



To: General Purposes Committee
From: George Duncan
 Chief Administrative Officer
Re: Richmond Streetcar Feasibility Study

Date: September 14, 2004
File:

Staff Recommendation

1. That the report entitled "Richmond Streetcar Feasibility Study" be received for information; and,
2. That Council provide direction to staff if it is their preference to forward a copy of the "Richmond Streetcar Feasibility Study" to RAVCO with a request for its distribution to the two proponents of the Richmond-Airport-Vancouver Rapid Transit Project.

George Duncan
 Chief Administrative Officer
 (4338)

Att. 1

FOR ORIGINATING DIVISION USE ONLY		
CONCURRENCE OF GENERAL MANAGER		
REVIEWED BY TAG	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
REVIEWED BY CAO	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>

Staff Report

Origin

At the TAG meeting on September 14, 2004, staff were presented the *Richmond Streetcar Feasibility Study* recently completed by URS – a light rail transit consultant based in Portland, Oregon. The study was commissioned by the Richmond Heritage Railroad Society with the objective of examining the option of incorporating an urban friendly streetcar system into the RAV project which would be compatible with the City's vision for the City Centre core.

This report summarizes the findings of the above study and staff seeks Council's direction if it is their preference that a copy of the study be forwarded to RAVCO with a request for its distribution to the two proponents of RAV for consideration in preparation for their respective Best and Final Offer (BAFO) submission.

Analysis

1. Study Purpose

The purpose of the study was to determine the feasibility of converting the existing exclusive busway lanes along No. 3 Road in the City of Richmond into an at-grade streetcar system. The study reviews how a streetcar could provide transit service serving downtown Richmond and how it fits with the development and transportation plans along the No. 3 Road corridor.

2. Context of RAV

The RAV line project, linking Richmond, Vancouver, and the Airport, is currently in the BAFO stage, which would allow the project proponents to specify the technologies and system that best meet the design parameters of the project. The proponents may use either grade-separated or at-grade rapid transit technologies.

3. Streetcar Characteristics

Streetcars run on tracks, typically operate in mixed traffic conditions within an urban environment. They are smaller and lighter than light rail vehicles, providing about one-half the passenger capacity. For example, Portland streetcar has a passenger load capacity of 157 as compared to the capacity of a CP/EV Prototype LRV of 261 passengers.

Based on the study findings, for most of the No. 3 Road corridor in Richmond, the alignment of a streetcar system could be accommodated within the existing roadway geometry and right-of-way. In fact, streetcar trackway would fit within the existing busway lanes north of Ackroyd Road. South of Ackroyd Road, where no existing busway lanes are available, streetcar could operate in the median or along the curbside of No. 3 Road.

The south end of the streetcar would terminate at the existing transit only lane south of Cook Road, while the north end would be at the proposed RAV Bridgeport station, therefore requiring a train-to-train transfer for passengers travelling between Richmond and Vancouver. The north terminus of the streetcar system would be located just north of Beckwith Road. With a

consistent elevation of the RAV and streetcar stations, the northbound RAV vehicle could share the platform with the streetcar.

The study concluded that the performance (train frequency, travel time, ease of transfer, and station spacing) of the streetcar system in Richmond would be similar to that of the at-grade RAV system, with the exception of a slower travel time and added transfer(s) introduced by the streetcar option. While the ridership impacts were not assessed in detail as part of the study, ridership of the streetcar system is generally expected to be slightly less than an at-grade RAV system without a transfer station. However, with the potential future extensions of the streetcar line south of City Centre, in the long term, ridership could be anticipated to increase beyond the levels projected for an at-grade RAV option terminating at the Richmond Centre.

4. Study Conclusions

It was concluded in the study that a streetcar system in Richmond would be competitive with other at-grade systems, as it requires a lower construction cost per kilometre, causes less construction disruptions to local business, requires similar operating costs, and allows readily future expansion of the system.

5. Staff Comments

The study presents some merits for further investigation into the feasibility of incorporating the “streetcar” concept into the current RAV BAFO process as it would, in general:

- be compatible with the City’s preference of an at-grade system
- provide a good urban fit within the existing No. 3 Road environment
- require less capital costs to construct
- allow better provisions for future line extension to the south; and
- attract visitors and tourists

In exploring the proposed “streetcar” concept further as part of the current RAV process, it is recommended that the attached study be forwarded to RAVCO with a request for its distribution to the two proponents for their consideration in preparing their respective BAFO submission. In particular, the proponents would examine the “streetcar” concept within the context of the established performance standards for RAV such as ridership, travel time, and line capacity.

