

June 29, 2012

Dear Responsible Officials,

The attached report, “C-TRAN High Capacity Transit Expert Review Panel Findings and Recommendations,” reflects the work of the Expert Review Panel in Vancouver between March and July, 2012. In accordance with Revised Code of Washington (RCW) 81.104, the panel reviewed and evaluated C-TRAN’s plans for bus rapid transit and light rail transit in Clark County. We appreciate this opportunity to contribute to the long-term transit planning efforts of your community.

We want to thank representatives of the Washington State Department of Transportation (WSDOT) for offering guidance on the requirements of RCW 81.104 throughout our review process and C-TRAN staff for their cooperation in providing the information we needed to evaluate the plans. We also appreciate the process management assistance provided by panel administrator, John White, and his staff at BergerABAM. In addition, we want to thank the City of Vancouver, the Southwest Washington Regional Transportation Council (RTC), TriMet, and the Columbia River Crossing (CRC) project team for providing very useful context to inform our deliberations. We also appreciate the attendance at our meetings by members of the public who are interested in the role that transit will play in the future of Clark County.

State officials empaneled our group and we began work in March 2012. Although the timeframe for our review was short, we believe that we received sufficient information about the proposed projects to conclude that both the bus rapid transit and the light rail transit plans are, in general, appropriate and reasonable. Our report identifies potential issues which need further consideration.

I want to emphasize that, consistent with RCW 81.104, our report does not address the merits or deficiencies of the larger CRC project except for the operations and maintenance obligations resulting from extending light rail into Vancouver. We understand that the Final Environmental Impact Statement and Record of Decision has been issued. Consistent with the mandate of state law, we kept our scope of work focused on the maintenance and operations of the light rail service portion of the project within Vancouver to be constructed as part of the larger project, and on the Fourth Plain Transit Improvement Project.

Once again, we appreciate this opportunity to review and comment on the implementation of these high capacity transit projects. Please feel free to contact me or other panel members if you have questions about our findings and recommendations.

Sincerely,



**Dennis Hinebaugh**

Expert Review Panel Chair

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## Introduction and Purpose

C-TRAN’s 20-Year Transit Development Plan – C-TRAN 2030 – looks into the future to determine the levels, placement, and modes of transit service needed to meet the transportation demands of a growing community. C-TRAN 2030 guides the agency’s choice of capital investment and service design options through 2030.

C-TRAN 2030 includes enhanced local bus service to meet the future needs of Clark County residents, a new bus rapid transit corridor from downtown Vancouver at least as far as Westfield Vancouver Mall along Fourth Plain Boulevard, and the extension of light rail service from Oregon via a new Interstate 5 (I-5) bridge to downtown Vancouver and Clark College.

If C-TRAN chooses to fund the operations and maintenance of high capacity transit with a sales tax increase, the increase must be approved by a vote of the public. As a consequence, Revised Code of Washington (RCW) 81.104.110 (Appendix A) requires that the Governor, Chairs of the Legislative Transportation Committees, and the Secretary of Transportation appoint an Expert Review Panel (the panel).

The panel, as directed by RCW 81.104, was asked to examine the assumptions that underlie planning for high capacity transit to ensure they are appropriate and reasonable. The panel’s technical review was intended to help guide C-TRAN’s decisions about investing in a high-capacity transportation system.

### Consistent with state law, the panel members agreed to:

- Attend up to three, two-day panel meetings in Vancouver, Washington;
- Provide their technical and policy expertise to review and assess the high capacity transit elements of C-TRAN 2030;
- Evaluate the potential strengths and weaknesses of the high capacity transit elements of the plan; and
- Produce a findings and recommendations report for consideration by the C-TRAN Board of Directors, the Washington State Department of Transportation (WSDOT), and elected officials as required by RCW 81.104.

The Governor of Washington, the chairpersons of the state’s Senate and House Transportation Committees, and its Secretary of Transportation appointed the panel members in March 2012. The panel met as a group for two sessions in Vancouver on April 4–5 and May 8–9.

The April 4 meeting was a daylong tour of existing TriMet light rail facilities in Portland and proposed routes and locations for stations and park and ride facilities for future high capacity

transit systems in Vancouver. Over the course of the April and May meetings, the panel learned details about C-TRAN 2030 and received background briefings about the Columbia River Crossing (CRC) project, the City of Vancouver downtown vision plan, and the history of high capacity transit planning in Clark County. At the request of the C-TRAN Board of Directors, the panel also devoted a portion of the May 9 meeting to discussing funding options to cover the annual expense of operating and maintaining light rail transit service in Vancouver. These briefings and the voluminous background information provided to the panel offered context for discussion and subsequent analysis of the plans for high capacity transit systems.

The April 5 and May 8–9 sessions were open to and attended by interested members of the public and the media. These meetings were announced in advance to the local media, on the project website, and via email to people who had requested meeting notifications.

***The project website contains summaries of each meeting and offered web links to all presentations delivered during those meetings. See appendices C-F and online at [www.highcapacityerp.com](http://www.highcapacityerp.com) for meeting summaries.***

For efficiency, the panel also conducted teleconferences between meetings to discuss logistics and develop meeting agendas. The panel met on May 25 for a half-day teleconference to craft initial findings and recommendations, and conducted a subsequent web conference on June 6 to refine the draft and develop a final draft report for review.

