

# HIGH RISK

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An Analysis of the  
Proposed Public-Private  
Partnership for the  
Richmond/Airport/  
Vancouver Rapid  
Transit Project

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by Blair Redlin

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MAY 2003



CANADIAN CENTRE FOR POLICY  
ALTERNATIVES – BC OFFICE

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for the Richmond/Airport/Vancouver Rapid Transit Project

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May 2003

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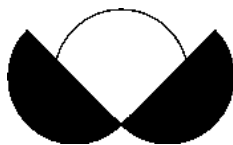
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# High Risk

## An Analysis of the Proposed Public-Private Partnership for the Richmond/Airport/Vancouver Rapid Transit Project

A VERY SIGNIFICANT DECISION for Greater Vancouver transit users and taxpayers is just around the corner. The councillors and mayors from around the Lower Mainland who serve on the Boards of the Greater Vancouver Transportation Authority (“TransLink”) and the Greater Vancouver Regional District (“GVRD”) are about to be asked to authorise a cost-shared capital investment of approximately \$2 billion for a

rapid transit line to connect Richmond and the airport with downtown Vancouver (known by the acronym “RAV”). Importantly, they will also be asked to approve the release of a sweeping request for private sector proposals to design, build, operate, maintain and partially finance the new line for a 30 to 35 year period. Annual payments for the contract are proposed to come from fares for the new line, as well as the savings from cuts to bus routes along the rapid transit corridor.

Funding for the proposed line is to come from TransLink, the federal and provincial governments, the airport authority, and a to-be-determined private investor.

The provincial government is reputedly insisting on a public-private partnership (P3) in exchange for its financial contribution, but local government officials who have primary responsibility for the regional transit system

should set aside this provincial pressure. They must consider their options carefully and neutrally, since taxpayers and transit users will deal with the implications of the decision for decades to come.

Due to the prospect for cost-sharing and private finance, as well as the role this line could play in support of the 2010 Winter Olympics, the RAV has overtaken the previous regional rapid transit priorities

agreed upon only a few years ago (i.e. central Coquitlam and Broadway corridors were to take priority over Richmond). This is a problematic way to make public policy, since investment decisions should be based on need, rather than the prospect of cost-sharing.

As TransLink Board members and GVRD Directors deliberate on the proposal for a P3, they should evaluate a variety of important factors including: whether or not such a procurement will provide value for money; whether it will be more or less costly to pursue a P3 rather than a more conventional public procurement; whether risks will be appropriately allocated to the parties best able to manage them; whether taxpayers will be appropriately protected against cost overruns and unexpected construction problems; whether transit service quality will be protected and enhanced; whether the proposed contract structure will be sufficiently accountable to

taxpayers; whether the new line will be properly integrated with existing rapid transit lines and the rest of the transit system; and whether they and the general public have been provided with enough information to make an informed decision. They will want to be assured that all appropriate due diligence has been completed.

In aid of better informed decision-making, this report takes a detailed look at the proposed public-private partnership. It attempts to disaggregate, explain and analyse the proposed partnership arrangement, but it does not attempt to address many of the other important issues and debates about the RAV, such as technology, the project's compatibility with regional land-use goals, travel times, the project's relative priority, international trade agreement implications, or the advisability of such a large expenditure. Special attention is paid to the proposed sharing of risk.

Although only a limited amount of information about the proposed P3 has been released to the public so far (and there is a huge range in the various monetary estimates that have been put forward), enough has been made available to raise significant concerns. Those concerns include the prospect that:

- The P3 may **cost** transit users and taxpayers considerably more than a conventional public procurement, given the added costs of private financing and operations. This is largely because the public sector can borrow money more cheaply than the private sector, but also because the private operator must earn a profit and pay more for GST and other taxes. One conservative estimate from the City of Burnaby concludes the increased cost to TransLink's budget is at least \$17 million per year for the life of the proposed P3 contract. TransLink's study of a proposal for private operations and maintenance of the Skytrain Millennium Line in 2000/2001 determined it would cost \$4.5 million more per year to use a private contractor than to continue to provide operations and maintenance in-house.
- There will be little or no reduction in public **debt**, compared to a regular procurement, since all RAV assets will continue to be owned by the public and the costs of private debt will be paid for with public funds. In fact, it is even proposed that the public

sector borrow \$63 million on behalf of the private concessionaire to assist with the first 10 years of operation.

- The P3 will result in less **control and coordination** than regular public sector management. This is a particular concern, given that the two existing Skytrain lines are publicly operated, yet will need to closely integrate with the new RAV. Once a 30 to 35 year contract is signed, flexibility for the public owner will be limited.
- The extra costs of private financing do not seem justified, given the inadequate and inappropriate levels of **risk** which it is proposed be transferred to the private sector. For example, if ridership does not match optimistic projections, the public sector will pay to make up the difference (ridership predictions for the airport are particularly risky); if unexpected soil and geotechnical conditions increase the cost of tunnelling, as is likely, the public sector will pick up extra costs; if bus cut savings do not materialise, the public sector will have to find other funds in order to honour its contractual commitments to the RAV operator; and, if the contractor(s) default, the public sector will have to pick up the resulting costs.

In short, the proposed RAV P3 offers few benefits to the public and limited risk mitigation. In theory, a P3 may make sense if it transfers substantial costs and risks to the private sector. This proposal fails to do so. The private concessionaire assumes some risk; however, the public is not protected from potentially large construction cost overruns and operating revenue shortfalls.

When it comes to risk transfer, the issue is not simply what is transferred, but at what cost. Private bidders will take on a variety of risks, but their bids will reflect that. That is why evaluations of P3s attempt to determine whether risks have been assigned to those best able to manage them. In the case of the RAV P3, the public is being asked to share many ridership and tunnelling risks, even though it is proposed that the private sector be responsible for operations, design and construction.

Although it is very possible the proposed P3 will not provide good value for money, there is no evidence in project workplans that a so-called "public sector

comparator” has been prepared (meaning an estimate or model for development of the project *without* private sector financing or operations). Nonetheless, staff are proposing to issue a Request for Proposals before the summer. This degree of commitment to a P3, in the absence of a public sector comparator, is a violation of the requirements of the provincial government’s *Capital Asset Management Framework*, which stipulates that a public sector comparator must be developed and refined at every stage of planning and development of major public capital projects. It is also inconsistent with the practice regarding P3s around the world.

Capital cost estimates for large projects are always subject to considerable uncertainty, and are often inaccurate. For this reason, protection of the public owner against post-construction claims is very important, particularly when tunnelling is involved. The report cites a number of spectacular cost overruns involving tunnelling and notes that a design/build contract is not necessarily protection against such claims. It is not clear how the proposed RAV P3 will protect the public against expensive legal claims.

This paper reviews recent experience with privatised rapid transit and airport rail links in Australia, the US and the UK. For three high profile projects in Australia and one in the US, project viability has been threatened by poor ridership and/or poor ridership projections. As a result, the Sydney Airport Rail Link is in receivership, the Brisbane Airport Rail Link has been given a significant credit rating downgrade, and a proposed airport rail link for Melbourne has been deferred indefinitely. In New Jersey, a light rail system developed through a design/build/operate/maintain contract is far short of ridership expectations and in the UK, a new P3 light rail system for south London is coping with a major financial crisis.

When it comes to rapid transit projects, the fundamental problem with a P3 model is that the public is locked into a long-term contract with a sole concessionaire, leaving the public in a poor bargaining position. Once a concessionaire is chosen, there are no market or competitive forces available to the public sector owner to minimise the cost of modifying the terms of service. To be successful at meeting public objectives, P3s should:

- face competition, and not have market power or a monopoly;

- create real efficiency gains, and not simply be dependent on a transfer of public costs and revenues to a private entity;
- be limited to discrete projects, not those that are part of an interdependent public system; and
- be self-supporting from user charges.

The RAV P3 meets none of these criteria.

## Recommendations and Conclusions

This paper highlights numerous risks of developing the RAV line as a P3. At a minimum, this study recommends:

- (i) The financial feasibility study by PricewaterhouseCoopers should be released to the public immediately. At the very least, it should be made available to TransLink and GVRD Directors.
- (ii) Before any further consideration is given to issuing a Request for Proposals, the provincial Auditor General should be asked to prepare an independent Public Sector Comparator.
- (iii) Ridership projections should be the subject of further independent review. Particular consideration should be given to the reasons for failure of ridership projections for similar projects in Australia and elsewhere.
- (iv) More detailed information should be provided to TransLink and GVRD Directors on the proposed sharing of major risks such as tunnelling and ridership. The precise nature of the risks to be borne by the public owner should be explained in detail.
- (v) If a P3 is approved and a Request for Proposals is issued, TransLink should ensure that consulting firms that have provided P3 advice are not permitted to, in turn, be part of bid teams.
- (vi) Project timelines should be adjusted to allow for adequate review and due diligence before a decision is made to develop the RAV as a public-private partnership.

It is the finding of this paper, however, that the RAV line is not an appropriate fit for a public-private partnership of the sort proposed. Insufficient risks and costs are to be transferred to the private sector to justify the increased costs of a P3.

# Introduction

THE PROPOSED RAPID TRANSIT project to connect Richmond, Vancouver International Airport and Vancouver (RAV) is being hotly debated for a number of reasons. Among the controversial elements is a reported stipulation by the Province that the project must be developed as a public-private partnership (P3) if there is to be a \$300 million provincial financial contribution.<sup>1</sup>

The proposed line would connect Vancouver's Waterfront Station in the north to Richmond Centre in the south as well as the YVR international airport terminal to the west. Although the RAV is not an "Olympic project" per se and is not included in the Bid Book that has been submitted to the International Olympic Committee, proponents of both the RAV line and the Olympics hope that the line will be in operation by 2010, in time for the anticipated Vancouver/Whistler Winter Olympics. The pressures of this Olympic timeline mean that major decisions are being made in great haste.

The RAV Project Team reports to a multi-agency committee. The "Contributing agencies" are the Government of Canada (represented by Transport Canada and Western Economic Diversification Canada), the Government of British Columbia, the Vancouver International Airport Authority (YVR), and TransLink. These are the agencies expected to make funding contributions. "Supporting agencies" (i.e. non-funding partners) are the City of Richmond, City of Vancouver, Greater Vancouver Regional District (GVRD), and the Vancouver Port Authority. The project is

currently in the definition phase, but it is anticipated that decisions on actual implementation will be made before July 2003.

