includes access to the island from I-5 in a similar manner to the LPA. Arterial access via the Marine Drive interchange has been removed, resulting in fewer overhead ramp structures over the island and raises the elevation of the community connector street, Tomahawk Island Drive. Local access to/from the island will instead be accommodated by a local bridge to the west of I-5, adjacent to the structure carrying light rail.

An evaluation comparing these interchange concepts found that Concept D provides the best balance of access to Hayden Island, freight mobility, environmental and community benefits, and project costs. Concept D carries a consensus recommendation from project partners, Hayden Island residents, and other stakeholders involved throughout the process.

Design concept maps and concept evaluations are attached in *Appendix D*.

Alternative Lane Configurations on the Bridge

IPS recommendation: Further refine the LPA to include a 10-lane permanent bridge with 12 foot shoulders, with northbound and southbound lane configurations according to the Phase I LPA design.

The City of Portland retained URS to conduct an evaluation of the potential to reduce the number of lanes on the I-5 bridge. CRC assisted URS in providing project traffic analyses for review and conducted additional analyses to support work on this task.

URS evaluated several scenarios relating to the number of lanes on the bridge in both the southbound and northbound directions. They found similar performance characteristics at the bridge between a 12-lane main span (Full Build) and a 10-lane main span (LPA Phase 1) if improvement elements included in

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the Full Build alternative, separate from the main span configuration, were added to a 10-lane main span bridge. The URS report addressing reduction in lanes is included in *Appendix E*.

URS offered methods for developing a 10-lane bridge for both northbound and southbound directions. For the northbound direction, the work group reviewed operational data and suggested that the lane configuration follow the 10-lane LPA Phase I design. A similar in-depth evaluation of traffic operations was needed for lane configuration concepts for the southbound direction.

Two 10-lane configurations for I-5 on the Washington side of the Columbia River were evaluated, including the LPA Phase I configuration and the URS “10-lane Full Build” configuration. The primary difference between the two 10-lane alternatives is the elimination of lane number four (4) in the vicinity of the Mill Plain interchange. The results of this evaluation found similar performance between the two configurations in terms of vehicle throughput and travel times within the bridge influence area. However, the 10-lane Full Build configuration was found to create a slowdown and turbulence in the merging area where the number of lanes is reduced from four to three. Further review by the City of Vancouver evaluated the alternatives in terms of traffic volumes, lane capacities, add/drop/merge and weaves, truck movements, distance between interchanges and traffic safety. Their findings (also included in *Appendix E*) support the LPA Phase I 10-lane option due to its ability to minimize turbulence and permit through lanes to function as designed to accommodate upstream merging and benefit traffic flow and safety.

The URS concepts for a permanent 10-lane river crossing include 12-foot wide inside and outside shoulders in accordance with American Association of State Highway and Transportation Officials (AASHTO) standards for freeways with six or more lanes carrying 250 more trucks per hour. I-5 meets this criterion and 12-foot wide shoulders may also accommodate future use by bus transit under certain conditions, an option that has been of continued interest by PSC members.

More aggressive post-construction traffic demand management (TDM) measures would improve the performance of the I-5 system with a 10-lane river crossing design and are addressed in the *Post-construction Travel Demand Management* section, below.

Performance Measures

IPS recommendation: Performance indicators for commuter, freight, and transit mobility; safety; greenhouse gas emissions; and overall benefit/cost ratio support the overall package of IPS recommendations. The application of these measures was successful, indicating that a package of indicators to be refined over time should also be used to inform Mobility Council recommendations in the future.

The Performance Measures work group focused on travel times; safety; greenhouse gas emissions; and overall benefit/cost. Project scenarios included the following:

- *Locally Preferred Alternative (2030)*: Replacement river crossing with three through lanes and three add/drop lanes; I-5 highway improvements, including improvements at seven interchanges; extension of light rail from the Expo Center to Clark College in Vancouver; bicycle and pedestrian facility improvements; tolling at the river crossing; and, transportation demand and system management measures.
- *Locally Preferred Alternative – Phase 1 (2030)*: Includes all elements of the Locally Preferred Alternative (LPA) except construction of the I-5 braided on- and off-ramps at Victory Boulevard, the Marine Drive interchange flyover, and the northern half of the I-5/SR 500 interchange. This scenario also assumes the new Columbia River bridges would be striped for 10 highway lanes (three through lanes and two add/drop lanes) not for 12 highway lanes; however, there is no difference in overall bridge width when shoulders are included.
- *No Build (2030)*: Assumes the CRC project is not built. Also assumes that the same population and employment growth occurs; and, the same transportation and land use projects are built, that are assumed in the LPA scenarios.