## Panel Members

### Dennis Hinebaugh (Chair) – Tampa, Florida



Dennis is the Transit Program Director for the Center for Urban Transportation Research at the University of South Florida in Tampa. He is also the director of the National Bus Rapid Transit Institute and administrator of the National Center for Transit Research. He has worked on transportation issues

at USF since 1995 and in the transportation field since 1980. He began his career in public transit in Detroit, and worked on the design and engineering of the Downtown People Mover, a rail system running through Detroit's business district. He is a member of the American Public Transportation Association's (APTA) Bus Rapid Transit Task Force, and is the Chair of the Transportation Research Board Bus Transit Systems Committee.

### Shelly Brown – Seattle, Washington



Shelly is the principal of Shelly Brown Associates, LLC, a legal and transportation consulting practice in Seattle specializing in helping public agencies nationwide. She has served as regional counsel for the Federal Transit Administration (FTA) in Seattle and has been an APTA member since 1999. She

has participated in the development of public transportation policy and projects and worked with federal agencies, state and local governments, public transportation providers, and others on an array of issues related to transportation funding, project development, and oversight.

### Linda Cherrington – Houston, Texas



Linda is the program manager for the Transit Mobility Program at Texas Transportation Institute (TTI), the Texas A&M University System. She has 36 years of experience in the transportation field and has served as a research scientist and program manager at TTI since 2003. As CEO and principal of

LKC Consulting Services, Inc., she worked with King County Metro and Pierce Transit in Washington from 1996 through 2003. Her experience includes 10 years with the Metropolitan Transit Authority of Harris County (Houston METRO) where she served in several senior management positions, including assistant general manager for Procurement and Bus Facility Development. She is a member of APTA, Southwest Transit Association, and Transportation Research Board.

### Mike Normand – Phoenix, Arizona



Mike is the director of transit programs at the Arizona Department of Transportation in Phoenix. He is the former Transportation Services and Planning Manager for the City of Chandler, Arizona, where he played a role in the development of the Valley's 20-mile Metro light-rail starter line

through Mesa, Tempe, and Phoenix. He has also worked for Valley Metro in Arizona and Sound Transit and Community Transit in Washington. He has experience in strategic planning and operational expertise in major metropolitan areas, capital improvement planning, project management and delivery, budgeting, contract negotiations, grant administration, intergovernmental relations, and communications.

### Jeffrey Parker – Chilmark, Massachusetts



Jeff is president of Jeffrey A. Parker & Associates, Inc., which he founded in 1981, in Chilmark, Massachusetts. With offices in Philadelphia, Miami, Atlanta, and San Francisco, his company is one of the nation's leading innovators in public-private partnerships and financing transportation projects. His

work has taken him to New York and New Jersey for bridge replacement, Atlanta and Miami for multi-modal passenger terminals, and Charlotte, Austin, Pittsburgh, Denver, and the District of Columbia for streetcar and light rail systems, and San Francisco, Miami, and Orlando for commuter rail systems.



## April 5, 2012

The panel reconvened on April 5 for a half-day session which included presentations from C-TRAN, the City of Vancouver, and the Southwest Washington Regional Transportation Council (RTC). Panel administrator John White also reviewed the panel's operating ground rules explaining consensus-based decision making, open public meetings, and the proposed report development process and timeline. Those ground rules are available on the project website. The panel also requested and received access via an FTP site to a range of supporting reference documents (Appendix B).

***The C-TRAN 2030 presentation described the 2008–2010 planning process and the consideration of five alternative service plans to guide C-TRAN development over the next 20 years. C-TRAN identified a combination of expanded bus services and development of high capacity transit as the preferred alternative.***

This alternative included both light rail and bus rapid transit services to be implemented during Phase 1 of C-TRAN 2030. The presentation also explained the 2011 public vote supporting a sales tax increase to preserve core bus service and the expectation to seek a second vote in 2012. The 2012 vote would support high capacity transit operations, maintenance, and local capital contributions beginning in 2014 for bus rapid transit on Fourth Plain, and operations and maintenance estimated beginning in 2019 for the start of light rail transit in downtown Vancouver. Appendix D contains a meeting summary that provides details of the panel's questions and requests for follow-up information; these requests were addressed after the meeting.

The Vancouver City Center Vision Plan and related high capacity transit content provided useful context for the City's downtown transportation decision-making. The RTC director presented the Clark County High Capacity Transit System Plan. The presentation explained the process RTC undertook to consider several high capacity transit corridor options. The RTC, C-TRAN, and the City identified Fourth Plain as the priority corridor for implementation and retained options for future improvements in other corridors outside the City limits.

## May 8, 2012

The April meetings focused primarily on background briefings and information-gathering to familiarize the panel with the planning landscape. The May sessions started drilling down into the base assumptions and projections driving C-TRAN financing for high capacity transit.

At the panel's request, representatives of the CRC team appeared on May 8 to present information about the process to identify the purpose and need for the project, identify and evaluate alternatives, select a locally preferred alternative (LPA) and prepare a Draft and Final Environmental Impact Statement (EIS). Panel members queried the CRC team about specifics, including the screening process that arrived at the Locally Preferred Alternative (LPA), the level of vetting provided by the FTA, and the management of a current issue with the Coast Guard regarding the height of the bridge.