Project planners have developed scenarios for both partially grade separated and fully graded separated lines up the Cambie corridor.<sup>2</sup> Travel times to Waterfront Station from Richmond Centre would be 32 minutes on a partially grade separated line and 30 minutes on a fully grade separated line, whilst from Waterfront to the Airport Terminal the respective times would be 28 and 25 min-

utes. No specific technology has yet been chosen, as the private sector is to be asked to provide solutions to satisfy the travel time objectives.

The recommended procurement option would see the new line delivered through a partially privately financed "design/build/operate/maintain" contract structure. While the project would be publicly owned, operation and maintenance of the new transit line would be privatised through a 30 to 35 year contract with the same private concessionaire that designs, builds and partially finances the line.<sup>3</sup>

A Request for Expressions of Interest (RFEI) was issued in late November 2002, in order to identify a short list of proponents for a more detailed and formal Request for Proposals (RFP) and subsequent Best and Final Offer (BAFO) to two finalists. According to the RFEI, contributing agencies "have not given approval to project implementation nor approved anticipated funding" and "the RFP will only be issued when...approvals and funding are in place."<sup>4</sup> Conclusion of the multi-decade contract will follow the RFP process.

The project is estimated to require total capital investment of between \$1.8 and \$2.2 billion in 2003 dollars, inclusive of interest during construction of approximately \$287 million.<sup>5</sup> For a \$1.6 billion base case (which does not include interest during construction), \$1.326 billion in public funding is being organised. It is contemplated that TransLink will be able to restrict its contribution to \$300 million if:

- the Province also contributes \$300 million;
- the Vancouver International Airport Authority (YVR) contributes \$300 million;
- the federal government contributes \$450 million in cash over the construction period (equivalent to \$426 million in 2003 dollars); and
- there is private capital of \$250 million (or more).<sup>6</sup>

It should be noted that, because interest during construction (“i.d.c.”) is a real cost, it is somewhat false to develop a base case without factoring it in. TransLink Directors have been told that the actual TransLink investment will be \$372 million, once interest during construction is added.<sup>7</sup>

If the project budget is higher than the conservative base case of \$1.6 billion (as is most likely), the plan is to have private financing make up the “gap” or difference. For example, if the capital budget is \$1.8 billion, there will be roughly \$470 million in private debt and equity, and if the budget is \$2 billion, then private financing of roughly \$670 million will be necessary. The private contractor will be paid to operate and maintain the new line from a combination of fare revenues and “savings” from cuts to north/south bus services.

## Proposed P3 Structure

The proposed P3 structure is sweeping, very long term and quite unusual in the North American context. While design/build (i.e. integration of design and construction within one contract) is an increasingly common delivery method for major capital projects, it is unprecedented in BC and uncommon in North America to conclude a multi-decade concession with one proponent for the design, building, financing, operation and maintenance of a major public service such as a new rapid transit line. Unusual too is the fact that the funding partnership with YVR and the proposed P3 for the RAV have driven a number of other public policy elements related to the line, such as very fast travel times and the consequent pressure for full grade separation. The proposal for an expensive and lengthy tunnel along the Cambie corridor follows logically from travel time requirements identified by the Vancouver International Airport Authority, as well as the 2001 P3 report by the Australian Macquarie Group of consultants. Given neighbourhood concerns about an elevated or at-grade line along Cambie, a very expensive tunnel has come to be seen by project planners as the preferred alternative.<sup>8</sup>

The financing and cost-sharing model has also encouraged regional politicians to advance the timing of the RAV project ahead of previous rapid transit priorities. Based on the objectives of the Livable Region Strategic Plan growth strategy, the previous regional priorities for additional rapid transit were, first, the Port Moody/Coquitlam line (which would connect the Expo and Millennium Lines to Coquitlam Centre) and, second, the Broadway line to connect the Expo and Millennium Lines with a line to central Broadway. Only then was a line to Richmond to follow.

The RAV project has now advanced in priority in large measure because of the hope that major contributions from other levels of government, the airport and the P3 will cap TransLink capital costs for the line at \$300 million (before i.d.c.). If successful, it is argued that this will significantly enhance rapid transit in the region, while allowing TransLink to allocate resources to other important priorities. What is missed in this reasoning is that the provincial government paid almost all capital costs for the previous two Skytrain lines.

It is unprecedented in BC and uncommon in North America to conclude a multi-decade concession with one proponent for the design, building, financing, operation and maintenance of a major public service such as a new rapid transit line.

It is apparent that the cost-sharing and financing model for the RAV has turned the normal process of transit prioritising upside down. Instead of investing on the basis of relative need in the context of the regional land use plan, the potential for cost-sharing and private financing is determining the new priority of RAV. This is not a prudent way to make public policy. Investments should be prioritised based on need.

Because a public-private partnership is so integral to the financing model for the project and because the recent priority of RAV may defer other needed projects, it is important that the P3 be reviewed in some detail.

This is challenging because, so far, the general public has been provided with only limited information on the proposed P3 for RAV. A detailed model for the P3 has been prepared by PricewaterhouseCoopers, but its “Report on Financial Feasibility” has not been made available to the general public, nor even to decision-makers on the TransLink Board. Only the executive summary of the report has been released to the public, while the Finance and Audit Committee of the TransLink Board was asked (as of April 9, 2003) to make do with a PowerPoint summary of the full report. In the executive summary, PricewaterhouseCoopers provides the following rationale for such limited disclosure:

*Our Advisory Report considers the likely cost of the Project, how it could be structured, and the amount of public funding that will be needed to make it work. It contains information and financial analysis that the Agencies wish to remain confidential in order to preserve their negotiating position. This Executive Summary encapsulates our views except those that would affect commercial negotiations.<sup>9</sup>*

The problem with this rationale is that a major expenditure of taxpayer dollars is proposed and explained in the report. Long term implementation decisions on the entire project and the financing model are imminent. The project, and the proposed P3, have not yet been approved. If the TransLink Board and the GVRD Board, on behalf of regional taxpayers, are to be asked to commit to an RFP for an unprecedented operation and maintenance contract of 30 to 35 years, as well as payments to a concessionaire of hundreds of millions of public dollars, then much more fulsome disclosure to the public is necessary.

It is clear that an understanding of the proposed P3 is required in order to gain a full understanding of the project as a whole. This report attempts to disaggregate, explain and analyse the proposed partnership arrangement.<sup>10</sup> The proposed sharing of risk is examined, as well as the prospects for a “public sector comparator.” Better informed decision making will hopefully be one result.

# The Deal in More Detail

THE MACQUARIE GROUP of Australia was contracted in 2000/2001 to review the prospects for a P3 for the RAV as well as to conduct a preliminary Multiple Account Evaluation of the project. Macquarie's early work suggested a number of P3 funding mechanisms, which are no longer under active consideration,

such as private capture of the value of commercial land development rights at stations, a "premium" airport service with higher fares, privatisation of all Skytrain operations, or rolling the Broadway western extension into the RAV project.

In early 2003, the Underhill Company LLC was engaged by the City of Vancouver to do an independent review of the RAV proposals. In commenting on the evolution of the P3 proposals compared to early recommendations, the Underhill report stated: "Given the restructuring of the PPP approach from that described by Macquarie, it's not clear what risks the private partner would be assuming, other than the risks commonly associated with Design/Build projects that are not PPP."<sup>11</sup>

Rather than a P3 arrangement that reduces public costs through capture of increasing land values, or that transfers major construction risks to the private sector, the current proposal is simply for full public funding of totally private delivery on a very long term basis.

## Project Organisation

Based on advice from PricewaterhouseCoopers, governance for the project will be structured as follows:

*"...the Contributing Agencies are proposing a special purpose corporation ("ProjectCorp")... TransLink, the Province and the Airport will appoint directors to the Board of ProjectCorp... TransLink and the Province will cause ProjectCorp to pursue arrangements with a private sector partner for the design, construction, financing and operation of the Project.*

*The Airport and ProjectCorp will enter into a construction agreement on terms satisfactory to the Airport and ProjectCorp for the construction of the Airport segment. The Airport will own the Airport segment, and lease it to TransLink. ProjectCorp will own the main part of the line between Richmond and Vancouver... the agreement between the Agencies will provide that certain decisions are referred to the Airport, TransLink and the Province for approval. These include approval of the essential elements of the Project.*

*There will be an advisory committee to ProjectCorp, through which the municipalities and other Participating Agencies will provide advisory input to the Board."<sup>12</sup>*

## Financial and Operating Structure

PricewaterhouseCoopers has recommended the following financial and operating structure:

- The RAV line will operate as an integral part of the regional transit network. TransLink will therefore continue to set schedules and fares and be responsible for marketing the service. It will receive the revenues collected from fares.
- There will be a long-term operating contract of up to 35 years under which the private sector partner will be responsible for designing, building and operating the system, as well as ensuring that it performs to standard.
- The private sector partner will also be responsible for raising funding that is needed over and above the Agencies' contributions. In return, it will receive payments from TransLink and the other agencies.
- The majority of Agency contributions will be made during the construction period. Payments will be made on behalf of the Agencies as certain specific construction milestones are achieved.
- During the operating phase, TransLink will make payments to the private partner for the provision of services which will be funded from the new cashflow the system is expected to generate. The majority of the payments will be for delivering the service according to defined performance standards. A portion of the payments will be an incentive to maximise ridership.
- The objective of the "design/build/finance/operate" structure is to transfer significant risk to the private sector and create effective incentives for performance by allowing the private sector to bring to the project its innovation and efficiency.
- Based on ridership and revenue projections from Halcrow/TSi (the contractors assigned to prepare detailed, investment grade ridership projections) and assuming current fare scales increased over time in line with the Consumer Price Index, the fully grade separated option will generate annual revenues (in 2003 prices) of \$39.9 million by 2010 and \$47 million by 2021. The partially separated option would generate \$33.7 million by 2010 and \$39.4 million by 2021. This is based on annual boardings of 28 to 33 million per year in 2010 and 32 to 39 million per

year by 2021. These annualised boardings average out to approximately 90 to 100,000 riders per day.

