

**Note: Responses to some questions are still under development and will be provided when completed.**

**City of Washougal - Connie Jo Freeman**

**1. Is "light rail" required to obtain federal funding, or will "bus rapid-transit" suffice?**

Local project sponsors unanimously selected light rail as the preferred option in 2008 because the benefits were greater than other options studied, including bus rapid transit. Changing the LPA to include bus rapid transit would require agreement from the project's partners in Washington and Oregon. If that agreement was reached, CRC would need to describe the design changes and the associated environmental impacts in a re-evaluation document. The Federal Transit Administration (FTA) and Federal Highway Administration (FHWA) would review the document and decide a course of action. If the re-evaluation finds no new significant impacts, FTA and FHWA would amend the Record of Decision and the project proceeds. If a change to the preferred alternative results in new and significant impacts, a supplemental EIS is required. A supplemental EIS would likely require 12 to 24 months to complete.

If an agreement was reached to change the LPA to include bus rapid transit, the New Starts Full Funding Grant Agreement (FFGA) would be delayed because it cannot be awarded without a current Record of Decision. A new grant application would be submitted, which FTA would re-evaluate. With a 12 to 24 month schedule delay, FTA has stated that federal funds may not be available for the CRC Project. See question 11 for more information.

**2. Do the stops meet the criteria for ½ mile employment requirement? [CTRAN]**

Yes. FTA Administrator Peter Rogoff wrote a letter dated July 24, 2012, related to this issue, stating that "local project sponsors have provided sufficient documentation to FTA that demonstrates that the light rail transit stations proposed as part of the CRC project are reasonably located within a one-half mile radius of the employment areas..."

**City of Vancouver - Larry Smith**

**3. Question on timing - is it necessary for the operations and maintenance funding plan to be in place by October 2013?**

A New Starts agreement requires all capital funds and operations and maintenance funds to be identified and committed, including state equity funds and tolling authorization. The Finance Plan assumes application for the grant by October 2013, with FTA grant funds committed in the second quarter of 2014. FTA has said there is less certainty for New Starts funding after 2013, and CRC is one of a few projects at the top of the list.

**Clark County - Tom Mielke**

**4. Will TriMet receive the farebox revenues in addition to the \$2 million they would be paid to operate light rail?**

It is assumed that C-TRAN will receive farebox revenue from the light rail transit trips that begin in Vancouver and TriMet will receive farebox revenue for the trips that begin in Portland.

Please refer to question 27 for more information about cost sharing between C-TRAN and TriMet for operations and maintenance of light rail.

**C-TRAN/ATU - Roy Jennings**

**5. What is the projected cost to C-TRAN for wages and fuel due to traffic congestion if the replacement bridge is not built?**

Based upon Alternative 4 of the C-TRAN 20 Year Plan that assumes no replacement bridge but an aggressive financially constrained budget for bus service, the operations and maintenance costs for express service is expected to reach approximately \$15,220,000 per year in 2030 dollars (inclusive of inflation). However, traffic congestion is expected to continue to raise costs more than what projected funding can accommodate and the projected express service levels will likely be reduced as travel times continue to increase.

**Cities of La Center/Ridgefield - Jim Irish**

**6. Show a representative year when tolls were levied on the existing bridges and compare to CRC estimates for proposed tolls.**

It is difficult to draw direct comparisons between the cost of tolls levied on the I-5 bridge between 1917 and 1929 and 1958 and 1966 with today's dollars. However, the following comparisons were made using the U.S. Bureau of Labor Statistics online Consumer Price Index Inflation calculator:

- Tolls were collected on the first bridge from 1917-1929. The toll was \$0.10 for a vehicle and driver. According to the BLS, the ten-cent toll levied in 1917 would have the equivalent buying power of \$1.82 in 2013. A \$0.10 toll in 1929 is the equivalent of \$1.36 in 2013 dollars.
- Tolls were collected on the second bridge from 1958-1966. Tolls were \$0.20 for cars and \$0.40 to \$0.60 for trucks. Using the same calculator, the \$0.20 toll in 1958 would be \$1.61 in 2013 dollars, and \$1.44 when comparing the 1966 value. For larger vehicles, the original \$0.40 to \$0.60 toll in 1958 would have the equivalent buying power in 2013 of \$3.22 to \$4.83. In 1966, this range would have the equivalent buying power of \$2.87 to \$4.31 in 2013 dollars.
- For the Final EIS, the range of one-way toll rates studied for the financial analysis was \$1 to \$3 (2006 dollars, see Exhibit 4.3-3 from the FEIS). Assuming a 2.5 percent annual inflation rate, this range in 2013 dollars would be \$1.19 to \$3.57.

Please note that the CPI Inflation calculator was used to calculate current dollar year figures for toll rates specific to the 1917 and 1958 I-5 bridges. The calculator was used for all years up to 2013.

Toll analysis for the project has been based on toll rate schedules in 2006 dollars which, when escalation was necessary, were escalated at 2.5% per year. The assumed toll rate provided in 2013 dollars is not calculated using the CPI Inflation calculator.

The CPI Inflation calculator escalation between 2006 and 2013 does not exactly match this 2.5% assumed escalation rate used in project tolling analysis. Because the 2.5% escalation rate has been assumed in analysis and is the basis for toll rates analyzed, it is continued here.

7. **Provide the number of people crossing southbound on both the I-5 and I-205 bridges daily and during peak hours.\*(updated )**

The latest data we've prepared for southbound peak period traffic is that reported in the FEIS Traffic Technical Report. That provides southbound data for a 2-hour AM peak on I-205 and for a 4-hour AM peak on I-5. These figures are as follows:

- I-5 vehicle demands (4-hour AM peak) = 26,300
- I-205 vehicle demands (2-hour AM peak) = 17,745

For 2012, we have average weekday traffic (AWD) volumes on I-5 and on I-205.

- 2012 AWD on I-5 is 128,400 vehicles (rounded to the nearest hundred).
- 2012 AWD on I-205 is 145,400 vehicles (rounded to the nearest hundred).

8. **Could the CRC project proceed as planned with the bridge simply LRT ready?**

No. Building the project without light rail would not meet the project's purpose and need, as documented in the analysis performed under the National Environmental Policy Act (NEPA) and approved in the federal Record of Decision.

**Clark County - Steve Stuart**

9. **What would be required procedurally (including potential time, additional approvals and from who, and analysis required) for FTA to switch funding for CRC high capacity transit from LRT to BRT (or if it would be even allowed)? \*(updated)**

Bus Rapid Transit was studied and not selected because light rail performed better. Going back and choosing a different high capacity transit mode would first require agreement by the project's partners in Washington and Oregon to initiate the change. The agreement reached by project sponsors and stakeholders on the current LPA occurred over a six year period between 2005 and 2011.

Amending the LPA requires describing the design changes and the associated environmental impacts in a NEPA re-evaluation document. FTA and FHWA would review the document and decide on a course of action. If the re-evaluation finds no new significant impacts, FTA and FHWA would amend the Record of Decision and the project proceeds. If a change to the preferred alternative results in new and significant impacts, a supplemental EIS is required. A supplemental EIS would likely require 12 to 24 months to complete, depending on the scope and degree of environmental and public involvement required.

The New Starts Full Funding Grant Agreement would be delayed until completion of the supplemental EIS because it cannot be awarded without a current Record of Decision. A new grant application would be submitted, which FTA would re-evaluate. With a 12 to 24 month schedule delay, FTA has stated that federal funds may not be available for the CRC Project.

**10. I would like an explanation of what an MOS (minimum operational segment) is, and how the Clark College terminus was determined to be that?**

A minimum operable segment (MOS) is defined in the FTA New Starts program as the shortest of alternative segments considered for a high capacity transit project. The MOS must remain effective as a stand-alone project, attracting riders but minimizing costs. FTA urges consideration of one or more minimum operable segments as separate alternatives.

The four potential terminus options in the draft EIS (Clark College MOS, Mill Plain MOS, Kiggins Bowl Terminus, and Lincoln Terminus) were each analyzed with one representative park-and-ride lot configuration unique to its alignment and terminus. The costs, transit ridership estimates, cost-effectiveness, and environmental consequences for each alternative are documented in the draft EIS and final EIS. Detailed findings can be found in the Transit Technical Report and appendices.

In July 2008, the Vancouver City Council and C-TRAN Board of Directors, along with the boards and councils of other regional partners, endorsed a LPA with a terminus at Clark College, following a 60-day review period, public hearings and the recommendation from the 39 member CRC Task Force.

**City of Vancouver - Tim Leavitt**

**11. Explain why the CRC LPA decided on light rail transit (LRT) as the preferred high capacity transit mode instead of bus rapid transit (BRT).**

Light rail was selected over bus rapid transit by the Vancouver City Council, C-TRAN Board, Southwest Washington Regional Transportation Council, Portland City Council, TriMet Board, Metro Council, and the bi-state CRC Task Force for the following reasons:

- Light rail will travel faster than bus rapid transit within the project area (averaging 17 mph versus 14.5 mph, including stops) because it will have signal priority, shorter wait times at stations, and quicker acceleration. Bus rapid transit would travel in exclusive lanes, but would be mixed with general traffic on local streets outside the project area, and would be delayed due to congestion in those areas.
- Light rail has more capacity and will carry 6,100 people over the I-5 crossing northbound during the peak period, while the alternatives with bus rapid transit would only carry 5,150 to 5,350 people.
- Integration with the existing system will allow transit users to travel between Vancouver and Portland without a transfer. Transfers add travel time and decrease trip reliability and convenience.
- Operation and maintenance costs for light rail are 25 percent lower per rider compared to bus rapid transit due to the need for more drivers on more buses.

The locally preferred alternative was endorsed by FHWA and FTA in the Record of Decision.

## Clark County - David Madore

1. **How many pages comprise the FEIS. How long would it take the average person to read all of them?**

The FEIS with full appendices is approximately 1,400 pages. It includes a 39 page summary which provides a meaningful explanation of the project, its impacts and mitigation. The time it takes to read these documents has not been estimated.

## History and LPA Selection

2. **Provide a concise definition of the LPA that received the ROD. Should a SEIS be done due to the significance of the change of scope, phasing, and basic financing changes made since the ROD?**

There has been no change to the LPA as identified in the ROD, nor have there been significant changes to the financing plan.

The full build LPA, is described on pages 1 and 2 of the ROD includes:

- A new river crossing over the Columbia River and I-5 highway improvements.
- Improvements to seven interchanges, from south to north: Victory Boulevard, Marine Drive, Hayden Island, SR-14, Mill Plain, Fourth Plain and SR 500. Related enhancements to the local street network.
- Improvements to the existing I-5 mainline bridge over North Portland Harbor
- A variety of bicycle and pedestrian improvements throughout the project corridor.
- Extension of light rail transit from the Expo Center in Portland to Clark College in Vancouver and associated transit improvements.
- Transportation demand and system management measures to be implemented with the project, including the use of tolls.

As the co-federal leads, FTA and FHWA will determine if a supplemental EIS should be produced for the project if any changes are made. To date, a supplemental EIS has not been deemed necessary. The final EIS indicated that due to funding constraints the LPA may be phased and that actual phasing would not be known until the timing and availability of funds are finalized, which would occur sometime after the ROD.

3. **Does the Federal Government require LRT on a replacement bridge for the I5 crossing?**

See response to question 5.

4. **Does the Federal Government require "high capacity transit" on a replacement bridge for the I5 crossing?**

See response to question 5.

5. **Does the Federal Government require any transit (beyond buses in mixed traffic) on a replacement bridge for the I5 crossing?**

Local project sponsors selected light rail as the preferred option in 2008 because the benefits were greater than other options studied, including BRT. See question 1 by Ms. Freeman and question 11 by Mr. Leavitt for more information.

Federal requirements (23 CFR Part 450) require planners analyze alternatives including transit prior to expansion of single occupancy vehicle travel facilities.

From the outset, the public and local agencies were involved in crafting the project's Vision and Values Statement and Purpose and Need Statement. Both documents identify limited transit options and poor transit reliability as one of the six elements project designs must address. Subsequently, all six local agency partners—including the City of Vancouver, Southwest Washington Regional Transportation Council, C-TRAN, City of Portland, Metro and TriMet—unanimously agreed in June 2008 on the overall project components, including light rail as the transit element. The process to select the LPA and was validated by FTA and FHWA in 2011 with the Record of Decision.

6. **The latest version of this project eliminates four freeway interchanges and the entire SR-500 interchange for this phase. Call this the LPA2. Provide a map showing the LPA2 components and the cost of each basic section.**

See response to question 9.

7. **Who authorized the changes that changed the LPA to the LPA2?**

See response to question 9.

8. **Did the project sponsors authorize the changes that converted the LPA to the LPA2? Which sponsors? Provide documentation showing the authorization from each project sponsor.**

See response to question 9.

9. **Did the staff notify the project sponsors? If so, provide copies other notices and information detailing the communication to each one.**

The CRC project has not made changes to the Locally Preferred Alternative. The LPA and the process to select it was approved by the FTA and FHWA in the Record of Decision in December 2011.

10. **Does the CRC staff recognize the authority of the project sponsors to approve or disapprove such changes? If so, what authority do the project sponsors retain? Define the present definition and authority of the project sponsors.**

In process.

11. **Do the project sponsors retain the authority to stop this project by withdrawing their support or by objecting to unauthorized changes by the CRC staff**

In process

**12. Since the CRC staff changed to the LPA2, has the staff also obtained authorization from and informed the FHWA, ODOT, WSDOT and both state governors of those changes?**

Please refer to the response in questions 6-9 above.

Cost, Finance and Funding

[Project Costs]

**13. Provide the projected costs for the parking facilities.**

Based on 2010 estimates, the total cost range for the three park and ride structures is \$158 million to \$176 million in year of expenditure dollars. This cost range includes design, construction and accounts for risk and inflation. It does not include the cost of acquiring property. It's important to note that these costs are specific to the CRC project. The range includes some allowances for mixed use development on the ground floor and architectural treatments, as per the recommendations of a CRC advisory committee and requirements of the City of Vancouver.

**14. Provide the projected costs for the toll collection facilities.**

Tolling implementation costs cover initial planning efforts; design and procurement of tolling equipment and infrastructure; installation and testing of tolling equipment and infrastructure; customer service center modifications and additional facilities locally for customer service and administrative hearings; and, communications and public education. The project's cost estimate includes \$45 million for tolling implementation.

**15. Provide the projected costs to collect the tolls (gross verses net revenue).**

The development of net toll revenue estimates from gross toll revenue estimates accounts for more than just the cost to collect tolls. First, adjustments are made to incorporate non-account fee revenue, rebilling fees, self-initiated payment costs, and adjustments for uncollectible revenue.

Then, deductions are incorporated for collection costs. Collection costs include operating and maintenance expenses for toll collection equipment, customer service center functions, centralized state operations costs and credit card fees associated with processing electronic transactions. Toll collection costs are estimated to reflect the nature of the cost, e.g. statewide collection activity costs may be estimated on a per transaction basis to proportionately share these costs between facilities based on their relative usage of these statewide activities. Toll collection cost ranges for the preliminary scenarios are estimated as follows:

- \$15M - \$21M in fiscal year 2022, the first year after completion of the facility
- \$33M - \$39M in fiscal year 2040, outer year with established revenue and traffic

In addition to toll collection costs, routine annual facility operations and maintenance (e.g. incident response, mowing, snow removal, striping, litter pickup), and insurance premiums for coverage of the physical structure of the bridge as well as business interruption (loss of revenue) are also allocated before deriving net revenues.

