

Evergreen Line Rapid Transit Project

Business Case

Executive Summary

February 2008

Recommendation and Executive Summary

The business case for the Evergreen Line Rapid Transit Project (the Project) demonstrates the need for investment in rapid transit to Coquitlam, recommends a preferred technology, reviews route options, and outlines a process for determining the preferred procurement method and competitive selection process to best meet the Project objectives and achieve value for taxpayer dollars.

The business case concludes that:

1. Advanced Light Rapid Transit (ALRT, or SkyTrain-type technology) is the clearly preferred technology.
2. Both the Northwest (NW) corridor (Lougheed Mall to Coquitlam via Port Moody) and the Southeast (SE) corridor (Lougheed Mall to Coquitlam via Lougheed Highway) options have good results in combination with ALRT technology. The NW corridor as the previously-adopted corridor has very slight technical advantages over the SE corridor and is consistent with current community development plans.
3. A comprehensive procurement and implementation analysis should be undertaken to determine the optimum procurement method for the Project, including public private partnerships. This approach reflects provincial policy that public private partnerships are the preferred procurement method for major capital projects unless there is a compelling reason to do otherwise.

These recommendations reflect the following findings from the business case:

1. **Ridership** – ALRT will produce two and a half times the ridership of Light Rail Transit (LRT) technology; this is consistent with the ridership goals in the Provincial Transit Plan.
2. **Travel Time** – ALRT will move people almost twice as fast as LRT (in the NW corridor).
3. **Benefits and Cost** – ALRT will achieve greater ridership and improved travel times at a capital cost of \$1.4 billion, with overall benefit-cost ratio that favour ALRT over LRT.
4. **System Integration** – ALRT will integrate into TransLink's existing SkyTrain system more efficiently than LRT.
5. **Corridor** – The NW corridor as the previously-adopted corridor has very slight technical advantages over the SE corridor and is consistent with current community development plans.
6. **Public Private Partnership** – Following the application of screening criteria, the Project demonstrates a range of characteristics that suggest there would be value for taxpayer dollars in procuring it using a public private partnership approach.

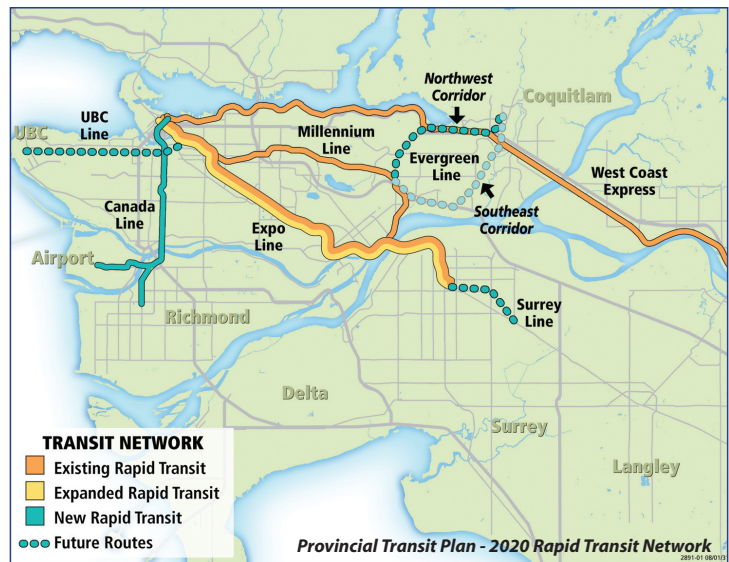
Purpose of the Evergreen Line

The purpose and need for the Evergreen Line has been long-established, with planning first undertaken in the 1990s. It was intended to provide a rapid transit connection between Lougheed Mall in Burnaby with Port Moody and Coquitlam Town Centre, with the main objectives of increasing transportation choice, supporting growth management, and supporting environmentally sustainable initiatives.

Metro Vancouver continues to experience significant population and economic growth that, combined with changing regional travel patterns and expanding trade, has placed considerable strain on our transportation system. Congestion on regional roads and highways continues to increase, with growing impacts on residents,

communities, the environment and the economy. The Evergreen Line will be one of a series of regional transit and transportation improvements that address these challenges, and is an important element of the Provincial Transit Plan.

