City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	February 25, 2002
From:	David McLellan General Manager, Urban Development	**File:**	6520-02-01
Re:	**Richmond/Airport-Vancouver Rapid Transit Study – Conclusions of Phase 2 Extension and Proposed Amendments to GVRD Liveable Region Strategic Plan Priorities**		

Staff Recommendation

1. That the Greater Vancouver Regional District be requested to revise the Liveable Region Strategic Plan by:

   (a) defining the Intermediate Capacity Transit System for the Richmond-Vancouver corridor to mean a rail transit system; and

   (b) amending the "bus lane" designation to Sea Island from this corridor as an integral part of this rail transit system.

2. That the Greater Vancouver Regional District Board be requested to rescind Resolution 8.3.2 of June 2, 1995, which identified priorities for regional rapid transit facilities; and that planning for and implementation of a rail transit system for the Richmond/Airport-Vancouver corridor not be tied to the completion or operation of other rail transit systems in the Greater Vancouver area.

3. That staff be directed to continue co-operation with all potential stakeholders in the early implementation of a rail transit system serving the Richmond/Airport-Vancouver corridor.

4. That the above recommendations be conveyed to the Greater Vancouver Regional District Board of Directors, the Translink Board of Directors and other agencies participating in the Richmond/Airport-Vancouver Rapid Transit Study.

David McLellan
General Manager, Urban Development

Att. 1

Staff Report

Origin

At the Council regular meeting held April 23, 2001, Council endorsed the overall conclusions and recommendations of Phase 2 of the Richmond/Airport Vancouver Rapid Transit Project as well as the following:

(a) That the extension of Phase 2 to conduct additional analysis be supported on a continued multi-agency basis, and that this analysis include further work by Macquarie Bank North America and the Project Director on the potential for a private-public partnership, including investigation of market and technical issues related to a possible Airport service, to be funded by TransLink and the Vancouver International Airport Authority.

(b) That City staff and the Project Director provide further updates to Council, specifically as to Macquarie's findings at the conclusion of the extension of Phase 2.

(c) That City staff continue to support the Project through participation on the Steering Committee and the provision of advice generally, on any issues which may have an impact on the City.

(d) That the Richmond Rapid Transit Public Advisory Committee be retained to continue to provide input following the Phase 2 extension.

(e) That the recommendations 1 - 5 be conveyed to the TransLink Board of Directors and the other agencies participating in the study.

This report presents the findings as directed by (b) noted above and suggests an approach for the revision of regional policy to facilitate early implementation of a rail rapid transit system for the Richmond/Airport-Vancouver corridor.

Findings Of Fact

1. Greater Vancouver Regional District Board of Directors Resolution

At a meeting held June 2, 1995, the Greater Vancouver Regional District (GVRD) Board of Directors adopted Resolution 8.3.2 regarding a report entitled "BC Transit Functional Studies of Rapid Transit Corridors" that included the following clause:

That the Board advise the Premier that ... the GVRD believes the initial objective for such a program should be build rapid transit facilities connecting Coquitlam Regional Town Centre, the Lougheed Mall area, New Westminster Regional Town Centre, Brentwood and Central Broadway (in Vancouver).

The resolution did not identify the Richmond-Vancouver corridor as a priority for rapid transit facilities (see Attachment 1 for the full text of the resolution).

2. Council Resolution

At its regular meeting held on November 13, 2001, Council considered a report regarding TransLink's funding options to address its forecast deficit and adopted the following motion:

That Council convey to the Board of the Greater Vancouver Transit Authority, the Board of the Greater Vancouver Regional District and the GVRD Planning & Environment Committee, that the Richmond light rapid transit line be given first priority for planning and implementation, not be tied to the completion or operation of the Millennium line, the Coquitlam line, or the Lougheed line, and that it be considered on its own merits and as the first priority regardless of the other lines.

3. Status of Rapid Transit in Greater Vancouver

The existing Expo SkyTrain Line provides a connection between Surrey and Vancouver via New Westminster and Burnaby (Metrotown). The completion of Phase 1 of the Millennium SkyTrain Line will provide for connections between New Westminster and Vancouver via Burnaby (Lougheed and Brentwood). Thus, all of the centres noted in the June 1995 GVRD resolution above will have rapid transit service except Coquitlam Regional Town Centre and Central Broadway (in Vancouver). Service to these two areas is being considered as Phase 2 of the Millennium SkyTrain Line. A rapid transit service between Richmond, the airport and Vancouver has not been identified as a near-term priority.

Analysis

1. Richmond/Airport-Vancouver Rapid Transit Study - Extension of Phase 2 Conclusions

Phase 2 of the Richmond/Airport-Vancouver Rapid Transit Study had two primary goals:

- to determine if there was a need to build a rapid transit connection between Richmond, the airport and Vancouver in the next 10 years; and
- to evaluate the potential to fund the line, including the possibility of private sector involvement.

With respect to the first goal, the Multiple Account Evaluation (MAE) cost-benefit analysis of the project, completed in April 2001, concluded that a rapid transit link should be built within the next 10 years. Macquarie Bank North America (MB) was retained to examine the potential of the project as a public private partnership (PPP) and completed its preliminary findings in April 2001. Phase 2 of the study was then extended to fall 2001 to allow further analysis of the PPP issue, particularly on the nature of the airport service. MB completed its work in December 2001.

The Project Team Report for the Richmond/Airport – Vancouver Rapid Transit Project is appended to this report in its entirety and this includes the Executive Summary of the PPP Review of RAV Rapid Transit Project as prepared by MB.

MB concludes that there is significant potential for the project to attract private sector investment provided the provincial government allows the commercial viability of the project to be

improved and develops new approval processes. Given TransLink's current fare structure, the projected fare revenue of the system would cover the operating costs and a small portion of the capital costs. The project would be more attractive to the private sector if the government creates a policy environment that allows the private sector to increase the financial viability of the project (e.g., charging premium fares for airport passengers) and ensures a direct subsidy. In addition, a predictable and transparent approval process for the private sector that allows for community input would be required as well as a willingness for government to vary its practice of selecting technology, specifying design and operating the system.

2. Existing Priorities for Regional Rapid Transit

Transport 2021, a 1993 joint study by the GVRD and the provincial government, identified three transit corridors, Richmond-Vancouver, Broadway-Lougheed and New Westminster-Coquitlam, that warranted capacity upgrades to Intermediate Capacity Transit Systems (ICTS) (see Attachment 2). Although the study concluded that the Richmond-Vancouver corridor had the highest anticipated ridership, GVRD policy subsequently established that the first priority for ICTS (i.e., SkyTrain or LRT) would be the completion of the T-Line that includes the extension of the Millennium Line east to Coquitlam and west to Central Broadway.

The priorities of the 1990s as reflected in the GVRD ICTS priority list, however, were to use transit investment to shape growth rather than respond to the service needs of the existing population. At that time, when the region did not have the financial responsibility for providing transit, it was reasonable to use these criteria.

3. Rationale for Revision of Priorities

The reality of the new millennium is that:

- the region is directly responsible for the financing of transit service;
- employment and housing growth has been stronger in the inner communities of the region rather than in the periphery; and
- bus system improvements are not a long-term substitute for a rail system that would feature a distinct and uncongested alignment.

The GVRD and Translink are faced with major reviews of land use and transportation policies for the region in 2002. The sustainability theme adopted for the review is pertinent and appropriate given the environmental, social and financial constraints we face as a region.

The City of Richmond can be proactive in this review by suggesting removal of regional policies that may not meet the criteria of sustainability. The policies and priorities for ICTS outlined in the Liveable Region Strategic Plan (LRSP) should be early candidates for removal and revision based on the tremendous change in circumstances since the middle 1990s. This action would enable a new evaluation process of proposed rail transit systems based on sustainability criteria. Staff therefore recommend that the GVRD be requested to amend the LRSP to identify the need for a rail transit system serving Richmond, the airport and Vancouver.

Unlike the Millennium Line to Coquitlam, which will require not only a total capital subsidy but also a substantial operating subsidy as well, a Richmond/Airport-Vancouver link should be able

to pay for its operational costs as well as a portion of its capital costs. The financial sustainability of the project is further improved by its potential as a PPP and the possibility of funding from the Vancouver International Airport Authority and the federal government as part of the 2010 Winter Olympics bid proposal. To facilitate the early implementation of a Richmond/Airport-Vancouver rail transit system, staff recommend that the GVRD Board be requested to rescind Resolution 8.3.2 of June 2, 1995. The project should be disconnected from other GVRD ICTS projects and each project allowed to proceed on its own merits in accordance with feasible financing strategies and travel demand characteristics.

Financial Impact

There is no budgetary impact at this time.

Conclusion

Based on its review of the potential of a Richmond/Airport-Vancouver rapid transit system as a public private partnership, Macquarie Bank North America concludes that there is significant opportunity to create a financially viable project that would attract private sector investment. The extent of private sector involvement and the success of the project as a PPP are contingent upon the willingness of the provincial government to allow the commercial viability of the project to be improved and to develop clear and predictable approval processes for the private sector.