- 75 per cent of the ridership forecast should be achieved in the first year, 85 per cent in the second year and full ridership in the third.
- Taking into account net additional revenue generated by the RAV line, and related savings in the cost of the overall transportation network, the fully separated option is expected to generate net additional funds for TransLink of \$40 million in 2013, rising to \$59 million in 2030. For the partially separated option, the figures are \$31 million in 2013 and \$47 million in 2030. These are the funds it is proposed TransLink will use to pay the private partner for delivery according to performance standards.
- As to the cost of private sector financing, PWC believes that the private sector is likely to raise short-term construction financing primarily from banks and then refinance with a long-term bond from institutional investors after construction is complete. The term of the bond would approach the length of the operating contract.
- While PWC feels there is a "good prospect" that the project can be procured with the public funds that have been identified, "ultimately, a successful procurement...will depend on how the private sector bids...and the Project Team's estimates of the ridership and revenues which would be generated from the private sector proposals. *It would be prudent for the Agencies to agree how additional funding should be made available if necessary* (emphasis added)."<sup>13</sup> In other words, more public funding may be required than has been identified to date.

### "The Numbers" So Far

Subsequent to release of the PWC executive summary, TransLink Directors were provided with examples on the how the proposed financing may work. (It is important to note that, despite the haste to make a decision before the summer, Directors are being asked to base their decisions on a huge range of varying estimates for capital, operating and interest costs, as well as projected revenues. Clear and consistent numbers are not yet available.) Summary presentations to a March Board of Directors workshop and an April meeting of the Finance and Audit Committee of the TransLink Board indicate:

- The base case for the whole bus and rail network assumes fares will increase to match inflation, service levels and related capital will increase in line with population growth, and current assets will be replaced at the end of their useful life.
- TransLink will soon need additional funding for its overall system. The network base case projects an annual deficit of \$10 million in 2004, growing to \$83 million in 2013 for an average over that 20 year period of \$50 million.
- The debt servicing cost for TransLink's \$372 million investment in the RAV project is reported as \$30 million per year over 20 years (the annual amount is this high because TransLink is planning to pay \$72 million for interest during construction and because it uses an amortisation period of 20 years).
- In answer to questioning from Directors, it was suggested that payments to the private contractor could range between \$40 and \$60 million per year – a huge range.
- Cash flows were presented for 2021 which were meant to be examples only – not actual projections. Those examples cited “bus savings” of \$18 million per year by 2021 and suggested that capital repayment and return on equity for the private contractor might also be \$18 million per year (out of total annual payments to the concessionaire of \$47 million per year. The remaining \$29 million per year would be for operating costs). The explanation for such apparently small financing costs for the concessionaire is that “private sector efficiencies” are already assumed. This is a big assumption.
- The RAV corridor bus cuts will primarily impact express and B-line services. There may be 66 fewer buses by 2010 and 94 fewer buses by 2021. Assuming other additional funding for bus service expansion and redeployment of bus services cut in the RAV corridor, it is projected there may be a 20 per cent increase in local Vancouver and Richmond bus service by 2010 (compared to 2002) and a 35 per cent increase over 2002 by 2021.
- There are currently 35,000 to 40,000 daily riders on the rapid and express buses in the RAV corridor, 2000 daily riders on the airport shuttle and 40,000 riders on local trolley routes in the corridor.
- A so-called “cashflow timing mismatch” has been identified. Increased ridership will take time to

ramp-up and “bus savings” will take time to materialise, but the private operator will have costs from the first day of operation of the new line. It is therefore recommended that TransLink provide additional public borrowing to the private operator of \$63 million (in 2003 prices) for the first 10 years of operation, which will be repaid over the life of the concession, so that the net present value of these cashflows, at 7 per cent nominal, will be zero. This public borrowing on behalf of the private operator will be in addition to the debt for the \$372 million TransLink is contributing to the project. Of course, provincial and federal contributions will also be in the form of taxpayer supported debt.

- Interest rate increases before conclusion of a contract for the RAV will impact financial projections. A 1 percentage point increase in interest rates will equate to a roughly \$3 million annual increase in debt service costs for TransLink. Once the deal is closed, increasing interest costs will be borne by the concessionaire.<sup>14</sup>

Certain particular elements stand out from the PWC executive summary and the financial presentations to TransLink Directors. These include:

- Ridership will need to ramp up to approximately 100,000 per day to support the financial projections. There are roughly 40,000 riders on the corridor today.
- Annual payments to the contractor will come from RAV fare revenue as well as the equivalent value of cuts to bus service in the RAV corridor. Therefore, despite some initial private financing, all costs will ultimately be funded by the public sector.
- The “value” of reductions to bus service in the RAV corridor is somewhat illusory. These transfers to the private RAV contractor are not a consequence of the P3 and will cost “real money” since TransLink is also planning to redeploy B-line buses and otherwise increase other local bus services in the Richmond and Vancouver areas. If the line was delivered through a more normal public procurement, the value of bus savings on the north/south corridor would also be available to the public sector.
- In addition to all other public contributions, there is the proposition mentioned earlier that the public sector borrow \$63 million on behalf of the private contractor for the first 10 years of operations.

# A P3 Will Likely Increase Public Costs

## Estimates and Assumptions

The financial modelling for the proposed RAV P3 tends to mix operating and capital costs together. The range of estimates is also very large, since real costs for this procurement model will only start to become fixed after private sector bids are in.

That being said, some financial implications can be adduced using mid-range assumptions.

For example, J.S. Belhouse, the Director of Planning and Building for the City of Burnaby, presented an important financial analysis on April 23, 2003 based on the assumption of \$400 million in capital contributions from the private concessionaire.<sup>15</sup> For the mid-range private capital estimate of \$400 million (the fully grade separated option) and based on ramp-up to mature ridership three years after opening in 2013, Mr. Belhouse reports that:

*...the \$40 million in total new revenue forecast by PricewaterhouseCoopers...would be enough to cover either the estimated annual RAV operating costs (\$25 million) or the annual cost of financing the \$400 million capital cost contribution from the private sector (\$32 million). The projected new revenue would not be sufficient to cover both costs.”<sup>16</sup>*

Mr. Belhouse calculates (for the fully grade separated option) that private financing of the RAV will leave TransLink with a negative impact on its current operating budget of at least \$17 million per year.

If the TransLink cost to finance its contribution of \$300 million is also figured in, Mr. Belhouse forecasts a total negative impact to TransLink’s existing operating budget of \$38 million per year.<sup>17</sup>

If anything, Mr. Belhouse’s calculations for Burnaby use conservative assumptions. For example, he uses the estimate of \$25 million per year in operating costs (in 2010) from the Project Definition Report (p. 50), even though that same report also states: “Operating costs are estimated to be between \$27 and \$34 million per year in 2012, increasing to \$31 to \$40 million in 2030.”<sup>18</sup> Similarly, the Burnaby report assumes a \$21 million annual debt service cost for TransLink’s \$372 million capital contribution, whereas the March 14, 2003 TransLink Board Workshop was given an estimate of \$30 million per year in debt servicing for the same contribution (as explained earlier, the figure of \$372 includes \$72 million for interest during construction).<sup>19</sup>

With the higher potential operating and debt servicing costs, one can reasonably project an even higher nega-

**Figure 1: Overall Impact on Translink**

City of Burnaby Method for Calculating Overall Negative Impact on TransLink’s Operating Budget (Annual Revenue minus Operating Costs). 2013. Fully Grade Separated

Net New Revenue from RAV:		\$40 million
RAV Operating Cost:	subtract	\$25 million
Cost to Private Sector to Finance \$400 million:	subtract	\$32 million
Impact on TransLink’s Existing Operating Budget:	=	-\$17 million

Note: Private sector financing cost based on repaying both interest and principal of a \$400 million bond monthly over a 35 year term at a private sector borrowing rate of 7.58 per cent.

Annual payments to the contractor will come from RAV fare revenue as well as the equivalent value of cuts to bus service in the corridor. Therefore, despite some initial private financing, all costs will ultimately be funded by the public sector.

tive impact for TransLink's operating budget than the April 2003 forecast by Burnaby. For example, if RAV operating costs are \$31 million in 2012 (mid-range between the project team's estimated \$27 to \$34 million) and if TransLink's cost to finance \$300 million is, in fact, \$30 million per year, then the total negative impact on TransLink's operating budget (annual revenue minus operating costs) by 2012 could be \$53 million. A similar calculation for 2030 (assuming operating costs of \$36 million) would result in a negative impact on TransLink's operating budget of \$58 million. These higher costs will have to be made up by either cutting service or increasing revenues.

It is worth noting that the Project Team's 2003 estimate of annual operating costs for the RAV are sharply higher than the estimates of only one year ago. Project consultants produced a final technical report in June of 2002 which examined in detail two alternatives for the Cambie corridor. For a mostly grade separated option (i.e. tunnel from Waterfront to 45th Avenue), their report projected "...total annual operating costs of \$13.5 million (for staffing, salaries, operating, maintenance and general administration)...these operating and maintenance costs represent \$93 per vehicle hour..."<sup>20</sup> It's not clear what has caused projected annual operating costs to nearly double from the estimates of only a year ago. One possibility may be that the higher costs of private financing have now been rolled into the calculation of "operating costs." Presumably, some clues on the reasons for these higher costs are contained in the final financial report of PricewaterhouseCoopers. That report remains confidential.

## P3s Can be Costly

Another factor in the higher projected operating costs of the RAV is likely the proposed privatisation of operations and maintenance. Previous detailed estimating work for the Millennium Skytrain line showed that contracting out operations and maintenance would be considerably more expensive than doing the work in-house, although there might be other benefits. The cost estimating was developed in support of commercial negotiations between TransLink and Bombardier, which flowed from a Skytrain cost-sharing agreement between the Province and TransLink. Based on advice from then TransLink CEO (and current Deputy to the Premier) Ken Dobell, TransLink eventually declined to conclude an operations and maintenance agreement with Bombardier because of these presumed higher costs.

The estimates for private operations and maintenance of the Millennium Line were subsequently reviewed by the provincial Office of the Auditor General, which explained in a 2001 report:

*TransLink concluded that the cost of contracting operations and maintenance to Bombardier would be \$4.5 million per year higher than the cost of having the work done by its subsidiary. A consulting firm hired by the provincial government substantially agreed...but also determined that the Bombardier offer includes additional value by extending the warranties on existing equipment and by protecting TransLink from some increased input costs in the future.<sup>21</sup>*

In its executive summary report on financial feasibility, PricewaterhouseCoopers deals with the issue of costs in only the most vague and ideological terms. Here is its somewhat contorted statement on "private sector efficiencies":

*International experience suggests that involving the private sector, giving it scope to decide the best way of optimising costs over the life of the project and a*

*financial stake in how the project performs, can lead to very significant savings on the public sector cost estimates; sometimes in excess of 20 per cent. In our view the scope for savings is significant but probably less than 20 per cent on the RAV project because the Project Team has already worked to optimise capital costs, and because the need to design the Project to operate as part of the integrated transit network may limit the potential for efficiency gains.”<sup>22</sup>*

Perhaps it is not surprising that projected savings are presumed to be an undefined “probably less than 20 per cent.” The private sector will have only a very limited “financial stake” in the proposed P3, given that private costs are to be fully funded by taxpayers and transit users. And it is hard to understand what “potential efficiency gains” might follow from failing to integrate the project with the rest of the transit system.