The panel discussed and agreed that the panel's legislative charge was not to review either the CRC process or the alternatives within the plan in detail. The panel did note, however, that the older of the two bridges opened in 1917 and the second was added in 1958. The original designers could not have anticipated the present day travel demands that would be placed on these bridges. Even with today's more sophisticated planning methods and tools, it is likely that rapidly evolving technologies and demographic shifts will alter how people travel between Vancouver and Portland 50 to 100 years from now. The panel supported the view that the new bridge should be designed and constructed to accommodate several modes (i.e. automobiles, trucks, express bus/bus rapid transit, light rail transit, as well as pedestrian and bicycle traffic). This flexibility to accommodate several modes of travel will provide the greatest return on the public's investment over time.

***While the extension of the TriMet MAX light rail line is a significant component of the project, the panel noted the project costs funded by FTA include structural elements that will provide additional auxiliary lanes to accommodate more traffic as well as separate decks to ensure safe pedestrian and bicycle movement. The panel acknowledged that these issues were considered and vetted through the National Environmental Policy Act (NEPA) review and alternatives analysis and that design details will continue to be refined as the project moves forward through final design.***

The second CRC presentation focused on project costs and funding. Presenters shared information about anticipated revenue, including a roughly one-third split among federal, state, and toll/bonding sources. The presenters stated that the local federal funding match for light rail extension capital costs will be provided by the states of Oregon and Washington in addition to anticipated tolling revenues. Assuming these sources of funds are confirmed, local agencies will not be required to contribute to capital construction costs.

CRC representatives also provided details on risk-based analysis used to validate assumptions governing construction and subsequent operations and maintenance costs. The presenters expressed confidence in funding through the FTA and Federal Highway Administration (FHWA), but acknowledged that state funding from Washington and Oregon, as well as through the federal Transportation Infrastructure Finance and Innovation Act (TIFIA), is in process but not yet been secured.

C-TRAN representatives followed the CRC presentations with a detailed report on the preliminary financing plan for Fourth Plain bus rapid transit service. The presenters discussed processes used to identify costs, risks, and anticipated revenues. The panel posed a series of questions on topics including the rationale for assuming 80% federal funding for bus rapid transit construction, assumptions about fare box recovery, operational costs per mile, and connecting the bus rapid transit system to light rail operations. Appendix E contains a summary of the May 8 meeting and a detailed list of questions. Panel recommendations stemming from that meeting are included in the Findings and Recommendations section of this report.

### **May 9, 2012**

The last Vancouver meeting began with a C-TRAN presentation regarding the agency's overall financial plan, including funding sources and allocations, and the sensitivity analysis process used to identify revenue risks. Panelists had a variety of questions regarding revenue assumptions, including fare box recovery rates, ridership projections, and maintenance cost assumptions. This discussion included several comments and recommendations from panel members which are reflected in the Findings and Recommendations section of this report.

At the request of the C-TRAN Board of Directors, the panel also heard a report from C-TRAN administrators regarding options other than a sales tax increase to fund light rail operations and maintenance and provide local match for the bus rapid transit capital investment.

***C-TRAN presented several alternative funding scenarios including an employee tax, license tab fee increases, various other surcharge fees, and the potential assignment of some operation and maintenance costs to the City.***

Panel members discussed the merits of various options, but noted that a series of smaller funding options might be less volatile than relying on a single funding source such as a sales tax. A matrix describing options presented by C-TRAN is available on the project website at [www.highcapacityerp.com](http://www.highcapacityerp.com).

## Findings and Recommendations

### Expert Review Panel Charter (Revised Code of Washington [RCW] 81.104.110)

The State of Washington, in consultation with the State of Oregon, formed the Expert Review Panel to provide an evaluation of C-TRAN's high capacity transit plans for light rail and bus rapid transit. The evaluation includes a review of the cost estimates and funding assumptions for maintaining and operating the portion of light rail in Vancouver, Washington and bus rapid transit in the Fourth Plain Boulevard corridor.

Consistent with requirements of RCW 81.104, the panel's objectives were to confirm if the cost estimates and financial assumptions used for planning high capacity transit were appropriate and to determine if the planning process was consistent with federal and state requirements for major capital investments. The panel reviewed supporting reports and study conclusions, concentrating on service modes and concepts including costs, patronage, and financing evaluations. The panel reviewed numerous supporting documents to the CRC draft and final EIS, including several related to the public involvement process.

***Subsequent to the panel's formation, the City of Vancouver proposed an analysis of additional funding mechanisms for operations and maintenance of the bus rapid transit project that might not require a public vote. The C-TRAN Board of Directors did not withdraw the expectation for a public vote, but did direct C-TRAN staff to investigate other funding options beyond the proposed 0.1 % sales tax increase.***

The Board also directed that the panel's review process continue in the event that the Board did choose to hold a vote in November 2012. [Note: On June 12, after this report was in draft, the C-TRAN Board expressed its intent to place a sales tax increase measure on the ballot in November 2012.]

In this evolving policy context, the panel continued its work and provided additional comments to C-TRAN regarding the viability of other potential operations and maintenance funding options.

The panel wishes to acknowledge that the scope of work for this review focused on the viability of plans to operate and maintain high capacity transit systems in Vancouver. The panel did not analyze the assumptions or guiding decisions behind the CRC project as a whole, except as they related directly to light rail operations in Vancouver.