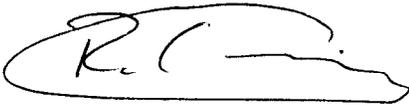
While the need for transfers by Richmond passengers at the Bridgeport Station may be contrary to TransLink’s service design objective of providing direct transit services between town centres – in this case from Richmond city centre to Vancouver downtown – the “streetcar” system may be deemed acceptable if the established performance standards can be achieved by the proponents.

Financial Impact

There is no financial implication to the City related to the report recommendation at this time.

Conclusion

The *Richmond Streetcar Feasibility Study* has brought forward some merits in requesting RAVCO to distribute the attached study to the two proponents for their consideration in preparing their respective BAFO submission. The positive aspects of the "streetcar" concept in Richmond can then be used as part of the evaluation criteria in reviewing the BAFO submissions.

A handwritten signature in black ink, appearing to read 'Victor Wei', enclosed within a hand-drawn oval border.

Victor Wei, P. Eng.
Acting Director, Transportation
(4131)

VW:vw

DRAFT

Richmond Streetcar Feasibility Study

September, 2004

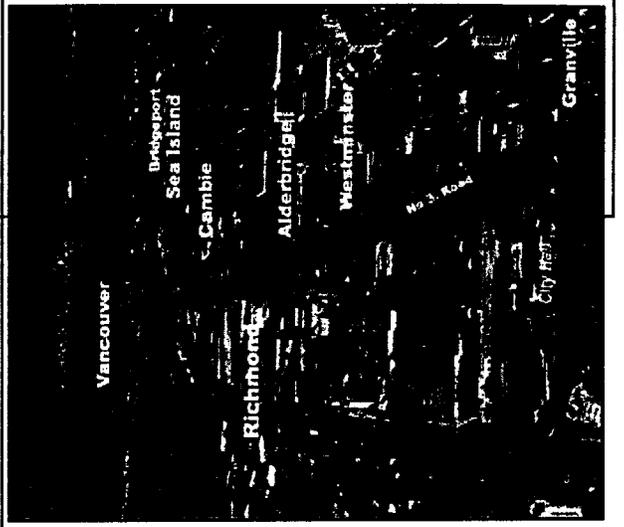


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Prepared for the Richmond Heritage Railroad
Society by



I. Introduction

Study Purpose

URS Corporation of Portland, Oregon has been retained by the Richmond Heritage Railroad Society to determine the feasibility of converting the exclusive busway on No. 3 Road in Richmond British Columbia into an at-grade streetcar system. The streetcar idea arose in response to a proposal by Translink to provide intermediate capacity rapid transit service to the City of Richmond via the Richmond, Airport and Vancouver (RAV) high capacity transit line.

Streetcar systems provide:

- A less intrusive way to provide fixed-guide way transit in urbanized areas
- A relatively low cost solution to providing local fixed-route transportation.
- Efficient operation in mixed traffic
- An excellent complement to regional mass transit systems.
- Enhanced mobility in the urban core, with the ability to replace short auto trips.

In addition, streetcar systems have been shown to spur economic redevelopment and private investment in areas adjacent to the system.

This study examines the feasibility of implementing a streetcar system by evaluating

- The Context of the RAV Project
- Vehicle types and Trackway Design
- Existing conditions along No. 3 Road
- A schematic plan for the streetcar
- Overview of streetcar operations
- Overview of projected RAV ridership for the Richmond segment
- Future expansion possibilities
- Conclusions

Context of the RAV Line Project

Translink, in conjunction with the Cities of Richmond and Vancouver and the Vancouver International Airport Authority, have developed a plan for a regional high capacity development system that will link downtown Vancouver, Richmond and the Airport. This system will extend south from downtown Vancouver via Granville and Cambie Streets to the Bridgeport area of north Richmond. At this point the system will split into two branches with one line extending south along Number 3 Road to the Richmond Centre / Richmond City Hall and the other line extending west across the middle arm of the Fraser River to the Airport. The proposed operations plans calls for vehicles to operate between Vancouver and Richmond at 6 minute intervals and between Vancouver and the Airport at 12 minute intervals