Current GVRD policy does not identify the Richmond/Airport-Vancouver transit corridor as a priority for capacity upgrade to a rail-based rapid transit system. The forthcoming reviews in 2002 of the GVRD's Liveable Region Strategic Plan as well as TransLink's Strategic Transportation Plan present an opportunity to revise regional policies to reflect sustainability criteria and changed circumstances. Accordingly, staff recommend that the GVRD be requested to amend the LRSP to identify a rail transit system for the Richmond-Vancouver corridor, including service to Sea Island, and that development of the project proceed distinct from that of other rail transit systems in the Greater Vancouver area.

David McLellan
General Manager, Urban Development

DJM:djm

Richmond/Airport-Vancouver Rapid Transit Project

Project Team Report

Phase 2 – Needs Assessment/Concept Feasibility Conclusion

December 2001

Preface

Phase 2 of the Richmond/Airport – Vancouver Rapid Transit Project consisted of an assessment to determine whether there is a need to build a rapid transit line in the next 10 years and an evaluation of the potential to fund the line, including the possibility of a public/private partnership. In April 2001 the Project Team reported on the conclusion of the timing assessment. The April report included preliminary conclusions of the public/private partnership analysis. That work continued from May to September. This report marks the conclusion of that work, and the end of Phase 2.

Report Outline

The purpose of this report is to provide the member agencies of the Richmond/Airport Vancouver Rapid Transit Project ("RAV") with the findings of the Project Team at the conclusion of *Phase 2: Needs Assessment and Concept Feasibility.*

For reference, the goals and objectives of Phase 2 are included as Appendix 1[1]. The April report set out the conclusions of the cost benefit analysis, and addressed the need to pursue rail in the Richmond/Airport – Vancouver corridor by 2010. This report deals with implementation – and the potential for the project to be done as a public private/partnership (PPP). The analysis is contained in the report titled "*PPP Review of the RAV Project, December 2001",* produced by Macquarie Bank North America for GVTA. The Executive Summary of that report is included as Appendix 2.

This report reviews the regional context for rail in the Richmond/Vancouver corridor, outlines the merits and challenges of a public/private partnership for the project and recommends the next steps.

Outline of Report:

1. ***The Challenge***
   Why is transit an issue in this region and in particular in the Richmond/Vancouver corridor?

2. ***The Vision***
   A summary of the Region's vision and the implications for Richmond and Vancouver.

3. ***Current Trends***
   Are transportation trends in the Region moving toward or away from the vision? What are the implications for transit in the Vancouver/Richmond corridor?

4. ***The Role of Rail***
   The role of rail to address the transit need in the corridor.

5. ***Building Rail – the potential for a public/private partnership***
   The opportunity to build rail differently in the Richmond/Vancouver corridor.

6. ***Moving Forward***
   How to proceed.

7. ***Recommendations***
   Recommendations of the Project Team.

Appendices

1. Phase 2, Background, Goals and Objectives
2. Executive Summary: PPP Review of the Richmond/Airport – Vancouver Rapid Transit Project, Macquarie North America, December 2001

[1] Appendix 1 also includes the workplan outline for the extension of Phase 2, from Spring – Fall 2001.

1. The Challenge

Why is transit an issue in the region and in this corridor?

A north/south rapid transit link connecting Richmond and Vancouver has been discussed since the 1970s[2]. Higher capacity transit between Richmond and Vancouver has been regional planning policy for over 20 years[3]. It is an element of the *Livable Region Strategic Plan* (LRSP), the growth management strategy for the region, and of *Transport 2021*, the long range transportation plan for Greater Vancouver. It has been the subject of many studies dating as far back as the early 70's, all of which have reaffirmed the need to invest in a rapid transit connection in this corridor.

The overall goals of the LRSP are to help the region develop in a way that protects the natural environment, creates a high quality of urban life and supports a growing economy[4]. *Transport 2021*, the transportation component of the LRSP and other transportation studies have concluded that the region's success in achieving those goals will depend in part on increasing *transportation capacity and choice*[5]. Plans consistently show rapid transit in 3 trunk corridors – including Richmond/Vancouver - as a key element of this strategy.[6]

Many of the transportation and transportation demand management (TDM) initiatives contemplated in Transport 2021 have not been implemented. Recent surveys suggest that regional transportation trends and behaviour are not moving in the direction envisaged in the LRSP. Indeed, it appears that people are travelling more; the majority of commuters leave their municipality; vehicle ownership continues to grow at a rate higher than the rate of population

---

[2] In 1968 the GVRD, B.C. Hydro and the City of Vancouver commissioned the "Greater Vancouver Area Rapid Transit Study" (GVARTS), which recommended constructing a rapid transit line from Downtown Vancouver to Willingdon as a first start to a $300m system serving Vancouver, Richmond and Burnaby and a part of the North Shore. In 1970, the GVRD Board of Directors commissioned two follow-up studies, one of which was called "A Preliminary Study of Light Rapid Transit", which looked into light rapid transit for the two routes which were given priority by GVARTS: Downtown Vancouver- New Westminster and Downtown Vancouver – Richmond (Greater Vancouver Regional District Rapid Transit Project, Report 1, Figure 1-2). In 1972 the GVRD Board proposed an LRT system for Greater Vancouver. The Board again proposed LRT in 1975 as part of the Livable Region Proposals. (Greater Vancouver Regional District Rapid Transit Project, Report 1, p.1). In 1978, the Board of Directors of the GVRD began the Greater Vancouver Regional District Rapid Transit Project. Report 1 of the Rapid Transit Project recommends rapid transit be built first between Downtown Vancouver and Surrey, with a branch to Lougheed Mall area; the Downtown Vancouver/Richmond corridor was second priority. (Greater Vancouver Regional District Rapid Transit Project, Report 1, p.19).

[3] *GVRD Official Regional Plan*, 1980

[4] *2000 Annual Report: Livable Region Strategic Plan, p.4*

[5] For example, *Transport 2021, A Medium-Range Transportation Plan for Greater Vancouver*, 1993, p. 35

[6] As discussed in the April 2001 Project Report, most of the policy documents refer to "intermediate capacity rapid transit", defined to mean higher capacity transit, with a peak hour capacity of about 10,000 passengers (*Transport 2021*, p.39). As defined, the term technically includes busways (buses on dedicated rights of way) and rail. A number of earlier studies concluded that intermediate capacity busways would not provide the required capacity to serve the corridor over the long term, and that busways developed to capacity would have potentially large community impacts. Having reviewed these earlier reports, the Project Team discussed the issue with the Steering Committee. The Steering Committee concluded that in light of the earlier work, dedicated busways would not be evaluated as part of this project, and that an analysis of rapid transit would assume intermediate capacity rail.

growth; congestion is increasing; the rush hour is becoming significantly longer, and transit use, while not decreasing, is not increasing.[7] .

2. The Vision

A summary of the region's vision and the implications for the Richmond/Vancouver corridor.

The LRSP has four objectives:

- Protect the green zone
- Build complete communities
- Achieve a compact metropolitan region
- Increase transportation choice

The LRSP encourages the development of complete communities to support the public's desire for communities that offer "a wider range of opportunities for day to day life". These communities are focussed on "town centres" throughout the region[8]. The Plan contemplates concentrating jobs in town centres, creating opportunities to "live where you work", and providing effective transportation services between centres. By increasing transportation choice the region hopes to reduce the chronic dependence on the automobile, control congestion and limit the corresponding undesirable effects on air quality and the economy.

*Transport 2021*identified three "trunk corridors" to connect regional town centres. These corridors warrant upgrading to rapid transit systems with a capacity of about 10,000 passengers per peak hour, with regular peak and off peak service over a separate right of way. These corridors are: Richmond-Vancouver; Broadway-Lougheed and Coquitlam–New Westminster.

3. Current Trends

Are transportation trends in the region moving toward or away from the vision?

At the Richmond/Airport – Vancouver rapid transit project open houses held during the spring of 2001 and during the regional focus group discussions, the Project Team heard from the public that their day to day transportation experience is not improving. More often than not they travel outside their community to work; it takes longer and it's more unpredictable; they do not feel their transportation choices are increasing; they have noticed the improvements at the Airport and the development on the surrounding Sea Island and the increase in traffic; it takes longer to cross the Oak Street and Arthur Laing Bridges; they remark on the number of buses on Granville; they allow more and more time to get to the Airport.[9]

The recent findings of the1999 Greater Vancouver Trip Diary Survey conducted by the Greater Vancouver Transportation Authority (GVTA) generally confirm the public's anecdotal experience. This report begins with a brief review of demographic and transportation trends in the region and in the Vancouver/Airport – Richmond corridor, to provide a context for the discussion of future rapid transit.