It is inadequate to rely on such vague bromides about private efficiencies, since the higher likely costs of private concessions are well known. As the Underhill Company report for Vancouver City Council put it: “What does the private partner bring to the project that the public sector can’t do for itself? For a PPP to pencil out, the private partner needs to add at least enough value to balance out the additional costs associated with private financing.”<sup>23</sup>

Costs of private financing are higher than public sector financing because private sector debt is more expensive than public sector debt and because the private sector must make a profit. Public debt is almost always cheaper than private debt because bondholders are better assured of timely and complete repayment by the pub-

lic. There is little likelihood of public sector insolvency or the public sector defaulting on debt obligations, in comparison to the private sector. According to the Underhill Company report: “A combination of private equity/private debt financing could require an effective combined interest/return rate of about 10-11 per cent, whereas TransLink can finance public debt at about 6 per cent.”<sup>24</sup>

Because of higher financing costs, the US Department of Transportation Federal Highway Administration strongly criticised privatised financing of transportation projects in a 1999 report on “Innovative Finance”:

*Put simply, a public sector entity’s cost of capital for a transportation project – all things being equal – is lower than a private sector entity’s cost of capital... the major financing fact confronting capital intensive transportation projects in the U.S. [is that] debt service levels for a privately financed project (not using tax-exempt debt) are higher than those for a publicly financed project of comparable cost... There have not been many recent examples of successful privatized financing... no private capital has been raised that could not have been raised on a public basis and at a lower tax-exempt cost. Such is the fallacy of most ‘privatized’ capital techniques... the project revenue which is the ultimate financing source is the user fee revenue paid by citizens and businesses.”<sup>25</sup>*

In Canada, the public sector also pays a significantly lower cost for GST. Public projects pay a federal GST of 3 per cent, whereas the private sector must pay 7 per cent. The Underhill Company again: “The difference [for GST] on this project could exceed \$50 million.”<sup>26</sup>

Dr. Marvin Shaffer summarised the problem well in a recent opinion article for the CCPA:

*The private sector does not ‘contribute’ – it invests. And the amount it invests does not reduce the cost of the infrastructure to BC residents – to the contrary it significantly increases the amount British Columbians will have to pay over time for recovery of the project’s costs.”<sup>27</sup>*

### Some Likely Higher Costs of a P3

- Minimum negative impact to TransLink’s existing operating budget = \$17 million per year (conservative Burnaby estimate assumes \$400 million in private financing). These higher costs will have to be made up by either cutting service or increasing revenues.
- Extra GST (four percentage points higher) = \$50 million.
- Private debt/equity is four to five percentage points higher than TransLink borrowing rate.
- Millennium Line study said private operations and maintenance were \$4.5 million per year more.

# High Risk

## Rapid Transit a Poor Fit for Privatisation

According to at least one international infrastructure expert, Dr. Jose Gomez-Ibanez of Harvard University, rapid transit is a poor choice for privatisation from a theoretical perspective. Dr. Gomez-Ibanez has identified four key factors that should be in place before privatisation of public infrastructure is considered:

- (i) There should be meaningful competition and no monopoly provision. A rapid transit line is not a pure monopoly, of course, since travellers can choose to drive their cars, but a rapid transit line is not purely competitive either, since there are rarely two lines competing for the same transit customers. In the case of RAV, cars will be the only competition.
- (ii) There should be real efficiency gains, not simply a transfer of public costs and revenues to a private entity. In the case of the proposed RAV P3, there appears to be little to gain to warrant increased private capital costs, since rapid transit projects are almost always built by private contractors in any event and public sector managers will have to carefully structure and supervise the operations contract to ensure the contractor is living up to terms and performance standards.
- (iii) The project in question should be discrete and not part of an interdependent public system. This is a critical weakness with regard to the RAV, and rapid transit in general, since investment success is dependent on factors such as municipal land use, road decisions, costs and service design of feeder bus services, and sensible fare integration. In the case of RAV, there is the crucial complicating factor of integration with the other two existing public sector Skytrain lines.
- (iv) The project should be self-supporting from user charges. In the case of the RAV, it will not come even close to paying for itself from fares even if optimistic ridership projections are achieved. Where privatisation deals entail more than self-supporting user charges they can become complex and often collapse.

The RAV project fails to match any of these privatisation criteria.<sup>28</sup>

## Appropriate Risk Transfer is the Goal

The proposed responsibilities of the RAV private concessionaire need to be well considered before a P3 structure is approved. P3s may, in theory, make sense for public sector owners if sufficient and appropriate construction, financing or operation risks are transferred to the private sector. There may be value in paying higher financing and other private costs if enough risk is transferred off the public's back to private investors. The *appropriateness* of the risks borne by respective partners is one of the major criteria for judging the worth of P3s. Risks should be transferred to the party best able to manage them.

P3s are also often enticing for public owners because of the prospect that they may reduce the overall amount of public debt. To the extent that the private sector carries debt for public projects, it is argued there is more "borrowing room" available to the public. In the case of the RAV P3, this is not a material consideration since: (i) most of the project financing will be in the form of taxpayer supported debt; (ii) the assets will continue to be owned by the public, so it will not be possible to place the debt for those assets "off book"; and (iii) the public

sector will have a long term liability for the annual contract payments. The private contractor will be dependent on public fare and tax revenue for repayment of private debt obligations. No private sources of funds have been identified for repayment of the private sector financing.

In examining the proposed RAV P3, then, it is primarily important to review the extent to which substantial risks will or will not be transferred to the private partner.

According to PricewaterhouseCoopers “...the objective is to transfer significant risk to the private sector...”<sup>29</sup>

## The Proposed Risk Structure

As currently contemplated, the RAV private concessionaire will bear system performance risks, operation and maintenance risks, and the risk of systems and civil works integration. The RAV “ProjectCorp” will be solely responsible for land and right of way acquisition risks, as well as the risks associated with default by the private partner. Both construction risks and passenger volume and revenue risks will be shared by the public owner and the private concessionaire.<sup>30</sup>

These risks, in more detail, are as follows.

### Risks for the Private Concessionaire

- Responsibility for **system performance** will be related to the performance standards set out by the public owner. It will be important for the public owner to be very specific and detailed in the “outputs” that will be required. Contract payments will presumably be withheld or reduced in the event of system non-performance. But if there is actual failure of the systems, it will be customers that will bear the immediate brunt. And actual withholding of contract payments invariably results in messy and expensive litigation.
- Private responsibility for **integration of systems and civil works** will likewise have a big impact on transit users in the event of inadequate performance. The RAV must operate seamlessly with the rest of the region’s transit system and, particularly, with the other parts of the rapid transit (i.e. Skytrain) system. Although it is planned that integration of systems and civil works will be the sole risk of the private concessionaire, close and frequent cooperation with Skytrain staff will be essential. This will, in reality, put a shared burden and responsibility for effective integration on both the private concessionaire as well as managers and staff of TransLink’s Skytrain.
- **Operations and maintenance** risks may be borne privately over the 30 to 35 year term of the contract, but the public owner will have a vital interest in the effective operations and maintenance of the assets, as these will revert to the public owner at the end of the contract. Performance standards set out by ProjectCorp will need to consider whole life cycle costs very carefully. Incentives will need to be developed to ensure that adequate and timely maintenance is carried out in order to protect the long term worth of the public’s assets. If these assets are run down, or inadequate consideration is given to renewal and disposal, the public will bear unnecessary additional costs over time. As the Underhill report observed: “The 30-35 year timeframe, however, could work against TransLink’s long term interest. As the end of the term approaches, the private concessionaire would have little incentive to perform major refurbishments or replace equipment. TransLink could find itself, when it takes control of the RAV line in 35 years, immediately faced with major capital costs to refurbish and upgrade the system to then modern standards.”<sup>31</sup>
- **Cost risks** after closure of the deal will generally be borne by the contractor, with the exception of the shared risk of tunnelling (which is the most risky part of the construction component) and ridership (the most risky part of the operations). Presumably, this means the private contractor will cover cost overruns, although the cost of change orders and post-construction claims may still be borne by the public as with other design/build contracts. The contract structure is intended to provide incentives to the private operator to cut costs, while meeting set performance standards. How may that be done? Dr. John Loxley provided one possible answer when summarising the record of P3s for public services at a 2002 CCPA public forum. With regard to projects where the private sector is given a budget by the public sector to take over and operate public operations, he said “Turning to the...group of P3s which promise lower operating costs for government, one must ask the question ‘How do you reduce the cost of government?’ The quick answer is by reducing the cost of labour. And how do P3s accomplish this? By de-unionising, by lowering wages, by cutting benefits, by laying

If there is failure of the systems, it will be customers who bear the immediate brunt. And withholding contract payments invariably results in messy and expensive litigation.

people off, by multiple tasking. There is no secret here, this will very quickly reduce the cost of government. But what about the quality of service when you do that?”<sup>32</sup>

Overall, then, while the private sector bears some risk, even those theoretically carried alone are, in fact, a burden shared with the public.