The FHWA and FTA issued a Record of Decision (ROD) for the CRC project on December 7, 2011. The ROD is a

determination by the federal government that a project has complied with applicable laws and regulations in conducting the environmental review through the NEPA process. The ROD is a legally binding document that represents a formal administrative action to advance the project toward implementation. As previously noted, the panel therefore concluded that an analysis of the decisions guiding the broader, bi-state project would not be productive, given the limited time available and the scope assigned to the panel by RCW 81.104. However, the panel did call for and receive detailed information from CRC staff regarding that project to better understand the assumptions leading to selection of the Locally Preferred Alternative (LPA) that now drives the C-TRAN planning process for light rail operations and maintenance.

Panel members believe that the findings and recommendations submitted herein reflect a level of due diligence that complies with the requirements of RCW 81.104.110.

### WSDOT Guidance for Organizing Panel Findings

To assist the panel in producing findings that met the requirements of RCW 81.104, WSDOT provided the following list of questions to be addressed during the panel deliberations regarding bus rapid transit and light rail transit operations and maintenance.

- Was the process leading to cost estimates for operations and maintenance figures sound and complete?
- Was the process for calculating potential revenue sufficiently broad and lending to accurate projections?
- Are the ridership and fare box recovery assumptions sound?
- Were the alternatives for funding light rail transit operations and maintenance adequately considered?
- Are sufficient contingencies and risk factors included in modeling?
- Is the system design (route alignment, stops, termini) rational for bus rapid transit and light rail transit operations?
- Have the impacts of high capacity transit on other transit elements been adequately considered?
- Will fixed route services be jeopardized by funding?
- Did the independent planning processes for light rail transit and bus rapid transit work compatibly from the perspective of the larger project?

The panel decided to use these questions as a framework for the report, rather than using a Question and Answer format. These questions guided the panel's deliberations in the preparation of this report, and are reflected in the findings below.

## Light Rail Transit: Supporting data and modeling assumptions

The panel recognizes that the CRC project has been evaluated through a NEPA process that began in 2005. The FTA New Starts program also tracked the NEPA process at each major level of analysis, culminating in the ROD by FHWA and FTA.

*The FTA's New Starts program is the primary federal funding source for major rail, bus, and other fixed guideway projects around the country. In order to qualify for this discretionary capital funding source, local project sponsors must adhere to a strict series of requirements spelled out by federal regulations administered by the FTA. All projects nationwide that seek FTA New Starts funding must follow this process, which is tracked by FTA staff at regional and headquarters levels.*

Projects with the highest ratings are best positioned to receive significant levels of federal funds. The CRC project has received an overall FTA rating of medium-high, which places the project favorably among other large transit projects nationwide.

Meeting the NEPA environmental and New Starts funding requirements involves developing an extensive amount of data through analysis and modeling to project anticipated impacts and outcomes once the system is in place. Thus, in some areas, data used to support certain CRC project assumptions are several years old and potentially out of date. While this is not unusual for such complex transportation planning processes, project managers should recognize the need to confirm and update these data as the CRC moves ahead.

### Sources Reviewed

The panel reviewed light rail-related sections of the CRC draft and final EIS and the operations and financing plan in the New Starts application, among other documents listed in the bibliography in Appendix B. The panel also received briefings from TriMet and CRC on May 8 and 9 about the data regarding the light rail component of CRC. These items are also included in the bibliography and appendices.

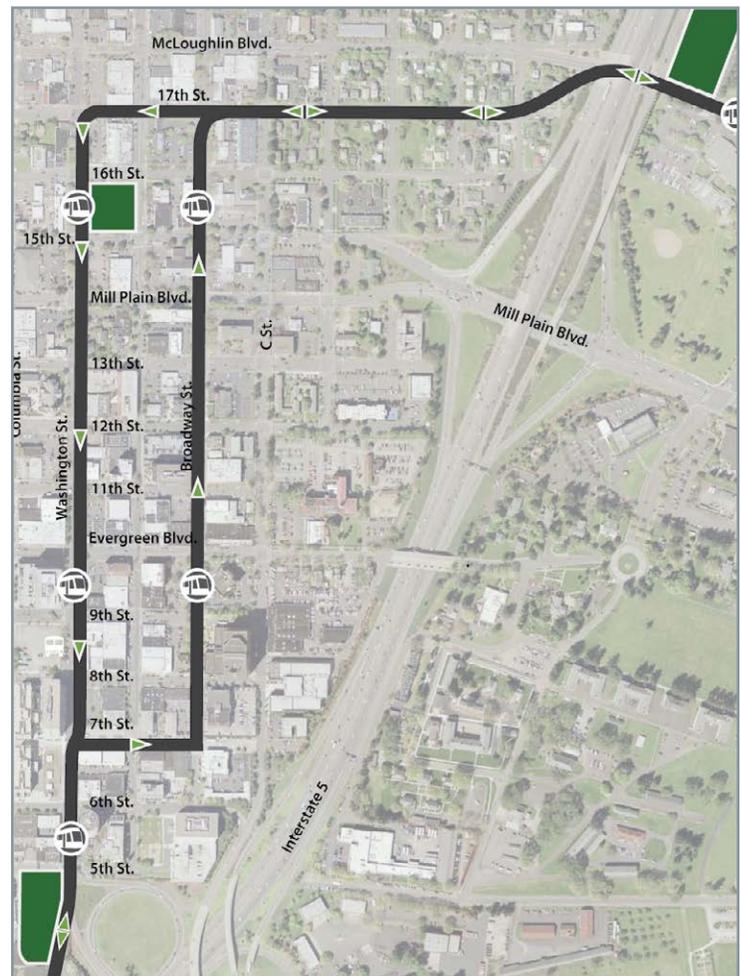
### Finding

Based on the information provided, the panel acknowledges that the CRC project differs from a typical New Start in that the light rail component is an extension of an existing system rather than the development of an entirely new system.