Overall Transportation Trends

The GVTA's recent report *"Recent Trends in Travel Behaviour: Analysis of the Greater Vancouver Trip Diary Survey"* (September 2001) ("Trip Survey Report") summarized

[7] These trends are identified in 1996 Statistics Canada Census, Journey to Work Data, TransLink 1999 Screenline Survey and TransLink Trip Diary Survey, 2000; unless specifically noted, statistical references that follow are from these reports, as interpreted by TransLink's Strategic Planning Department

[8] *Livable Region Strategic Plan*, 1996, p.2

[9] *Richmond/Airport – Vancouver Rapid Transit Project Project Team Report*, April 23, 2001. *Appendix 6 "Summary of Open Houses, On-line survey and comments"* and *Appendix 7, "Summary of Focus Groups/Qualitative Research"*

transportation trends from trip surveys gathered between 1994 and 1999. This work and other recent studies have concluded:

Employment growth in the region is becoming more widely dispersed. Between 1981 and 1996 the concentration of jobs in the regional town centres identified in the LRSP fell from 44% to 37%.

The total number of trips is increasing. Between 1994 and 1999 total trips increased by 14.6 % from 4.8 to 5.5 million, considerably faster than the rate of population growth. Over 56% of people travel outside their municipality to go to work.

Transit supply is not keeping up with the growth in trips. Though increases in transit supply (10.8% from 1994 to 1999) are keeping up with population growth, the increases fall short of the growth in travel. Moreover, though the number of transit vehicle hours is has increased, so has the congestion in which they travel. The Trip Survey Report states: "Also, it should be noted that because of decreasing speeds of transit vehicles due to congestion, in practice, the carrying capacity of the system relative to the population may well have declined slightly."[10]

Transit ridership as a percentage of total trips is not increasing. The transit mode share increased only slightly from 10.2% to 10.3%.

Rush hour periods are becoming longer. In the 4 years between 1994 and 1999 the "rush hour" increased by almost an hour, and now lasts 3 hours; in the past 10 years, the average commute time increased by 1/3.

The Richmond/Vancouver Corridor

These trends exist in the Richmond Vancouver corridor, due in part to the employment and residential growth in Downtown Vancouver, Central Broadway, Sea Island at the Airport, and in Richmond.

In terms of employment and population growth:

- Downtown Vancouver is home to the biggest concentration of jobs in the region; it has 77,000 residents and over 130,000 jobs. The rate of residential growth has exceeded expectations and job growth continues. By 2021, 175,000 people will work in the downtown.
- The Central Broadway area in Vancouver continues to be the second largest regional employment centre in the region; by 2021, 70,000 people will work in this area; it is also home to major regional employers (e.g. Vancouver General Hospital – 7300 jobs in the VGH precinct alone).
- In Richmond, the population is expected to double by 2010 and job growth continues to be very strong.
- The Airport has experienced a dramatic increase in both passengers and employees. In the past 10 years, passenger traffic increased by 62% and cargo by 74%. YVR has become a significant regional economic engine.
- In 2000 the Airport generated more than 22,000 jobs on Sea Island – 20 years ahead of predictions.
- By 2021, employment projections for the Airport and Sea Island are expected to double to 40,000, making it one of the biggest employers in the region.[11]

[10] *Recent Trends in Travel Behaviour: Analysis of the Greater Vancouver Trip Diary Survey,* September, 2001, p.4

[11] YVR 2000 Economic Impact Study; the Study indicates that as of May 2000, direct employment at the Airport was 26,053; though the events of September 11, 2001 have negatively affected air travel, current predictions contemplate a return to pre-September 11 growth patterns over the next several years

As a transportation corridor, the Vancouver/Richmond corridor is one of the busiest in the region.

- in terms of total trips, about 1,000,000 people travel the corridor daily
- from 1994 - 1999 trips in the Richmond/ Vancouver corridor increased by 11%
- traffic volumes on the Arthur Laing Bridge were up 18% in the am peak hour over the same period
- in terms of bus passenger volumes – the Vancouver/Richmond corridor and Broadway to UBC are the busiest in the region by a very significant margin
- looking forward, Vancouver anticipates a 35% increase in trips to, from and within the downtown peninsula in the next 20 years
- there are no plans to increase road capacity – Vancouver's plans anticipate that all new trips to the downtown will be by transit, walking or biking.

The Transport 2021 vision to connect Surrey, Vancouver, Burnaby, the North East Sector and Richmond with rapid transit is not complete. As noted above, Transport 2021 envisioned rapid transit lines in the 3 trunk corridors (Richmond-Vancouver; Broadway-Lougheed and Coquitlam–New Westminster) by 2006. As of 2002, with the Millennium Line, the region will have rapid transit on ½ of NW-Coquitlam corridor and ½ of the Broadway-Lougheed corridor. The busiest of the three trunk corridors, Richmond/Vancouver, will not be served by rapid transit.

Economic Implications

One of the LRSP's overall aims is to guide the location of urban activities to create a high quality of urban life and support a growing economy.[14] Not completing the transportation infrastructure investments envisioned in the 1993 plan has had significant consequences for the liveability of the region, but also for the economy. In terms of the Richmond/Vancouver corridor, these consequences are particularly significant for the region's "gateway industries" – those industries comprise the people, services and infrastructure that connect passengers, goods and services to their destinations. Economic impact research compiled by the Greater Vancouver Gateway Council[15] indicates gateway industries are the source of 1 in 12 jobs[16] in Greater Vancouver. The research also notes that both the Airport and the Port have experienced unprecedented growth in international cargo and passengers in recent years. In addition to cargo growth, Vancouver Port has recently completed construction of a third cruise ship berth at Canada Place.

The corridor connecting the Airport and Richmond to Downtown Vancouver and Vancouver Port plays a critical role in the gateway growth strategy. Over 48% of Airport employees live in the Richmond/Vancouver corridor. Because of its proximity to the Airport and Fraser ports, many gateway industries are located in Richmond.

As Canada's western gateway, Greater Vancouver competes with Portland, Seattle, San Francisco and Los Angeles. Those cities are investing in transit infrastructure. In Portland and San Francisco rapid transit connections to regional airports are under construction. The Gateway

[12] 1999 Greater Vancouver Trip Diary Survey, TransLink

[13] Greater Vancouver Trip Diary Survey

[14] *2000 Annual Report: Livable Region Strategic Plan,* p.4

[15] The Greater Vancouver Gateway Council is the industry association that represents Gateway industries, including the Airport and Vancouver Port, both participating agencies in this study

[16] Economic Impact Overview of the Greater Vancouver Gateway, Gateway Council Secretariat, May 1996

Council has identified transit in this Richmond/Vancouver corridor – with particular emphasis on a connection to the Airport - as one of their infrastructure priorities.[17]

4. The Role of Rail

Where does rail fit in the vision for Greater Vancouver?

As noted above, in 1993 Transport 2021 named the 3 trunk corridors (Coquitlam/New Westminster; Broadway/Lougheed, Richmond/Vancouver) as candidates for higher capacity transit capable of moving about 10,000 people in the peak hour. The plan cites 3 primary factors in support of higher capacity transit in these corridors:

- Operational imperatives: without highercapacity transit, to meet demand, the region will require more roads and bridges
- Cost effectiveness: it's more cost effective to handle the volume of passenger traffic by rapid transit than by conventional bus
- Level of service: higher capacity transit would attract more riders, increasing transit's share of total trips

Of the three corridors, Richmond/Vancouver had the highest anticipated ridership, the highest total passenger kilometres and the greatest intensity of use in the peak hour. For those reasons, Transport 2021 concludes it to be the most efficient transit investment. These predictions were based on a lower rate of growth than has been the case in Richmond. In addition, it did not consider extending rail to serve Sea Island - nowas a fast growing employment node.

Generally, the role of rail is to provide increased capacity and higher ridership than the bus alternative. Higher ridership is generally attributed to shorter travel time, greater reliability and increased attractiveness of rail.

The following table compares the current 98B line bus service in the Richmond/Vancouver corridor with the projections for rail:

	98 B – line 2002	**98 B – line 2010**	**Rail 2010**	**Rail 2021**
Capacity (per peak hour)	2400	2800	15000+	15000+
Daily Ridership	22,000	32,500	107,500	137,000
Travel times	35-40 min.	42-50*	22**	22**

* Given the congestion trends in the past decade, this is an optimistic estimate
** Exclusive right of way

In addition to an overall increase in transportation capacity, rail in this corridor offers significant ancillary benefits. The cost benefit analysis that formed the first part of Phase 2 measured the other benefits of rail in terms of:

- *Maintaining* congestion.[18]

[17] Greater Vancouver Gateway Council, Major Commercial Transportation System, Gateway Council Secretariat, 2001

[18] It is unlikely rail will *reduce* congestion; international research has shown that to the extent rail attracts additional trips from adjacent highways, thus providing more highway space, traffic grows or reallocates itself to meet the available highway space.

- Creating a cleaner environment, both in terms of ground level air pollution and greenhouse gas (GHG) emissions – all modes of transportation produce 25% of GHG emissions from human activity – in Canada urban passenger transportation accounts for 30% of transport emissions.[19]
- Reinforcing compact development by concentrating development around corridors, nodes and neighbourhood centres.
- Supporting the economy by reducing the costs associated with growing congestion – currently estimated at $500m per year in Greater Vancouver.

5. *Building Rail – the potential for a Public/Private Partnership*

The opportunity to build rail differently in the Richmond/Vancouver corridor.