### Risks for the Public Owner

- Public responsibility for **property acquisition and right of way** risk is normal for infrastructure projects that are publicly owned and constructed. However, in a design/build construction process there is considerable likelihood of expensive claims from the contractor in the event of failure to acquire property in a timely way. Recent experience with the Millennium Line’s difficulty in timely acquisition of property from the Burlington Northern and Santa Fe Railway is instructive in this regard. If contractor construction timetables are held up by property litigation, expropriation difficulties or other right of way acquisition delays – and the public is solely responsible for this risk – then it is probable that public sector costs will increase because of contractor claims.
- The risk of **contractor default** is made more serious by the sweeping P3 structure that is proposed. More simple design/build or design/bid/build contracts are secured through bonding processes that are regular and well understood. However, for a 30 to 35 year contract that includes operation and maintenance as well as construction, extra bonding and insurance against default will be necessary and will need to be ironclad to protect the public owner. As the TransLink Finance and Audit Committee was told on April 9, 2003 “TransLink will be exposed to risk in the event that the Concessionaire defaults on its obligations. This is because risk can only be transferred to the extent that capital is available to absorb it. Mechanisms will be put in place to manage and mitigate risk during the life of the Concession...[that] must be sufficient to satisfy the Agencies and private sec-

tor investors that the Concessionaire is highly unlikely to default. However, mitigation mechanisms are not foolproof. If the Concessionaire defaults, ultimately, risk transfers back to the Agencies. It is worth noting that while these risks could have a material impact on TransLink, they are highly unlikely to occur.”<sup>33</sup>

- The risk of not achieving **bus savings** will also be borne by TransLink. As we have seen, payments to the private contractor will come from RAV fare revenues plus the computed value of cuts to bus service in the corridor. The bus fleet is controlled by TransLink. Bus cut decisions will eventually be a function of bus passenger demand, available funding and political considerations by TransLink Directors. If TransLink doesn’t, for whatever reason, make the bus cuts that are projected it will have to make that up in funding for legal commitments to the RAV contractor. As an example, if there are 10 per cent fewer bus savings than currently projected, TransLink will have to make up approximately \$3 million per year on average over a 30 year contract.<sup>34</sup> There is already risk to the bus forecasts, since the Halcrow/TSi ridership projections were based on 1,600 peak buses. In the interim, TransLink’s long-term strategy has reduced that number to 1,400 peak buses. This smaller bus fleet reduces incremental revenues by \$2.5 million per year.<sup>35</sup>

### Shared Public/Private Risk

#### Ridership Risks

- According to the model, there will be a sharing of passenger volume (ridership) risk. The manner in which the ridership risk will be “shared” is not yet defined in detail, but it is generally understood that if ridership does not match forecasts, it is the public that will have to pay the private operator for any shortfall. This is because control of fares, bus integration decisions and marketing will remain with TransLink.

Private investors will seek certainty regarding operating contract payments, no matter the actual ridership results. The forecasts of ridership are, therefore, critical to an assessment of the risks that will be borne by the public in this partnership. Based on an investment grade report by Halcrow/TSi, the financial model is predicated on a forecast of 26 to 38 million passenger boardings per year in 2010 for the fully grade separated option (excluding a three year traffic and revenue ramp-up), generating a wide ranging forecast of revenue in 2002 dollars of between \$37 and \$56 million per year. Boardings are forecast to increase to between 31 and 45 million passengers per year in 2021. The forecasts do not include the prospect of “premium” service to the airport as it was concluded that the original benchmarking for a premium service was “over-optimistic.”<sup>36</sup>

From the forecast ridership range provided by the consultants, the Project Team’s Project Definition Report settles on projected boardings of 32.7 million passengers per year in 2010 and 38.5 million passengers per year in 2021.

Put more simply, the forecast is for 90,000 to 100,000 passengers per day by 2010. The forecast ridership is composed of 57,700 passengers that will switch from RAV corridor buses to the new rail service, 5,100 new RAV rail users from the airport, and 37,200 new passengers on the corridor. Intuitively, the attraction of over 37,000 new passengers on the corridor per day will be extremely difficult. Today, there are 35,000 to 40,000 daily rapid/express riders on the corridor, 2,000 daily riders on the airport shuttle, and 40,000 riders on local trolley routes in the corridor.<sup>37</sup>

A key factor in achieving ridership projections will be the value customers put on their time. The value of time is a very sensitive input to the model. If line travel times increase by 20 per cent, the model forecasts a 15 per cent decrease in boardings. Conversely, a 20 per cent reduction in line travel times increases boardings by 15 per cent.<sup>38</sup>

The ridership projections assume a strong rebound in air travel in 2002/2003 followed by a period of sustained air travel growth. This is likely optimistic. Halcrow/TSi did a so-called “Monte Carlo” sensitivity analysis to assess the likely risks of the various components of the ridership forecasts. The riskiest portion is the forecast of total airport ridership, including airport employees. This accounts for 10 per cent of ridership and 15 per cent of revenues. The overall risk assessment is +/- 15 per cent

for non-air passenger ridership (which includes airport employees) and +30 per cent/-20 per cent for airport passengers on a non-premium service. The bottom line for TransLink will be a risk of +/- \$8 million per year on average over 30 years.<sup>39</sup> This is very significant risk.

The April 23, 2003 report to Burnaby Council compared RAV ridership projections with the actual experience on the Expo Line:

*First boarding revenue assignment rates used for the RAV Rapid Transit Project are significantly higher than rates observed on the Expo Line (110 per cent to 141 per cent higher). This seems unlikely given that the Expo Line has a considerable number of high density land uses within walking distance clustered along its length (e.g. downtown New Westminster, Metrotown, and Collingwood village) while the proposed RAV Line travels large stretches without similar significant destinations.<sup>40</sup>*

The Burnaby report includes a critique of other elements of the ridership forecast as well, including the presumed ratio of air passenger transfers; the extreme sensitivity of conversion factors to convert model outputs; the fact that 2010 ridership and revenue has not been discounted to allow for ramp-up; the sensitivity of the value of time; the importance to the estimates of construction of a Bridgeport Park and Ride; and the absence of an accounting of seasonal variations in air passenger volumes. Overall, Mr. Belhouse characterises the ridership assumptions for RAV as “aggressive.” With regard to the various assumptions of the ridership projections he says: “Any of these assumptions taken in isolation may seem reasonable; however, the collective impact of aggressive ridership assumptions could be significant given that TransLink will be responsible for any gaps between projected ridership and actual revenues.”<sup>41</sup>

Ridership risk will be very significant for the public sector, resulting in potential increased costs of \$8 million per year, or more. Decision-makers at TransLink and the Province will want to be absolutely confident of the reasonableness of the projections before agreeing to this proposed P3 – especially given the experience of flawed ridership projections for similar projects in other jurisdictions such as Australia. They may want to subject the forecasts to further independent review.

Given the above, the characterisation of ridership risk as “shared” is questionable. It is TransLink that will bear this risk alone.

## Construction Risks

- There will also be sharing of the risks of construction (particularly tunnelling) and utility relocation.

Proponents of design/build construction contracts argue that there are significant synergies and savings that can be achieved by assigning both design and construction to the same contractor. This is often true, but design/build can also increase owner costs significantly if there are major legal construction claims for additional payments as a result of changes or delays that can be attributed to the owner after conclusion of the contract. The proposed regime for construction claims with the RAV is not clear, but if the public owner wants to submit change orders (for example, by changing scope in response to neighbourhood concerns), or there are delay claims attributable to the public, then there will likely be extra public costs for the RAV, just as with other design/build projects.

Recent experience with design/build transportation projects in Greater Vancouver are instructive. For example, the Millennium Line Skytrain project ended up paying contractor SAR Transit an additional \$36 million beyond the agreed price for the guideway construction contract after a successful mediated claim for delays caused by the Canadian Environmental Assessment process as well as delays in obtaining private railroad rights of way. The \$36 million payment took the actual contract price up to \$272 million from an awarded contract value of \$235.5 million, an increase in the price of that particular contract of 15.2 per cent.<sup>42</sup>

Similarly, the prime contractor for the Lions Gate Bridge project (American Bridge/Surespan) received an additional \$7.5 million on top of an original contract value of \$86.6 million after a claim for “project complexity” and related delays. This was 8.6 per cent more than the originally agreed contract amount. This despite the project being delivered considerably behind schedule and with a much increased number of bridge closures than originally agreed, and also despite various clauses in the contract intended to penalise the contractor for extra delays and closures. In November of 2001, the provincial cabinet approved a 16 per cent increase in overall spending on the project, as compared to the originally approved budget.<sup>43</sup>

Protection against unforeseen construction claims should be a top priority for RAV procurement and contract negotiation.

The P3 as currently proposed would have the public sector owner share utility relocation risk with the private

contractor. It is not clear why this has been suggested. Negotiation with utility agencies such as BC Hydro or BC Gas should primarily be the responsibility of the construction contractor. While the City of Vancouver or the City of Richmond will be able to assist in that process, as they do whenever there is major construction in their municipalities, there is no apparent reason why the costs of utility relocation problems should be shared with ProjectCorp or TransLink. The contractor will be in the best position to manage such risk within the context of the project construction workplan.

There are always major risks and uncertainties in design and construction of any multi-billion dollar transportation project, but the proposed RAV faces the particular risk of extensive tunnelling. Fully grade separated options for the Cambie corridor contemplate a lengthy tunnel running from south of Waterfront/Cordova through downtown and continuing to 39th Avenue, 49th Avenue, or even 63rd Avenue. The Peer Review Value Analysis estimated that the cost of tunnelling to 63rd Avenue would be approximately \$336 million.<sup>44</sup>

In the Project Definition Report, the Project Team identified the tunnel as a significant risk to schedule and hence budget.

*Tunnelling...involves considerable risk. Any reduction in length will reduce the risk that unanticipated ground conditions or equipment breakdown will extend the construction period... The schedule is primarily driven by the requirement for tunnelling. It requires between six months and twelve months to procure a refurbished or new tunnel boring machine. The rate at which these machines can advance is related to the nature of the materials through which they are digging... The time to construct the longest of...three segments...dictates the overall schedule.”<sup>45</sup>*

Additional geotechnical investigation is recommended by both the value analysis and in the project definition report, but it is only when tunnelling is underway that the specific details of underground conditions become clear.

One potential advantage of a P3 for the RAV might be transfer of the risk of tunnelling to the private sector, but the current proposals foresee an undefined “sharing” of that risk. However, since risk is supposed to be allocated to the party best able to manage it, and given that design and construction will be under the control of the contractor, it is not clear why the public sector is being asked to share this risk at all. Geotechnical conditions are a function of nature and cannot be changed by the public sector owner.

Ridership risk will be very significant for the public sector, resulting in potential increased costs of \$8 million per year, or more.

P3 proponents might respond that it is an advantage of the P3 to have the private partner share this difficult risk. The difficulty with this argument is that the public sector would have more control over decisions about what to do about tunnelling risks with a more conventional procurement. In the P3 model as proposed, the public will bear some amount of the cost of the tunnelling risk, but will have limited control over decisions.