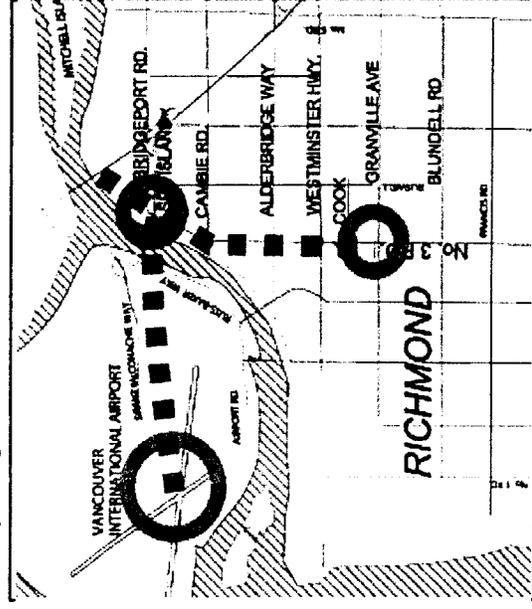
The RAV line project is unique in the sense that it is a public / private partnership and is currently in the final process of soliciting Design, Build, Operate and Maintain (DBOM) proposals. DBOM proposals by their very definition allow the proposers to specify the technologies and the system that best meet the design parameters of the project. As a result, the successful proposers may use either grade separated or at-grade rapid transit technologies.

In response to the possibility of the successful proposer opting to use an elevated grade separated option along No. 3 Road, the City of Richmond City Council has gone on record as strongly supporting an at-grade option along No. 3 Road. This reflects the strong concern that a grade separated system would not be conducive to the future plans for downtown Richmond. This official City position and the desire

of other interested parties has led to the exploration of a streetcar option to meet the intermediate capacity system needs of the RAV project

This study looks at how a streetcar could provide the City of Richmond with transit service that serves downtown Richmond along Number 3 Road. Primarily considers the development and transportation plans along the Number 3 Road corridor between Bridgeport and City Hall, while also considering the corridor to Steveston and growth areas throughout the city.

RAV Project Alignment



Definition of Streetcar Transit

Contemporary streetcar runs on tracks that are set at a standard gauge, requires traction electrification and operates in urban environments. Streetcars typically operate in mixed traffic and provide about one-half the capacity of light rail vehicles. The following is a brief comparison of streetcar and light rail systems.

Vehicles

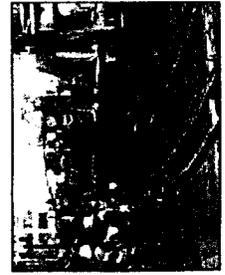
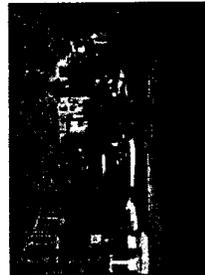
Streetcars are smaller and lighter than light rail vehicles. Table 1 shows vehicle specifications of the Portland streetcar vehicle (the first modern streetcar in North America).

Trackway

Where it runs in mixed traffic the streetcar must run on paved track treatment. Because the depth of a trackway depends on the weight of the vehicle, shallower depths reduce the streetcar's impact on existing utilities, when compared to light rail trackway. When the streetcar runs in exclusive right-of-way, the trackway treatment is similar to that of light rail. Table 2 shows typical trackway treatments for a streetcar system.



Portland Streetcar in Mixed Traffic



Construction of Direct Fixation Track

Table 1 - Vehicle Specification Comparison between CP/EV Prototype LRV and Portland's Skoda Streetcar

LRV	CP/EV Prototype Streetcar	Prototypical (Portland)
General Information	Siemens	Skoda-Inekon Astra
Manufacturer	8	6
Doorways per vehicle	72	29
Number of Seats	166	93
Passenger load at 4/m2		
Passenger load at 8/m2 (crush capacity)	261	157
Technical Specifications		
Length	92 feet	66 feet
Width	8.71 feet	8 feet
Height	11.7 feet	11.35 feet
Train Weight	109,000 pounds	53,351 pounds
Floor Height Above Rail	14"	14" typ (10" Portland)
Number of Articulations	2	2
Number of Trucks	3	2
Number of Powered Trucks	2	2
Operating Voltage	750 VDC	750 VDC
Average Acceleration	3 mphps	3 mphps
Average Deceleration	3 mphps	3 mphps
Emergency Deceleration	3.8 mphps	3.8 mphps
Maximum Speed	55 mph	46 mph
Minimum Turning Radius	82 feet	65 feet