Phase 2 had two primary goals:

- To determine whether there is a need to build a rapid transit connection in the next 10 years
- To investigate the potential to fund the line, including the possibility of private sector involvement

The multiple account evaluation (MAE) conducted in the first part of Phase 2[20] reaffirmed the policy direction of Transport 2021 and the LRSP, and confirmed there is a need to build a rapid transit connection in the Richmond/Vancouver corridor next 10 years, and that a connection to the Airport was a justifiable addition to the primary Vancouver/Richmond line. In April 2001 the GVTA board confirmed that the development of a Richmond/Airport – Vancouver rapid transit link was a medium term policy objective.[21]

Investigating the potential for the private sector to partner with government was based on the observation that while all levels of government have a place in financing urban transportation, they are increasingly capital constrained. Elsewhere in Canada and in other countries the private sector has played an increasingly important role in the construction, maintenance and operation of transportation infrastructure. The involvement of the private sector, through public/private partnerships, has allowed the public sector to leverage its investment, lower its overall costs, transfer risk to private companies and access the benefits of innovation and greater flexibility in management and operations so often attributed to the private sector.

Following an initial investigation of the potential to involve the private sector, GVTA decided to retain an advisor to analyse the potential for this project as a public-private partnership. After a proposal call, GVTA retained Macquarie Bank North America (Macquarie). Macquarie conducted its early analysis concurrently with that of the Project Team and the consultants who had been retained to complete the MAE cost benefit analysis. Macquarie worked closely with the Project Team, interviewed participating Agencies, and reviewed and interpreted the data produced in the cost benefit analysis. Macquarie prepared a preliminary draft of their findings in April of this year. The early work was discussed with the participating agencies and it was agreed that further work, in particular on the nature of the service to the Airport, was warranted. Phase 2 was extended from late April 2001 to the fall of 2001. The additional work was funded equally by GVTA and the Airport. The Steering Committee (comprised of representatives from the 8 participating agencies)[22]remained in place to provide direction to the Project Manager and Macquarie.

---

[19] *A Strategy for Rail Based Transit in the GTA*, July 2001

[20] The details of the MAE analysis are contained in the *Richmond/Airport – Vancouver Rapid Transit Project Project Team Report*, April 23, 2001, and the *Multiple Account Evaluation Final Report*, April 16, 2001

[21] Meeting of the GVTA Board of Directors, April 20, 2001

[22] Transport Canada, Province of BC, TransLink, Vancouver International Airport Authority, Vancouver Port Authority, City of Vancouver, City of Richmond, GVRD

The Potential for a Public Private Partnership

MB has now completed its work. The draft report was circulated to the agencies for comment. The final report, *PPP Review of the RAV Project, Macquarie North America, December 2001* has been delivered to the agencies. The Executive Summary of the report is attached as Appendix 2.

Macquarie concludes that there is significant potential for a public/private partnership in this corridor. However, the partnership is likely to be restricted to design and construction and not involve an investment on the part of the private sector *unless government is prepared to go some way to improve the commercial viability of the project* (which may include providing a direct or indirect subsidy) and create new approval processes. Given the characteristics of this corridor and agencies involved, Macquarie believes that there is significant opportunity to create a commercially viable project that would attract private sector investment, and to develop an approval process that allows for community input, but provides a predictable, transparent process for the private sector.

This report does not repeat the Macquarie analysis. Based on the earlier conclusion that the region should pursue a rapid transit line connecting Richmond, the Airport and Vancouver in the next 10 years, and the Macquarie analysis, it argues that the agencies should decide now to pursue a public/private partnership to implement the line.

The spectrum of private sector involvement runs from at one end "construction only" to, at the other end, a project where the design, finance, construction, ownership and operation of the project is all done by the private sector. The level of risk borne by the private sector increases with its involvement. At one end, government designs the project and oversees construction – the private sector bears little risk. At the other, the private sector bears considerably more risk: risk of design and construction, risk associated with ownership of the infrastructure (including operations and maintenance) and risk of revenue from operations. This level of private sector involvement usually involves the private partner taking responsibility for some or all of the requisite approvals. As such it requires a specific approval process, one that provides a greater level of certainty than would be the case if the private sector's role were limited to construction.

It is reasonable to assume that the private sector will be involved in this project at some level. The extent of its involvement - where the project falls on the above spectrum, depends on three factors:

- The *financial viability* of the project – does it pay for itself; and if not, to what extent is government prepared to either: a. create a policy environment that allows the private sector to increase the financial viability of the project; or b. provide a direct subsidy
- The *willingness of government to vary its practice of selecting technology, specifying design and operating the infrastructure*
- The *willingness of government to provide a level of certainty in the government approval and community processes* associated with the project

Financial Viability

- Depending on whether the line operates on an exclusive or shared right of way, ridership in 2010 is likely to be between 66,000 and 100,000 people per day
- Using GVTA's existing fare structure, and not including other commercial opportunities (i.e. premium fares for Airport passengers), or opportunities to capture the benefits of the line (i.e. travel time benefits to drivers, or development opportunities – particularly on Sea Island and in Richmond) to contribute to the project, fare revenue will cover the operating cost and a small amount of the capital cost

- Under this scenario, there is very little return on the infrastructure investment - and as such no real role for the private sector to finance and own the infrastructure – the cost of building it would fall to government, though there may be a role for the private sector to design and build the line, or to operate it under a franchise agreement
- There may be significant opportunities for the government to create a policy environment that improves the viability of the project – for example, the ability to charge premium fares to airport passengers; or the ability to include some of the existing transportation infrastructure in the operation of the system, or implement "user pay" mechanisms
- The government may also wish to subsidise the project - to leverage its investment, and to achieve pubic policy objectives (e.g. complete the transit network; achieve greenhouse gas emissions targets; encourage compact development)
- Under this scenario, the private sector may be able to achieve a return on its investment, such that it may play a role not only in design and construction, but in financing, ownership and operation of the line
- If the private sector were to finance and own the infrastructure, government could transfer not only construction risk, but the revenue risk (i.e. ridership) to the private sector
- Government will never transfer all of the risk; given the nature of public transportation, and the imperative that it be available and affordable, there will always be an element of political risk

Willingness of Government to depart from past practice

Past Practice:

- Typically government, often through private sector consultants, designs transportation infrastructure
- In the case of rapid transit in this region the provincial government practice (i.e. the Expo and Millennium Lines) has been to select the alignment and the technology, the train operating system and the rolling stock without a tender; the selection is followed by a competitive tender for the construction of the guideway and stations; on project completion, government assumes ownership of the infrastructure and operates the train[23]
- While this model could be termed a partnership, it involves very little "partnering" with the private sector; the role of the private sector is restricted to construction of infrastructure to suite a very specific technology it does not assume any of the risk associated with the ongoing operation of the line, or whether it meets its objectives

Government may wish to vary its practice and pursue for this project a public/private partnership involving a competitive tender for the following reasons:

1. Overall Cost/Government Capital Constraints/Risk
2. Unresolved Technology/Alignment issues
3. Unique Characteristics of this Project
4. Financial Transparency

1. Overall Cost/Government Capital Constraints/Risk

- Macquarie's report refers to experience internationally and states that the overall cost of projects are often significantly lower for projects completed as public private partnerships

[23] In the case of the Province's Millennium SkyTrain line, the elevated guideway was constructed under what was termed a "design/build contract" but the SkyTrain system specifications restricts latitude for design innovation

- As outlined above, government is and will continue to be capital constrained[24] and may wish to leverage any investment with an investment from the private sector
- Government, particularly in light of recent megaprojects in this region, is risk averse; depending on the model, the opportunity to transfer design, construction and ridership risk may argue for a change in practice

2. *Unresolved technology issues*

- For the Richmond/Vancouver corridor, the issue of technology has not been resolved: though there appears to be consensus[25] that some form of rapid transit is desirable, within the rail category some believe a "light rail" technology would be preferable, others "SkyTrain" – or at least a largely grade separated system
- Leaving aside the merits of selecting technology in advance, government's past practice of doing so has fuelled the regional technology debate to the point that it will be very difficult for government to select *any* technology without significant opposition from segments of the planning community and the public; all sides will be supported by consultants' reports
- In addition, though there have been many studies, the debate between the Arbutus and Cambie corridors continues
- Other discussions are around the nature of the transportation problem: is it providing an alternative for commuters to and from downtown Vancouver and Richmond; or is it addressing a broader range of transportation trips; is the objective to extend the existing network, or to start a new one?
- These circumstances offer a significant opportunity for the private sector – through a competitive tender - to provide not only technical innovation, but to bring the debate about technology and performance criteria to a more practical level
- Macquarie notes that the selection of technology is closely linked to the selection of route; they recommend keeping the major technology (and possibly route) options open at this stage

3. *Unique Characteristics of this Corridor*

- The Richmond/Airport/Vancouver triangle has characteristics that make it a better candidate for a partnership with the private sector than other transit projects in the region
  These include:

  - A well developed, balanced corridor; the most intensely used of the three corridors identified in Transport 2021 – even at current fares, revenues would cover operating costs on opening day with a possible contribution to capital
  - A tradition of transit in the corridor; bus service, including the recently introduced 98B line, will reinforce transit patterns
  - Efficient transit use: ridership demand is strong in *both* directions; more people go from Vancouver to Richmond to work than the reverse; Richmond is unique in the region - more people travel to Richmond to work than leave it
  - The potential to serve a growing employment node on Sea Island which has the characteristics of a good transit market: compact development, located on an island with restricted road and bridge access, no opportunity to 'live where you work'
  - The potential for a premium airport service, requiring additional capital costs, but commanding a premium fare

[24] There is an argument that the government's cost of borrowing is less than that of the private sector; Macquarie's work suggests that depending on the risk allocation between the government and the private sector partner, the difference in the cost of funds is not significant.