## Expensive Tunnelling Surprises

Local government decision-makers will want to have a thorough sense of the extent to which major tunnelling can lead to budget pressures and cost overruns. The experience with major tunnelling for transportation projects in other jurisdictions is instructive. For example:

- The “Big Dig” highway tunnel project under the City of Boston has seen its costs go from an estimate of \$2.5 billion (US) in 1985 to a revised estimate of \$4.5 billion in 1987 to real costs of over \$14.6 billion today. Project costs have risen \$4.5 billion in the last three years alone (in the year 2000, the projected cost was \$10.8 billion). The project is now over four years behind schedule. Amongst other cost pressures, some \$1.6 billion in extra payments have been made to the design and build partnership of Bechtel and Parsons Brinkerhoff. Although there are many reasons for the massive cost pressures besides tunnelling, there is no doubt that the tunnelling component is a major factor. Extra payments to Bechtel include \$357 million for a category called “differing site conditions.” There was a massive tunnel flood in 1999 which increased costs considerably.<sup>46</sup>
- The Channel Tunnel between England and France (a P3 now known as Eurotunnel) saw capital costs increase from an estimate of £4.9 billion in 1987 to real costs of more than £11.7 billion by 1994. A 1999 article on the project by John Lowe of Glasgow Caledonian University observes: “This project demonstrates the problems associated with offloading risk to the contractor. Ultimately on such a project, the contractor could be able to claim back extra costs from the client by the simple expedient of threatening to quit or liquidate. Eurotunnel chairman Sir Alistair Morton accused TML [the construction consortium] of blackmail.”<sup>47</sup> Once tunnelling is underway for the RAV, similar demands for extra payment are a real possibility.
- The cost of the new Dublin Port Tunnel has risen from £449 million in 2000, to an estimated £625 million today. Design of the tunnel is apparently problematic and some 5 per cent of trucks will be unable to use it because the tunnel is “too low.”<sup>48</sup>
- The cost of a 4.5 mile tunnel under Capital Hill in Seattle has contributed to over \$500 million in budget pressures for the Sound Transit light rail project. Construction bids for boring of the tunnel were 40 per cent higher than budget estimates, in part because of soft, wet soil conditions in Seattle. Costs for the overall project rose from \$3.9 billion (US) in 1996 to more than \$4.4 billion by 2000.<sup>49</sup>

## Cost Estimates are Often Inaccurate

While tunnel projects are particularly challenging, there is a worldwide problem with construction costs for infrastructure projects sharply exceeding estimates. According to a 2002 study by Aalborg University in Denmark that looked at 258 projects around the world, 90 per cent of large public works projects exceed estimates, and cost estimates are no more accurate today than they were a century ago. “Costs and benefits are routinely exaggerated to sell projects to policymakers.” On average, bridge and tunnel projects cost 34 per cent over estimates while rail projects run 45 per cent over estimates on average.<sup>50</sup>

If the RAV project is approved as a P3 and tunnelling risks are shared between the public and private sectors, decision-makers at TransLink should brace themselves for surprises and unanticipated costs. It is unusual for major tunnel or rail projects to come in on budget – and the RAV is both. If the decision is made to go ahead with a P3, as much of the tunnelling risk as possible should be transferred to the private partner.

# Where is the Public Sector Comparator?

PART OF THE DIFFICULTY in assessing the merits of a potential P3 for the RAV project is that workplans and studies for the project are basically silent on the question of a public sector comparator (PSC), meaning the RAV Project Office has not produced an estimate or model for construction of the RAV

*without* a private-sector partner. From the time of the first preliminary work by the Macquarie Group in 2000/2001, the potential advantages of a P3 have been extolled in the abstract and without any quantifiable basis for public sector comparison. This violates provincial government guidelines for development of public capital projects.

## Provincial Government Guidelines

Provincial guidelines for public sector comparators are set out in the *Capital Asset Management Framework* of May, 2002. The document provides an overarching set of provincial advice and rules for evaluation, development, procurement and review of public capital projects in BC.

On the subject of public sector comparators, the document states:

*Agencies should develop and use a Public Sector Comparator (PSC) to assess the financial aspects of value for money – and as a benchmark against which to measure the net value of alternative procurement options... A full assessment of value-for-money and public interest issues should be continu-*

*ally applied and refined as a project is developed.*<sup>51</sup>

The Capital Asset Management Framework goes on to explain that a PSC should be composed of: (i) a factor for “competitive neutrality” that “generally includes the quantification of government advantages (such as property tax exemptions) and disadvantages”; (ii) a

factor for “raw PSC” that examines life cycle base costs, less revenue; and (iii) a factor for “risk quantification.”<sup>52</sup>

Crucially, the public sector comparator and an assessment of value-for-money should be developed and refined at all stages of the project. During the preliminary Strategic Options Analysis phase, a preliminary PSC should be prepared that does a preliminary assessment of costs and risks. Similarly, in the development of a Business Case for the project, a PSC should be developed in more detail. Finally, as a project moves to procurement, the PSC should be further refined and used in the evaluation of proposals.<sup>53</sup>

None of this has been done for the RAV. The project has already moved through its preliminary analysis and business case phases and is well down the road to procurement, with only the most scant reference in early documents to the development of a public sector comparator. The project should definitely not have issued a Request for Expressions of Interest to the private sector (a key stage in procurement) without some detailed sense in hand of the comparative costs and benefits of public sector procurement and operations.

Without a public sector comparator, the proposed P3 structure appears ideological, rather than based on sound evidence or a clear business case.

The absence of a public sector comparator casts a shadow on the entire RAV proposal in its current form. Without a public sector comparator, the P3 component appears ideological, rather than based on sound evidence or a clear business case.

### **The PSC Should Protect Taxpayers, not Bidders**

The process for development of an eventual PSC is quite unclear at this time. The Macquarie P3 report actually recommended that any PSC be shared with bidders on the project: “In Macquarie’s view, there are significant advantages of making a public sector benchmark available to bidders as part of the process, particularly if government is likely to revert to a public sector delivery approach if the private sector does not meet its hurdle.”<sup>54</sup>

It would be a clear violation of the provincial Capital Asset Management Framework to follow Macquarie’s advice in this regard. The Capital Asset Management Framework clearly states: “The costs allocated to risks should not be disclosed to potential private partners.”<sup>55</sup> Which is, of course, only common sense if the objective is best value for public funds, rather than promotion of the P3 ideology.

### **The PSC Must be Independent and Objective**

If a public sector comparator is to be developed for the RAV in the future, it is important that the public have complete confidence in its veracity and objectivity. It is common for public sector comparators to be developed by the same private consulting firms that also make recommendations on P3 procurement or financial modeling. This can be a mistake, since it may prompt questions about the objectivity or accuracy of the PSC.

In the UK, for example, the PSC for the proposed London Underground P3 was developed by PricewaterhouseCoopers. Its work indicated that a private partnership might be as much as £4.5 billion more cost effective than a public procurement. This figure was touted widely by the British government and other proponents of the P3. However, when Deloitte and Touche Corporate Finance

did a detailed evaluation of the public sector comparator from PricewaterhouseCoopers, it found amongst other things that:

*We have seen no evidence that there is a valid basis for establishing that the PPP will achieve Value for Money using commonly accepted techniques for projects of this nature... highly material adjustments to the PSC are judgementally volatile or statistically simplistic... some of the statistical analysis is arbitrary and could be misinterpreted by the reader... selection of preferred bidders too early in the process could lead to a materially adverse impact on Value for Money... public sector bond financing has been largely dismissed.”<sup>56</sup>*

If it has not begun already, work should commence immediately on development of an objective public sector comparator for the proposed RAV project. In order to enhance public confidence in the PSC, it should not be developed by any of the consultants who have worked on the RAV P3 so far, including Macquarie and PricewaterhouseCoopers. To maximise public confidence, a public sector comparator for the RAV should be developed by the provincial Auditor General.<sup>57</sup>

### **P3 Consultants Should Not be Part of Bidding Teams**

Many consulting firms, such as PricewaterhouseCoopers and the Macquarie Group, act internationally as advocates for public-private partnerships. It should be a given that consultants who have advised on the structure of the proposed P3 for the RAV should be excluded from teams that subsequently bid on the project. Surprisingly, perhaps, the provincial government (through Partnerships BC) recently gave a special clearance to PricewaterhouseCoopers to participate in the bidding for the Abbotsford private hospital, despite the fact that they wrote the report that set the terms for the P3 for that new facility.<sup>58</sup> It should hardly require stating, but given the recent provincial dispensation for P3 consultants in the Abbotsford hospital case, TransLink should be careful to protect the objectivity of its processes by ensuring that P3 advisors do not form part of RAV bid teams.

# Learning From Related Experience Elsewhere

IN RECENT YEARS, in other parts of the world, a variety of rapid transit P3s and privatised airport rail links have been developed that ought to be instructive for decision-makers in Greater Vancouver. Experience in Australia is particularly interesting.

## The Australian Experience

In an August 2002 article, Stephen Wisenthal of the *Australian Financial Review* summarised the Australian experience this way:

*Australia's three biggest state capitals have either built or considered building train links to their airports. So far, the record has not been good. Sydney's airport rail line fell into receivership within months of opening, Brisbane's has stopped making payments on some of its debt and, in Victoria, the state government decided not to build one to Melbourne Airport at all.*<sup>59</sup>

When the **Sydney Airport Rail Link** was announced in 1990, then Transport Minister Baird said, "the airport link will not require one cent of government money."<sup>60</sup> In reality, significant taxpayer contributions were required and "the end result of this PPP was that the New South Wales...government had to bail out the project, costing taxpayers \$704 million (Aus)."<sup>61</sup> Inaccurate ridership pro-

jections appear to have been the main culprit: "Passenger levels were projected to be around 48,000 when the link opened, rising to 68,000 within 10 years. In practice they were around 12,000 a day. Problems with the service included overcrowded carriages at peak times, lack of luggage space and high ticket prices."<sup>62</sup> On November 30, 2000, within months of the closing ceremonies of the Sydney Summer Olympics, the Airport

Link Corporation was placed into the hands of receivers at KPMG at the behest of the National Australia Bank, which was owed \$200 (Aus) million, a debt guaranteed by the New South Wales government.<sup>63</sup>

The **Brisbane Airport Rail Link** (known as Airtrain Citylink) is a \$223 million, 8.5 km project developed as a build/own/operate/transfer P3. It commenced operations in May 2001. It is planned that the project will be turned over to the Queensland government after five years of operation, though the company has a 35 year operating concession. Contractual arrangements require that the state government take control if Airtrain fails. The Macquarie Group is one of the partners in the project.