- *Existing (2005)*: Baseline information derived from the existing transportation network, population and employment levels from year 2005.

Travel times

Travel times were summarized for each mode along I-5 including auto/commuter, freight, transit and auto/commuter on I-205 for the most highly used routes for each specific mode. Listed below is a very brief summary of the findings, more detailed information is available if requested.

Overall travel time findings

The work group found that both the LPA Full Build and LPA Phase 1 scenarios provide significant improvements over existing conditions and the No-Build scenarios. General findings on build scenarios:

- **Peak a.m. southbound** travel times on I-5 are significantly improved. Southbound traffic from connecting east/west facilities benefit from dramatically improved travel times in Washington due to reduced delays and queues on SR 500 and SR 14 entering southbound I-5. Southbound a.m. travel times are limited by downstream bottlenecks at Going Street/ I-405 and the Rose Quarter.
- **Peak p.m. northbound** travel times on I-5 are dramatically improved. The LPA Full Build is slightly faster than the LPA Phase 1 alternative due to increased operations near the I-5 Bridge.
- **Both Build scenarios** provide significant benefit to freight compared to the No Build scenario considering freight typically travels off peak and the number of hours of uncongested times increases from 9 hours under the No Build scenario to 22 hours under the Build scenarios.
- **I-205 northbound and southbound** travel times are improved with both CRC Build scenarios because the combination of improved transit, lane capacity and the DEIS level of toll keeps traffic in the I-5 corridor compared to the No Build which diverts significant I-5 traffic to I-205 because excessive I-5 No Build congestion levels.
- **Transit rider travel times benefit significantly in both CRC Build scenarios** for riders whose trips would include light rail and those who would take express buses from elsewhere in Clark County.
- **Full LPA and LPA Phase I benefits vary little between them.** Most travel times for all modes were effectively the same whether only Phase I were construction or the Full LPA as previously defined were constructed.

Automobile Commuters

- **Southbound a.m.** travel times under both the No Build and Existing scenarios showed significant delays at SR 500 and SR14 westbound to I-5 southbound, creating queues and increased travel time due to backups on these facilities.
- **Southbound a.m.** travel times in both CRC Build scenarios improve significantly over Existing and No Build. Even more significant potential travel time savings are constrained due to downstream bottlenecks at Going/ I-405 and the Rose Quarter/ I-84.
- **Northbound p.m.** travel times under both CRC Build scenarios demonstrate dramatic travel time savings. For example between the Morrison Street merge and SR 500 the travel time is reduced from 40 minutes in No Build to 17 minutes with the LPA Full Build. A slight difference of one minute between the Full Build compared to LPA Phase 1 was due to increased traffic near the I-5 Bridge.

Freight

- **Southbound a.m.** travel times for most freight origin/destination pairings had modest improvements for the CRC Build over existing conditions and No-Build scenarios due to the affects of upstream and downstream metering at different bottlenecks under different scenarios. Travel times to and from Mill Plain and Going Street follow similar patterns as summarized under for the commuter patterns.

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- **Southbound a.m. freight entering I-5 at Marine drive** will experience longer travel times for the two CRC Build scenarios compared to the No Build scenario due to the interactions of existing bottlenecks upstream and downstream of Marine Drive and the I-5 Bridge metering downstream throughput under the No Build scenario versus trucks entering I-5 in a congested segment under the Build scenarios.
- **Northbound p.m.** CRC Build alternatives provided dramatic travel time improvements to freight in both build scenarios similar to that received by commuters (16 minutes for LPA Full Build scenario vs. 43 minutes for the No Build scenario from I-84 split to Mill Plain Boulevard).
- **Southbound a.m. and northbound p.m. build scenarios** provide significant benefit to freight (freight travels more off peak than during peak), allowing for 22 hours of uncongested off-peak freight travel time vs. only 9 available uncongested off peak hours in a 24-hour period with no-build.

Transit

Transit travel times were run on the Regional Model, and were based on a representative urban to urban commute (downtown Vancouver to downtown Portland), and a representative suburban to urban commute (99th Street Vancouver to Pioneer Square Portland). These two scenarios provide a good example on which to examine the level of performance for commuters living in closer proximity to the light rail park-and-ride commute-shed, and those who live further out that may choose to take express bus from outer suburban areas. The following conclusions were made:

- Both LPA and LPA Phase I scenarios greatly benefit both express bus and light rail transit over a no-build scenario
- Downtown to Downtown Route (light rail) is a faster commute than a no-build express bus, with benefits even more significant on the northbound commute
 - SB light rail in both build scenarios: 32 minutes vs. 43 minutes via Route 105 bus no-build
 - NB light rail in both build scenarios: 32 minutes vs. 47 minutes via Route 105 bus no-build
- Express bus service is faster under both build scenarios, with more significant time savings on the northbound commute
 - SB express via Route 199 bus is 53 minutes in both build scenarios vs. 58 minutes in no build
 - NB express via Route 199 bus is 37 minutes in both build scenarios vs. 52 minutes in no build

I-205

- **Southbound** peak travel times for both CRC build scenarios demonstrate slightly improved travel times compared to the No Build scenario. The combination of improved transit and lane capacity along with the moderate toll rate for the CRC build alternatives keeps I-5 traffic in the I-5 corridor compared to the No Build scenario which diverts traffic to I-205 because of excessive I-5 congestion.
- **Northbound** peak travel times demonstrate slightly more savings for the CRC build scenarios compared to Existing and No Build scenarios as compared to southbound peak travel times.

Safety

Project scenarios were compared with respect to the total number of accidents expected on an annual basis in the project area. Both the Full Build and LPA Phase 1 scenarios reduced the number of accidents compared with the No Build scenario. Most of the reductions in accidents were realized in the reduction of substandard merges, diverges, and weaving sections, and reduced congestion throughout the project area, particularly areas where heavy volumes of trucks are entering and exiting I-5.

- Existing accidents – 400/yr
- 2030 No Build accidents -750/yr
- 2030 Full Build accidents – 200/yr

- 2030 LPA Phase 1 accidents – 210-240/yr

Greenhouse Gas Emissions

Project scenarios were compared for their contributions of greenhouse gas emissions (GHG). The methodology for calculating GHG follows the same analysis peer-reviewed by the CRC Greenhouse Gas Emissions Expert Review Panel in late 2008. This methodology calculates GHG emissions based on energy consumed during construction and operation of the CRC project. Findings show the most GHG benefits for the Build scenarios when compared to the No Build scenario.

GHG emissions are estimated both in the project area itself and for the region accounting for diversion to I-205 and other arterials. According to these estimates, the Full Build LPA has 0.5 percent fewer emissions region-wide and 4.4 percent fewer emissions in the project area compared to the No Build scenario. The LPA Phase 1 has the same regional emissions as the Full Build LPA. In the project area, emissions are 1.1 percent reduced from the Full Build LPA.

Benefit/Cost

A calculated benefit/cost ratio was developed for each of the scenarios to provide a basis for comparing the multiple benefits and costs associated with project performance. The analysis was conducted using methodologies and metrics recognized and championed by the US Department of Transportation, including FHWA and FTA. The principal categories of benefit considered are congestion management benefits to the area, mobility improvement benefits, economic development benefits in the region, and bridge lift time savings.

CRC convened a panel of stakeholders and subject matter experts, including practitioners and local academic experts to scrutinize the evaluation methodology, the inputs used to conduct the evaluation and the analytic method. The stakeholder panel reviewed the calculations used in each benefit category and provided input on adjustments and refinements and suggestions on appropriate input values. The Full Build and LPA Phase 1 were assessed using this updated methodology. Either build option demonstrates substantial benefit per cost compared to the No Build.

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| • Full Build benefit/cost: | 1.9:1 |
| • LPA Phase 1 benefit cost: | 2.0:1 |
| • LPA Phase 1 with Marine Dr flyover and Victory Braid: | 1.9+:1 |

Additional materials supporting Performance Measures work group findings are attached in *Appendix F*.

Post-construction Travel Demand Management

IPS recommendation: Expanded and increased TDM measures beyond those contemplated in the Draft EIS should be implemented after bridge construction is completed. This builds on a previous recommendation to implement TDM measures pre-construction and during construction. Different TDM measures may be most effective in each phase.

Principle Recommendation

- Develop TDM strategies to shift an additional 11 percent of peak period person trips crossing the bridge in 2030 to non-single occupancy vehicle SOV modes.
- This shift would reduce 2030 vehicle bridge crossing demand by 10 percent beyond the 2030 regional travel model forecast used for the LPA.

Recommended Strategies to Reduce Drive-Along Trips

- Individualized marketing
 - Provide personalized travel option information to corridor employees and residents

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- Financial incentives:
 - Short-term (up to six month) financial incentives for commuters to vanpool, take transit or carpool
 - No toll for carpools, vanpools and buses

Projected Trip Reductions Based On:

- Local experience in Vancouver, Washington state (Commute Trip Reduction) and Portland (SmartTrips)
 - For example, Portland annually reduces drive alone trips 8-13% in targeted geographic areas using “SmartTrips” individualized marketing programs
- Research related to the cost effectiveness and scalability of rideshare services
- Benchmarking comparison with Central Puget Sound and Bay Area corridors
- Research in WSDOT’s SR 520 Transportation Discipline Report

Benefits of Post-Construction TDM Program

- Increases efficiency of all designs by moving more people in fewer vehicles
- Lengthens functional lifespan of all designs
- Reduces costs for Clark County commuters using travel options
- Reduces fuel consumption and greenhouse gas emissions from all designs

What’s Not in TDM Committee Recommendation that Could Reduce Drive-Along Further?