[25] The GVRD has not yet taken a position on the Richmond/Airport Vancouver Rapid Transit Project

- Potential for significant innovations in route selection, technology and implementation which would result in costs below the (appropriately) conservative estimates in the MAE analysis

- As indicated above, Transport 2021 notes that "measured according to the goal of transportation efficiency alone, the Richmond-'Vancouver trunk transit corridor, ranks highest as a candidate for capital upgrade"; transit in other corridors, such as Coquitlam/New Westminster, serves other goals, such as shaping land use patterns – to the extent that private sector projects are driven by financial viability, the goals of transit in this corridor are better suited to a PPP model

4 Financial Transparency

- Funding transportation – particularly transit - is a problem in most urban centres
- Lack of funds creates debate about how much each mode of transit, or any given route – is subsidised; who subsidises whom; whether the tax paying community receives "value" for its investment
- The Macquarie report notes that given the scope of the project, it will likely require significant contribution from government and is unlikely to be viable as a wholly private sector project financed on a user pays basis
- Partnering with the private sector will necessarily involve setting a benchmark at which the project would be fully cost recoverable, such that it could be could be wholly financed by the private sector; this benchmark may be unacceptable from a public policy perspective
- There are good reasons (i.e. environmental, health and social objectives) for government to subsidise transit – but the quantity of that subsidy, and the policy imperatives that justify it, need to be clear
- Given that public funding is limited, and there are competing demands for public dollars, a clear understanding of the quantity and nature of the subsidy will facilitate a healthy debate about the tradeoffs inherent in this level of public investment

Willingness to Create Approval processes that Provide Certainty

- The SkyTrain projects in this region have been undertaken by a sole purpose government agency with significant legislative power, and exemptions from conventional approval processes
- Other GVTA projects, like the 98B line, have been implemented on a consensual basis, with necessary agreements negotiated between stakeholders
- Should this project proceed as a public private partnership, the private sector will be nervous about a muti-level consensual process; given the size of the project, the risk of delay and change in scope inherent in this process will likely discourage private sector partners
- Government will have to be willing to design and legislate an approval process that encompasses environmental approvals, land assembly, municipal permitting and bylaws, life safety requirements and extensive community consultation[26]
- To some extent, the requirement for certainty is in conflict with the natural tendency of government and the community to preserve flexibility in the process and to add elements to the process in response to community requests
- Other jurisdictions have tackled these issues successfully; the Maquarie report recommends a process which includes stakeholder and public consultation to develop a community and environmental impact assessment process which would follow a request for expressions of interest in the private sector

[26] Workshop meetings with municipal and Millennium Line project staff conducted as part of Phase 2 suggest that if the project were to be approved, staff at the Cities of Vancouver and Richmond could come to consensus on an approach that recognises the need for certainty.

- While in large part dictated by the private sector requirements, clear process is good process in any circumstance – and the region would likely benefit from legislation, developed with input from all levels of government and the community, which prescribes the process for large PPP projects, be they in transportation or another sector

6. *Moving Forward*

How to proceed

As indicated above, there seems to be consensus, supported by the MAE analysis, that rapid transit in this corridor is good policy, and, measured by efficiency alone relative to other corridors, a good transportation investment.

There appears to be potential to implement the project as a public private partnership. Clearly, further work is required to confirm the financial viability of the project, the nature, amount and availability of government subsidy, and the willingness of government to undertake a PPP approach to transportation projects.

Should the project proceed past this point, further work would involve discussions with GVTA, the Province, the Airport and Transport Canada regarding the viability of the project, its priority in the context of other regional transportation projects, the nature and extent of the financial commitment required from government, and the structure of approval processes. As such, the next stage does not mean an unequivocal commitment to the project. It does however, involve addressing key issues of government policy, and discussions with senior levels of government and the Vancouver International Airport Authority as to the extent to which they would be prepared to make a financial commitment. The outcome of this next stage would lead to a decision regarding whether to approach the private sector for a request for expression of interest.

Given that the next stage would involve substantive conversations with senior levels of government, the Project Team cautions against proceeding unless there is a clear commitment to the project, should it be financially viable. To that end, the recommendations to the participating agencies mark a significant decision point.

The recommendations of the Project Team is to proceed to the next stage for the following reasons:

1. This project is an opportunity to serve a large segment of the population and a growing part of the region with higher capacity transit.

2. Rapid transit in this corridor is a key, longstanding element of regional and municipal transportation policies.

3. The corridor is a critical piece of the regional transportation network; its contribution to the overall rapid transit network offers the potential to significantly alter the behaviour of the travelling public and orient the culture of the region toward transit.

4. This is a project that is well suited to Federal participation..
   - The federal government is committed to urban transit; the recommendations in the recent CTA review support investment by the federal government
   - The federal government funded a significant share of Phase 2, and has indicated its support for the project in principle
   - The Gateway industries – key economic generators – support this project (in particular they emphasize the importance of the Airport connection), and argue that it

will contribute positively to the economy and to Vancouver's role as Canada's western gateway; it is part of the Greater Vancouver Gateway Council's Major Commercial Transportation Network
- An investment of this nature will improve Canada's ability to compete with other western gateways that are making similar investments
- The Gateway Council's arguments are borne out by recent initiatives in Portland and San Francisco to build rapid transit to the Airport
- The project enjoys significant public support – and that support extends throughout the region, and within the affected communities
- While a rapid transit connection is clearly not necessary to accommodate Olympic visitors, the 2010 Olympic Bid may provide an opportunity for a federal financial contribution to this project.

6. Though the work undertaken as part of this study did not involve a comparative analysis of the suitability of a PPP approach, it is reasonable to conclude that given its comparatively high ridership, this Project may be better suited to a public private partnership than other transit priorities in the region.
   - The Province has indicated its support for public private partnerships to implement transportation projects; this may be a good candidate
   - There may be an opportunity to pursue the next aspects of this project jointly with Provincial staff

7. The Project has the potential to attract more than one investor.
   - The Airport has indicated its willingness in principle to commit capital to the project
   - Transport Canada has acknowledged the federal nature of the project, and its ongoing interest
   - The potential exists for the private sector to invest
   - Although it is too early in the process to qualify the level of government commitment that may be required the ranges discussed in the Macquarie work, while large, are not beyond possibility, particularly when paired with commitments from the Airport, and, depending on the PPP model, an investment from the private sector

8. While there are significant challenges for the Project, those challenges are likely to become more rather than less significant over time.
   - Governments are not likely to have more capital
   - Affected communities are not likely to be less sensitive
   - The Project will not become cheaper
   - There will always be a difference of views about technology and alignment

9. At some point, reality begins to encroach on, and impair the credibility of the vision; if Government and the people of the region do not intend to proceed to implement the regional and municipal transportation plans, they should consider formally amending them.
   - The existing City of Vancouver Transportation Plan and the almost complete City of Vancouver Downtown Transportation Plan both contemplate rapid transit in the Vancouver/Richmond corridor
   - The LRSP assumes rapid transit in this corridor by 2006, as does Transport 2021, the transportation component of the regional plan[27]

If the decision is to not to commit to the next stage, the Project Team cautions against commitments to further planning resources to the project, unless or until the factors listed above

[27] As noted earlier, regional policy refers to ICTS technology and does not include a connection to Sea Island

(financial viability, availability of government capital, willingness to depart from past practice and a willingness to address the approval process) become significantly more favourable.

7. Recommendations

The Project Director recommends to the Steering Committee that:

1. The Phase 2 public/private partnership analyses and the report of Macquarie North America be referred to participating agencies for consideration.

2. The Phase 2 work, in particular the Multiple Account Evaluation and the report of Macquarie North America, be referred to the GVRD for consideration in the forthcoming review of the Livable Region Strategic Plan (LRSP).

3. Noting that current GVRD policy includes "Intermediate Capacity Rapid Transit" between Richmond and Vancouver, the GVRD specifically consider as part of their review of the LRSP:

    a. Including as regional policy the development of a link to Sea Island as part of any Richmond/Vancouver rapid transit connection;
    b. Defining "rapid transit" for the Richmond/Airport/Vancouver corridor to mean "rail" transit, rather than using the term "ICTS" or another defined term that includes a high capacity busway.

4. Noting that to date the Province has participated in the Project as an observer, the Phase 2 work be formally presented to the Province.