**16. What are the costs for each of the major basic components of the project? Each interchange, the bridge, each parking facility, total light rail costs?**

**Columbia River Bridges, including approaches – \$1.2 billion**

Deck truss structure that includes the landings for mainline I-5 on both sides of the river. The limits for the landings extend approximately 3,600 feet into Oregon on Hayden Island, and approximately 4,600 feet into Washington in Vancouver.

**Oregon - Marine Drive Interchange – \$325 million**

Improvements include a single point urban interchange to increase mobility through the interchange and onto I-5 directly in both directions (north and south).

**Oregon - Hayden Island Interchange and connector – \$270 million**

Improvements include full interchange ramps to access Hayden Island and a new structure/bridge to connect Hayden Island to the improved Marine Drive interchange.

**Washington - SR 14 Interchange – \$250 million**

Improvements include the connection to the major east/west state route in Washington at the north shore of the Columbia River.

**Washington - Mill Plain – \$80 million**

These improvements include upgrading the Mill Plain and I-5 interchange to allow for more vehicular and freight capacity to move through the interchange. This interchange is the primary access point to the Port of Vancouver.

**Washington - Fourth Plain – \$100 million**

This interchange is an alternate freight access point for the Port of Vancouver, and is also the primary interchange connection to the light rail terminus park and ride (Clark College). Some capacity improvements are planned at this interchange to accommodate those uses.

**Light rail transit – \$820 million**

Improvements include extending the MAX Yellow Line from the Expo Center in the Marine Drive area of Oregon to the Clark College park and ride terminus in Vancouver (3 miles). The light rail will share two major structures, the mainland connector, and the southbound (western-most bridge) Columbia River bridge. The costs includes track, stations, three park and rides, light rail vehicles, modifications to a maintenance facility and operations center and modifications to the Steel Bridge. Park and ride costs are \$158 to \$176 million. Capital construction is funded by an \$850 million FTA New Starts grant which can also include a portion of the bridge structure costs estimated at \$1.2 billion. The FTA finance plan identifies \$925 million of light rail costs that are transit eligible.

**17. Provide the total debt service payment schedule (principal and interest) for each year until the debt is repaid in full that will cover all debt for this project.**

The total amount of debt service for the project depends on the funding contributions and bond authorizations to be enacted by the Oregon and Washington legislatures, and is consistent with the delivery of other state transportation projects. Attachment A provides preliminary estimates of the debt service for toll bonds under several scenarios.

**18. Provide the total cost for this project including all finance costs, interest rates, and interest to be paid for the life of for each loan.**

Direct design and capital construction costs are provided in response to question 16. Attachment A provides estimates of finance-related costs associated with toll bonds and TIFIA loans for several



different scenarios. As stated in response to question 17, the debt service for the state contributions depends on future decisions regarding funding contributions and bond authorizations to be enacted by the Oregon and Washington legislatures.

19. **On February 19, 2013 Tiffany Couch asked for the Base Cost Estimate that would support the costs Kris Strickler testified about in Oregon, regarding a modified CRC project. See attached email. On March 20<sup>th</sup>, Ms. Couch received the following email indicating that a Base Cost Estimate for a more modified project cost did not exist, instead she was given a different document, not responsive to her request. It appears that the \$2.8B projection being testified about matches the same modified project as per the November 2012 FFGA application (see attached). Wouldn't a base cost estimate be necessary in order to then fill out the attached FFGA application? Please provide the Base Cost Estimate for the modified proposed project.**

There has been no change to the LPA. The base cost estimate for the initial construction program identified in the 2012 New Starts update was provided in the table delivered to Ms. Couch. (See Column 5.)

The following project elements were identified in the New Starts application as those that need to be constructed first to achieve significant transportation benefits and are necessary to operate the light rail system:

- The new river crossing over the Columbia River and the I-5 highway improvements, including improvements to three interchanges (Marine Drive, Hayden Island and SR 14/City Center), as well as associated enhancements to the local street network. This includes 4th Plain interchange improvements needed to support the light rail system.
- Extension of light rail from the Expo Center in Portland to Clark College in Vancouver, and associated transit improvements, including transit stations, park and rides, bus route and station changes, and expansion of a light rail transit (LRT) maintenance facility.
- Upgrades and modifications to the Steel Bridge and transit command center.
- Purchase of 19 light rail vehicles (LRV), public art and other transit-related procurements.
- Bicycle and pedestrian improvements throughout the project corridor that connect to the transit system.
- Toll system for the river crossing.
- Transportation demand and system management measures to be implemented with the project.

20. **Attached is the summary of the CRC's base cost estimate, the actual base cost estimate from which the summary is derived, as well as the maps you often share with legislators and public officials reporting the costs of the project. According to your CEVP report, the Base Cost Estimate is the cost of the project before it is escalated for risk and inflation.**
- a. **Why are the costs of the interchanges for Oregon and Washington, per your Base Cost Estimate, MORE than the maps you are showing legislators?**
  - b. **When you escalate the costs of the Oregon and Washington interchanges from this Base Cost, won't the disparities between the actual costs and what you are reporting on your map be greater?**
  - c. **If the project costs are now different than the ones shown, please provide the current numbers.**

The provided base cost estimate summary allocating cost to various project elements was not developed by the project and inaccurately assigns project costs. Costs may have simply been allocated based on their titles, without an understanding of their relationship to the project design (e.g. whether a line item related to the river crossing and approaches versus an interchange). Detailed assumptions underlying the summary are not shown.

The current project cost estimate, in escalated, year of expenditure dollars including risk and inflation, includes \$595 million associated with Oregon roadway and interchange improvements, \$435 million associated with Washington roadway and interchange improvements, \$1.2 billion for the replacement bridge and its approaches on both sides of the river, and \$820 million for light rail transit extension. Capital construction is funded by an \$850 million FTA New Starts grant which can also include a portion of the bridge structure costs estimated at \$1.2 billion. The FTA finance plan identifies \$925 million of light rail costs that are transit eligible.

21. **The newly revised project, as per the attached FFGA application is a deviation from the Record of Decision approved in December 2011. Who approved a project that deviates from the FFGA application?**

There has been no change in the project description as described in the final EIS and ROD.

22. **Per the FEIS and the current CRC plan shown in the following link, please provide the available detail including the document section, page number and line number referenced that provides the following basic information:**

[http://www.fta.dot.gov/documents/WA\\_Vancouver\\_Columbia\\_River\\_Crossing\\_Profile\\_FY14.pdf](http://www.fta.dot.gov/documents/WA_Vancouver_Columbia_River_Crossing_Profile_FY14.pdf)

Chapter 2 of FEIS includes a project description and sequencing plan description. Section 2.1, p. 2-4 to 2-5 includes a description of the project's LPA and the potential for phasing construction.

23. **There is a contradiction between the latest document that the CRC submitted (attached) to the FTA and the letter from Amy Grotefendt, of ODOT, speaking on behalf of the CRC staff, to Clark County Commissioner Steve Stuart on April 19, 2013. That letter says "There have been no changes to the project definition." The letter goes on to claim that nothing else has changed. The latest document submitted to the FTA says in bold type "Significant Changes Since Last Evaluation (November 2011): The project's capital cost decreased from \$3,507.87 million to \$2,796.91 million per a local decision to implement the project in phases." The initial phase will include all project elements required to make the LRT, highway, and tolling facility fully functional. Improvements at four highway interchanges, as well as the entire interchange at State Route 500, will be deferred." Since no funding is provided for anything that is deferred, the effect is to effectively delete all work except that which has not been deferred. Unless the project is funded and built as previously approved by the Record Of Decision, claims that the deferred (deleted) interchanges are disingenuous. Provide a clear compelling answer that reconciles these inconsistencies.**

Deferral or phasing of elements of the CRC project is a function of funding. The Washington Legislature is currently considering a transportation package that would provide construction funding for the Washington portion of the CRC project. The Oregon Legislature and Governor have already approved state funding for the Oregon portion of the CRC project.

Elements described in the New Starts application include the minimum number of improvements to be included in the first sequence of the project construction, while maintaining eligibility for federal transit funding. The construction program described in the New Starts application does not dictate phasing for other elements of the project as described in the ROD. The FTA Full Funding Grant agreement (FFGA) is only one source of funding needed to complete the full scope of the project as defined in the ROD. The local funding provided by both state legislatures and other Federal Aid Highway funds provided by FHWA will complete the full scope of the project.

[Operation and Maintenance Cost/Funding]

**24. Gross annual O&M cost for light rail for each forecasted year.**

Light rail transit operations and maintenance cost estimates depend on unit costs, as they inflate from year to year, and the amount of service provided. Light rail service levels are projected to grow to match ridership growth. The 2020 operation and maintenance associated with the CRC project is estimated to cost about \$5.9 million in 2020 dollars, assuming a full year of operations. With the increase in the amount of service provided, 2030 operation and maintenance for CRC is estimated to cost \$12.8 million in 2030 dollars.

**25. Gross annual O&M cost increases needed for C-Tran to provide extra bus service to serve light rail riders for each forecasted year.**

C-TRAN has assumed increases in bus service will occur in conjunction with light rail service, not necessarily as a result of light rail; therefore the increase does not necessarily represent “extra” bus service needed to service light rail. The following shows total projected operations and maintenance cost for all routes that are expected to feed light rail in downtown Vancouver in each forecasted year. The costs are based on the hours developed as part of the C-TRAN 20-Year Plan and a projected cost/hour (inclusive of inflation) for each year developed as part of the C-TRAN System and Finance Plan.

	2020 Projected Annual Cost	2030 Projected Annual Cost
Total	\$ 23,062,000	\$ 39,111,000

**26. Provide the total Light Rail O&M cost for each year?**

Please refer to question 24.

**27. Provide the total yearly amount to be paid to TriMet by C-Tran for all services rendered by TriMet to Washington for each of the next 45 years.**

C-TRAN and TriMet will enter into an agreement describing the operations and maintenance functions to be performed and the costs to be paid by each agency. Costs are anticipated to be paid by each district for the service provided to meet the demand of each district's residents. Neither district will be expected to pay the costs of the other district. Because certain operations and maintenance functions, for example the operator of the light rail trains, are most efficiently provided by one agency on behalf of both agencies, those costs would be allocated between the districts -- again based on the service levels needed to support the residents/ridership levels of each district. Because the agreement has not yet been drafted, it is impossible to identify a cost for 45

years. C-TRAN, as a party to the agreement, has a say over the level of service, and therefore the cost. The amounts are subject to other budget pressures on C-TRAN and C-TRAN system needs.

**28. What is the expected life of the Light Rail Trains and other basic Light Rail components? What is the plan to cover the cost for replacements?**

TriMet’s anticipated replacement cycle for light rail vehicles is 36 to 41 years, depending on the type of vehicle. These are expenses anticipated to arise in 2050 or later. A portion of these costs would be paid with formula federal funds associated with the CRC light rail extension provided by FTA under its State of Good Repair Program (formerly Fixed Guideway Modernization). Responsibility for paying the remaining costs would be allocated between C-TRAN and TriMet based on a formula to be included in the C-TRAN-TriMet light rail operations and maintenance agreement.

**29. Provide the expected real cost per passenger for those C-Tran express buses and for those Light Rail trains.**

The following chart shows total cost/passengers for each C-TRAN Express route expected to continue traveling across the I-5 Bridge after project opening. The rates were derived from the total cost for each route (which was used to develop the response to question 25) and the total passengers listed in question 53.

Route	Cost/Passenger	
	2020	2030
105	Route Will Not Cross River	
134	\$ 13.88	\$ 18.42
157	\$ 8.37	\$ 11.11
190	\$ 8.29	\$ 11.01
177	\$ 38.81	\$ 57.25
164	\$ 7.90	\$ 10.49
199	\$ 12.76	\$ 16.94
EXP Avg	\$ 12.29	\$ 16.40

The current TriMet cost per ride for light rail is \$1.71, (TriMet audited 2012).

[FTA Funding]

**30. What is the realistic expectation of receiving \$850 million in Federal funding?**

The New Starts program is currently funded and the project is well positioned to receive support. The project’s favorable rating with FTA has earned the project a favorable spot in the competitive queue for New Starts funds. The project is requesting \$850 million in New Starts funds. To apply for the New Starts transit funds in 2013, FTA requires both Oregon and Washington to have committed state funds. After 2013, however, our federal partners have made it clear that there is less certainty about federal transit funding and other projects may move into a leading spot.

**31. What would be the impact to the project if it was postponed a year or two?**

The project finance plan is designed to access FTA New Starts funds, which will exist through 2013. FTA has said there is less certainty after 2013, and CRC is one of a few projects at the top of the list. State funds must be committed in 2013 to continue the process as well as potentially secure a TIFIA loan. Oregon has already committed funding to the project and ODOT's capital funding is expressly contingent on funding commitments by Washington state by September 30, 2013. The increase in cost associated with a delay in construction start is \$50-\$70 million a year. Additionally, a delay would prohibit the project from competing for existing low-interest TIFIA loan funds.

**32. How much is available now for all New Starts projects in the nation?**

MAP 21 authorized about \$1.9 billion for each of FY2013 and FY2014; subject to about a 5% reduction due to sequestration cuts. The project plans to receive funding in approximately \$100 million disbursements over an eight year period, starting in FY2015. The President's FY 2014 budget to Congress seeks appropriation authority of \$2.1 billion for FTA's Capital Investment program.

**33. How much is expected now for this New Starts project?**

The CRC Project is seeking \$850 million New Starts funds in its application to FTA.

**34. How much is the minimum amount that might be available for this New Starts project? \*(updated)**

The project anticipates \$850 million in New Starts funding.

[Financing]

**35. How much is the minimum and maximum total debt from all sources that is foreseeable for this project?**

Please refer to the response in question 17.

**36. Prudence demands that a responsible contingency plan be in place to meet the needs in case only the minimum New Starts funds materialize and to cover cost overruns. What is that prudence plan?**

The CRC Project has a risk-management plan that allows for early identification of potential cost risks that could result in cost overruns and early response to address or mitigate the problem. The capital cost estimates for the CRC Project incorporate a prudent amount of contingency based on the risk-management plan.

**37. Debt repayment schedule for all forecasted years to cover all debt obligations for the expected and for the prudence plan.**

Please refer to question 17.

**38. Forecasted toll schedule and revenue to cover the expected and for the prudence plan.**

Tolling is expected to fund about one third of the construction cost: \$900 million to \$1.3 billion. Like other toll projects, the responsibility of debt repayment depends on the bond covenants and the types of bonds. The responsibility to repay the bonds lies with the states.

