

# Project Definition Report Summary

## Project Definition Report

This is a summary of the **Project Definition Report** for the proposed rail rapid transit connection between Richmond, the Airport and Vancouver (RAV). The report summarizes the results of the Project Definition Phase, which took place from April 2002 to January 2003. It describes the results of the **technical and financial analysis** of the proposed project undertaken by the RAV Project Team and its professional advisors. The full report is available at [www.ravprapidtransit.com](http://www.ravprapidtransit.com).

### The Vancouver/Richmond Corridor



### Travel patterns in the corridor

The Cities of Vancouver and Richmond, separated by the North Arm of the Fraser River, contain **two of the region's busiest town centres**. In the river's mouth lies Sea Island, site of Vancouver International Airport and one of the region's fastest growing job centres.

The transportation corridor that connects downtown Vancouver with downtown Richmond is almost straight, covering about 16 kilometers. It is one of the **busiest corridors in the region** - home to **1/3 of the region's jobs and 20% of its population**. The corridor crosses two main water bodies, the Fraser River estuary and False Creek. The estuary is spanned by 3 road bridges: Arthur Laing, Oak Street and Knight Street. Additional road bridges cross False Creek, into Vancouver's downtown peninsula.

Multiple north/south roads and bridges provide variable road capacity - ranging from about six traffic lanes each way across the Fraser River, to about nine lanes on through routes in Vancouver. There are **no freeways** in the corridor, except at the southern end where the Oak Street Bridge becomes the Highway 99 freeway, heading toward the United States. Car and bus traffic along most of the corridor is slowed by congestion, particularly at the bridges, and by the cross traffic at numerous intersections, many controlled by traffic lights.

The **corridor is unique** in the region for two reasons:

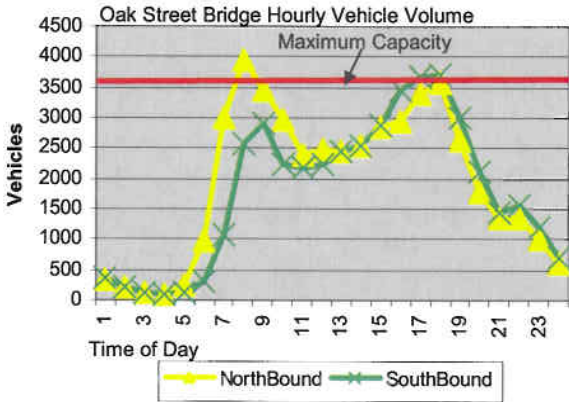
- It is **equally busy in both directions**; recent data suggests more people travel from Vancouver to Richmond to work than in the opposite direction.<sup>1</sup>

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<sup>1</sup> those who live in Vancouver with a usual place of work in Richmond: 21,580; those who live in Richmond with a usual place of work in Vancouver: 17,410; Source: *Commuting to Work, Census 2001*.

- Of the 4 major transit corridors in the region, it has the **greatest traffic density.**<sup>2</sup>