5. GVTA and the Airport (in collaboration with Transport Canada) ask the Province to develop a legislative framework for PPPs and in particular to consider how the framework could facilitate the use of this mechanism for transit projects of this type.

6. The appropriate authorities be informed that to the extent the Project is under consideration as one of a series of projects for the 2010 Winter Olympics, construction of the Project would have to begin no later than 2004 to be completed by 2009. Elements of the first phase of the project* would have to begin as soon as possible and include:
    - investigation of financial issues;
    - development of service specifications and community requirements;
    - development of PPP processes, including consultation with other governments who have experience with PPPs in transportation;
    - public and stakeholder consultation on service specifications, financial proposals and environment and community impact review processes.

*This work would take between 6 and 9 months. If a satisfactory financial package is achievable, work to finalize the PPP process would take place through 2003, with a decision to approach the private sector in terms of an Expressions of Interest being made in mid 2003.

Phase 2 Goals and Objectives

The Management Plan[1] provides that in Phase 2 the Agencies will assess, in consultation with the community, whether there is a need to build a rapid transit connection between Richmond, the Airport and downtown Vancouver in the next 10 years. The plan further provides that the Agencies will investigate the potential to fund the line, including the possibility of private sector involvement. If a decision is made to pursue development of a rapid transit line in the corridor, Phase 3 will involve defining the requirements for a line, perhaps including private sector participation through a competitive bidding process.

The specific goals for Phase 2 are as follows:

Needs Assessment

With respect to the objectives that relate to the question of the needs assessment/concept feasibility, the Management Plan outlines the objectives as follows:

1. to define need including:
   - ridership demand factors (including air/sea passenger and freight traffic)
   - congestion issues in relation to regional land use policy objectives
   - development opportunities
   - key linkages with regional transportation system
2. summarize the results of the needs assessment
3. verify with Agencies and the public, through consultation, whether support exists for construction of a rapid transit line in the next decade
4. identify the general requirements for a rapid transit line to a level necessary for a needs assessment and feasibility including:
   – corridor and technology options
   – public realm design considerations/imperatives/mitigation strategies
   – potential future extensions
   -- overall cost estimates

Private Sector Involvement

The Management Plan includes as a goal of this Phase, exploring and defining structures for potential private sector participation.

Public Sector Funding

The Management Plan includes as a goal of this Phase, an investigation of the potential to fund a rapid transit connection. The potential to involve the private sector and the potential for public sector funding are interrelated. The extent of government contribution that would be required for a rapid transit line is in part a function of the amount and terms on which the private sector would be prepared to invest in the project.

[1] *Richmond/Airport – Vancouver Rapid Transit Project Management Plan*, September, 2000, p.2-3

Richmond/Airport – Vancouver Rapid Transit Project

Phase 2A; May – September 2001

1. Report

Deliverable: final report for public and stakeholder dissemination

- Initial comments (March 1 draft) from staff at various agencies — Week of June 18
- Staff workshop to discuss comments/ response — Week of July 9
- Potential broader workshop involving elected officials — Week of July 16?
- Report revisions; accompanying staff report
- Preliminary public consultation plan

2. Airport Service

Deliverable: preliminary principles for the Airport service (noting some issues may not be resolved)

- Discussion of following issues, and resolution where possible
  - Airport financial contribution (incremental cost of Airport service)
  - Parking policies
  - Employee versus passenger service
  - Service frequencies
  - Nature of link to Richmond
  - Dedicated rolling stock/express service
  - Downtown check-in
  - Fare levels

3. Airport Demand Model

Deliverable: concept for Airport demand model

- Develop concept for Airport demand model incorporating
  - Airport employees
  - Aircrew
  - Business passengers
  - Leisure passengers
  - Cruise ship passengers
  - Meeters and greeters

- Identify
  - Size of total market
  - Size of transit eligible market
  - Parking factors; daily to annual conversion factors
  - Value of time based mode diversion factors
  - Other than VOT diversion factors
  - Fare elasticity
  - Average group sizes travelling together

4. Airport Premium service

Deliverable: report on results to agencies; preparation of appendix to report

- On iterative basis in conjunction with development of Principles and Demand model, investigate market and technical issues associated with service and discuss with other agencies
- Issues include: compatibility with commuter service; ability to accommodate revised services at different frequencies; need for bypass tracks, if any

5. Fare Analysis

Deliverable: technical memo for submission to TransLink, with comments from Project Director

- Review of fare level, structure and likely elasticity affecting TL network for consideration by TL
- Review fare level and structure issues from North America and Europe to place Lower Mainland in international context

6. Review of RAV trip generators

Deliverable: Memo to Project Director and private sector view of ridership potential from existing an identified future trip generators, including implications for station locations and refinements to existing traffic zone model

*** attempt to identify preferred downtown route

- review proximity to commercial/tourist and residential trip generators
- assess potential impact on ridership for commuter and airport services
- identify and discuss synergies/overlap with convention centre and proposed Port land developments
- review trip expansion factors with particular view to Oakridge; VGH

7. Approval Processes

Deliverable: documentary collection of approval processes from other jurisdiction and memo to Project Director with respect to possible structures that may have some applicability here

- Assembly and review of other processes
- Discussion with other agency staff re their agency's involvement in any approval process

MACQUARIE

1. WHAT IS A 'PPP' ?

...accessing private finance for development of public infrastructure ...

Public Private Partnerships (PPP's) are a way of the Government accessing private finance for development of public infrastructure and provision of public services. With the application of PPP's increasing over the last decade, they are now widely acknowledged by both the private and public sectors as a way of drawing on the expertise of both groups to provide a long-term mutual benefit.

PPP's have been implemented by Governments throughout the world under a variety of different models with a variety of different names. However the underlying key principles have remained the same:

- Increased transfer of risk to the private sector;
- Improved cost effectiveness in the delivery of the project;
- Increasing level of 'user pays' in the community;

PPP's were first initiated in their current form by the British Conservative government in 1992 – then labelled the Private Finance Initiative (PFI). The objective of this initiative was to deal with the shortage in funding that the then Government was experiencing without having to increase the level of public sector debt.

Since then the PFI, now relabelled as PPP, has gained bipartisan support and despite the improved financial position of the British Government and the election of a labour Government, it is continuing to be used as a means of financing public infrastructure and services. While initially PFI's where focused primarily in the transport sector (up to 85%), PPP's are now being used more broadly to fund social infrastructure projects as well.

PPP's in Transportation

Traditionally, governments have invested directly in roads and transit systems, and operated them as part of government. However, since the early 1990's, many governments have adopted models where the private sector funds, designs, builds, and operates roadways and transit systems. This practice is widespread in England, Australia, New Zealand, and Asia, and is becoming more common in North America.

Canadian Government's have also demonstrated a growing interests in PPP's over the last decade. The following table outlines some examples of PPP's in Canada over the last decade.

FIGURE 1

Project	Comments/Issues
Charleswood Bridge (Manitoba)	• New 152 metre bridge over Winnipeg's Assiniboine River (and associated roadworks) – $15M in capital costs
1994	• Bridge awarded on a design, build, finance, own, maintain, transfer basis – City of Winnipeg to make annual ascending lease payments under a 30-year lease
	• Objective was to avoid increased debt, accelerate project completion and identify innovative solutions – City estimates delivery (in 1995) was 2 years faster and $1M less expensive than if government procured

PPP Review of RAV Rapid Transit Project **Executive Summary – December 2001**

Project	Comments/Issues
Confederation Bridge (Prince Edward Island/ New Brunswick) (1987)	• New 12.9 km fixed link bridge over Northumberland Straight between PEI and New Brunswick - $730 million in direct construction costs • In response to three unsolicited bids for bridge-tunnel solution in 1985-1986, Federal Government issued a Request for Expressions of Interest in 1987 seeking innovative designs that would provide long-term fixed link • 35-year agreement for the design, build, financing and maintenance of the Confederation Bridge awarded in 1993. At end of contract, bridge transferred to Government for $1. Construction completed in 1997 • Government pays annual lease payment of $41.9M (1992 dollars) escalated at 75% of CPI – equal to previous ferry subsidy. Operators able to collect tolls. Lease payments securitised for $660 million and toll revenues for $328 million
Fredericton-Moncton Highway (New Brunswick) (1998)	• Province recognized need to build and finance a new 195 km highway faster than through traditional methods • Not-for profit project company set up to manage and operate the FM-Highway – design/build and operating agreements with private sector • Financed through $540M securitisation of Provincial lease payments and $150M of toll-based debt • Tolls were removed in 2000 – payments based on traffic count are now paid to project company to service toll-based debt – excess payments are returned to Government • Structure now on Province balance sheet because of absence of significant risk transfer
Hamilton International Airport (Ontario) (1996)	• City of Hamilton sought public-private partnership to eliminate operating development and develop airport which was operating at a loss • In 1996, selected a private consortium (incl. a YVR subsidiary) to lease, operate and maintain the airport – one of few privately operated airports in Canada • The airport now operates profitably with a profit sharing agreement with the City • The private sector has been responsible for over $17M of new capital investment
Highway 104 (Nova Scotia) (1997)	• Province needed to build a safe 45-km by-pass on the TransCanada Highway (the Cobequid Pass) faster than would be possible with public sector delivery • Design, build operate (toll system) awarded – project built for $113M, $10M less than if built using traditional methods • Off-balance sheeting financing of not-for-profit entity responsible for collecting tolls, operations and maintenance. Federal/Provincial Governments each contributed $27.5M and $5.5M of subordinated debt was provided by the Sydney Steel Corporation pension fund
Highway 407 (Ontario) (1993 and 1999)	• In 1993 the Province issued an RFP seeking mechanisms to build the 69-km highway more quickly, cheaply and with lower risk to the taxpayer • Highway 407 Central was to be designed, built, financed by toll revenues, operated and maintained by the successful bidder over a 35 year concession period • However, both consortia requested limited government guarantees to backstop the financial risk presented by the uncertainty of the traffic forecasts. Also, the Canadian financial markets had no experience in financing projects of this type • As a result, the Province modified the franchise to a design, build, operate and transfer scheme with the financing responsibility retained by the government • This meant that the financing, traffic and revenue risks remained with the government • In 1999, the Province sold a 99-year concession for Highway 407 central, together with