Toll rates will be set to sufficiently cover operations and maintenance, debt service and required reserves. Traffic and revenue analysis work will support initial toll rate setting and annual (or as needed) review to ensure rates are producing sufficient revenue to address bond covenants. Initial funding capacity estimates inform decisions around total toll-backed borrowing and will be based on conservative assumptions to ensure repayment. The state transportation commissions anticipate an annual evaluation of rates. Tolls may need to be adjusted to address revenue shortfalls, however, analysis demonstrates that every corridor has a revenue maximization point. As toll rates rise above this point, there are diminishing returns and total revenue declines while traffic effects associated with diversion increase.

On other tolled highways, WSDOT seeks to establish borrowing levels to provide sufficient project funding while maintaining a sufficient distance from forecasted revenue maximization to ensure there is the ability to adjust toll rates without exceeding this point. Toll rates cannot be adjusted upward without considering the effects to revenue generation and traffic diversion.

**39. What is the projected toll price for commute hours?**

Toll rates have not yet been selected. The February 2013 Preliminary Toll Estimates were developed using the toll rates documented in [Attachment A](#). The toll rate schedule is based upon time of day and day of week. In FY 2016, the first year of pre-completion tolling, the toll rate range is \$1.87 to \$2.50 for passenger car drivers using a transponder. In FY 2022, the first year of post-completion tolling, the toll range is \$2.17 to 3.62 for the same driver. These toll rates are given in year of collection dollars.

**40. Provide the projected traffic schedule and the associated toll revenue that provides for the necessary debt service.**

The February 2013 Preliminary Toll Estimate analysis projected the range of transactions starting from 20 to 30 million transactions annually in FY 2016 increasing to 45 to 60 million transactions in FY 2060. During pre-completion tolling, tolls are anticipated to be collected between 5 am and 8 pm; transaction estimates are specific to the limited duration of daily toll collection in this period. During post-completion tolling, tolls are anticipated to be collected 24 hours a day. The initial toll revenue estimated in this analysis, in year of collection dollars, start at about \$61 million to \$85 million in FY 2016 increasing to \$180 million to \$277 million by FY 2060.

**41. I would ask questions regarding Joe Cortright's review (attached – see pages 1 and 2) of the new (February 28 2013) CDM Smith Traffic report:**

**a. Greater than 50% of users will divert to avoid toll**

The February 2013 analysis shows a preliminary estimated decline in traffic of about 25,000 to 50,000 trips a day. This figure includes all potential types of diversion. Toll diversion, including when travelers take another route (e.g. I-205); shift mode (including switching to transit or consolidating into carpools); change destination (i.e. do not cross Columbia River); and, shift travel to another time of day.

**b. How will this impact toll revenue?**

Toll revenue estimates in the February report account for the anticipated diversion.

**c. How will this impact traffic?**

An investment-grade tolling study is underway and anticipated to provide additional information about the effect of tolling on traffic during different times of the day.

**d. Why didn't the CRC update their traffic projections in the 2011 FEIS?**

Traffic projections for the financial analysis were updated for the 2011 FEIS.

The CRC FEIS used conservative traffic projections for both the environmental and financial analysis. To conservatively appraise financial feasibility, the financial plan scenarios in the FEIS are based on low estimates of borrowing capacity which were developed from low traffic projections. By using low traffic projections, potential funding capacity from tolls is not relied upon to be greater than they could be. Use of this low estimate was recommended by the Oregon State Treasury through their 2011 review of the CRC financial plan.

The traffic projections used for environmental analysis were based on regional estimates for population and employment growth. These projections identify the upper bound of traffic volumes and thus ensure potential environmental effects are not assumed to be smaller than they could be.

**e. Why didn't the CRC update their tolling schedules in the 2011 FEIS (they are stated in 2006 dollars)? \*(updated)**

Final EIS toll rates are expressed in 2006 dollars to be consistent with previous studies, including the Draft EIS from 2008. The Final EIS provides full toll rate schedules in 2006 dollars and provides some rates in 2010 and 2018 dollars to demonstrate the effect of assumed increases at completion of construction. The project is transitioning to "year of collection" dollars as the traffic and revenue analysis work progresses. The February 28, 2013 report [Attachment A] presents the toll rate schedules in "year of collection" dollars.

**42. Provide the projected traffic diversion to the Glenn Jackson Bridge for each year until the debt is repaid in full.**

An investment-grade tolling study is underway and anticipated to provide additional information about the effect of tolling in various time periods, including the period after tolling begins. Previous studies have shown little diversion to I-205. The majority of drivers would not change their travel patterns. Some would choose a new destination or a non-tolled route.

NEPA Process

**43. On February 18, 2013, Kris Strickler testified in Salem Oregon that a Supplemental Environmental Impact Statement process would take 6 to 18 months to complete.**

**Please confirm:**

**a. The estimated cost to conduct an SEIS**

Please refer to the response in 43 b.

**b. The amount of time necessary to conduct an SEIS**

If a change to the preferred alternative results in new and significant impacts, a supplemental EIS is required. A supplemental EIS would likely require 12 to 24 months to complete. The New Starts Full Funding Grant Agreement for the transit element would be delayed and become very uncertain because it cannot be awarded without a current Record of Decision. The cost of conducting a supplemental EIS would depend on the scope of analysis and the length of delay. Costs incurred for such an effort would include engineering, technical analyses, documentation and public outreach. The estimated cost of delay to the project is \$50 to \$70 million a year and does not include the cost of a supplemental EIS.

**44. Provide a list of the properties that are listed on the National Historic Register that will be displaced or negatively impacted by this project.**

As documented in the final EIS, 25 National Register of Historic Places (NRHP) listed or eligible resources would be impacted by the project. For many of these properties, there has been a determination that there will be “no effect.” Of these 25 resources, three will have “Adverse” effects. Please see the attached table [Attachment B] for the list of resources that will be impacted. The three resources on which the project will have an “Adverse” effect are: the Pier 99 building in Oregon, the existing I-5 bridge, and the Vancouver National Historic Reserve (including Officer’s Row). Two of these resources will be displaced (Pier 99 and the I-5 bridge).

**45. How many properties listed on the National Historic Register will be displaced by this project?**

Two properties that are NRHP-listed or eligible would be displaced: the Pier 99 building in Oregon, and the existing I-5 bridge.

[Effects to Business/Mitigation]

**46. Aside from any gains that may be expected or jobs "created" by this project construction, how many businesses will be displaced by this project?**

In Oregon and Washington, an estimated 916 employees (747 in Oregon and 169 in Washington) would be displaced by the LPA. Displaced businesses will receive relocation assistance from the project; therefore it cannot be assumed that all displacements would result in job losses. In Vancouver, the number of displaced businesses will be lower than in Oregon because much of the project can be accommodated within existing right-of-way.

**47. Aside from any gains that may be expected or jobs related to project construction, provide the specifics about job losses as follows:**

**a. Provide the total number of jobs projected to be lost as a result of this project reducing the vertical clearance for river traffic?**

Ninety-nine percent of all river traffic will be able to pass under a 116 foot bridge. During the period 2002-2012, employment attributable to height-constrained work at the Columbia Business Center amounted to an average of 78 employees per year, assuming no re-investment is made by the companies to adjust business practices to the height constraint.

Source: USCG GENERAL BRIDGE PERMIT ECONOMICS REPORT, Additional Information – April 17, 2013



**b. Provide the projected annual economic loss to businesses in the Columbia Business Center and their suppliers due to this project reducing the vertical clearance for river traffic?**

WSDOT and ODOT are currently in confidential negotiations with the fabricators that are located at the Columbia Business Center.

**c. Provide the total number of jobs projected to be lost as a result of this project impacting businesses around the construction areas around Vancouver?**

Construction will have both positive and negative impacts to businesses in the project area. Job losses based on construction impacts were not estimated in the final EIS. Construction activities associated with the project have the potential to cause economic impacts by temporarily blocking visibility and access to businesses, causing traffic delays and rerouting traffic to detours.

Construction of the project also would result in increased spending on construction-related supplies and services as well as spending by construction workers in the area. The extent of these effects depends on the source of project funding and the makeup of work crews used during project construction.

The project has committed to mitigation measures to mitigate for construction impacts of the project, as described in the Record of Decision.

Commitments include:

- Maintaining physical access to businesses
- Providing signs to identify the location of access points to businesses during detours or closures
- Contractors will coordinate schedule, pace and order of construction to minimize impact to nearby businesses
- Identify local businesses to provide services during construction
- The City of Vancouver is planning to establish a Growth and Transportation Efficiency Center. This center will be charged with improving transportation efficiency and will develop and administer a construction communication and mitigation plan, which will be funded by ODOT and WSDOT as mitigation for project impacts.
- Implementation of programs to help businesses during construction such as:
  - Business planning assistance
  - Marketing and retail consulting
  - Promotions to generate patronage in construction areas

**d. Provide the projected annual economic loss to businesses as a result of this project impacting businesses around the construction areas around Vancouver?**

Economic losses based on construction impacts were not estimated in the final EIS. Please see response to question 47-c.

**e. Provide the number of direct construction jobs projected to construct this project by year.**

Approximately 20,975 total job-years (defined as one job for one year) will be required for design and construction of the LPA. The average annual regional jobs required will be 1,906 over the 11-year construction project. These estimates include direct, indirect and induced jobs.

**f. Provide the source of funds and cost allotted for mitigating losses to businesses negatively impacted by this project. Show how these costs are included in the finance plans (total project costs, debt payment schedule and tolls to cover those costs).**

Per the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act), the project will compensate for direct and temporary impacts related to property acquisition and loss of access. Individual property acquisition costs will be established through an independent appraisal process to ensure the owner receives the fair market value of the property. This process is governed by the federal Uniform Act. To date, the project has not conducted specific property valuations, which are necessary to determine the individual property acquisition cost. For the Draft EIS, the project team made general assumptions about the cost of acquiring property, based on a rough estimate of square footage, land use, possible demolition costs, etc. to compare the costs of alternatives in the Draft EIS, and made similar assumptions to inform the financial planning in the Final EIS. These estimates do not reflect what property owners will actually receive as compensation, and therefore were not distributed for review. These estimates are included in the project cost estimate. Funding for property acquisition will come from both federal and state sources, depending on the specific need for the property.

Business losses are not compensable in the states of Washington or Oregon. Therefore, no assessments are made as to business solvency and how construction activity, for example, may further impact a business' operations. As with any project, businesses and individuals have the right to file any claim they feel is in their best interest. The project team did survey businesses that would be directly displaced by the project to learn more about the demographics of owners, employees, and customers, but has not done such a detailed survey of the businesses that would not be directly affected. The project team has met with many of these business owners as well, and has afforded opportunities for all business owners to provide input on and learn about the project.

Separate from the Uniform Act, the U.S. Coast Guard may require mitigation for potentially affected businesses related to impacts to height-constrained work as a condition for approval of a general bridge permit.

Section 3.4 of the FEIS discusses measures to reduce such impacts on businesses during construction.

**g. Provide the reference lawful (RCW, fed law) provision for payments to mitigate business losses. Quote the text providing that authorization and basic limitations on the amounts.**

Please refer to the response in question 47-f.

48. **It appears that this project offers no means to provide any real mitigation or justification for impeding the river traffic. The reasonable mitigation would be for the bridge design to incorporate a lift span of some sort that would provide access to river traffic. It does not. How can you reconcile this?**

The project's bridge permit application includes a bridge height of 116 feet, which would accommodate over 99 percent of all river traffic, increase safety for river users by eliminating the "S" curve and limiting the number of piers in the water, and eliminating the need for river captains to call for a bridge lift.

Mitigation for the four impacted river users is a procedural process being completed at the direction of the U.S. Coast Guard. The USCG, states of Washington and Oregon, and potentially affected businesses are engaged in ongoing conversations to determine appropriate levels of mitigation. Mitigation amounts have not yet been determined.

Adding a lift span to the proposed deck truss bridge and alignment would result in a structure of unprecedented complexity with several technical challenges. Lift spans are not typically constructed on bridges with a curved alignment. The lift would need to be many times heavier than is standard due to the double-deck bridge configuration and the proposed pier configuration (which creates a longer lift span). In addition, lifting a span with a variable deck width due to ramps entering the mainline over the water is a technical challenge. A lift span that provides clearance of 125 feet would increase the cost of the project by approximately \$250 million; costs associated with a lift span providing higher clearances would be significantly higher. The challenges of placing a lift span on the proposed bridge would lead to a re-evaluation of the bridge type, configuration, and alignment. This would require additional environmental reviews and increase costs due to delay.

#### Traffic and Transit Modeling

[Traffic]

49. **How many Clark County morning commuters currently drive to their Portland office before 8:00 a.m. on workdays?**

Specific information about Clark County residents who work in offices in Portland before 8:00 am is not available. Individual data on counties where Clark County residents work is available from the U.S. Census Bureau. Information about when Clark County residents depart for work is also available from the U.S. Census Bureau. These data are presented below.

The number of Clark County commuters traveling to work in Oregon (Multnomah, Clackamas, Washington, and Marion Counties) on a daily basis was 55,260 in year 2010. This information was summarized using the OnTheMap application summarizing data from the 2010 Census (U.S. Census Bureau. 2012. OnTheMap Application. Longitudinal-Employer Household Dynamics Program. <http://onthemap.ces.census.gov/>).

**50. How many Clark County morning commuters currently use C-TRAN buses to arrive at their Portland office before 8:00 a.m. on workdays?**

Approximately 1,000 morning commuters currently use C-TRAN buses that cross the I-5 Bridge to arrive in Downtown Portland before 8 a.m. on weekdays. This number is based on all trips scheduled to arrive in Portland before 8 a.m.

**51. What is the traffic congestion benefits projected for the LPA2. How many minutes will be saved for rush hour traffic going south and north in the affected areas for the LPA2? Provide the available detail. \*(updated)**

See responses to questions 6-9 on page 5 for response to “LPA2”.

The project has analyzed the traffic conditions associated with current conditions (2005 conditions) and future conditions (estimated in 2030) with the full project. These results are documented in the FEIS. The project has not conducted traffic analyses of interim project phase conditions.

Improvements will provide considerable benefits for travel time, reliability and duration of congestion for most bridge users, but not for everyone at all times. Bridge lifts will be eliminated, collisions significantly reduced and traffic will flow more smoothly to and from interchanges. Travel time benefits vary based on time of day, location and travel direction.

There are significant travel time savings in the afternoon. During the p.m. peak period, drivers heading north on I-5 from I-84 in Portland to 179th Street in Vancouver are predicted to save 20 minutes compared with the no-build scenario. Drivers using the short segment of I-5 from Columbia Boulevard to SR 500 are predicted to save eight minutes compared with the no-build scenario.

For drivers traveling southbound during the morning peak, the time savings will not be as significant, but the trip will be more reliable and safer. During the a.m. peak period, drivers heading north on I-5 from I-84 in Portland to 179th Street in Vancouver are predicted to save 8 minutes compared with the no-build scenario. Drivers using the short segment of I-5 from Columbia Boulevard to SR 500 are predicted to save one minute compared with the no-build scenario.

For drivers traveling outside of the peak commute hours, there are significant travel time savings both northbound and southbound because vehicles will experience much less congestion than with the no-build scenario. Additionally, the duration of congestion on the bridge is substantially reduced, from a predicted 15 hours a day in 2030 under the no-build scenario, to 5.5 hours with the project.