Metro Vancouver's Northeast sector—including the municipalities of Coquitlam, Port Moody, Port Coquitlam, Anmore, and Belcarra—has experienced rapid growth and continues to be one of the fastest growing areas in Metro Vancouver. This current and anticipated population growth is adding pressure to the regional transportation network as traffic volumes build and congestion increases. Without alternative transportation improvements, this trend is expected to continue, resulting in the road network in the corridor reaching capacity shortly after 2021.



History of Evergreen Line Planning

Early in the planning process for the Evergreen Line, ALRT was considered as an option and the Lougheed SkyTrain station included provisions for the Evergreen Line when it was built in the late 1990s as part of the Millennium Line. However, due to the capital cost of the fully grade-separated system exceeding the \$800 million project funding envelope, TransLink undertook a study of a broader range of transit alternatives. In 2004, TransLink decided to move forward with a light rail transit (LRT) option through the NW corridor. LRT was selected because, at the time, the cost of this technology was projected to fit within the funding envelope. The NW corridor was selected because it reflected the Livable Region Strategic Plan and Official Community Plans (OCPs) of the municipalities. Since then, TransLink has continued to develop the LRT design through the NW corridor and has consulted extensively with the public.

Re-evaluating the Evergreen Line

Recently, however, circumstances and priorities that affected the 2004 choice of technology and route for the Evergreen Line have changed considerably. These changes have provided an opportunity to re-evaluate the Project.

The changes include increasing concern about the environment and a greater sense of urgency with respect to providing viable transportation alternatives to the automobile, helping to reduce both the number and distance of car trips. The Provincial Transit Plan, announced in 2008, is intended to maximize the opportunity for people to get out of cars and onto transit, driving a focus on system capacity and ridership. Other changes contributing to the opportunity for re-evaluation include:

- An increase in estimated LRT capital costs beyond the previously-established funding envelope, as a result of changes in scope and construction inflation over time;
- The need to consider the potential for both residential and employment density along the routes based on the opportunity in the NW corridor for re-development and the opportunity in the SE corridor for both new and re-development, which could have an impact on route selection; and
- Funding uncertainty.

In light of these changes, an updated evaluation has been completed to review rapid transit technology and route options for the Northeast sector. The updated evaluation has included: the review and confirmation of the scope of each route corridor for LRT and ALRT; updated ridership forecasts; updated capital and operating cost estimates; updated benefit:cost analyses; and updated development assessments for each corridor.

Maximizing Ridership

In the re-evaluation, primary consideration was given to maximizing ridership by determining the system that will provide the best opportunity for people living in the Northeast sector to regularly choose transit, rather than automobiles, as their preferred method of transportation.

In assessing the likelihood that people will choose a particular technology, consideration was given to characteristics that are important to passengers when choosing whether or not to use transit, including:

- Frequency;
- Reliability;
- Speed; and
- Capacity.

Key characteristics for the two technologies are summarized below in Table 1.

Table 1 Summary of Alternative Frequency, Capacity and Operating Speed

	ALRT	LRT
Frequency: time between trains (minutes)	3.0	5.0
Maximum Operating Speed (km/hr)	80	60
Peak Hour Capacity (2021)	10,400	4,080

ALRT provides the opportunity for significantly greater frequency, speed and capacity than LRT, thus supporting the opportunity for higher ridership. ALRT also has greater potential to increase capacity by reducing the peak period headway (time between trains) from three minutes to fewer than two minutes, without requiring additional vehicles or civil work.

In addition to the advantages ALRT technology has in these areas, it is anticipated that it would also be safer as a result of running on an elevated guideway, separated from street level traffic.

Taking the two corridors into consideration, modeling was undertaken to compare how the route and technology combinations would perform in terms of travel time and ridership. Some of the key results are summarized in Table 2.

Table 2 Summary of Route and Technology Characteristics

	NW CORRIDOR		SE CORRIDOR	
	ALRT	LRT	ALRT	LRT
Total Distance (kilometres)	10.9	11.2	12.6	12.6
Total Travel Time (minutes)	12.6	23.6	14.8	17.7
Annual Riders (000s – 2021)	22,900	9,000	22,500	10,300
Annual Riders (000s – 2031)	31,800	12,400	33,300	13,100

Ridership modeling to 2021 shows the ALRT option in the NW corridor, which runs adjacent to the Canadian Pacific railway line through Port Moody, produces significantly higher ridership than both LRT options and comparable ridership to ALRT on the SE corridor. This is the result of this technology and route combination offering the shortest travel distance and travel time, and is further enhanced because ALRT is compatible with the existing Millennium Line service, creating an integrated system.