### Growth in congestion



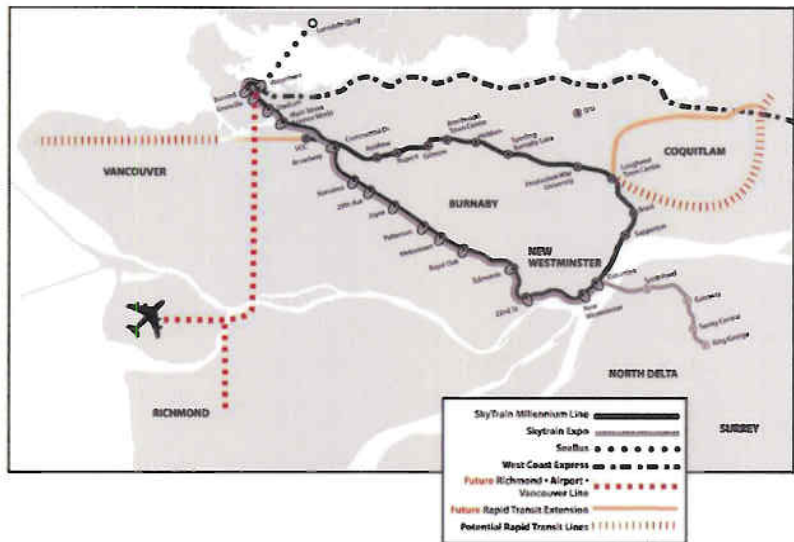
### Adding Capacity

Richmond and Vancouver have experienced **significant growth in population and employment**. This growth has resulted in an increase in the number of trips in the corridor. About 500,000 people travel daily between downtown Vancouver, central Richmond and the Airport (defined as Main, Cambie, Oak and Granville Streets). Of these, roughly 65% travel by car, 25% by bus and 10% by bicycle and on foot.

Between 1985 and 1999 daily vehicle traffic crossing the Arthur Laing, Oak and Knight Street bridges grew by 54%. These bridges are at capacity in the peak hours as shown on the adjacent diagram. As the roads and bridges approach capacity, the peak period spreads and the corridor becomes more congested, over a longer period. As a result of this increase in traffic congestion, travel times on the corridor have increased between 20% and 60% (depending on the route, direction and time-of-day).

The challenge is to add capacity to this corridor. There are **no plans to add road and bridge capacity**, nor is it practical to significantly expand the street network in the developed neighbourhoods of Vancouver and Richmond. The proposed rail investment is intended to add significant capacity without expanding roads and bridges.

As proposed, **the rapid transit system is capable of providing capacity equal to 10 arterial road lanes**.



<sup>2</sup> As measured in passenger kilometers per peak hour, per route kilometer and as compared to similar statistics for other corridors published in the *Transport 2021 Medium Range Plan*.

## Rapid Transit in the Vancouver Richmond Corridor

### A long history of studies, plans and policies

- 1969 Rapid Transit Study
- 1970 Report on the Greater Vancouver Area Rapid Transit
- 1972 Kelly Report
- 1975 The Livable Region: 1976/1986
- 1979-80 GVRD's Light Rail Transit Studies
- 1980 GVRD's Official Regional Plan
- 1981 Hickling Report examines Cambie and Arbutus
- 1989 GVRD's Freedom to Move Study
- 1991 BC Transit's Vancouver-Richmond Rapid Transit Project:
- 1992 BC Transit's Vancouver-Richmond Rapid Transit Project
- 1993 GVRD's Transport 2021: A Long Range Transportation Plan
- 1993 GVRD's Transport 2021: A Medium Range Transportation Plan
- 1993 Vancouver International Airport: Rapid Transit Concept Study
- 1994 BC Transit's Review of Intermediate Capacity Transit
- 1995 BC Transit's Summary of Intermediate Capacity Transit
- 1995 BC Transit's Multiple Account Evaluation of Rapid Transit
- 1996 GVRD's Livable Region Strategic Plan
- 1997 City of Vancouver Transportation Plan
- 1999 Vancouver International Airport's Rail Access
- 2000 City of Richmond Transportation Plan
- 2000 TransLink's Strategic Transportation Plan

### A connection to Sea Island and the Airport

In light of the traffic patterns in the corridor, Vancouver/Richmond has long been a candidate for a rapid transit line. A north/south line has been the subject of **many studies**, dating to the 1970s.

Regional policies anticipated a rapid transit line would be completed in this corridor by 2006<sup>3</sup>. The **TransLink Strategic Transportation Plan** completed in 2002 also includes rapid transit in this corridor as a priority. The City of Vancouver in both its **Transportation Plan** (1997) and **Downtown Transportation Plan** (2002) anticipated the construction of a north-south rapid transit line. The **Vancouver Downtown Transportation Plan** notes "The Richmond/Airport rapid transit line will represent the biggest single improvement to access into the downtown peninsula". A rapid transit connection is part of **Richmond's Official Community Plan**, and in the **Airport Master Plan**.