[Ridership: light rail, express bus, bus]

**52. a.) How many of 1 and 2 [questions 49-50] will switch to Vancouver Light Rail?**

The following tables in the FEIS Transit Technical Report compare existing and future (LPA) mode splits:

- Table 3-2: Average daily transit mode split between Portland Central City and the Project Corridor residential area was 21 percent in 2005 and is forecast at 39 percent in the LPA.
- Table 3-10: Home-Based work transit mode split to Portland Central City was 22 percent in 2005 and 34 percent with the LPA
- Table 3-8: Average Weekday I-5 Columbia River Crossing Ridership by Transit Mode in 2030 shows 91 percent of riders use light rail versus 9 percent using express bus.

**b.) C-Tran’s ridership and schedule for each express bus that will continue to cross the bridge for each forecasted year.**

Route	2020		2030	
	Projected Annual Ridership	Peak Schedule Frequency	Projected Annual Ridership	Peak Schedule Frequency
105	Route Will Not Cross River			
134	122,000	15 mins	130,000	15 mins
157	36,000	30 mins	38,000	30 mins
164	122,000	10 mins	130,000	10 mins
177	24,000	15 mins	23,000	15 mins
190	62,000	30 mins	66,000	30 mins
199	133,000	10 mins	141,000	10 mins
Total	499,000		528,000	

C-TRAN has projected ridership for the purposes of projecting fare revenue in the 20 year financial plan. The financial plan is based on conservative growth assumptions and is updated every few years. Express ridership in the financial plan is projected to increase half as fast as population growth as projected by Washington State Office of Financial Management. This is simply ridership responding to population growth, but if C-TRAN were to introduce more service, ridership growth could increase in some cases.

**53. C-Tran’s ridership and schedule for each bus that will serve the Vancouver light rail riders for each forecasted year.**

The following chart shows total projected ridership for each route that is expected to feed light rail in downtown Vancouver in each forecasted year. The actual ridership expected to transfer to light rail from these routes will be less than the numbers shown below.

Route	2020		2030	
	Projected Annual Ridership	Peak Schedule Frequency	Projected Annual Ridership	Peak Schedule Frequency
2	49,531	30 mins	52,665	30 mins
3	128,689	25 mins	136,832	25 mins
4	2,173,889	10 mins	2,311,444	10 mins
25	287,330	35 mins	305,511	35 mins
30	426,930	30 mins	453,944	30 mins
32	405,671	30 mins	431,340	30 mins
37	1,488,790	15 mins	1,582,995	15 mins
41	4,849	3 trips	5,156	3 trips
47	6,436	3 trips	6,843	3 trips
105	67,774	15 mins	72,062	15 mins

**54. Ridership and schedule for each light rail train that will serve the Vancouver light rail riders for each forecasted year.**

Ridership and schedule by light rail vehicle is not available as trains are used throughout the system, not exclusively on the CRC alignment.

CRC estimated that in 2030 a fleet of 19 Type 5 light rail vehicles (16 in service and three spares), will be needed to accommodate an average of about 18,700 weekday boardings on this extension.

**55. Does the current plan include C-Tran continuing running all existing express buses across the I-5 Bridge? [C-TRAN]**

C-TRAN expects to run all existing express buses across the I-5 Bridge with the exception of Route 105, which will end in Downtown Vancouver, with service to 99th St. Transit Center and Salmon Creek P&R only.

**56. Provide the expected travel times, frequencies and ridership for those buses.**

Ridership and frequency can be found in response to Question 52, b. Based on data included in the FEIS that compares hourly congestion between existing conditions and the “No-Build” scenarios, northbound and southbound congestion is expected to increase by approximately 93% (from 4 hours to 7.75 hours) and 263% (from 2 hours to 7.25 hours), respectively. It can be assumed that these increases in congestion levels will be similar to increases between the current travel times for all express buses currently operating along the I-5 corridor and the projected increases in 2030.

**57. How many jobs and residents are currently, and projected to be, within 1/2 mile of the following light rail stations and how many riders are expected at each of these stations?**

- **Hayden Island.**
- **Expo center.**
- **Hayden**

This issue was raised earlier this year by an individual. To give the issue its proper context, an email response from C-TRAN to the individual and accompanying documents are found in [Attachment G](#).

**58. Provide the weekday ridership and frequency projections for this new Vancouver Light Rail line for each year.**

Based on the CRC’s current travel demand model, on opening year (2019) approximately 13,650 light rail riders will cross the Columbia River daily and in 2030 approximately 18,700 light rail riders will cross the Columbia River daily.\* Forecasts are not typically made beyond 2030 for transportation projects at this time. See response for question 61 for frequency projections.

\*Assumes this in an inquiry about ridership on the CRC extension of the existing system.

**59. Provide the weekday ridership and frequency projections for C-Tran buses across the bridge for each year.**

The following chart shows average weekday ridership and frequency for all routes expected to continue traveling over the I-5 bridge for each forecasted year. Ridership projections are based upon existing average daily ridership for each year and the conservative growth estimates used in the ridership results. See responses to questions 52 and 53 for ridership information.

Route	2020		2030	
	Average Weekday Ridership	Peak Schedule Frequency	Average Weekday Ridership	Peak Schedule Frequency
105	Route Will Not Cross River			
134	561	15 mins	596	15 mins
157	137	30 mins	146	30 mins
164	467	10 mins	497	10 mins
177	100	15 mins	107	15 mins
190	254	30 mins	270	30 mins
199	467	10 mins	496	10 mins
4	7,044	10 mins	7,490	10 mins
47	30	3 trips	32	3 trips
Total	9,060	-	9,633	-

**60. What is the maximum achievable frequency of the LPA Light Rail service compared to the maximum achievable frequency of buses running in mixed traffic across the bridge?**

The current ridership projections modeling assume that light rail will operate in two trains at 7.5 minute intervals between trains during the peak and 15 minutes in the off peak. The maximum achievable frequency of light rail vehicles given the current signaling and power supply system on the existing Yellow Line and included in the current design for the CRC Project would be approximately three minute intervals between trains.

Achievable frequency for buses in mixed traffic is more variable. Based on previous modeling work, over forty busses an hour is approximately the maximum frequency, but this can vary as buses are affected by traffic congestion and street configuration. It is difficult to accommodate a large amount

of buses in downtown Vancouver as the signaling system has a difficult time accommodating a high volume of busses while allowing other vehicles to efficiently traverse the downtown grid.

**61. Provide the projected counts and percentage of riders who will cross the I-5 Bridge via motor vehicles, buses and light rail. Same question, only for the morning commute.**

The 2030 LPA daily vehicle trips over I-5 (both directions) are forecast to be 178,500 vehicles. Person trips were not calculated on a daily basis, but typical automobile occupancy rates are approximately 1.2. Assuming this automobile occupancy rate, we estimate approximately 214,000 persons would use autos to cross the bridge on a daily basis in 2030.

The 2030 4-Hour Southbound AM peak period person trips over I-5 is forecast to be 28,600 persons in vehicles; 1,600 persons by bus; and 5,900 persons by LRT.

In 2030 with the LPA, it is estimated that 58 percent of PM peak direction vehicles will be single-occupancy vehicles, 26 percent will be high-occupancy vehicles and 17 percent will be transit.

**62. Table 3-11 of the FEIS *Interstate 5 Columbia River Crossing, Transit Technical Report for the Final Environmental Impact Statement* projects average weekday station usage (Ons and Offs) by Mode of Access and Egress, Year 2030. Please explain where the following people living/working/study and compare that to the total population (both current & projected) living/working/studying within 1/2 mile of the station:**

Clark (Vancouver)	700 Walk
Mill SB (Vancouver)	400 Walk
Mill NB (Vancouver)	400 Walk
9th St SB (Vancouver)	500 Walk
9th St NB (Vancouver)	650 Walk
5th St (Vancouver)	800 Walk
Hayden Island	2,450 Walk

**Table 1-4 of the FEIS *Interstate 5 Columbia River Crossing, Transit Technical Report for the Final Environmental Impact Statement*, shows the following parking capacities:**

Clark (Vancouver)	1910
Mill SB (Vancouver)	420
Columbia	570

**Please explain how these stations have the listed number of park & ride users in Table 3-11 of the FEIS *Interstate 5 Columbia River Crossing, Transit Technical Report for the Final Environmental Impact Statement*:**

Clark (Vancouver)	4,300
Mill SB (Vancouver)	650



<b>Mill NB (Vancouver)</b>	<b>600</b>
<b>5th St (Vancouver)</b>	<b>1,400</b>

Station usage figures cite modeled station area usage along the light rail line. Model outputs are based on 2030 population and employment inputs from Metro and RTC. See [Attachment I](#) for specific population and employment values, in base year and 2030 forecasts, associated with a ½ mile radius from each station area. Please note that the Mill, 9<sup>th</sup> St. and 5<sup>th</sup> St. stations are represented by the “New Vancouver Station Area Cluster.”

Park and ride usage numbers represent station ons and offs by mode of access (park and ride in this instance). For example, at the Clark park and ride there are approximately 1,910 parking spaces, so if we assume only one person per car and only one car per space that is  $(1910*2) = 3,820$  ons and offs. That leaves approximately 480 ons and offs attributable to carpoolers, drop-offs or park and ride turn over throughout the service day.

[Travel times; light rail, express bus, bus]

**63. Provide the expected travel times, frequencies and ridership for the Light Rail trains to travel from downtown Vancouver to the first Yellow Line Light Rail station.**

Travel time from 5<sup>th</sup> and Washington in Vancouver to Expo Station in Portland is approximately four minutes. Intervals between trains are planned to be 7.5-minute during the peak and 15-minute off peak. Current modeling projections assume approximately 18,700 river crossings per day on light rail in 2030.

**64. What time would each commuter have to leave home for each of the following scenarios:**

- a. **Driving directly from their home to arrive at their office before 8:00 a.m.?**
- b. **Walking or driving to a bus stop, taking a bus to downtown Vancouver, transferring to the next light rail train, transferring to another light rail train, or TriMet bus, and then hiking to arrive at their office before 8:00 a.m.?**
- c. **Driving to downtown Vancouver, parking, transferring to the next light rail train, transferring to another light rail train, and then hiking to arrive at their office before 8:00 a.m.?**
- d. **Walking to a bus stop, taking an express bus to downtown Portland, transferring to a light rail train, and then hiking to arrive at their office before 8:00 a.m.?**
- e. **Walking to a bus stop, taking an express bus to downtown Portland, and then hiking to arrive at their office before 8:00 a.m.?**
  - i. **How many existing commuters are expected for each option above?**

Transit travel times are assessed using in-vehicle time and total travel time (in-vehicle *plus* wait time *plus* representative walk access times), as shown in [Attachment H](#).

CRC modeled trips between specific widely-recognized public destinations, such as between the Clark College terminus and downtown Portland, between downtown Vancouver and downtown Portland, and between downtown Vancouver and major employment centers in Portland.

The in-vehicle and total transit travel times for all of the origin and destination pairs reported in Table 3-4 [Attachment H] would improve with the LPA, compared to the 2030 No Build Alternative, with savings ranging between three and 28 minutes. For example, in the PM Peak northbound, total transit travel times from Pioneer Square to Clark College would drop from 72 minutes to 44 minutes (28 minutes faster) with the LPA. Similar improvements in travel time occur for other locations and for AM Peak southbound travel. In-vehicle time improvements with the LPA, range from three to 20 minutes of time savings.

Transit travel times would be more competitive with automobile travel times with the LPA, despite numerous highway improvements. In many cases, the travel times for transit are shorter than travel times for automobiles. (Trips where transit takes less time than automobile travel are shaded in Table 3-4.) It would take three fewer minutes (in-vehicle) during the AM Peak to travel from downtown Vancouver to Pioneer Square (32 minutes versus 35 minutes). The AM southbound automobile travel times during this time of day are longer than in the PM northbound, because of remaining I-5 bottlenecks south of the bridge influence area.

Transit reliability between major origins and destinations is higher due to the availability of LRT that travels in an exclusive guideway.

**ii. Does new Vancouver light rail accomplish that goal and justify the cost compared to other options?**

Please refer to discussion in number 11 on page 4.

**65. What is the latest projected frequency and number of weekday light rail trips across the bridge?**

Based on current modeling, in 2030 during the PM 2-hour peak, trains are operating at approximately 98 percent capacity with 7.5 minute intervals between trains, which equates to a two hour peak load of approximately 4,180 riders.

Contracting and Operations:

[Contracting/Bid Process]

**66. In contrast to a concept or basic kind of bridge, has the bridge actually been designed and engineered so it is ready for construction? Has the bridge engineering been competed? Or must the actual detailed engineering still to be done?**

Bridge design and engineering is not sufficiently complete to begin construction. The procurement method that is being used for the river crossing bridges is design/build which requires the contractor to provide the detailed final design for the bridge that they will build. Therefore the bridge design is currently at a conceptual level and final (detailed) design will be completed by the design-build contractor, who will be selected through a competitive process.

**67. Have the main contractors involved with this project so far, competitively bid on their work? Provide the main documents.**

To date, the project has been developed using expertise provided by WSDOT, ODT, C-TRAN, TriMet and consultant companies, primarily under a consultant contract.

Consistent with national best practices learned from other large transportation projects, WSDOT issued a competitive and widely advertised Request for Qualifications (RFQ) in February 2005 for a general engineering consultant (GEC) to quickly mobilize a workforce and provide expertise and specialized skills that ODOT and WSDOT did not have available in-house. In addition to being advertised online, notification was provided in the Seattle Daily Journal of Commerce which is a paper of record in the Pacific Northwest and widely known as a source of information on contracting opportunities. The tasks identified in the RFQ included completing the environmental planning process under the National Environmental Policy Act (NEPA), permitting, and performing necessary preliminary design work leading to construction. The procurement process that resulted in selection of a GEC for the CRC project was open and competitive. Competition in this sense is defined by federal regulations that preclude a “low bid” process. Instead, selections are based on professional qualifications provided at a reasonable cost to complete the work.

*Requested documents are being collected.*

**68. Will future design and construction work be competitively bid? Explain.**

Yes. All construction contracts will be selected through a competitive process that considers technical expertise and price.

**69. What corrective steps has management taken to resolve the problems already identified showing that employees converted to self-employed consultants who then charged much higher rates? Explain.**

CRC has reviewed the questions related to subconsultants of David Evans and Associates, Inc., and found that rules have been appropriately followed. David Evans and Associates, Inc. is the prime/general engineering consultant for the CRC project. As with all large state projects, both in development and construction, contracts are issued to consultants to provide issue-specific expertise and supplement the state work force. These contracts are limited to a defined scope of work. This approach allows the state to secure the right team members at the times their expertise is most needed. Consultants might work for a few months or a few years, depending on their specific skill set and the needs of the project as it moves from planning through construction. State budgets benefit because government overhead costs do not need to expand and adjust as projects begin and end. Prime consultants and consultants often utilize sub contracts to bring forth complementary yet different skill sets to move projects forward. For a project such as CRC, it is common practice to have services provided by discipline-specific subconsultants.