Capital and operating costs were also estimated as part of the analysis. The costs are presented below in Table 3.

Table 3 Capital and Operating Costs

	NW CORRIDOR		SE CORRIDOR	
	ALRT	LRT	ALRT	LRT
Capital Costs (\$millions)	1,400	1,250	1,400	1,100
Annual Operation & Maintenance Costs (\$2007 millions)	10.2	15.3	10.8	15.1
Operating Cost (\$2007) per Passenger (2021)	\$0.45	\$1.70	\$0.48	\$1.49

Capital costs for ALRT are only 17 per cent higher than the LRT option in the NW corridor and 33 per cent higher in the SE corridor. ALRT also has significantly lower annual operation and maintenance costs, despite offering a more frequent service and having more substantial stations. This reflects the automated nature of the technology, and the operations and maintenance efficiencies available as part of a larger integrated system. Furthermore, an assessment of overall benefits indicates that ALRT provides significantly greater benefits than LRT, and that the benefits for ALRT on the NW corridor are slightly greater than ALRT benefits on the SE corridor, as shown in Table 4.

Table 4 Present Value of Benefits (\$2008 millions)*

	NW CORRIDOR		SE CORRIDOR	
CATEGORY	ALRT	LRT	ALRT	LRT
User Benefits	792	540	712	530
Producer Benefits	145	110	133	100
Total Benefits	937	650	845	630

*Based on a real discount rate of six per cent.

When the benefit results are compared to the relative cost of each alternative, the resulting benefit-cost ratio shows that ALRT NW has the best outcome followed by ALRT SE and then by LRT SE and LRT NW respectively. These outcomes are presented in Table 5.

Table 5 Present Value of Benefits and Costs (\$2008 millions)*

	NW CORRIDOR		SE CORRIDOR	
CATEGORY	ALRT	LRT	ALRT	LRT
PV Total Benefits	937	650	845	630
PV Total Costs	740	718	745	631
Benefit-Cost Ratio	1.27	0.91	1.13	1.00

*Based on a real discount rate of six per cent.

Development Potential

In terms of development potential, the NW route is expected to benefit from more immediate transit-related development as construction along the route is already taking place in anticipation of the introduction of rapid transit. This development is expected to continue over the five to ten years following the opening of a rapid transit line. In the SE corridor, there is also very significant development potential (in what is a largely undeveloped corridor); however, this development is estimated to require a longer timeframe to be realized, and is less certain since no transit-related land use planning has been undertaken in the area.

Public and Stakeholder Consultation

Stakeholder issues are also important factors in comparing the rapid transit alternatives. In the NW corridor, public and environmental consultations were conducted previously with respect to rapid transit in the area, both in 2000 when SkyTrain was proposed, and more recently for the proposed LRT. As a result, stakeholder issues are well understood and will be taken into account as part of the evaluation process. While stakeholder and potential environmental issues have been identified along the SE route, the same level of consultation has not been undertaken to date.

Taking into account the updated evaluation of technology and route, ALRT is clearly recommended over LRT technology for the Evergreen Line. Both route options have a strong business case when coupled with ALRT technology, and the NW corridor option has a very slight technical advantage over the SE corridor.

Procurement

To identify a preferred approach to procuring the Project, a preliminary assessment was conducted to evaluate the Project's characteristics relative to the procurement criteria set out by the Province's Capital Asset Management Framework and capital standard. The results of this assessment demonstrate a range of characteristics which satisfy the key attributes for considering a public private partnership procurement approach for the Evergreen Line. A comprehensive procurement analysis is recommended to determine the best procurement structure and implementation process to achieve value for taxpayer dollars.

Conclusion

Overall, the results of the analysis show that ALRT technology is the clearly preferred option due to its superior ridership potential. The analysis also shows a strong business case for ALRT along both corridors, with slight advantages for the NW corridor. Finally, the characteristics of the Project have been demonstrated to make it a strong candidate for public private partnership procurement.