Table 2 - Typical Trackway Treatments for Streetcar

Track System	Streetcar in Mixed Traffic
Open Tie and Ballast	Typically no; an option if in exclusive ROW
Open Direct Fixation	Typically no; an option if in exclusive ROW
Concrete embedded	Yes, in mixed traffic
Hard Covered Tie and Ballast (brick, concrete, asphalt)	Yes, in mixed traffic
Hard Covered Direct Fixation (brick, concrete, asphalt)	Yes, in mixed traffic
Soft Cover ballast track (grass, landscape)	Typically no; an option if in exclusive ROW

II. Existing Conditions

No 3 Road is Richmond's commercial spine. The current environment is predominantly auto-oriented, and most buildings are accompanied by generous parking lots. The scale of buildings vary, generally according to age. The newer buildings are taller and more pedestrian-oriented, while older buildings are lower-scale and more auto-oriented. Significant developments in the corridor include the Richmond Centre Mall, and Richmond City Hall. To the west of the corridor there is a major city park, and to the east a growing mixed-use residential community.

One of the Vancouver region's innovative RapidBus lines, the 98 B-Line, runs on No. 3 Road (Figure 1). Articulated buses run within a guideway on a portion of the corridor, while local buses run in mixed traffic. This successful service runs at 5-6 minute peak period headways, 7 days a week, up to 22 hours a day. In 2002 the weekday ridership was 18,000 passengers. The stations are spaced approximately 400 metres apart in downtown Richmond. The buses benefit from "conditional" signal preemption, which takes effect when a bus is more than two minutes behind schedule.



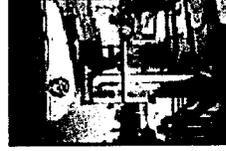
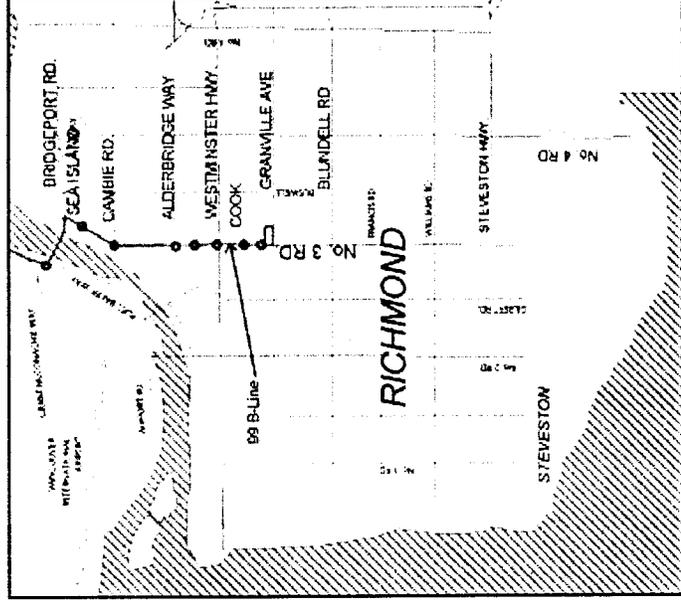
98 B Line Busway on No. 3 Road

Bridgeport Road to Richmond Center/City Hall No 3 Road is divided into two segments, a segment north of Ackroyd Road, with dedicated bus lanes and a segment, south of Ackroyd Road, without. For the segment with dedicated bus lanes, the right-of-way is typically 35.5 metres. For the segment without the dedicated bus lanes the right-of-way is typically 24.2 metres with some sections 26.8 metres wide. In each direction, there are two travel lanes and a dedicated left turn lane at the signalized intersections. North of Ackroyd Road, two dedicated rapid bus lanes, one for each direction, and landscaping run in the median. These lanes are for buses only and continue north to Bridgeport Road, some 3.4 kilometres.