Subconsultants accepted by the state are qualified firms and are held to applicable provisions of the prime contract. Employees of previous subconsultants who have started small businesses themselves may be eligible subconsultants, provided they meet these requirements and enter into agreement with the prime consultant.

Furthermore, the both the states of Washington and Oregon are committed to engaging diverse suppliers of services including contracting opportunities for minority and women-owned firms and

veteran-owned firms. At least one of the current subconsultants cited as a concern is registered with the State of Oregon as a federal Disadvantaged Business Enterprise and as a state recognized Minority Business Enterprise, Women Business Enterprise and Emerging Small Business. Rates charged to the state by consultants and their subconsultants are accepted through adherence to state procurement regulations and agency policies. There have been claims that subconsultants are charging rates up to twice previously paid by the state for similar work. This is simply not true. It is incorrect to compare the unburdened raw labor rates of subconsultants in their previous status as employees to their negotiated billing rates as self-employed consultants. Subconsultant's billing rates are negotiated according to standard rates for services provided for similar work.

[Parking Operations]

**70. Provide the projected total number of vehicles per day that will park in the new parking facilities.**

In 2030, Columbia park and ride would generate an estimated 310 morning and 280 afternoon/evening peak trips; Mill Plain park and ride would generate an estimated 225 morning and 205 afternoon/evening peak trips; and Clark park and ride would generate an estimated 1,050 morning and 955 afternoon/evening peak hour trips.

**71. Will parking be free for the parking facilities? Must they be free according to current law?**

The current plan assumes parking will be free, however, there have been recent discussions about charging for parking at the park and rides as a means to generate revenue to help pay for the operations and maintenance costs for light rail. According to the FTA, parking at the facilities must first prioritize parking for transit riders but after peak hours the parking can be used for other purposes.

**72. If parking is not to be free, what are the projected costs to park per hour and per day?**

There has not been a comprehensive analysis completed on this issue so we are not able to answer the question at this time.

**73. Will staff be provided for parking enforcement? What will the cost for enforcement? What is the funding source for parking enforcement?**

If the owner of the park and ride facilities elects to charge for parking at the facilities, additional analysis will be necessary in order to answer these questions.

[TriMet Operations]

**74. TriMet has published weekday ridership and frequency projections for each of their Light Rail lines, commuter rail, and streetcar projects. They are publishing ridership projections for this extension into Vancouver. Their track record of credibility and accuracy can easily be established by comparing those projections as published in the DEIS and FEIS for each of those projects. What were each of those projections? What are their actual weekday ridership numbers as of the most recent reports?**

A table of recent ridership projections and actual ridership performance is attached [[Attachment C](#)].

**75. What is the total unfunded liability of TriMet?**

TriMet does bond for defined capital costs, including but not limited to new buses and TriMet's share of light rail projects. The TriMet Board has set a policy that TriMet's senior lien (or payroll tax backed debt) will not go beyond a sustainable level of 7.5 percent of net continuing revenue. Current levels of senior lien debt for Fiscal Year 2013 are approximately 5.4 percent. TriMet's most recent bond rating is AAA (Standard & Poor's highest) and Aa1 (Moody's second highest). TriMet has sold capital grant receipt bonds as well, but these are being paid off by outside resources, such as federal funds from regional flexible funds or from the FTA through a Full Funding Grant Agreement for a light rail project, so these bonds do not have an effect on TriMet financial resources.

**76. What is the total debt of TriMet?**

TriMet's unfunded pension liability is \$266 million. TriMet is paying down the unfunded liability over the next 17-18 years by increasing the annual amount of funding.

TriMet's unfunded retiree medical liability is \$852 million. TriMet is taking steps to reduce the retiree medical benefit for union and non-union employees to what is affordable on a PAYGO basis.

**77. Are there any debts that TriMet has not paid on time (according to the original terms)? Provide basic documentation.**

No. Attached is the June 30, 2012 Debt Compliance Opinion provided by Moss Adams LLP [[Attachment D](#)].

**78. Has TriMet reduced bus, Light Rail, or Streetcar service during the last 5 years? Elaborate.**

Yes, TriMet has reduced service hours approximately 14 percent in the past five years in response to funding shortfalls caused by the Great Recession, in addition to laying off staff and raising fares. This year for the September service update, TriMet is reversing that trend, making a modest increase in service without an increase in fares.

**79. Provide the total compensation range for Light Rail train operators including all benefits.**

\$58,404 - \$141,958

**80. Provide the total compensation range for the top 10% of TriMet executive and administration staff members including all benefits.**

\$136,550 - \$263,439

**81. Provide the total TriMET expenses and revenues by year for the past 10 years.**

A spreadsheet detailing TriMet's revenue and expenses is attached [[Attachment E](#)].

**82. Provide the total TriMET ridership by year for the past 10 years for each Light Rail Line.**

A chart show total MAX boardings and boardings by line is attached [[Attachment F](#)].

# **ATTACHMENT A**

**PUBLIC RESOURCES ADVISORY GROUP**

**MEMORANDUM TO:** Les S. Brodie, Oregon Department of Transportation (“ODOT”)  
 Lee A. Helgerson, ODOT  
 Laura Lockwood-McCall, Oregon State Treasury (“OST”, and together with  
 ODOT, the “State”)

**FROM:** Public Resources Advisory Group (“PRAG”)

**SUBJECT:** Columbia River Crossing – Range of Estimated Project Funding Capacity of  
 Net Toll Revenues Based on Updated Traffic and Revenue Projections

**DATE:** February 24, 2013

**SUMMARY OF RESULTS**

This memorandum is prepared in response to ODOT’s request that PRAG prepare an updated analysis to estimate the range of project funding capacity provided by tolling the Columbia River Crossing (CRC) Project bridges. This analysis is based on the preliminary traffic and revenue estimates prepared by CDM Smith and presented in its report titled “Columbia River Crossing Traffic and Revenue Study, Preliminary Gross Toll Revenue Estimates, February 22, 2013” (the CDM Smith Study). For each of the four traffic and revenue scenarios described in the CDM Smith Study, PRAG modeled the estimated funding capacity based on two sample bonding scenarios, namely (1) 100% State-backed (GO) Toll Revenue Bonds, and (2) up to a \$1 billion TIFIA loan combined with stand-alone toll revenue bonds. In estimating the total project funding available from tolls, we include both the net bond proceeds that can be generated from the projected net toll revenues as preliminarily provided by Parsons Brinckerhoff (PB) on February 22, 2013, as well as the projected net toll revenues available during the pre-completion period (i.e., that period between when tolling commences and when both bridges are fully operational) to fund project costs on a pay as you go (PAYGO) basis. Based on these data sources and the other assumptions described below, our analysis indicates the following levels of capital funding capacity for each of the scenarios:

**Estimated Project Funding Based on Updated Traffic and Revenue Projections**

Amounts in \$Millions	Principal Amount						Non-Project Uses of Proceeds				PAYGO From Pre-Com- pletion Tolling	Net Project Funding Available
	Standalone Senior		State-Backed		TIFIA Loan	Total	COI	Cap-I	Reserve	Total		
	CIBs	CABs	CIBs	CABs								
<b>Scenario 1</b>												
GO	-	-	955.7	16.2	-	971.9	6.9	118.3	-	125.2	226.4	1,073.1
TRB & TIFIA	-	43.9	-	-	940.8	984.7	1.1	-	4.4	5.5	226.4	1,205.6
<b>Scenario 2</b>												
GO	-	-	1,075.3	-	-	1,075.3	7.5	139.8	-	147.3	254.9	1,182.9
TRB & TIFIA	95.9	25.3	-	-	1,000.0	1,121.2	3.0	5.8	12.1	20.9	254.9	1,355.2
<b>Scenario 3</b>												
GO	-	-	1,408.6	-	-	1,408.6	9.9	211.3	-	221.1	363.9	1,551.3
TRB & TIFIA	501.3	1.9	-	-	1,000.0	1,503.2	12.6	55.6	50.3	118.5	363.9	1,748.6
<b>Scenario 4</b>												
GO	-	-	1,957.0	-	-	1,957.0	13.7	382.8	-	396.5	355.8	1,916.3
TRB & TIFIA	907.5	66.3	-	-	1,000.0	1,973.8	24.3	136.6	96.8	257.7	355.8	2,071.9

# Public Resources Advisory Group

## INFORMATION SOURCES AND MAJOR ASSUMPTIONS

The following is a description of the data sources and major assumptions employed by PRAG to calculate the above range of estimated project funding potential. The amount of net bond proceeds that can be generated by projected net toll revenues will ultimately depend on the results actually achieved – i.e., the final projections of traffic and gross toll revenue and net toll revenue, the timing of bonding, types of debt utilized, interest rates, coverage, and debt amortization. We believe the assumptions detailed below are reasonable under current market conditions, but actual results will vary from those presented herein. These estimates are preliminary and part of an ongoing and increasingly refined analysis of toll funding capacity, leading to the final investment grade traffic and revenue analysis required just prior to issuing debt secured by net toll revenues.

- **Gross Toll Revenue** – PRAG’s analysis was based on Scenarios 1-4 described in the CDM Smith Study. The scenarios vary by a number of parameters, including socioeconomic forecasts utilized, toll rates in the post-completion period, value of time, escalation of the pay by mail surcharge, ETC penetration, ramp-up adjustments, among other factors. These Stage 1 projections will be updated in a refinement study to be prepared by July 1, 2013 and finalized in an investment grade study to be completed by late 2013. We should also note that all scenarios in the CDM Smith Study assume no additional increases to the basic toll rate after FY2022, when the new facility is projected to be open. (Scenarios 1 and 4 do assume the pay by mail surcharge increases at the rate of inflation through 2036, but the basic toll rate remains unchanged after FY2022.) This is intended to provide for a more conservative estimate of project funding capacity, which does not rely on on-going future toll rate increases. This same approach was also assumed in the modeling PRAG completed at the request of ODOT and OST as part of the OST’s July 20, 2011 presentation to Governor Kitzhaber (the 2011 PRAG Analysis.)
- **Net Toll Revenue** – All toll-backed bonds and TIFIA loans are assumed to be paid after the funding of Operating and Maintenance (O&M) expenses and both tolling and facility Repair and Replacement (R&R) reserve deposits. This is a conservative assumption that mirrors the assumptions used for the 2011 PRAG Analysis. As a practical matter, the legal structure for the toll-backed bonds (including TIFIA) to be issued in the future likely will involve a pledge of net toll revenues that deducts only O&M costs and not R&R reserve deposits (which would be paid after debt service). This approach is consistent with the debt structure used for Washington’s SR 520 project. However, we also assume that deposits to the R&R reserve are deducted to provide a more conservative range of estimated funding potential as well as to be more consistent with the assumptions used in the 2011 PRAG Analysis.

All preliminary estimates of net toll revenues were prepared by PB, based on the preliminary traffic and gross toll revenue estimates detailed in the CDM Smith Study.

- **Project Sources and Uses** – To estimate the required timing of toll-backed bond issuances, PRAG obtained data from the CRC project staff that included estimated project funding needs and projected non-toll funding sources. Project costs were based on the cost refinement study conducted by CRC project staff in November 2012.
- **Bond Structuring Assumptions** – Provided below is a discussion of the major structuring assumptions of the analysis, which are detailed in Exhibit 1. We point out several factors that have changed since the 2011 PRAG Analysis, namely:
  - **Interest rates** – Since bonding is now closer than it was in 2011, and the interest rate assumptions used in 2011 were materially higher than then-current market rates, we have reduced our interest rate assumptions by applying an interest rate spread to estimated current market rates for each of the credit structures contemplated. Since there has been more volatility in tax-exempt rates than in taxable rates in recent years, particularly for lower-rated credits such as would be expected for stand-alone toll revenue bonds, we assume an interest rate spread over current market rates of approximately 1.0% (100 bps) for TIFIA (which is based on the 30-year U.S. Treasury yield),



## Public Resources Advisory Group

1.5% (150 bps) over current rates for State GO-backed bonds, and 2.0% (200 bps) for stand-alone toll revenue bonds.

Please note that the actual interest rates achieved on toll-backed borrowing (whether TIFIA, State GO-backed bonds or stand-alone toll revenue bonds) will impact the amount of project funding available from the net toll revenue stream. Higher interest rates than assumed in our analysis will result in lower project funding, while lower interest rates would produce higher project funding.

- **Coverage** – In the 2011 PRAG Analysis, we assumed TIFIA debt service coverage at 1.10x. However, based on the experience of Washington with the SR 520 TIFIA loan, and consistent with the assumption used in the CRC’s August 2012 Annual Section 5309 New Starts Report to the Federal Transit Administration, we have increased that debt service coverage factor to 1.15x. Similarly, we have increased our debt service coverage factor for the State GO-backed toll revenue bonds to 1.30x from the 1.25x assumption in the 2011 PRAG Analysis.
- **Pre-Completion Tolling** – In the 2011 PRAG Analysis, we did not assume any pre-completion tolls. For this analysis, we assume that revenues from pre-completion tolls will be used to pay O&M, and fund deposits to an O&M reserve, R&R reserve, and a rate stabilization fund during the pre-completion period, all as calculated by PB. Excess net toll revenues available after funding these costs in each fiscal year are assumed to be available in the following fiscal year to fund project costs on a PAYGO basis. These amounts are summarized in the results table above as “PAYGO from Pre-Completion Tolling.”
- **Debt Service Structure** – In all cases, we structure the bond debt service to match the shape of the net toll revenue stream. As stated above, the traffic and revenue projections in the CDM Smith Study assume no additional increases to the basic toll rate after FY2022 when the facility is complete (although both Scenario 1 and Scenario 4 assume the pay by mail surcharge continues to grow with inflation.) Both net toll revenue and debt service increase only with forecast increases in traffic. This produces a modestly increasing debt service structure, with compound average growth rates of between approximately 1.3% per year and 1.9% per year during the years when the bulk of the debt is amortizing, depending on the scenario analyzed. The debt structures for the eight scenarios analyzed are depicted graphically in Exhibit 2.

### CONCLUSION

Based on the updated analysis, and assuming the net revenue projections for Scenarios 1-3, the toll revenue funding capacity is reasonably estimated to range between \$1.07 billion and \$1.75 billion in capital funding for the CRC Project. A scenario testing the impact of a higher toll rate (Scenario 4) yielded an even higher amount of capital funding; however, that scenario is not incorporated in the estimated range. It should be emphasized that these results are based on preliminary Stage 1 projections which will be updated in a refinement study to be prepared by July 1, 2013 and finalized in an investment grade traffic and revenue study to be completed by CDM Smith in late 2013, along with a final net toll revenue report to be completed by PB. Further, these preliminary projections are based on a number of assumptions, including factors related to toll policy (toll rates and surcharge rates) that will be subject to future decisions of Oregon and Washington policy makers.