The **primary rapid transit service** would run north/south along the **Vancouver/Richmond corridor**. About 80% of the transit riders would be traveling between and within Vancouver and Richmond. However, in the past 10 years, the Airport has experienced significant growth, well beyond projections. Over 26,000 people now work at or near the Airport. By 2010, this number is expected to grow to 40,000. All of these employees commute to and from Sea Island. 48% of them live in the Vancouver/Richmond corridor. For these reasons, TransLink, the Airport Authority and others decided that a connection to the Airport would be a desirable addition to the Vancouver/Richmond trunk, to serve both the growing employment base and future and existing terminals. The work of this Phase assumed a connection to the Airport would be part of the Project. The Airport Authority has agreed in principle to pay for the Airport segment of the line.

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<sup>3</sup> *Transport 2021 Medium -Range Transportation Plan for Greater Vancouver*, GVRD September 1993

## 2000 – 2002 Needs Analysis

As noted above, all of the regional and city plans of the past decade contemplate rapid transit in this corridor. The question of **whether** rapid transit is to be built in the corridor has already been answered with a “yes”. In 2000, a group of eight agencies agreed to jointly participate in a multi-phased process to determine if a rapid transit connection should and could be funded and built in the next 10 years. The agencies are: the Federal Government, the Province of British Columbia, Vancouver International Airport Authority, TransLink, the Greater Vancouver Regional District (GVRD), the Cities of Richmond and Vancouver and Vancouver Port Authority (the Agencies). In the first phase, the Agencies agreed on the objectives, and on how they would work together. The second phase examined the timetable to determine if there was indeed a **need to pursue building the line in the next 10 years**, or whether it could be postponed for a decade or more. They also decided to focus on rail-based technology. On the basis of the work in the second phase, public support, and the opportunity for Federal funding, the Agencies decided to proceed to the third phase: defining **what** could be built.

## Project Definition Phase

The **Project Definition Phase** took place over 10 months, beginning in April 2002 and concluding in January 2003. The work of this phase was designed to **define the requirements for a rail rapid transit line** and to identify a structure, including public and private sector participation, to **build and pay for the line** as defined.

## Project Approach

**Multi agency:** All eight agencies continued to participate in the Project Definition Phase. The agencies appointed a Project Team that reported to a senior staff Steering Committee.

**Public and private funding:** From the outset it was clear to the participating agencies that this line is likely to be one of the most efficient in the region. However, like virtually all rapid transit lines in the world, the fare revenue would not cover the full cost of construction, operations and financing – and therefore a public subsidy would be required. The Airport Authority, the Province and TransLink all indicated that they were prepared to consider a substantial contribution. However, they noted that there were competing demands for their capital, and that efforts should be made to pursue private sector funding as well in order to minimize the public sector contribution.

**Competitive bidding process:** Rather than choose a particular rail technology, the Project Team and the agencies' Steering Committee elected to identify the performance standards that would be required for the line, including capacity, travel time, frequency, reliability among others, and to select, through a competitive bidding process, the rail system best able to meet the performance standards, within the Project budget.

## About the Project

### Three conclusions:

#### 1. Technically Feasible



Proposed Alignment

**TransLink to control fares:** TransLink is the regional transportation authority. Its responsibilities include regional transportation policy and projects, major regional roads, SkyTrain, Westcoast Express, and the bus system in the Greater Vancouver region. The RAV Project will be part of this transportation network. TransLink will retain control of fares, bus system integration, ticketing and marketing.

The Project is a proposed rail rapid transit line connecting central Richmond, the Airport and Sea Island, central Broadway and downtown Vancouver. It would connect with existing rapid transit lines at Waterfront Station and with major east west transit services, creating a transit network to serve the region.

The technical work confirms that the Project can be built to meet the defined performance standards, including in particular the capacity, travel time and reliability standards.