- Increased light rail ridership
- High Occupancy Vehicles (HOV) / Managed lanes and/or HOV ramps
- \$3 peak period toll (which may further reduce peak demand)
- Compact development financial incentives

Implications/Issues

- Increased number of C-TRAN buses in downtown Portland
- Increased demand for Park and Ride spaces in Clark County
- Need for regional coordinating or management structure
- Impact of \$0 toll incentive on financial plan

Estimates

- The focus of the post construction TDM program is to achieve a greater reduction of drive alone trips. Estimates of potential mode shift build on top of the modeled forecasts for the 2030 LPA. The post construction estimates were developed based on market observations, and post processing. Over time individual mode splits may vary based on penetration of the TDM services while moving towards the post construction goal.

2030 LPA PM Peak 4-Hours I-5 NB without Special TDM Program					
	Vehicles	% of Vehicles	Occupancy	Persons	% of Persons
Drive Alone	23,815	77%	1.0	23,815	54.3%
Carpool	5,025	16%	2.2	10,925	24.9%
Carpool >4 / Vanpools	90	0%	5.0	450	1.0%
Trucks	1,900	6%	1.0	1,900	4.3%
Vehicles(subtotal)	30,830	99.9%	1.20	37,090	84.5%
Buses	25	0%	51.0	1,275	2.9%

	Vehicles	% of Vehicles	Occupancy	Persons	% of Persons
LRT				4,750	10.8%
Transit (subtotal)	25	0.1%		6,025	13.7%
Pedestrians				80	0.2%
Bicyclists				700	1.6%
Ped/Bike (subtotal)				780	1.8%
Total River Crossings	30,855	100.0%		43,895	100.0%

2030 LPA PM Peak 4-Hours I-5 NB with Special TDM Program + \$0 Carpool Toll					
	Vehicles	% of Vehicles	Occupancy	Persons	% of Persons
Drive Alone	18,749	67%	1.0	18,749	43.1%
Carpool	7,020	25%	2.1	14,916	34.3%
Carpool >4 / Vanpools	136	0%	5.5	750	1.7%
Trucks	1,900	7%	1.0	1,900	4.4%
Vehicles(subtotal)	27,806	99.9%	1.31	36,315	83.4%
Buses	33	0%	50.8	1,675	3.8%
LRT				4,750	10.9%
Transit (subtotal)	33	0.1%		6,425	14.8%
Pedestrians				80	0.2%
Bicyclists				700	1.6%
Ped/Bike (subtotal)				780	1.8%
Total River Crossings	27,839	100.0%		43,520	100.0%

Additional materials supporting TDM Work Group findings are included in *Appendix G*.

Next Steps

Metroscope

A final detailed report on the Metroscope analysis will be available by the end of August. The IPS Metroscope work group will be responsible for preparing the final report of this work and will ensure consistency of the travel networks on both sides of the river.

Hayden Island Access

Further due diligence on design, environmental, and cost issues related to Concept D will be needed. The CRC project and its partners will work with community stakeholders to finalize aspects of the design. The CRC project will assess the new interchange design for purposes of documentation in the Final EIS. The results of further analysis and design will be input to further work on the 10-lane bridge design.

Alternative Lane Configurations on the Bridge

The selection of lane reduction configurations are influenced by the final highway design and will follow decisions and additional design work on the Hayden Island interchange. The CRC project will assess the new highway design for purposes of documentation in the Final EIS.

Performance Measures

Performance measures have been used to inform discussion of other IPS work items. This task is complete.

Post-construction Travel Demand Management

Pre-construction, construction and post-construction TDM measures will be documented in the Final EIS.

TDM measures are likely to reduce congestion and improve I-5 performance in all project phases. PSC and CRC project partners should discuss a plan and timeline to request federal, state and regional funding to implement pre-construction TDM in order to provide benefits to Interstate Bridge corridor users as soon as possible.

To prepare for funding requests, the CRC TDM Work Group should develop a proposal with specific mode share objectives, specific actions to achieve the objectives, a three-year budget, potential funding sources and a coordinating structure for consideration by the PSC and/or partner agencies.

Other issues

[To Be Supplied]

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