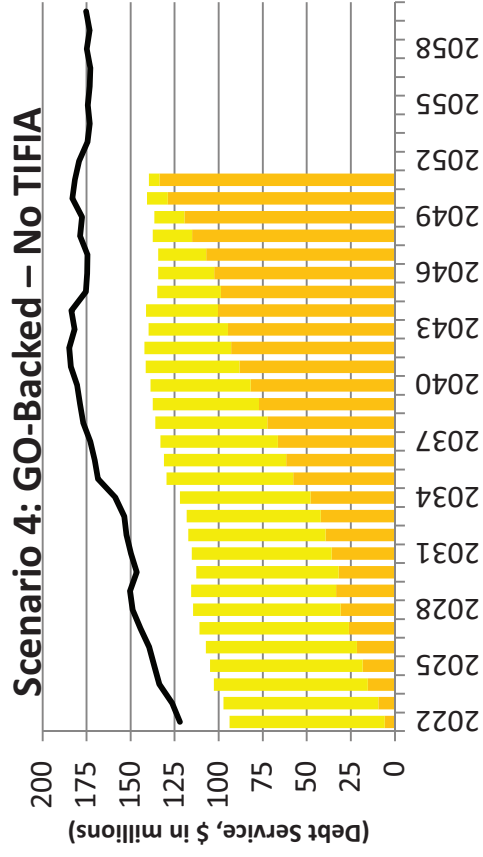
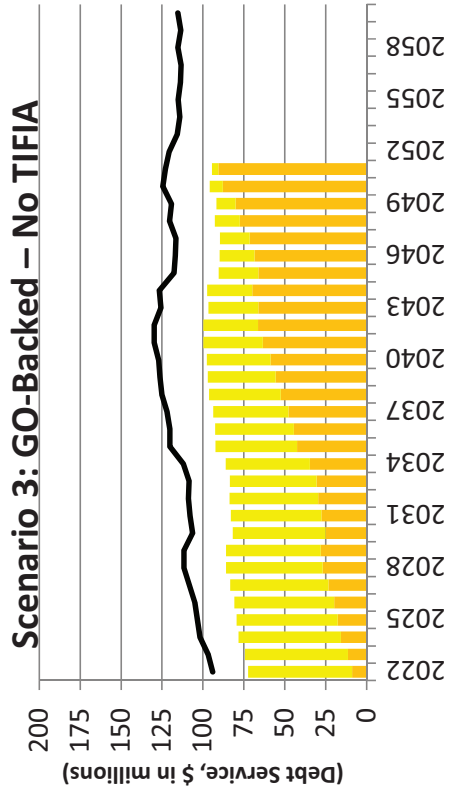
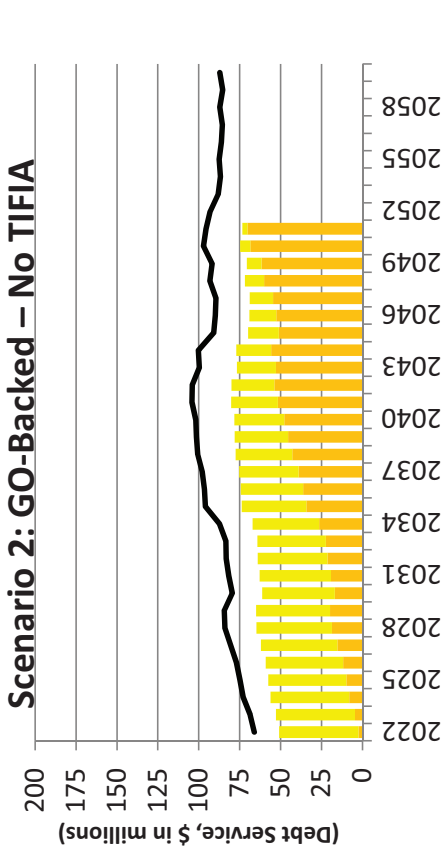
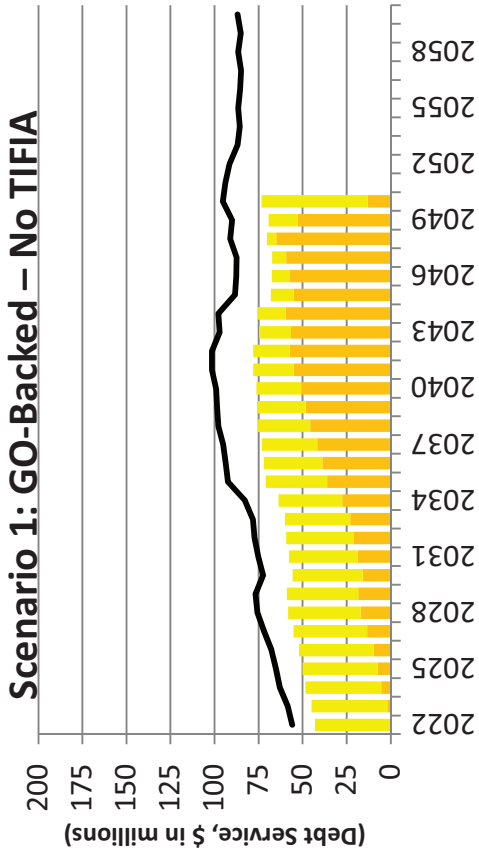
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## Exhibit 1 – Overview of Major Assumptions

Debt Vehicle	Standalone Toll Revenue Bonds (TRBs)	State GO-Backed Toll Revenue Bonds	TIFIA Loan
<b>Credit Structure</b>	Secured by Net Toll Revenues (net of O&M and R&R)	Secured by Net Toll Revenues, plus State backstop of revenues and/or GO pledge	Secured by Net Toll Revenues
<b>Amortization</b>	Max 40 years	Max 30 years	35 years from project completion
<b>Minimum Debt Service Coverage</b>	2.00x Senior; 1.50x Junior	1.30x (note: <i>FEIS assumed 1.25x</i> )	1.15x ( <i>FEIS assumed 1.10x</i> )
<b>Interest Rates (reduced from prior analysis)</b>	~200 bps over current rates: Current Interest Bonds: 6.00% (Senior) / 7.00% (Junior) Capital Appreciation Bonds: 7.25% (Senior)	~150 bps over current rates: Current Interest Bonds: 4.50% Capital Appreciation Bonds: 5.75%	~100 bps over current 30Yr UST: 4.25%
<b>Debt Service Structure</b>	Proportional to Net Toll Revenues	Proportional to Net Toll Revenues	Proportional to Net Toll Revenues
<b>Use of Pre-Completion Tolls</b>	Fund O&M Reserve, R&R Reserve, and Revenue Stabilization Fund first; use excess to pay Project Costs.	Fund O&M Reserve, R&R Reserve, and Revenue Stabilization Fund first; use excess to pay Project Costs.	Fund O&M Reserve, R&R Reserve, and Revenue Stabilization Fund first; use excess to pay Project Costs.
<b>Debt Service Reserve Fund</b>	Funded at lesser of Maximum Annual Debt Service, 10% of par, and 125% average annual debt service	n/a	n/a
<b>Bond-Related Expenses (COI)</b>	2.5%	Current Interest Bonds: 0.7% Capital Appreciation Bonds: 1.2%	n/a (paid from revenue, not included in loan sizing)

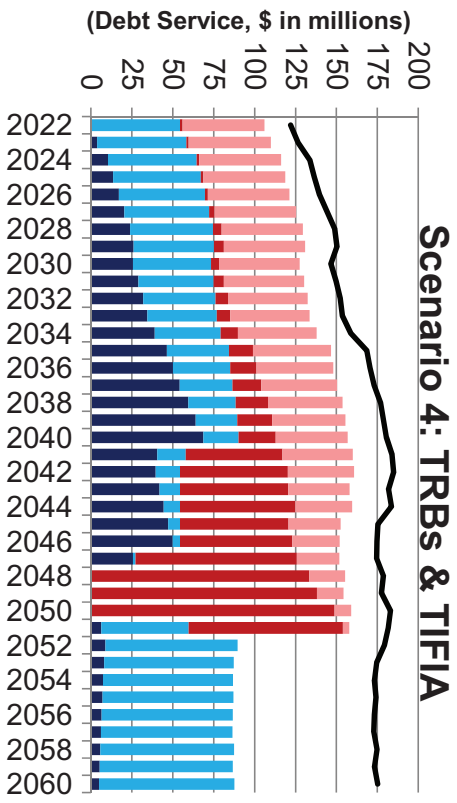
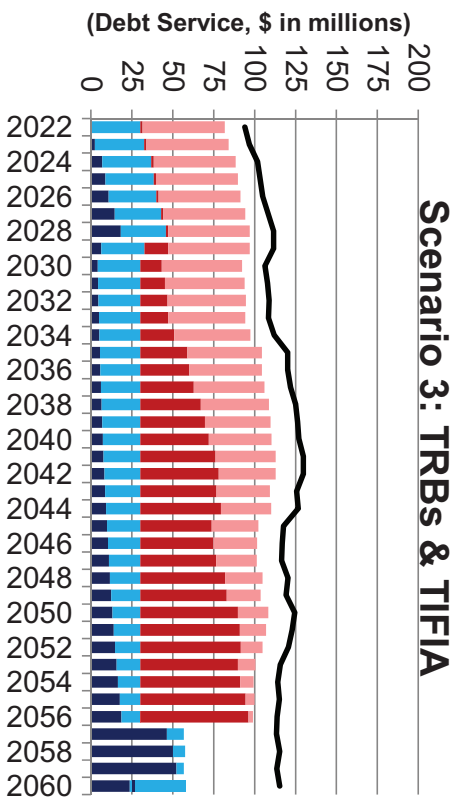
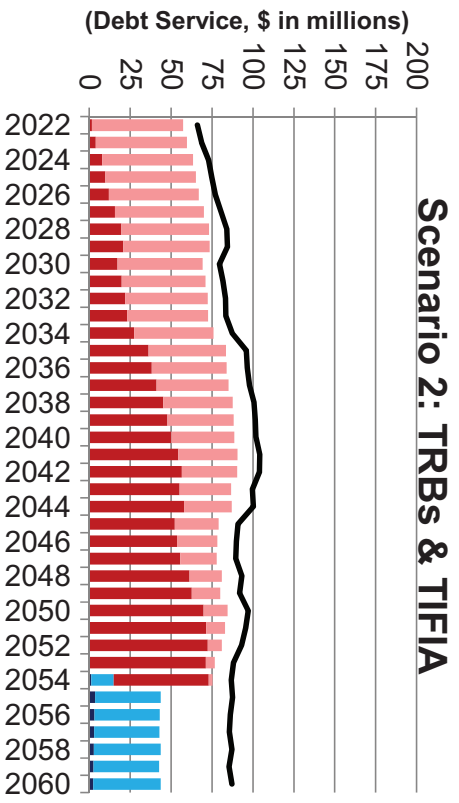
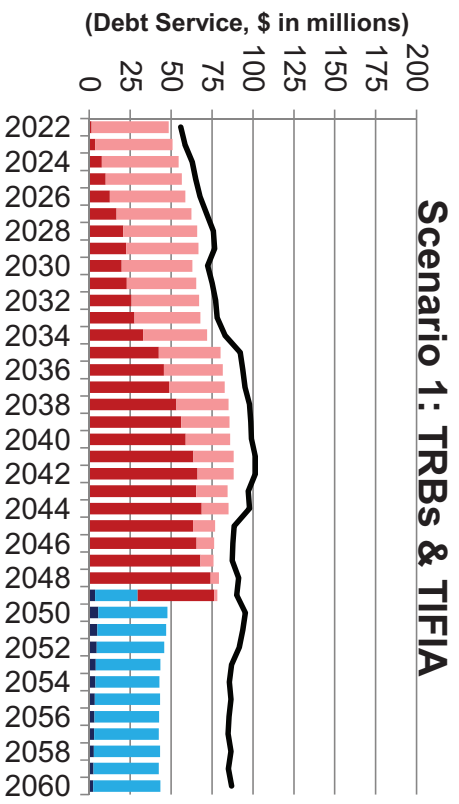
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Exhibit 2 – Net Toll Revenues and Debt Service



GO Principal    GO Interest    Net Revenue

# Public Resources Advisory Group



■ Sr. Pmn.   
 ■ Sr. Int.   
 ■ TIFIA Pmn.   
 ■ TIFIA Int.   
  Net Revenue

# **ATTACHMENT B**

Exhibit 3.8-9

**Long-term Effects on Historic Resources<sup>a</sup>**

State ID	Parcel ID#/Address	Resource Name	Permanent Acquisition	Permanent Easement	Access/Parking	Noise/Vibration	Visual	Findings of Effect
OR 3	Bridge No. 02733	Willamette River (Steel) Bridge	-	-	Minor modification to recently added component			Not Adverse
OR 1	R951340820/ 1415 Marine Drive	Pier 99	1.25 ac.	-	N/A, Resource Displaced			Adverse
OR 2		Oregon Slough Levee	330 linear feet	-	-	-	-	Not Adverse
OR 9	Moored at Thunderbird Hotel site, Hayden Island	LCI-713	Acquisition of the Ship's temporary location		-	-	-	Not Adverse
381		I-5 Bridge	Displacement	-	N/A, Resource Displaced			Adverse
368, 369, 918, 109	38279906, 38279927, 38279911, 38279935	VNHR (including Officers Row)	1.67 ac.	0.16 ac.	Loss of access to west side of Barracks Post Hospital	Highway noise effects	Visual Impacts At Hospital and Village	Adverse
10	47870000 515 Washington Street	Smith Tower	-	-	Access changed. Loss of parking	-	-	Not Adverse
149	38820000 318 E 7th Street	Normandy Apartments	0.01 ac.	under 0.1 ac.	-	Highway noise effects	-	Not Adverse
11	47940000 114 W 6th Street	Schofield Building	-	-	Adjacent parking changed to RI/RO	-	-	No Effect
21	47890000 500 Main Street	Evergreen Inn	-	-	-	Highway noise effects	-	Not Adverse
13	47930000 111 W 7th Street	Vacant Commercial	-	-	Adjacent parking changed to RI/RO	-	-	No Effect
35	47101000 110 W 13th Street	W Foster Hidden House	-	-	Access changed to RI/RO	-	-	Not Adverse

State ID	Parcel ID#/ Address	Resource Name	Permanent Acquisition	Permanent Easement	Access/ Parking	Noise/ Vibration	Visual	Findings of Effect
38	51830000 112 W 11th Street	Vancouver Telephone Exchange	-	-	Access changed to RI/RO	-	-	Not Adverse
73	47281000 1300 Washington Street	Luepke Florist	-	-	Adjacent parking changed to RI/RO	-	-	No Effect
1043	39630000 210 E 13th Street	Vancouver City Hall	-	-	Access changed to RI/RO	-	-	Not adverse
1045	39490000 1205 Broadway Street	Washington Mutual/ Chase Bank	-	-	Access changed to RI/RO	-	-	Not Adverse
113	40290000 1500 Broadway Street		-	-	Access and use of large bay door changed.	-	-	Not Adverse
116	40890000 307 E 17th Street		-	-	-	Requires residential sound insulation	-	Not Adverse
129	41255000 404-406 E 17th Street		-	-	-	Requires residential sound insulation	-	Not Adverse
133	41380000 604 E 17th Street		-	-	-	Requires residential sound insulation	-	Not Adverse
168	39810000 500 E 13th Street	Fort Apartments	-	-	-	Highway noise effects	-	Not Adverse
59	13460000 3110 K Street		-	0.04 ac.	-	-	-	Not Adverse
61	13725000 3000 K Street		Under 0.01 ac.	0.05 ac.	-	-	-	Not Adverse
62	13670000 903 E 31st Street		-	0.07 ac.	-	-	-	Not Adverse
993	12454005 Main Street	Kiggins Bowl	0.04 ac.	0.27 ac.	Access modified	-	-	Not Adverse

Notes: RI/RO = Right-in/right-out only. The absence of a particular impact is indicated with a "-".

a Impacts for the LPA Options A and B are the same.