As with the Sydney rail link, Brisbane's ridership has been much lower than predicted. "Executives for Brisbane's Airtrain concede that passengers have not flocked to the service as quickly as investors hoped... they say confidentiality clauses prevent them from the revealing the figures... 'It's no secret that it's taking longer than we forecast,' said Airtrain Citylink company secretary Vince

Decision-makers should brace themselves for surprises and unanticipated costs. It is unusual for major tunnel or rail projects to come in on budget – and the RAV is both.

Scully, a Macquarie Bank executive who helped put the project finance together.”<sup>64</sup>

On March 28, 2003, Moody’s Investors Service sharply downgraded its rating for Airtrain Citylink Ltd., reducing it to Caa1 from B2 and saying the debt outlook is negative. The culprit is once again ridership:

*Revenue continues to be significantly below that which was forecast for the rail link when the rating was originally assigned. In addition, ramp up has been slower than anticipated and operating costs are higher than projected. While Airlink has been working on a number of initiatives aimed at...improving passenger numbers, the result of such initiatives has been poor... the negative outlook on Airtrain rating reflects Moody’s concerns that there is unlikely to be a material improvement in patronage.”<sup>65</sup>*

The State of Victoria decided in January 2002 that it would not proceed with the proposed **Melbourne Airport Rail Link**. A news release from Transport Minister Peter Batchelor made clear that ridership would not be sufficient to warrant the investment:

*A comprehensive patronage study has found that a rail link to Melbourne Airport would not be commercially viable for at least ten years... A financial analysis undertaken by the Rail Projects group of the Department of Infrastructure showed that building an airport rail link now would require government subsidies over a ten year period of between \$350 million to \$450 million in today’s dollars... The patronage study prepared by Booz Allen Hamilton showed that currently seven per cent of passengers travelling to and from Melbourne airport use public transport... the study predicted that by 2009 a new rail link would increase public transport usage to around nine percent... ‘This small diversion to public transport is insufficient to justify the high cost of a new rail link,’ Mr. Batchelor said.<sup>66</sup>*

## The North American Experience

Design/build/operate/maintain arrangements for rapid transit are rare in North America. Two US examples, however, highlight the risks.

While construction of the 7.5 mile **Hudson-Bergen Light Rail** project in New Jersey line was on budget and on schedule, it has failed to meet ridership projections. Before the new light rail line opened in April 2000, planners for NJ Transit had predicted that the line would carry 14,000 fares to begin with and 18,000 by Fall 2000.<sup>67</sup> After one year of operation, ridership was running about only 8,000 fares a day, less than half of what had been projected, with revenues covering only about 10 per cent of expenses.<sup>68</sup> By February 2002, average daily ridership had grown to 11,700, still well short of the planning projections for opening day.<sup>69</sup> Under the design/build/operate/maintain contract, however, ridership risk rests with NJ Transit. The public owner pays the private contractor an annual fee for operation and must find the funds to make up the ridership shortfall from public resources.

The new \$1.9 billion (US) **JFK AirTrain** in New York is also being developed through a design/build/operate/maintain contract structure. It is owned by the Port Authority of New York and New Jersey and is funded through a combination of Port Authority dollars as well as an existing \$3 surcharge on passengers departing JFK Airport. The technology is essentially the same as Greater Vancouver’s Skytrain.

While the JFK Airtrain project has been built on budget and on schedule, progress was marred by a fatal accident on September 27, 2002. An operator was killed during system testing by Bombardier Transportation, a member of the consortium that will ultimately operate and maintain the system. On April 15, 2003 the Port Authority Safety Board issued a report that stated:

*The investigation revealed that the combination of the lack of effective communication between the test supervisor and test personnel, the insufficient training of train operators, and the incomplete documentation of test procedure modifications created the circumstances that led to this accident.*<sup>70</sup>

The safety board emphasized that the accident was unrelated to construction or design, but rather was a function of problems with communications, training, coordination and management. Bombardier is implementing the report's recommendations and an Airtrain Safety Oversight Board has been created to oversee operational changes.

While fatal accidents are, unfortunately, all too common for large infrastructure projects (whether developed publicly or privately), this particular accident and the response to it highlights the fact that public sector owners bear a responsibility for ensuring safe operational practices even when operations are contracted out. The general public expects the public sector owner to shoulder responsibility for health and safety. In this case, the Port Authority suspended testing and commissioning operations, carried out a safety investigation, made recommendations to improve safety of operations by the contractor and created an oversight board to ensure compliance. The "risk" for health and safety has not been transferred to the contractor and the public sector owner will take on the costs of overseeing safety compliance.

## The British Experience

Finally, two British P3s highlight certain concerns about financing and coordination amongst contractors.

The **Croydon Tramlink**, a privately financed "off balance sheet" light rail project in South London, is facing serious financial difficulties due primarily to high levels of debt, significant operating losses and the financial crisis facing Amey, one of the lead companies in the consortium. According to the *Times of London*:

*Tramtrack Croydon, which was formed by a consortium led by Amey, the troubled support services company, had net debt of more than £100 mil-*

*lion... Tramtrack Croydon suffered a 34 per cent increase in pre-tax losses, to £9.47 million in the year to March 31, 2002, and its operating losses more than doubled to £1.58 million.*<sup>71</sup>

The **London Underground** P3 has generated considerable controversy for several years. It has been strongly opposed by the Mayor of London, Ken Livingstone, for amongst other reasons, the complexity of a variety of private companies being responsible for differing components of a vital public system. "Critics have called the PPP dangerous and incomprehensible. Operational contracts include 300 different formulas for measuring performance, with a complex system of attribution to determine who is at fault for every delay."<sup>72</sup> The London Underground is an example of what one P3 analyst termed the "mind-boggling contractual complexity" of many P3s.<sup>73</sup> Investors in the Tube Lines consortium are expected to make a 19 per cent return on equity.<sup>74</sup>

THESE ASSORTED RECENT EXPERIENCES WITH RAPID transit and airport rail P3s in other countries highlight that:

- Ridership projections are often faulty and can be a serious risk to the public owner or to the overall viability of a project;
- Risks for issues like health and safety may, in theory, be transferred to a private operator, but are in reality borne by the public owner, which must respond to public concerns about accountability;
- Many P3s protect private investors at public expense as a consequence of a contract structure that guarantees public payments despite project viability or ridership; and
- Some P3s feature great contractual and bureaucratic complexity that can diffuse accountability for operational problems.

TransLink and GVRD Board members should weigh these and other risks for taxpayers carefully before approving a P3 for the RAV. A first step should be full disclosure of financial analysis and the development of a public sector comparator. Insufficient due diligence on the P3 option has been undertaken so far.

# Recommendations and Conclusions

THIS PAPER HAS HIGHLIGHTED numerous risks of developing the RAV line as a P3. At a minimum, this study recommends:

- (i) The final financial feasibility study by PricewaterhouseCoopers should be released to the public immediately. At the very least, it should be made available to TransLink and GVRD Directors.
- (ii) Before any further consideration is given to issuing a Request for Proposals, the provincial Auditor General should be asked to develop an independent Public Sector Comparator.
- (iii) Ridership projections should be the subject of further independent review. Particular consideration should be given to the reasons for failure of ridership projections for similar projects in Australia and elsewhere.
- (iv) More detailed information should be provided to TransLink and GVRD Directors on the proposed sharing of major risks, such as tunnelling and ridership. The precise nature of the risks to be borne by the public owner should be explained in detail.
- (v) If a P3 is approved and a Request for Proposals issued, TransLink should ensure that consulting firms that have given P3 advice are not permitted to, in turn, be part of bid teams.
- (vi) Project timelines should be adjusted to allow for adequate review and due diligence before a decision is made to develop the RAV as a public-private partnership.

It is the finding of this paper, however, that the RAV line is not an appropriate fit for a public-private partnership of the sort proposed. Insufficient risks and costs are to be transferred to the private sector to justify the increased costs of a P3.

# Notes

- <sup>1</sup> According to a February 2003 report to Vancouver City Council from the Underhill Company, LLC, “It is our understanding from other staff that one of the Province’s requirements for agreeing to contribute to the project is that it be a Public-Private Partnership, with a private concessionaire responsible for design, construction, financing and operations.” See “Report to Vancouver City Council on the Richmond/Airport/Vancouver Rapid Transit Project: Independent Review: Phase 1”, The Underhill Company, LLC. February, 2003, p. 41. <http://www.city.vancouver.bc.ca/engsvcs/transport/rav/>
- <sup>2</sup> Rail rapid transit systems that are separated from the street by being underground or above the street are referred to as “grade separated.” “Partial” grade separation refers to a combination of some street level travel (e.g. through downtown) with grade separation in other sections.
- <sup>3</sup> “RAV Project Definition: Report on Financial Feasibility Executive Summary”, PricewaterhouseCoopers, February 2003, <http://www.ravrapidtransit.com/en/reports.php>
- <sup>4</sup> Richmond-Airport-Vancouver Rapid Transit Project, “Request for Expressions of Interest”, RAV Project Office, November 30, 2002, <http://www.ravrapidtransit.com/en/reports.php>
- <sup>5</sup> “Richmond-Airport-Vancouver Rapid Transit Project, “Peer Review/Value Analysis Final Report”, Bramcon Project Consultants Ltd., January 24, 2003, p. ii.
- <sup>6</sup> “Project Definition Report” Richmond-Airport-Vancouver Rapid Transit Project, Final Draft, February 2003, p. 56.
- <sup>7</sup> “Presentation to TransLink Board of Directors Workshop”, March 14, 2003, p. 5.
- <sup>8</sup> “PPP Review of RAV Rapid Transit Project”, Macquarie Group, December 2001.
- <sup>9</sup> “RAVP Project Definition: Report on Financial Feasibility Executive Summary”, PricewaterhouseCoopers, February 2003, p. 2.
- <sup>10</sup> This report does not attempt to address many of the other important issues facing decision makers about the RAV, such as technology, travel times or the project’s relative priority. It only canvasses aspects related to the proposed P3.
- <sup>11</sup> “Report to Vancouver City Council on the Richmond/Airport/Vancouver Rapid Transit Project: Independent Review: Phase 1”, The Underhill Company, LLC. February, 2003, p. 51.
- <sup>12</sup> “Project Definition Report – Final Draft” Richmond-Airport-Vancouver Rapid Transit Project, February 27, 2003, p. 62.
- <sup>13</sup> “RAVP Project Definition: Report on Financial Feasibility”, Executive Summary, February 2003, pp. 3, 5-6.
- <sup>14</sup> “Presentation to TransLink Board of Directors Workshop”, March 14, 2003; “Presentation to TransLink Finance and Audit Committee on the Proposed RAV Rapid Transit Project”, April 9, 2003; and interview with TransLink Director David Cadman.
- <sup>15</sup> “Report to City Manager from J.S. Belhouse, Director of Planning and Building re: RAVP/Northeast Sector Rapid Transit Alternatives”, City of Burnaby, April 23, 2003.
- <sup>16</sup> Ibid, p. 9.
- <sup>17</sup> Assumes a \$21 million financing cost from the Municipal Finance Authority (MFA) with semi-annual interest and principal payments at the current 25 year MFA public sector borrowing rate of 6.2 per cent.
- <sup>18</sup> “RAVP Project Definition Report – Final Draft”, February 27, 2003, p. 68.
- <sup>19</sup> TransLink Board of Directors Workshop presentation, March 14, 2003, “Additional Capital and Operating Costs”, p. 4.
- <sup>20</sup> “RAV Rapid Transit Service Optimization Study”, IBI Group in cooperation with Delcan and TSi Consultants, June 2002, p. 23.