The line would be about **19.5 km long**, have **18 to 19 stations**, and serve major employment destinations, including Richmond City Hall, Richmond Hospital, Richmond Centre, Lansdowne and Aberdeen Centre shopping malls, the Airport, Langara Community College, Oakridge Shopping Centre, Vancouver City Hall, Vancouver Hospital, BC Cancer Agency, the central Broadway business district, the central business district in downtown Vancouver, and Canada Place and the cruise ship facilities.

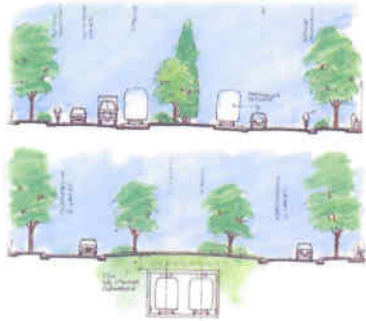
The proposed travel time performance standard is no longer than **30 minutes from central Richmond to Waterfront Station**, and **25 minutes from the Airport to Waterfront**.

The participating Agencies have deliberately not chosen a specific rail system. Rail systems range from “streetcar” systems, which run on the street in mixed traffic, to “heavy” rail transit systems, fully separated from the street, such as the subway systems in Toronto or Montreal.

In between, there are systems that run on street, but in their own right of way, separate from street traffic; systems that are “**fully separated**” from the street, either underground or elevated, like SkyTrain; and systems that are “**partially separated**”. Partially separated systems have segments that are at street level and segments that are separated from the street level, either underground or above street (elevated), like Calgary’s system. Generally, fully separated systems are automated, while systems that run at street have drivers.

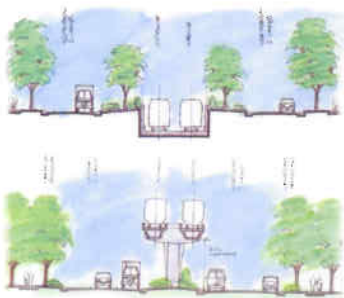
Fully separated systems cost more to build and, where elevated, can be visually intrusive. However, underground and above street level (elevated) systems are cheaper to operate, faster, safer and more

Illustrations of degrees of separation from street



**2. Contributions from local agencies, private sector and Federal government could pay for line**

**3. Five Year Construction**



**Ridership Forecast**

reliable than at street level systems, because they do not cross road intersections.

The technical work analyzed 10 different rail configurations ranging from fully separated configurations, to varying degrees of partial separation. For the detailed financial analysis, the Project Team selected the two configurations that appeared likely to meet the performance standards and be financially feasible. One of the two selected configurations has a rail line fully separated from the street; the other partially separated from the street.

For technical and financial reasons, it is likely that RAV will ultimately have some street level, some elevated and some underground segments.

The technical work confirmed that the cost estimates for the Project are **between \$1.5 and 1.7 billion** cash. Depending on the configuration, operating costs would be covered by fare revenue.

As proposed, the line would be designed, built and operated by the private sector over a long term operating contract. However, the line would not be owned by the private sector. TransLink and the Province would retain ownership of the main line over the long term. Similarly, the Airport would retain long-term ownership of the Airport segment of the line.

**TransLink would receive the fare revenues.** TransLink would make the fare revenues available to pay the operator for providing the service. The payment regime will include incentives to maximize ridership and meet service quality standards.

The proposed schedule indicates that **if the project is approved by June 2003, it could be built and in service by the end of 2009.** It would require about two years to complete a competitive bidding process, environmental approvals, and public consultation. Construction would begin in late 2004/early 2005, and is scheduled to be complete in late 2009.

The Project is not an Olympic project. The line has **long been identified as a regional priority, based on the need to add capacity in this busy corridor in a sustainable way.** However, the schedule is designed to complete the project by 2010, so that the Project can be in place for the games, and not under construction.