# **ATTACHMENT C**



# Average weekday rail ridership projections, historic performance

	Opening year	First year projected	First year actual	FY2012
Eastside Blue Line (includes ridership at stations east of 11 <sup>th</sup> Ave)	1986	19,000	19,225	65,070***
Westside Blue Line (stations west of 11 <sup>th</sup> Ave in downtown Portland)	1998	20,470	24,130	--
Red Line (Airport)	2001	11,060	11,280	22,760
Yellow Line	2004	13,900	11,730	16,850
WES	2009	1,594*	1,200	1,630
Green Line	2009	25,250	18,200	23,520
Portland Streetcar	2001	4,200**	4,500	10,720

\*WES forecast agreed to by FTA. \*\*Forecast not from Metro model. \*\*\*East + West Blue Line

# **ATTACHMENT D**

## REPORT OF INDEPENDENT AUDITORS

The Board of Directors  
Tri-County Metropolitan Transportation District of Oregon

We have audited, in accordance with auditing standards generally accepted in the United States of America, the balance sheet, statement of revenues, expenses and changes in net assets, and statement of cash flows of Tri-County Metropolitan Transportation District of Oregon (the District), as of and for the year ended June 30, 2012, which collectively comprise the District's basic financial statements, and issued our report thereon dated September 20, 2012.

In connection with our audit, nothing came to our attention that caused us to believe that the District failed to comply with the terms, covenants, provisions, or conditions in Sections 902(b) through 902(f), inclusive, in the Indenture dated December 1, 2001, as amended and supplemented with The Bank of New York Trust Company, N.A., insofar as they related to accounting matters. However, our audit was not directed primarily toward obtaining knowledge of such noncompliance.

This report is intended solely for the information and use of the Boards of Directors and managements of TriMet and The Bank of New York Trust Company, N.A., and is not intended to be and should not be used by anyone other than these specified parties.

*Moss Adams LLP*

Portland, Oregon  
September 20, 2012

# **ATTACHMENT E**

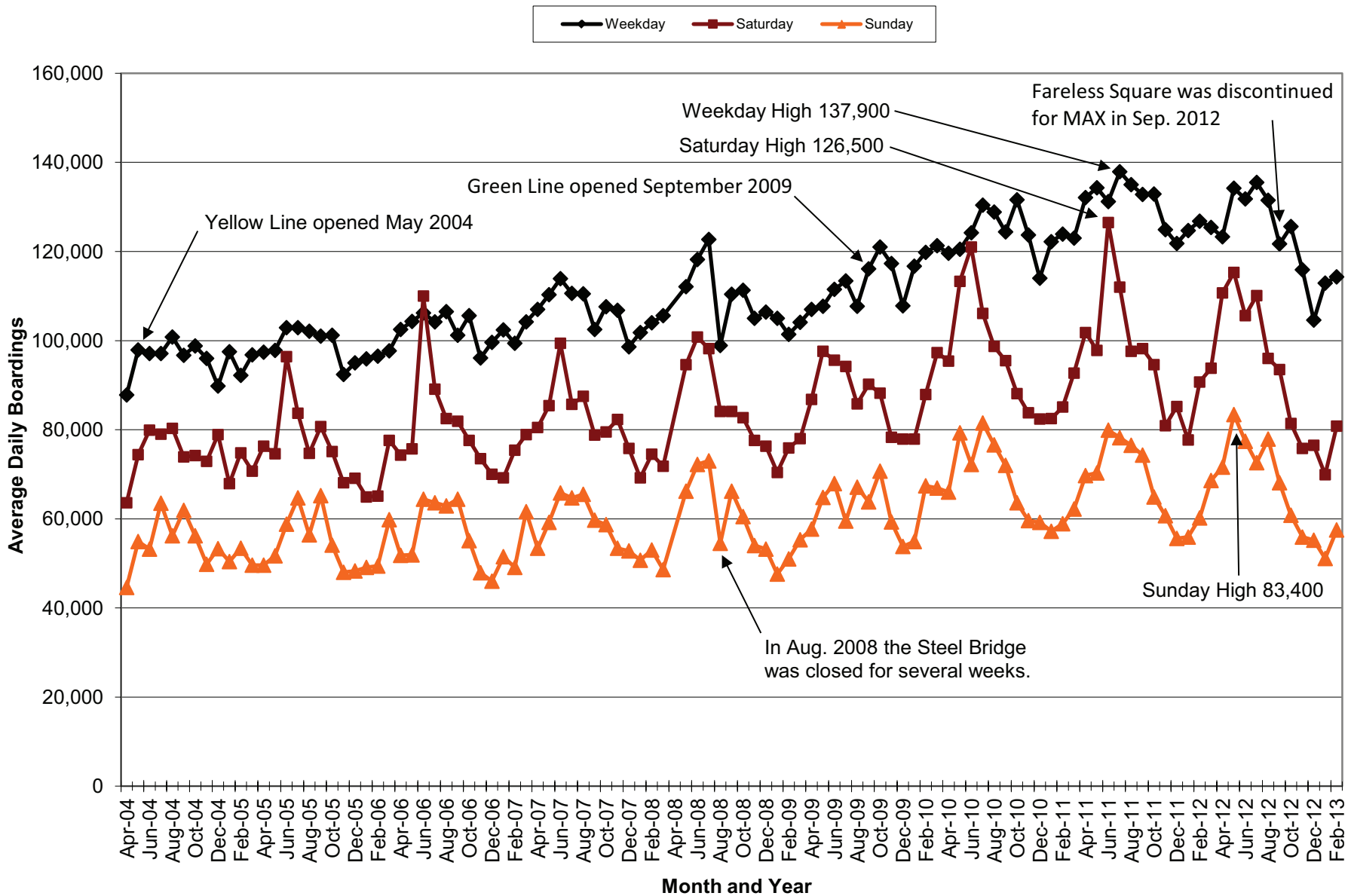
Table 1.

## August 2011 New Starts Submittal

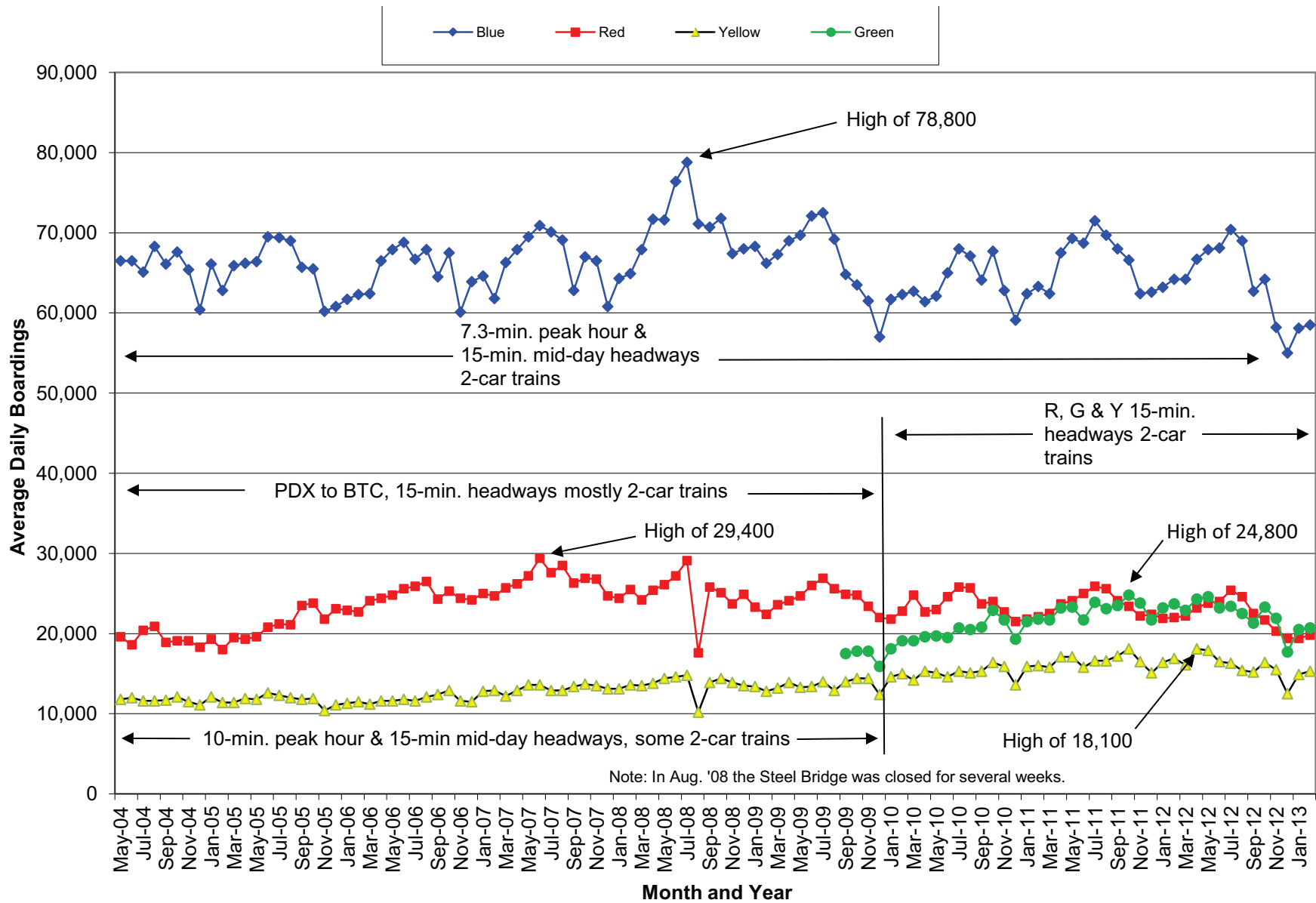
General Fund Cash Flow (YOE, 000s)	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014
	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	FORECAST	FORECAST	FORECAST	FORECAST
<b>Revenues:</b>												
1 Passenger Revenue	52,746	55,664	59,487	68,464	75,931	80,816	91,172	93,360	96,556	102,414	107,859	113,685
2 Other Operating Revenue	4,570	5,244	5,884	5,096	11,275	11,170	12,005	15,563	13,391	14,344	14,116	14,538
3 Employer/Municipal Payroll Tax (underlying growth)	145,478	146,125	155,348	170,176	180,540	189,559	186,870	179,218	188,233	195,762	205,550	215,211
4 Self Employed Tax (underlying growth)	7,252	7,542	7,917	9,486	11,511	11,200	10,340	10,518	10,446	10,812	11,352	11,863
5 State In-Lieu	1,869	1,855	1,971	1,990	2,259	2,255	2,482	2,676	2,659	2,659	2,779	2,904
6 Grants & Capital Reimbursement	32,866	38,837	43,460	41,565	47,711	52,197	55,312	53,936	27,417	88,119	57,316	57,084
7 Interest	2,072	1,622	2,375	2,137	4,777	6,463	2,367	702	784	429	474	1,407
8 ATP-Cigarette Tax, Agency	3,380	3,173	3,192	3,519	3,496	3,223	4,717	3,760	3,931	2,945	2,923	2,902
9 One-Time Only and DMAP Reimbursement	18,164	23,199	27,516	29,521	15,708	22,337	34,342	43,949	28,881	40,107	24,200	22,185
10 New Revenues (rate increase to .8218% begins Jan '15)	-	-	639	3,610	6,991	10,469	13,306	15,789	19,699	23,757	28,385	33,319
11 Total Continuing Revenues (CR)	250,233	260,062	280,273	306,043	344,491	367,352	378,571	375,522	363,116	441,240	430,753	452,912
12 Total Revenues (CR and OTO)	268,396	283,262	307,788	335,564	360,199	389,689	412,912	419,471	391,997	481,347	454,954	475,097
<b>Expenditures, Current Service:</b>												
13 Bus	127,070	133,955	143,951	149,792	154,604	162,996	174,085	173,462	147,634	150,453	153,109	156,581
14 Light Rail	36,576	38,438	45,490	40,181	39,971	44,007	47,798	51,757	47,548	49,711	51,384	53,206
15 Commuter Rail						138	3,073	6,125	5,873	6,236	6,486	6,688
16 Streetcar	3,048	3,216	3,569	4,258	5,110	6,192	6,520	6,593	5,800	6,050	6,217	6,365
17 Field Services	9,630	9,987	10,672	11,009	11,684	12,076	12,188	14,044	11,631	12,278	12,665	12,978
18 Facilities	5,666	6,710	6,619	12,007	13,821	14,524	15,142	16,372	15,272	14,137	14,651	15,103
19 Accessible Transportation-LIFT	18,478	22,086	24,840	27,014	29,027	30,891	31,159	30,802	30,878	31,677	31,025	31,009
20 Accessible Transportation-DMAP	11,545	9,828	10,529	11,405	12,557	14,084	15,276	15,270	16,153	16,730	17,316	17,922
21 Security and Operations Support	4,855	5,745	6,382	6,678	6,298	7,390	9,803	9,350	10,186	11,256	11,798	12,358
22 Capital Project Development	3,872	3,394	3,338	2,943	4,218	2,584	2,725	3,126	3,956	5,157	5,661	5,764
23 Funding Exchanges	3,394	7,782	9,514	5,323	225	3,198	2,750	3,847	0	12,189	2,889	1,500
24 General & Administration	31,164	32,184	32,345	32,769	32,706	37,558	37,995	38,508	34,809	37,521	39,064	39,980
25 OPEB Trust										410	866	1,475
26 Retiree and Disabled Medical	4,816	6,064	7,639	8,847	10,294	11,782	13,523	15,055	16,868	20,583	26,346	30,623
27 DB Pension Plan UAAL Funding							incorporated in departmental costs		25,701	28,063	24,877	28,120
28 Add'l Cost Union Pension Higher Discount Rate										-	1,355	1,385
29 Capital & Operating Projects (net of grants & bond proceeds)	20,349	10,554	9,195	11,641	5,051	(751)	57,371	(27,243)	6,506	14,144	10,997	12,877
30 Debt Service (excludes Milwaukie debt)	9,357	10,389	15,229	16,016	18,844	24,483	23,543	30,566	33,368	40,377	33,799	40,112
<b>Expenditures, Future Service</b>												
31 Bus Operations: Peak Capacity and Reliability - .8%										-	1,124	2,322
32 Rail Operations: Peak Capacity - .5%										-	175	275
33 Frequent Service Bus (cost net of fare revenue)												
34 Frequent Service Rail (cost net of fare revenue)												
35 Portland-Milwaukie Light Rail (net of replaced bus service)												
36 Portland-Milwaukie Debt Service											3,043	3,043
37 Portland Streetcar Loop to OMSI (TriMet share)										-	1,253	1,289
38 Streetcar OMSI to PSU + Expanded Hdways (TM share)												
39 Columbia River Crossing (TriMet share)												
40 Total Continuing Expenditures (CE)	274,881	282,722	309,270	323,155	331,628	353,869	434,925	368,518	396,029	428,052	435,892	461,551
41 Total Expenditures (CE and OTO)	289,821	300,332	329,312	339,883	344,410	371,151	452,951	387,634	412,183	456,970	456,096	480,973
42 General Fund Results	(21,424)	(17,070)	(21,524)	(4,319)	15,788	18,538	(40,039)	31,837	(20,186)	24,377	(1,142)	(5,875)

# **ATTACHMENT F**

# MAX System Average Daily Boardings by Month



# MAX Average Weekday Boardings by Month by Line





# ATTACHMENT G

Ms. Nasset

In the June 3, 2012 letter from Senator Benton to FTA Administrator Peter Rogoff information is incorrectly cited from the CRC Draft Components Step A Screening Report, March 22, 2006 regarding travel from five geographic subareas in Portland. The numbers reported as “*transit riders*” in the Senator Benton letter, are in fact, ***person trips***. Person trips are defined as the sum of one-way trips made by all persons for all purposes in single occupancy vehicles (SOV), HOV, and transit. The report estimated that in the year 2020: “Over 80 percent of all northbound person trips [with destinations in Clark County] will originate in five “I-5 Corridor” districts: Hayden Island, Delta Park, Rivergate, North Portland and Portland Central City. These five districts will account for approximately 25,200 trips in the 4 – hour PM peak travel period.”