*In addition, cost and revenue allocations with TriMet have not yet been determined, nor have cost allocations for street-related improvements been fully established. With the understanding that there is work to be done as design moves ahead, the panel remains comfortable concluding that appropriate, reasonable processes have been followed to date.*

### Recommendation

The panel emphasizes, however, the need to update the data that drive some cost and operational assumptions. For example, future modeling updates should factor in 2010 Census and forecasting based on information reflecting post-2008 economic conditions. These updates should occur naturally as CRC project managers provide annual updates to FTA and pursue grant agreements through the New Starts program.



**The panel found that the proposed route and station locations shown above were appropriate to support light rail transit operation in downtown Vancouver.**

## Light Rail Transit: Operations and maintenance cost assumptions and projections

### Sources Reviewed

The panel reviewed C-TRAN 2030, C-TRAN's 20-year development plan, and two versions of C-TRAN's financial plan. The second financial plan was provided to the panel after the panel suggested revisions to the draft financial plan at its meeting in May. The panel also received briefings from C-TRAN and TriMet about operations and maintenance cost assumptions and projections. The panel reviewed these and other items listed in the bibliography in Appendix B to reach the findings in this section.

### Finding

The CRC project team followed standard industry practice for developing operations and maintenance cost estimates for the extension of light rail into Vancouver. The assumptions driving these estimates are reasonable based on currently available information. The panel recognizes, however, that there remain unresolved key operational variables between C-TRAN and TriMet. Still pending negotiation is whether C-TRAN will be responsible for light rail maintenance from the current Expo Center station, or from the state line. While this interface of two transit agencies offers economies of scale for light rail extension into Vancouver, it also could include C-TRAN inheriting at least some of the existing TriMet cost structure, potentially including unresolved labor arbitration settlements. The panel recommends that as many of these variables as possible be resolved prior to a public vote.

The assumption of an operations and maintenance cost range between \$2 and \$3 million annually is appropriate. If cost structures shift due to currently unresolved variables, C-TRAN will need to account for that shift in its financial planning. The panel also recognizes that conclusions for the selection of the LPA drew on an extensive body of data developed from many years of TriMet's experience operating light rail in the Portland metropolitan area.