The line is designed to serve 3 categories of riders:

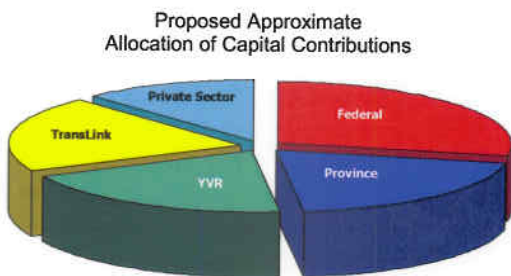
- commuters and other riders traveling between and within Richmond and Vancouver
- employees traveling to Sea Island and the Airport
- airline passengers

As noted above, a large majority (about 80%) of riders will fall in the first category. The ridership and revenue forecasts suggest that in 2010 ridership in this category will be approximately 26-38 million per year, or about 100,000 per day. This is roughly the same number of riders as currently ride the Expo SkyTrain line on a per kilometer basis. These forecasts are consistent with observed patterns in this region, and also with similar systems elsewhere in the world. Further work will need to be done to better understand the potential value of providing a special service to airline passengers. Some airline passengers would use a "regular" rapid transit service. However, there may be an opportunity to provide a "premium", limited stop service for passengers for a higher fare. This has been done elsewhere in the world, with mixed success. The ridership forecast work completed for this line indicated that further work would be required to confirm the level of demand for this type of service. As a result, none of the financial analysis assumes a premium service or premium revenues.

### Effects on local and feeder bus networks

If the RAV line were to be built, it would be fully integrated with the bus system. Many bus services would be improved to connect with the rail line and to accommodate increased ridership, while buses that duplicate the rail service would be discontinued. Overall the local and feeder bus networks in Vancouver and Richmond would have better service with the RAV line in operation.

### Shared Funding



As is the case with virtually all transit systems in the world, a Richmond/Airport/Vancouver system cannot pay for construction with fares alone, and will require a significant public contribution. TransLink, the Province and the Airport Authority have agreed, subject to formal approval, to contribute up to \$900 million to the Project in 2003 dollars. These agencies have asked the Federal government to contribute \$450 million. The private sector will also be asked to make a significant contribution. The financial analysis indicates that contributions from the local agencies and the private sector, together with funding from the Federal government, could provide sufficient funding to build the line. Further details are available in the report on financial feasibility (executive summary) by PricewaterhouseCoopers.

### Environmental Approvals

Application has been made for full environmental review under the BC Environmental Assessment Act and the Canadian Environmental Assessment Act. Should the Project be approved, these approval processes and the related public consultation will take place over the next two years. The private sector partner would be

involved in these consultations. In addition, the Project Team will meet its obligations to have consultations with affected First Nations to address concerns or comments they may have.

### **Public Consultation**

The results of the Project Definition Phase will be presented to the Agencies. In addition, the work will be shared with the public for comment. A Discussion Guide and feedback form have been prepared to facilitate public commentary. During the month of March, the Project Team and TransLink will host a series of open houses and public workshops. In addition, the materials will be available at [www.ravprapidtransit.com](http://www.ravprapidtransit.com).

The results of the consultation will be summarized in a **consultation summary report** and presented with the technical reports to the Agencies.

Should the Project proceed, there will be a second phase of public consultation that will focus on the neighbourhoods affected by the Project and the station areas.

### **Project Definition Complete**

On the basis of a history of study, regional and city policies and the recent needs analysis indicating the need for rapid transit in this corridor, the Agencies decided to pursue project definition. The Agencies wanted to **define the requirements for a rail rapid transit line** and to identify a structure, including public and private sector participation, to **build and pay for the line** as defined. They also wanted to determine if it was possible to complete the Project in time for it to be in service by 2010. This work is now complete. The Agencies may now consider whether to approve the Project and as appropriate, confirm their financial contributions.

### **Timing**

In order to complete the Project by 2009, the agencies making a financial contribution will need to decide to proceed by June 2003. In addition, the Federal funding will need to be in place.