(see

<http://www.columbiarivercrossing.org/FileLibrary/TechnicalReports/StepAScreeningReport.pdf> pages 3-10, 3-11 and Figure 3-7).

Transit ridership forecasts for the CRC project reflect extensive empirical analyses and use of travel demand modeling tools. See:

[2030 Update to Transit Travel Markets Technical Memorandum](#), January 10, 2007

[CRC Draft Environmental Impact Statement](#) , April 21, 2008

[CRC Travel Demand Model Review Panel Report](#), November 25, 2008

[Columbia River Crossing MetroScope Results Documentation](#) , December 2010

[Transit Technical Report for the Final Environmental Impact Statement](#) , December 2010

[CRC Final Environmental Impact Statement](#) , September 23, 2011

The transit forecasts published in the Final EIS in 2011 incorporated the most up to date version of the Metro Travel Demand Model, which included periodic updates to the regional model in accordance with the regional Transportation Plan (RTP) in Oregon and the Metropolitan Transportation Plan (MTP) in Clark County, Washington.

The Federal Transit Administration has provided technical oversight throughout the development and analyses of transit alternatives and their respective ridership forecasts for the CRC project. Note that in FTA Administrator Peter Rogoff’s July 24, 2012 response letter to Senator Benton he states: “Local project sponsors have provided sufficient documentation to FTA that demonstrates that the LRT stations proposed as part of the CRC project are reasonably located within a ½ mile radius of the employment areas identified within your incoming letter” (see attached).

If there is a particular analysis you would like to review or have questions about, we would be pleased to meet with you.

Jeff Hamm  
C-TRAN  
Executive Director



U.S. Department  
of Transportation

**Federal Transit  
Administration**

Administrator

1200 New Jersey Avenue, SE  
Washington, DC 20590

**JUL 24 2012**

The Honorable Don Benton  
Washington State Senator  
109B Irv Newhouse Building  
Olympia, WA 98504

Dear Mr. Benton:

Thank you for your letter of June 3, concerning the proposed Columbia River Crossing (CRC) multimodal project. You requested that the Federal Transit Administration (FTA) verify the ½-mile distance of several employment areas to the planned light rail transit (LRT) extension that would be built as part of CRC, including the North Portland, Rivergate, Delta Park, Hayden Island, and Portland Central City areas. You expressed concerns that these areas would not benefit from LRT service and would be better served with improved bus service. Additionally, you noted that enhanced bus service between Clark County and North Portland was not adequately studied by local CRC project sponsors.

The decision of how best to provide transportation services within a specific geographic region, including the choice between rail and bus alternatives, as well as alignment options, is a locally driven process. These actions are the responsibility of local decision-makers, which in the case of CRC includes the Washington State Department of Transportation, Oregon Department of Transportation, Clark County Public Transit Benefit Area Authority, Tri-County Metropolitan Transportation District, Southwest Washington Regional Transportation Council, and Portland Metro, in consultation with FTA and the Federal Highway Administration. Federal statute requires that the locally preferred alternative (LPA) resulting from an alternatives analysis study for a potential major transit capital investment (New Starts) project be adopted into a region's financially-constrained long range transportation plan before FTA can consider advancing a project into the New Starts program. This requires the involvement of local residents and decision-makers in the LPA selection process.

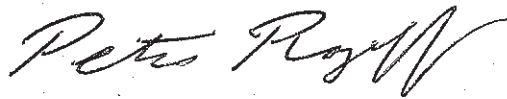
In response to your point that local project sponsors did not adequately examine improved bus service for the CRC project, CRC sponsors developed a lower cost transit option that included increased frequency on bus routes to meet demand, as well as replacement of the I-5 bridge, high-level fixed spans, more travel lanes, reconstructing seven interchanges, and variable tolls across the I-5 bridge. The CRC LRT extension is expected to significantly improve peak period transit travel times to Portland from Vancouver since it would avoid congested bottlenecks on the I-5 bridge and beyond. The LRT extension would link the fast-growing Vancouver Central City and the residential areas in Clark County with the employment areas of Portland Central

City. Compared to lower cost options, including more frequent bus service, the LRT project is anticipated to significantly reduce peak period transit travel times and provide a fast, reliable and enhanced transit link between two major activity centers, Portland Central City and Vancouver.

Local project sponsors have provided sufficient documentation to FTA that demonstrates that the LRT stations proposed as part of the CRC project are reasonably located within a ½-mile radius of the employment areas identified within your incoming letter. Since FTA formally advanced the CRC project into the preliminary engineering phase of the New Starts program in December 2009, FTA has annually evaluated and rated the project. Information provided by CRC project sponsors facilitated FTA's review of local land use information, including data on employment areas that are located within ½-mile of proposed LRT station areas. Based on information received from the project sponsor during our most recent evaluation, the project rated *Medium-High* overall. Information on FTA's New Starts evaluation and rating process can be found at [http://www.fta.dot.gov/documents/FY13\\_Evaluation\\_Process.pdf](http://www.fta.dot.gov/documents/FY13_Evaluation_Process.pdf). Additionally, FTA's land use assessment for the CRC project is located at: [http://www.fta.dot.gov/documents/WA\\_Vancouver\\_Columbia\\_River\\_Crossing\\_Profile\\_final\\_pdf.pdf](http://www.fta.dot.gov/documents/WA_Vancouver_Columbia_River_Crossing_Profile_final_pdf.pdf).

I hope this information is useful. If you have further questions, please feel free to contact FTA Region X Administrator, Rick Krochalis, at 206-220-7954.

Sincerely yours,



Peter Rogoff

cc: Victor Mendez, FHWA Administrator

# ATTACHMENT H

**Table 3-4. Transit Average Weekday Peak 4 Hour Travel Times to Selected Corridor Locations from Selected Portland CBD Locations, Year 2030**

Origin/Destination	2030 No Build		2030 LPA	
	Transit AM Peak 4 Hour Southbound Direction	Transit PM Peak 4 Hour Northbound Direction	Transit <sup>3</sup> AM Peak 4 Hour Southbound Direction	Transit <sup>3</sup> PM Peak 4 Hour Northbound Direction

*In-Vehicle Travel Time*

Between Downtown Vancouver and Rose Quarter	28 <sup>3</sup>	27 <sup>3</sup>	21	21
Between Downtown Vancouver and Pioneer Square	43 <sup>4</sup>	47 <sup>4</sup>	32	32
Between Downtown Vancouver and Hayden Island	5 <sup>5</sup>	7 <sup>5</sup>	2	2
Between Downtown Vancouver and Lombard Transit Center	13 <sup>3</sup>	14 <sup>3</sup>	8	8
Between Clark College and Pioneer Square	50 <sup>6</sup>	55 <sup>6</sup>	38	38

*Total Travel Time<sup>1</sup>*

Between Downtown Vancouver and Rose Quarter	42 <sup>3</sup>	41 <sup>3</sup>	29	29
Between Downtown Vancouver and Pioneer Square	50 <sup>4</sup>	55 <sup>4</sup>	39	39
Between Downtown Vancouver and Hayden Island	16 <sup>5</sup>	18 <sup>5</sup>	10	10
Between Downtown Vancouver and Lombard Transit Center	27 <sup>3</sup>	28 <sup>3</sup>	16	16
Between Clark College and Pioneer Square	68 <sup>6</sup>	72 <sup>6</sup>	44	44

Notes: Shaded cells in Table 3-4 indicate transit travel times that would be faster than automobile travel times for the same trip and time period.

Sources: CRC VISSIM microsimulation, Metro Travel Demand Model and LTK runtime simulation model.

<sup>1</sup> Total transit travel times include 3.6 minutes of walk access (1.8 minutes at either trip end) in addition to initial and transfer wait time. Bus wait times are based on half the combined headway of the routes serving the origin-destination pair.

<sup>2</sup> LPA transit travel times are for the Yellow Line LRT including the new extension to Clark Station

<sup>3</sup> Transit travel times are for C-TRAN bus Route 44 (Fourth Plain Limited) to Delta Park/Vanport MAX Station, transfer to Yellow Line LRT.

<sup>4</sup> Transit travel times are for C-TRAN bus Route 105S (I-5 Express Shortline).

<sup>5</sup> Transit travel times are for C-TRAN bus Route 4 (Fourth Plain).

<sup>6</sup> Transit travel times are for C-TRAN bus Route 30 (Burton) to Vancouver CBD, transfer to bus Route 105 (I-5 Express).

# ATTACHMENT I

**LAND USE (QUANTITATIVE) TEMPLATE**

<b>PROJECT NAME:</b>	<b>Columbia River Crossing Project</b>			
<b>Population and Employment – Metropolitan Area, CBD, and Corridor</b>				
<b>Item</b>	<b>Base Year</b>	<b>Forecast Year 2030</b>	<b>Growth (%)</b>	
<b>Metropolitan Area</b>				
Total Population	1,659,041	2,262,541	36.4%	
Total Employment	972,859	1,547,991	59.1%	
<b>Central Business District [see footnote 1]</b>				
Total Employment	145,535	208,713	43.4%	
Employment – Percent of Metropolitan Area	0.149595162	0.134828303	---	
CBD Lane Area (sq. mi.)	3,888	3.9	---	
Employment Density (e.g., jobs per sq. mi.)	37,432	53,681	---	
<b>Corridor</b>				
Total Population	338,965	516,370	52.3%	
Total Employment	331,251	493,213	48.9%	
Population – Percent of Metropolitan Area	20%	23%	---	
Employment – Percent of Metropolitan Area	34%	32%	---	
Corridor Land Area (sq. mi.)	161.5	161.5	---	
Population Density (persons per sq. mi.)	2098.9	3197.3	---	
Employment Density (jobs per sq. mi.)	2051.1	3054.0	---	
<b>Total All Station Areas (1/2-mile radius) [See footnote 2]</b>				
Housing Units	24,834	52,770	112.5%	
Population	42,727	100,196	134.5%	
Employment	145,900	203,721	39.6%	
Land Area (square miles)	9.0	9.0	---	
Housing Unit Density (units per sq. mi.)	2759.3	5863.3	---	
Population Density (persons per sq. mi.)	4747.4	11132.9	---	
Employment Density (persons per sq. mi.)	16211.1	22635.7	---	
<b>Station Area 1 [See footnote 3.]</b>	<b>Station Name:</b>	<b>New Clark College Station Area Cluster</b>		
Housing Units		297	398	34.0%
Population		611	760	24.4%
Employment		1,736	2,695	55.2%
Land Area (square miles)		0.6	0.6	---
Housing Unit Density (units per sq. mi.)		495	663	---
Population Density (persons per sq. mi.)		1,018	1,267	---
Employment Density (persons per sq. mi.)		2,893	4,492	---
<b>Station Area 2</b>	<b>Station Name:</b>	<b>New Downtown Vancouver Station Area Cluster</b>		
Housing Units		1,726	4,573	164.9%
Population		3,338	7,429	122.6%
Employment		11,818	21,473	81.7%
Land Area (square miles)		1.1	1.1	---
Housing Unit Density (units per sq. mi.)		1,569	4,157	---
Population Density (persons per sq. mi.)		3,035	6,754	---
Employment Density (persons per sq. mi.)		10,744	19,521	---
<b>Station Area 3</b>	<b>Station Name:</b>	<b>New Hayden Island Station Area Cluster</b>		
Housing Units		639	644	0.8%
Population		1,118	1,203	7.6%
Employment		2,667	3,046	14.2%
Land Area (square miles)		0.4	0.4	---
Housing Unit Density (units per sq. mi.)		1,598	1,610	---
Population Density (persons per sq. mi.)		2,795	3,008	---
Employment Density (persons per sq. mi.)		6,668	7,615	---
<b>Station Area 4</b>	<b>Station Name:</b>	<b>Existing Stations: Yellow Line Station Area Cluster</b>		
Housing Units		8,210	15,031	83.1%
Population		18,842	28,780	52.7%
Employment		24,585	33,948	38.1%
Land Area (square miles)		5.1	5.1	---
Housing Unit Density (units per sq. mi.)		1,610	2,947	---
Population Density (persons per sq. mi.)		3,695	5,643	---
Employment Density (persons per sq. mi.)		4,821	6,656	---
<b>Station Area 5</b>	<b>Station Name:</b>	<b>Existing Stations: Portland Transit Mall Station Area Cluster</b>		
Housing Units		13,962	32,124	130.1%
Population		18,818	62,024	229.6%
Employment		105,094	142,559	35.6%
Land Area (square miles)		1.8	1.8	---
Housing Unit Density (units per sq. mi.)		7,757	17,847	---
Population Density (persons per sq. mi.)		10,454	34,458	---
Employment Density (persons per sq. mi.)		58,386	79,199	---



**LAND USE (QUANTITATIVE) TEMPLATE (page 2)**

	Base Year	Forecast Year	Growth (%)
<b>Station Area 6</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 7</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 8</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 9</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 10</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 11</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 12</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 13</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---

**LAND USE (QUANTITATIVE) TEMPLATE (page 3)**

	Base Year	Forecast Year	Growth (%)
<b>Station Area 14</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 15</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 16</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 17</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 18</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 19</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---
<b>Station Area 20</b>	<b>Station Name:</b>		
Housing Units			0.0%
Population			0.0%
Employment			0.0%
Land Area (square miles)		0.0	---
Housing Unit Density (units per sq. mi.)	0	0	---
Population Density (persons per sq. mi.)	0	0	---
Employment Density (persons per sq. mi.)	0	0	---

[1] Optionally, employment for the largest activity center(s) served by the New Start project may be reported.  
 [2] See Appendix A for a sample methodology for estimating station area population, households, and employment.  
 [3] Reporting of data by individual station area is required.