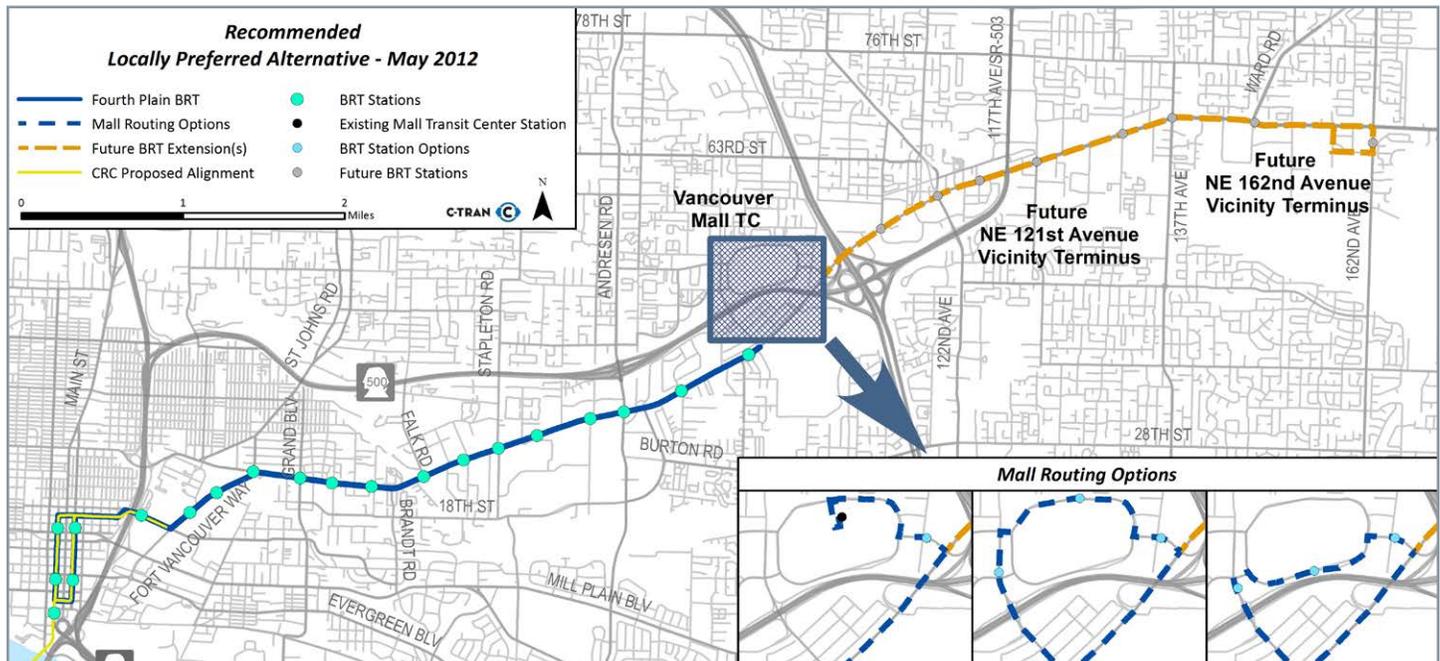
### Recommendation

The panel acknowledges, however, that final bridge design is not complete and that changes in design could also influence operational considerations for light rail service in Vancouver. This relationship between capital project design and Vancouver light rail operations should be monitored closely in order to update and validate the financial plan.

## Bus Rapid Transit: Operations and maintenance cost assumptions and projections

### Sources Reviewed

The panel reviewed documents related to the Fourth Plain Transit Improvement Project including reports on cost methodology, alternatives, and the LPA for the corridor. C-TRAN also provided two briefings to the panel. The first was during the panel's tour of proposed high capacity transit facilities in April; the second was during the panel's meeting in Vancouver in May. C-TRAN also presented the financial plan at the May 9 meeting and provided an updated financial plan as a result of that meeting. The presentations are in appendices C, E, and F.



The panel acknowledged that the locally preferred alternative for bus rapid transit was still under official review, but noted that the chosen route configuration was reasonable.

## Finding

The panel concludes that cost assumptions underlying the operations and maintenance of bus rapid transit service along the Fourth Plain Boulevard corridor are reasonable and in line with industry standards. Benchmarking similar bus rapid transit systems elsewhere in the United States and in the region is an effective approach for forecasting likely operational costs in Vancouver. The panel also concludes that the proposed bus rapid transit LPA now under review will likely have lower operations and maintenance costs than the “No Build” option of continuing current services without bus rapid transit improvements. Bus rapid transit is projected to achieve a higher fare box recovery than regular fixed-route service.

## Recommendation

Although this planning process is in a different development phase than the light rail project, the project managers are following NEPA and FTA project development requirements. Panel members recommend that C-TRAN monitor operational assumptions closely and revise operating and financial assumptions to reflect changing circumstances as the project moves ahead.

## Light Rail Transit: Financing assumptions and projections

As noted previously, CRC light rail financial assumptions were reviewed extensively as part of the NEPA process and analyzed through the FTA New Starts program, which ranked the CRC project medium-high overall during the preliminary engineering phase.

C-TRAN’s primary financial commitment to the CRC project involves financing the operations and maintenance of the LPA that will extend light rail service into Vancouver. CRC funding will cover the capital costs of constructing the light rail system, stations, and park and ride facilities.

## Sources Reviewed

The panel reviewed two versions of C-TRAN’s 20-year financing plan that included light rail components. The panel also heard presentations from CRC and C-TRAN representatives about financing for light rail during panel meetings in April and May. The financing plans and presentations are listed in the bibliography in Appendix B and the presentations are in appendices C, E, and F.

## Finding

The panel concludes that the range of cost estimates provided by C-TRAN for the annual operations and maintenance of light rail is reasonable. The C-TRAN estimates reflect the incremental cost of extending an existing light rail system, and are further

supported by many years of detailed data derived from TriMet operations in the Portland area.

As noted at the outset of this report, the panel was formed under RCW 81.104 with the assumption that there would be a November 2012 vote seeking voter approval for a sales tax increase to fund C-TRAN light rail and bus rapid transit operations and maintenance costs and to provide local match for the bus rapid transit capital investment. The C-TRAN Board reaffirmed that approach in a meeting on June 12, 2012. In May, however, the Board did request that the panel provide counsel regarding other funding options investigated by C-TRAN staff. Following a presentation of alternatives at the May 9 panel meeting, members agreed that evaluation of alternative funding sources beyond the sales tax increase is reasonable and prudent.

## Recommendation

Compared to the multi-billion dollar CRC project, the estimated \$2 to \$3 million needed for annual light rail operation and maintenance in Vancouver seems relatively small. C-TRAN should remain aware, however, that each light rail capital improvement, including stations and park and rides, financed with federal funds through CRC will carry a related and ongoing operations and maintenance liability. As CRC moves into advanced design, C-TRAN should remain vigilant regarding how capital construction decisions may affect future operations and maintenance costs.

The panel also advised that, rather than depending on a single revenue source such as a sales tax, a package of multiple funding sources would provide greater assurance of reliable revenue streams to support light rail maintenance and operation. The panel has further advised C-TRAN of its concern that too many C-TRAN tax revenue accounts in place today are dedicated to support specific services.

While this practice certainly enhances the agency’s financial transparency, the practice can also limit operational flexibility during periods of economic change. The panel believes that adding some program-wide flexibility to allow C-TRAN to shift money between accounts would be a preferable management practice.