Project	Comments/Issues
	the right/obligation to make 39-km of extensions for $3.1B

There are many models which may be adopted for the implementation of a PPP. At one end, the private sector may provide all or most of the funding, and absorb major risks associated with the project – construction costs, delays, lower than projected revenue, higher than expected operating costs. At the other, the private sector's role may be limited to designing and building a facility within broadly specified parameters and operating for a fixed income. In the middle, a private contractor may take the risks of design, construction, and schedule, but be guaranteed revenues sufficient to cover the bid cost of the project and subsequent operations.

Why do Government's Use PPP's ?

...involvement of the private sector can deliver the Government & the community value for money through risk transfer ...

The rationale for a public-private partnership usually results from:

- a shortage of government funds
- a desire to obtain the benefits of private sector project management;
- transfer of risks to private companies; and
- greater flexibility in management and efficiency in operations enjoyed by the private sector.

Private sector involvement has the potential to manage many of these issues and bring significant cost and risk allocation benefits to the provision of public transport.

International experience has proven that the involvement of the private sector in the delivery of public infrastructure can deliver the Government and the whole community value for money through the transfer of risk – particularly the risk associated with ridership levels – innovation, and project delivery responsibility.

Private sector efficiencies in the provision of infrastructure are largely a result of better project management through an increased commercial focus, increased flexibility and better ability to perform long-term planning. At an employee level, the private sector performs the same work at the same level as the public sector. However, private sector employees often benefit from a different set of incentives and improved access to resources.

London Underground

London Underground originally estimated that a PPP for the provision of infrastructure would deliver 30-40% savings, resulting from:
- Steady funding (and improved planning or capital renewals);
- Design and technical innovation efficiencies;
- Whole life costing and value management;
- Reduction in over-specification of engineering standards and changing output requirements;
- Better maintenance access efficiencies.

Other benefits of the PPP include:

Commercialisation of revenues – the private sector often provide a much keener focus on developing commercial opportunities associated with the project.

Access to capital – Government funds are usually limited. PPP's provide an alternative funding source.

Accountability and on-time delivery – PPP's allow the Government to penalise the private sector when they do not met the contracted timeline or budget.

Cost of funds – the cost of the private sector funds reflect the full risk associated with the project.

MACQUARIE

MACQUARIE

2. WILL A PPP WORK FOR RAVP ?

There is a growing acceptance of PPP's in Canada by both the private and public sectors.

Canadian PPP's have been largely aimed at faster delivery, reduced capital costs and improved commercial focus relative to public sector delivery. These benefits have been realized in several PPP's throughout Canada including with the construction of the Confederation Bridge. This project saw the delivery a new 12.9 km fixed-link crossing of the Northumberland Straight for the same cost as the pre-existing ferry service. In addition to this a number other of significant infrastructure projects have been delivered faster and for lower cost than expected public sector delivery costs.

Ontario's Highway 407

Construction of Highway 407 demonstrated the level of increased acceptance in the private sector of project risk. In 1993 when the project was tendered the private sector was not willing to take full traffic risk. When the project was retendered six years later the private sector assumed full traffic and financing risk for the $3.1 billion, 99 year franchise.

The Macquarie analysis has demonstrated that the RAVP displays strong characteristics supporting a PPP delivery mechanism. This is based on the following findings:

- ability to meet all operating costs from farebox;
- strong potential for premium services (such as a specialised airport service) to cross-subsidise other elements of the project);
- potential for innovation in route and technology selection and implementation;
- comparatively few government or institutional constraints on private sector involvement;
- significant capital cost recovery potential through farebox revenues and potential associated commercial benefits arising from the project;
- economic justification for government capital cost support or other forms of contribution;
- potential for private sector cost of capital to come close to public sector cost on an appropriate risk transfer basis; and
- potential for significant construction, maintenance, operations and financial risk transfer to private sector.

...the RAVP displays strong characteristics supporting a PPP delivery mechanism ...

The demand for the transit service offered by the RAVP by residents and daily commuters along the corridor would be significant with the project relieving a current capacity constraint in the regional network. This level of demand combined with the potential to also serve the increasing number of airport employees, as well as airport passengers are key elements that suggest a PPP may be suitable for this project.

In addition, this corridor provides unique opportunities to take advantage of a partnership with the private sector:

- Strong overall demand for the transit service in both directions (note – the majority of trips are regional commuters)
- Strong ridership and fare revenue
- Potential for innovation in technology and route selection
- Significant community support
- The opportunity for a premium fare for Airport passengers – increasing overall revenue and cross subsidizing the commuter service

- Other funding partners (e.g. the Airport)

While some government subsidy will be required for the RAVP under a PPP model, the above mentioned characteristics suggest that the private sector would be prepared to make a significant capital investment and accept a reasonable level of risk.

However, it is important to note that worldwide experiences have shown that although there have been some significant successes in PPP delivery of urban passenger rail, there have also been some relative failures. The single largest cause of the projects which have not been successful has been an inappropriate allocation of risks between government and the private sector. Having introduced advice on PPP models at such an early stage and having a relatively high degree of flexibility, TransLink and the other agencies have the opportunity to properly assess the project and allocate risk appropriately.

Key features of the RAVP

A Richmond – Vancouver rapid transit connection has been part of regional planning for some time. It is a key piece of the long – term integrated rapid transit system envisioned for the region.

The Richmond/Vancouver corridor is one of the busiest in the region. Over 1 million people travel it daily with growth in this figure expected as Vancouver, Richmond and the Airport all continue to experience significant growth in residential and employment populations.

The proposed RAVP will provide a much needed transit link in the regional network connecting some of the fastest growing economic and social centres in the region – principally Richmond, the central Broadway area and the downtown peninsula. Between each of these centres the corridor will pass through and service several growing residential areas including False Creek North, providing the much needed transit links for these communities to these centres of employment and general community activities.

Transit usage in this heavily populated corridor is already high with communities being served by local and regional transit services. However, the continuing growth means increasing pressure on the north/south corridor.

Looking forward, Vancouver anticipates a 35% increase in trips to, from and within the downtown peninsula in the next 20 years. The capacity of the current transit services and road network to cope with this are limited by finite road space and increasing traffic congestion. There are no plans to expand road access. Vancouver plans see virtually all new trips into the downtown peninsula being by transit, walking or biking. Trips to Richmond and the Airport are predicted to increase significantly as these destinations continue to grow.

A rapid transit line connecting Richmond, the Airport and Vancouver would be a significant expansion to the overall regional transportation network. Building this train connection would provide a faster more direct service to these growing concentrations of employment.

The development of a public transit service along the Richmond – Vancouver corridor has been acknowledged widely in the community as a priority.

For the City of Vancouver it provides much needed transit services into the rapidly growing downtown area of the City and an alternative to car use in the City area. As noted above the City's Downtown Transportation Plan is no increase in automobile trips into the downtown – the Plan contemplates rapid transit in the Vancouver Richmond corridor.

The City of Richmond has identified the project as a key element in achieving and supporting increased development in the area, particularly the town centre, and reducing the car dependency of the area.

For the Vancouver International Airport Authority the project will provided much needed transit services for the 20,000 employees who work on Sea Island and increase the transit mode share to the airport. The potential to serve growing numbers of airport passengers is also of interest to the airport.

It is important to note that, though significant, Airport commuters remained a relatively low proportion of the user group, with the line being used primarily as a daily commuter transit corridor to and from Vancouver and then to and from Richmond. As each of these centres experience continuing residential and employment growth in the coming years, demand for this service will continue to increase.

As noted in Part Two of the Report, the strong transit demand for this project will mean that the project will be able to recover tall of the estimated operating costs, as well as some of the projects capital costs through the fare box revenue. While Macquarie believes that as a result of the projects projected revenue stream there is a significant opportunity for a PPP, the report does note that a Government contribution will be required either in the form of an up front capital contribution, an ongoing operating subsidy, enhanced commercial opportunities or a combination of each. The way in which the Government chooses to provide the required financial assistance to the project will be the subject of further detailed consideration by the Government given the significant policy and financial implications.