- <sup>21</sup> “Transportation in Greater Vancouver: A Review of Agreements Between the Province and TransLink, and of TransLink’s Governance Structure – Part II”, August 2001. <http://www.bcauditor.com/PUBS/2001-02/Report2/sec3.htm#Work>
- <sup>22</sup> ”RAVP Project Definition: Report on Financial Feasibility, Executive Summary” PricewaterhouseCoopers, February 2003, p. 4.
- <sup>23</sup> “Report to Vancouver City Council on the Richmond/Airport/Vancouver Rapid Transit Project: Independent Review: Phase 1”, The Underhill Company, LLC. February, 2003, p. 48.
- <sup>24</sup> Ibid, p. 50.
- <sup>25</sup> “Innovative Finance”, Chapter 3, “Selective Use of Shadow Tolls – Comparison of Shadow Toll Financing to Other Methods”, U.S. Department of Transportation, Federal Highway Administration, 1999, <http://www.fhwa.dot.gov/innovativefinance/stchap3htm>
- <sup>26</sup> Ibid, p. 50.
- <sup>27</sup> “The P3 approach to financing transit projects will cost us more”, by Dr. Marvin Shaffer, Canadian Centre for Policy Alternatives, May 2, 2003.
- <sup>28</sup> Presentation to 1996 Council of Councils meeting of the GVRD, and “Going Private: The International Experience with Transport Privatization”, by Jose Gomez-Ibanez and John R. Meyer, The Brookings Institution, November 1993.
- <sup>29</sup> “RAV Project Definition: Report on Financial Feasibility Executive Summary”, PricewaterhouseCoopers, February 2003, p. 3.
- <sup>30</sup> “Proposed RAV Rapid Transit Project – Presentation to TransLink Finance and Audit Committee”, April 9, 2003, pp. 8, 23 and 26.
- <sup>31</sup> “RAV Independent Review: Phase 1 Report to Vancouver City Council”, The Underhill Company, LLC, February, 2003 p. 49.
- <sup>32</sup> “The Economics of P3s and Public Services: The Big Picture”, by Dr. John Loxley in “Assessing the Record of Public-Private Partnerships: Proceedings of a CCPA–BC Public Forum”, edited by Sylvia Fuller, April 2003, <http://www.policyalternatives.ca/>
- <sup>33</sup> “Proposed RAV Rapid Transit Project – Presentation to Finance and Audit Committee”, TransLink, April 9, 2003, pp. 26-27.
- <sup>34</sup> Ibid, p. 25.
- <sup>35</sup> Ibid. p. 24.
- <sup>36</sup> “RAV Rapid Transit Project Definition Phase Final Report on Ridership and Revenues”, Halcrow Group Limited with TSi Consultants, January 2003, pp. 149-150.
- <sup>37</sup> “Proposed RAV Rapid Transit Project – Presentation to TransLink Board Finance and Audit Committee”, April 9, 2003, pp. 14-15.
- <sup>38</sup> Halcrow/TSi, p. 127.
- <sup>39</sup> Ibid. pp. 23-24.
- <sup>40</sup> “Richmond-Airport-Vancouver Rapid Transit Project/Northeast Sector Rapid Transit Alternatives”, Report to City Manager from J.S. Belhouse, Director, Planning and Building, City of Burnaby, April 23, 2003, p. 6.
- <sup>41</sup> Ibid. pp. 6-7.
- <sup>42</sup> “Millennium Line Dispute Settled by Mediation”, Information Bulletin, B.C. Ministry of Transportation, December 14, 2001. [http://www.th.gov.bc.ca/bchighways/nr\\_2001/millenniumback](http://www.th.gov.bc.ca/bchighways/nr_2001/millenniumback)
- <sup>43</sup> “Lions Gate Project Budget Transparency and Accountability Act Disclosure”, B.C. Ministry of Transportation, December 5, 2001. <http://www.th.gov.bc.ca/lionsgateproject/lionsgateproject.htm>
- <sup>44</sup> “RAV Rapid Transit Project Peer Review/Value Analysis”, Bramcon Project Consultants, January 24, 2003, p. 2.
- <sup>45</sup> RAV Rapid Transit Project “Project Definition Report, Final Draft”, February 2003, pp. 64-65.
- <sup>46</sup> The *Boston Globe* newspaper has done an extensive series of articles on the budget problems of the “Big Dig.” A good summary article is “Ex-judge to review Big Dig contracts” by Sean P. Murphy, *Boston Globe*, January 24, 2003. That article plus links to the series can be found at <http://www.boston.com/globe/metro/packages/bechtel/archives/012403>
- <sup>47</sup> “The Channel Tunnel”, by Dr. John G. Lowe, Cost Studies III, Department of Building and Surveying, Glasgow Caledonian University, November 1999. <http://www.callnetuk.com/hom/johnlowe70/M339/M339D2.doc>

- <sup>48</sup> “1,000 trucks a day to clog Dublin streets because tunnel is too small, says study”, by Michael Lehane, *Irish Examiner*, March 10, 2003, <http://www.examiner.ie>
- <sup>49</sup> “Community groups seek an independent audit of light-rail plan”, by Chris McGann, *Seattle Post-Intelligencer*, Sept. 6, 2000, <http://seattlepi.nwsourc.com/local/audi06.shtml>
- <sup>50</sup> “Underestimating Costs in Public Works Projects: Error or Lie”, by Dr. Bent Flyvbjerg of Aalborg University, Denmark, *Journal of the American Planning Association*, July 2002.
- <sup>51</sup> “Capital Asset Management Framework”, Partnerships B.C. and the B.C. Ministry of Finance, May 2002, p. 40.
- <sup>52</sup> *Ibid*, p. 40.
- <sup>53</sup> *Ibid*, p. 42.
- <sup>54</sup> Untitled “Draft: Part One” Report on P3s for the RAV Rapid Transit Project, Macquarie Group, 2001, p. 57.
- <sup>55</sup> “Capital Asset Management Framework” p. 40.
- <sup>56</sup> “Transport for London, London Underground Public Private Partnership – Emerging Findings”, Deloitte and Touche Corporate Finance, July 17, 2001.
- <sup>57</sup> The Auditor General of Australia has recently outlined a comprehensive set of concerns and observations about P3s from an auditor’s perspective. See “Public Private Partnerships – Are there gaps in public sector accountability?”, by Pat Barrett, A.M., Auditor General of Australia, 2002 Australasian Council of Public Accounts Committees, 7th Biennial Conference, Melbourne, February 3, 2003, <http://www.anao.gov.au/website.nsf/Publications/CFO7591C2441E5E74A256CC5002309BF>
- <sup>58</sup> “Conflict taints bidding process for Abbotsford private hospital”, news release, B.C. Nurses’ Union, April 7, 2003, [http://www.bcnu.org/News%20Releases%202003/nr\\_030\\_2003.htm](http://www.bcnu.org/News%20Releases%202003/nr_030_2003.htm)
- <sup>59</sup> “Airtrain aiming to get back on track”, by Stephen Wisenthal, *Australian Financial Review*, August 8, 2002. <http://afr.com/specialreports/report2/2002/08/08/FFXCOT014D.html>
- <sup>60</sup> “Taxpayer became a passenger as debt-laden ghost train ran off the rails”, by R. Wainwright, *Sydney Morning Herald*, November 22, 2000.
- <sup>61</sup> “PPPs in South Australia: Partnerships, privatisation and the public interest”, by John Spoehr, Evatt Foundation, September, 2002, pp. 4-5. <http://vwatt.labor.net.au/publications/papers/63.html>
- <sup>62</sup> *Ibid*, p. 5 .
- <sup>63</sup> *Ibid*. p. 5 and column by Elizabeth Knight, *Sydney Morning Herald*, December 1, 2000.
- <sup>64</sup> “Airtrain aiming to get back on track”, by Stephen Wisenthal, *Australian Financial Review*, August 8, 2002.
- <sup>65</sup> Moody’s Investors Service Downgrades Rating of Airtrain Citylink Ltd. to Caa1 from B2. Outlook negative”, news release, Moody’s Investor Service, March 28, 2003.
- <sup>66</sup> “Melbourne Airport Rail Link not viable now”, news release, Victoria Department of Transport, January 18, 2002, <http://www.doi.vic.gov.au/airportlink>
- <sup>67</sup> “Rail usage doubted”, by Richard Pearsall, *Courier-Post Online*, April 23, 2001.
- <sup>68</sup> *ibid*.
- <sup>69</sup> “Hudson-Bergen Light Rail retains some of fall’s big jump in riders”, *Mobilizing the Region*, Tri-state Transportation Campaign, March 18, 2002. <http://www.tstc.org/bulletin/20020318/mtr35708.htm>
- <sup>70</sup> “Port Authority Safety Board Investigation of September 27, 2002 Airtrain JFK Accident”, The Port Authority of N.Y. and N.J., April 15, 2003. <http://www.panynj.gov/airtrain/>
- <sup>71</sup> “Tram project threatens to be PFI casualty”, *Times of London*, February 5, 2003.
- <sup>72</sup> “PPP heads Underground”, by Andrew Clark, *The Guardian*, January 1, 2003.
- <sup>73</sup> “PFI: beyond criticism, beyond debate?”, by Victor Smart, *Accounting and Business*, February 2, 2003.
- <sup>74</sup> “Tube Investors to make 19 per cent”, by Terry Macalister, *The Guardian*, January 9, 2003.

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