## Bus Rapid Transit: Financing assumptions and projections

### Sources Reviewed

The panel reviewed two versions of C-TRAN's 20-year financing plan and other documents related to the Fourth Plain Transit Improvement Project. The panel also received two presentations about the Fourth Plain Transit Improvement Project. The presentations are located in appendices C, E, and F.

### Finding

C-TRAN's finance plan regarding bus rapid transit operation and maintenance is appropriate and adequately reflects changes recommended by the panel as cited below. The panel also understands that C-TRAN expects to submit a Small Starts grant application in September 2012 for federal consideration. The panel concluded that the financial plan, as currently being developed, will likely meet the requirements for a Small Starts funding application.

### Recommendation

The panel identified specific changes to strengthen the draft bus rapid transit financial plans:

- Reduce the federal capital funding percentage assumption from 80%, which the panel felt was too optimistic, to 70%. This is a more realistic figure, but still above the federal contribution rates seen in some other transit systems. At a minimum, C-TRAN should have contingency plans that accommodate a lower federal contribution.

- Change the assumed fare box recovery rate from a fixed 40% to a range that is as low as 33% to better reflect recovery rates from similar transit systems and the range of assumed ridership in the project model. The panel acknowledges that C-TRAN has revised its financial plan to include this more conservative 33% floor on fare box recovery.
- Revise the financial plan to include three distinct scenarios reflecting what C-TRAN now calls pessimistic, optimistic, and realistic cost and revenue projections.
- Although the overall C-TRAN financial plan is well considered and conservative, panel members noted that C-TRAN should develop multiple risk management scenarios to avoid potential disruption by unanticipated events or economic upheavals. Rather than reliance on a single scenario, this tiered system allows C-TRAN to consider in advance the necessary adjustments to system management should costs or revenue expectations change. The panel acknowledges that C-TRAN has revised its financial plan to include this tiered scenario as displayed in the figure below.
- Affirm that projections of a 30% to 50% ridership increase in the first year of bus rapid transit operations are reasonable and in line with the experience of other systems throughout the country and the region

At the recommendation of the panel, C-TRAN amended its finance plan to include three different scenarios that reflect differing revenue projections.

At the recommendation of the panel, C-TRAN amended its finance plan to include three different scenarios that reflect differing revenue projections.

Funds Source (Millions)	Realistic 2035	Optimistic 2035	Pessimistic 2035
Sales and Use Tax	97.7	103.2	94.0
Passenger Fares	31.5	42.2	27.9
Other	15.2	17.1	16.0
<b>Total</b>	<b>144.4</b>	<b>162.5</b>	<b>137.9</b>
Use of Funds (Millions)			
Capital	16.0	18.7	15.5
4th Plain Bus Rapid Transit	10.8	10.7	11.0
Light Rail Transit	9.2	9.2	9.2
Transit Operations	75.4	86.7	70.5
Paratransit	36.9	36.6	41.1
Change in Cash	-3.9	.6	-9.4
<b>Total</b>	<b>144.4</b>	<b>162.5</b>	<b>137.9</b>

## High Capacity Transit: System design and mode selection process

The panel reviewed two separate high capacity transit system plans for operation in Vancouver: a light rail extension from the current MAX terminus at the Expo Center through downtown Vancouver to Clark College, and a bus rapid transit system along the Fourth Plain Boulevard corridor from downtown to Westfield Vancouver Mall. The light rail plan has an adopted LPA, and the Vancouver City Council approved an LPA for bus rapid transit on May 21, 2012. As of the writing of this finding, the bus rapid transit LPA has been preliminarily approved by the C-TRAN Board and is awaiting approval by the RTC.

Overall, briefings provided by the City, RTC, the CRC, and C-TRAN demonstrate that the separate planning processes are well integrated and mutually supportive of the chosen transit modes for downtown Vancouver and the Fourth Plain Boulevard corridor. These plans included the Vancouver City Center Vision, the RTC High Capacity Transit plans, the CRC LPA, and C-TRAN 2030 and Fourth Plain Transit Improvement Project.

The panel did not debate the merits of the LPA for light rail since that was approved and was the basis of the federal ROD. The panel did consider the alternatives analysis process to be relevant as necessary background for the panel's deliberations, and therefore requested a detailed presentation and related information from CRC staff. CRC representatives explained the screening process used to narrow the initial 70 project options down to one final LPA. This preferred package selected a light rail extension to Vancouver from among 14 different transit alternatives, including bus rapid transit and streetcars.

### Sources Reviewed (Light Rail Transit)

The panel reviewed documents relating to the extension of light rail from its current terminus at Expo Center into Vancouver. Presentations from C-TRAN and CRC described the process utilized to select the LPA which includes light rail. The City of Vancouver also presented the Vancouver City Center Vision Plan and explained how the plan is integrated with the LPA. These documents, listed in the bibliography, along with the presentations cited in appendices C-F, informed the findings in this section.

### Finding (Light Rail Transit)

Panel members did have questions about the relative merits of bus rapid transit versus light rail for the new bridge crossing. The panel concluded, however, that the LPA provided a unique opportunity to connect to an existing light rail network, and that CRC staff had provided adequate information to validate the alternatives analysis process and thereby justify the light rail choice for bridge transit. The CRC process was thorough, including the adoption of the LPA by a total of six governmental agencies in the Portland metro area.