3. DEVELOPMENT OF AN AIRPORT RAIL LINK

The primary purpose for the development of the RAVP is to provide a much needed commuter transit system to the economic and residential centres of Richmond and Vancouver. This is supported by the ridership forecasts that have been developed which demonstrate that by far the largest share of the ridership on the RAVP will be commuter journeys to and from downtown Vancouver and Richmond.

However in developing this corridor as a PPP and ensuring maximum involvement from the private sector, the development of a link into the Airport has been examined. Inclusion of the Airport Link in the corridor development provides the government with the opportunity to capture the commercial elements of the proposal, making it more attractive as a PPP, while also providing a commuter service to the growing employment centre at Sea Island.

In considering the potential development of the link into Vancouver Airport, Macquarie undertook a review of international experience on airport rail links.

Airport Rail Lines – International Experience

In developing the report Macquarie has undertaken an extensive review of airport rail links world wide and an analysis of the reasons resulting in their individual success or failure. While the comparison may be useful each of these projects has a unique set of characteristics, resulting in differing ridership results.

Three general factors become apparent from an analysis of international airport rail experience:

- there is a correlation between journey time savings and mode shift, – this typically equates to higher mode shares for airports located further from downtown/trip generators as rail tends to be fastest means of transport over distance. Express services are therefore preferable than stopping services;
- providing the lowest cost means of transport to the airport is not necessarily a driver for mode share, especially where the airport is relatively central and therefore the actual dollar cost differential is less significant. In fact, in the longer distance and most successful cases a fare above that of competing dedicated coach services is achievable; and
- the most successful airport links are those based on the provision of a premium express service – Hong Kong, London Stanstead, Oslo and Sweden. The least successful are those that form part of a regular urban passenger service, with no special features – for example Sydney Airport Link.

Providing a Premium Airport Service

A Premium Rail Service to the Airport on the corridor would include additional features accommodating the needs of airport users such as differentiated rolling stock, specially designed stations, downtown check-in facilities and high reliability of travel time and arrival time.

The Macquarie analysis concluded that a Premium Service can be created at a relatively marginal additional expense.

The Macquarie analysis also showed that there is likely to be strong demand for a premium rail service to the Vancouver Airport which offers a high degree of reliability, convenience, reduced travel times and avoids road congestion and other environmental influences.

Deciding what level of service to offer passengers, and for what fare, involves a complex range of commercial and technical decisions. In addition, because the market for " airport passengers" is a specialized market, significant research will be required. Macquarie is of the view that it is possible to capture some of the passenger market for a premium fare that could cross subsidize the commuter service. Government could use the private sector to help it to define the level and nature of Airport passenger service. Clearly both government and the Airport Authority will need to work closely with the private sector in finding the solution that suits the circumstances at the Airport and on Sea Island - bearing in mind that the Richmond/Vancouver service is by far the primary movement to be serviced.

Macquarie's view is that optimising the costs and revenues for the Airport service can be best determined by involving the private sector through a tender process. However this will need to be undertaken in close consultation with Government and RAVP stakeholders (especially YVR), to ensure that service objectives are met.

4. WHAT MODEL SHOULD BE USED TO DELIVER A PPP ?

...the projects commercial viability will have a significant impact on determining the most appropriate model...

There are a variety of models appropriate to the circumstances of the RAVP and consequently a high degree of flexibility in selection of the preferred model. Few absolute constraints have been identified by Stakeholders in selecting and developing the most appropriate model. However the projects commercial viability will have a significant impact on determining the most appropriate model.

In determining the appropriate scope and structure of the PPP for the particular project Government's must consider:

- What is the preferred delivery option, ie: the bundling of different elements of project delivery into a single contract.
- What physical and functional components of the project are to be under private sector ownership and control (ie: stations; infrastructure; rolling stock); and
- What network components are included in the PPP (eg: the airport and commuter elements of the project and the existing system).

There is a substantial overlap between these different scope elements. The type of PPP that is implemented in many instances is determined largely by the type of the role the Government choses to assume and whether the Government is required to provide an upfront or ongoing contribution to the project.

The Macquarie analysis has considered in detail the most effective PPP structure that can be established specifically for the RAVP, in which risk allocation is clear and private sector involvement is optimised, but not necessarily maximised.

Potential PPP Models for RAVP

Outsourcing of Delivery and Operational Risk

Multiple Account Evaluation ("MAE") analysis suggests the direct Project cash flows would not support any significant level of private sector contribution to capital costs, eliminating the single Build Own Operate Transfer option of passing all risks to the private sector.

However a PPP may still be appropriate operating on a similar basis to the Perth – Mandurah Project[1]. Under this model the government commits to contributing the full costs of the project over time, but remains enthusiastic about the potential for a competitive PPP bid (including financing of capital expenditures for rolling stock and infrastructure) to reduce costs and to result in effective risk transfer which will outweigh the increased transaction costs and higher cost of capital.

The PPP focus in this environment would be more on Design – Build – (Finance) – Maintain delivery and operations franchising.

Hybrid Outsourcing/ Franchising / Financing Models

If the Direct economic benefits to broader beneficiaries from the RAVP identified in the MAE can be captured commercially and the risks and rewards of this capture can be effectively transferred to the

[1] Perth – Mandurah Project is a 77km extension to the Australian city of Perth's urban rail system, the extension of the existing Northern Suburbs Line, upgrading of existing stations and acquisition of new rolling stock.

private sector PPP proponent, then significant capital costs could be financed in the private sector. Depending on the nature of the benefits capture, the most appropriate form of PPP may move from an outsourcing of infrastructure and operations on a franchise basis towards a full Build Own Operate Transfer model.

Full Risk Transfer Build Own Operate Transfer Concession models

If the commercial opportunities to increase revenues and reduce costs identified by Macquarie are realistic, then the full range of PPP models could be employed for the project. This will include the full transfer of design, construction, ownership, operation, revenue and financing risks that can be achieved through a build own operate transfer style model.

The Report identifies potential value from incorporating elements of the existing urban rail operations of TransLink into the scope of the PPP.

5. WHAT ARE THE NEXT STEPS TO DELIVERING A PPP ??

Broadly, Macquarie recommends a PPP process that incorporates the following work/steps:

Step	Description
1.	Development of service specifications and community requirements
2.	Investigation of financial issues (i.e. ability to fund the line as a public private partnership, and required financial contributions)
3.	Development of a PPP process
4.	Public consultation on service specifications, financial proposals, and proposed environmental and community impact review process
5.	Finalization of PPP process and approval documentation (incl. any necessary legislation related to approvals processes, etc.)
6.	Request for Qualifications (RFQ) (Select 3-5 bidders)
7.	Request for Expressions of Interest (EOI) (Shortlist 2-3 bidders)
8.	Environmental/Community impact assessment process
9.	Request for Tenders (RFT) (Select preferred tenderer)
10.	Negotiate MOU with preferred tenderer and sign contract

Based on our understanding of technical, commercial and policy analysis that will need to be done before the RAV Project could be taken to the private sector, we estimate an additional 12 months of work will need to be done. Specifically this would involve:

- clearly identifying the role of all key stakeholders, and clearly setting out any partnering arrangements between Stakeholders and the private sector;
- agreement on the range of project definition issues (system design, technology, route or routes) which are acceptable to take forward for consideration in to the next stage;
- agreement on an appropriate level of financial contribution by government to the project which must be realistic in the context of the Project scope. Note the form of the contribution need not be determined at this stage, but any constraints should be identified;
- agreement to proceed with the Project if the governments' objectives above can be achieved;
- agreement on a clear set of evaluation criteria for private sector submissions; and
- agreement on consultation and approval processes which are balanced (in terms of the commerciality of conditions imposed) and have a definite timeframe.

NSW EIS PROCESS

In NSW all new infrastructure projects are subject to rigorous environmental and community approval process – the Environmental Impact Statement (EIS) process. This involves:

- A comprehensive set of community and environmental approvals process, providing for significant public input, and overseen by an independent agency.
- The ability for the state, subject to satisfying the necessary criteria, being able to expedite necessary approvals processes.

Macquarie has recommended a similar process be established for the approval of the RAVP.

Implementing an Alternative Approvals Process

The process outlined above includes undertaking an environmental and community assessment process.

Macquarie's analysis identifies clear governmental approval and community consultation processes and a reasonably clear view of what may be acceptable or unacceptable to the government is a critical precursor to involving the private sector in the projects development.

To achieve this outcome Macquarie recommends that TransLink and the Province look at options for a system whereby:

- A regional (or project) agency (possibly TransLink) is given responsibility for sponsoring major transportation projects.
- This body is given the ability to:
  - Expropriate necessary lands;
  - Obtain necessary municipal and provincial environmental approvals; and,
- This ability is subject to satisfying a community (and environmental) impact screening process administered by an independent body. Projects would be subject to review by the public, municipal and regional governments and would only be able to go forward in compliance with approve recommendations for mitigation measures.

... a reasonable view of what may be acceptable & unacceptable to the government is a critical precursor to involving the private sector ...