## Recommendation (Light Rail Transit)

In principle, the panel believes that siting park and ride facilities in downtown Vancouver may appear in conflict with general urban design concepts and with the Vancouver City Center Vision that seeks to minimize single-vehicle entry into an urban core. However, the panel also recognizes that such facilities will serve the commuter corridors that include downtown Vancouver and are necessary to meet parking space requirements for commuters who transfer from auto to transit modes in downtown. The panel recommends that the Columbia and Mill District Park and Ride facilities should be designed to support mixed uses such as commercial, residential, and/or retail businesses. C-TRAN also should investigate charging for parking at park and ride facilities, which the FTA allows.

### Sources Reviewed (Bus Rapid Transit)

The panel reviewed documents related to the Fourth Plain Transit Improvement Project including the project website, alternatives evaluated, and the selection process for the community's LPA. The panel also received two briefings about the project from C-TRAN in April and May. The documents reviewed are listed in the bibliography and the presentations are included in appendices C, E, and F.

### Finding (Bus Rapid Transit)

This planning process is in an earlier phase than light rail. The proposed LPA is still under review at this writing. The panel is fully briefed on this alternative, which calls for buses operating in mixed traffic without a dedicated guideway. Actual stop locations and orientation at curb or median have yet to be refined.

Based on the information at hand, and recognizing that work still needs to be done, the panel agrees that the alternatives analysis process was sound and that the proposed LPA is a reasonable approach. Compared to local bus service, bus rapid transit along the Fourth Plain Boulevard corridor will improve travel times and reliability for riders. In addition, operations and maintenance savings will be possible because of the decision to reduce or remove existing fixed-route service for the #4 and #44 lines and retain the existing terminus at Westfield Vancouver Mall.

### Recommendation (Bus Rapid Transit)

None.

## High Capacity Transit: Potential impacts on current local bus service

The FTA specifically prohibits transit agencies from degrading local bus service by transferring funds from existing service to finance high capacity transit operations.

### Sources Reviewed

The panel reviewed documents which included analyses of impacts of light rail transit and bus rapid transit on existing bus service. Documents in the bibliography related to the Fourth Plain Transit Improvement Project outline how existing bus service will be affected by the addition of bus rapid transit. C-TRAN prepared a mock schedule showing how bus rapid transit would impact ridership per vehicle. C-TRAN 2030 also analyzed how light rail and existing bus lines will interact when both serve the downtown area. Finally, C-TRAN presented the details of C-TRAN 2030 during the April panel meetings in Vancouver. The bibliography includes a complete list of documents the panel was able to review, and the C-TRAN 2030 presentation is located in Appendix D.

### Finding

The panel concludes that C-TRAN has identified adequate funding opportunities to ultimately implement bus rapid transit services without jeopardizing current local bus service within Vancouver and throughout the Clark County service area. In fact, the bus rapid transit investment appears to improve local service within the corridor. The panel also accepts C-TRAN assurances that, as a matter of policy, the three-tier financial planning model does not include scenarios where funding would be transferred from local routes to bus rapid transit services.

***The C-TRAN 2030 Plan also includes plans for improved bus service to communities outside Vancouver which will not be affected by commitments to high capacity transit funding.***

### Recommendation

None.



**Mill District Park and Ride - The panel recommended that C-TRAN consider charging for parking at park and ride facilities to help cover some light rail maintenance and operations costs.**

## High Capacity Transit: Public process

The panel was particularly concerned that its work be conducted transparently. Each of the panel's Vancouver meetings was open to the public and documented by panel staff in meeting summaries. Copies of PowerPoint presentations were provided to panel members and the attending public, and, along with meeting summaries, were posted on the project website. Some audience members also videotaped the meetings, and many provided verbal comments to panel members at breaks and before and after panel meetings. The panel also received several email communications from members of the public. Because the CRC NEPA process – including its extensive public involvement and comment requirements – had been completed and an ROD had been issued by the time the panel convened, the panel determined that an additional public comment process would be inappropriate to its work. According to the December 2011 ROD, the CRC NEPA process between 2005 and 2011 included 27,000 outreach contacts, hosted or participated in 900 public events, and formed nine community advisory groups. In addition, 134 substantive comments were addressed between the time of the submission of the final EIS and the ROD. C-TRAN also completed an extensive outreach process for the Fourth Plain bus rapid transit project, which included public review and comment on design alternatives and multiple public meetings.

The panel appreciated the time taken by members of the public to attend its meetings and the courtesy shown by the public toward the panel, its staff, and the overall process.

## Coordination and consistency among bus rapid transit, Vancouver light rail transit, and the CRC project

### Sources Reviewed

The panel reviewed the Clark County High Capacity Transit System Study and received a briefing on the study from RTC during the April panel meeting. Several other briefings during the April and May meetings provided information about the coordination between the components of high capacity transit and the agencies involved in providing high capacity transit in the region.

### Finding

The panel concludes that the high capacity transit systems proposed within Vancouver have been well coordinated and will provide adequate service for both local and longer-distance riders. Panel members emphasize that managing such coordination is not a simple task, considering that the overarching CRC project involves stakeholders representing multiple interests on both sides of the Columbia River.



Mill District Park and Ride aerial view.



Columbia Park and Ride - The panel noted that this park and ride facility design should offer mixed use commercial or residential options as part of the structure.