Figure 1

The Richmond Segment Coincides with the 98 B Line Busway on No. 3 Road



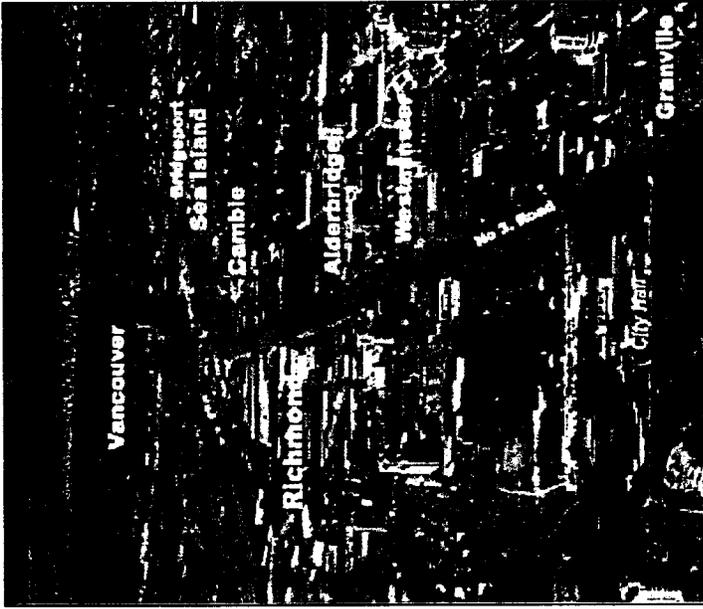
Planned Environment

Through adoption of policies and guidelines, the City of Richmond has adopted goals and measures that over time will create a walkable town center in downtown Richmond. The vision of the community is for No. 3 Road to become more pedestrian-oriented, and for the buildings in the corridor to be more dense, urban, and comprise a mixed use community center.

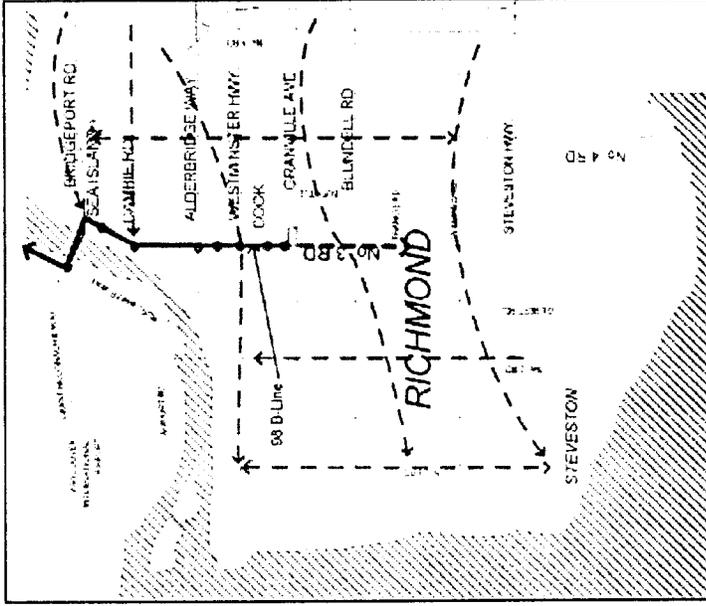
The plans are consistent in their support for development of a lively downtown, and promotion of sound urban design and effective transit service. No. 3 Road is designated as a Pedestrian Street, the commercial spine, and the main transit corridor in the city.

All of the plans call for rapid transit service connections to Vancouver and increased local circulation. The 98-B Line project met many of these goals, and more recent plans look forward to further transit enhancement. Most significantly, the *Richmond City Centre Area Plan*, adopted in early 2004, directs the city to integrate plans for light rail “into the development of a well-linked and accessible City Centre” by connecting the downtown with Vancouver and connecting “key business areas in the city centre.” The policy also calls on the city to “support the use of conventional light rail transit which can operate at grade and complement the high-amenity, pedestrian character of Downtown.” (p. 15)

A streetcar system on No. 3 Road would support the vision of a pedestrian-friendly corridor. The at-grade streetcar would support redevelopment of adjacent land. Small, strategically spaced stations could support the developing identity of Richmond’s downtown. At the same time, strategically spaced stations could enhance parking management, reducing local auto trips within the corridor.



View to the North along No. 3 Road



Major Transit Network (Richmond Official Community Plan)

III. Schematic Plan for a Streetcar System in the Richmond Segment

What would a Streetcar System Look Like on No. 3 Road?

Contemporary streetcar systems can play an important role in a region's transportation network. The function of a streetcar can be characterized by operating hours that complement other transit systems, frequent and fast service, few stops, and low to medium initial costs. The primary goal is to provide alternative means of transportation for commuters by connecting residential neighborhoods to employment centers, major activity centers, and other regional public transit systems.

The following sections describe routes, design features and the feasibility of integrating the streetcar into the existing public right-of-way and streetscape.

Potential Streetcar Alignment

For most of the No. 3 Road corridor, the existing roadway geometry and right-of-way is adequate to accommodate the streetcar alignment. Furthermore, the trackway would fit within the existing busway. The following analysis addresses the proposed streetcar alignment in two main segments – No. 3 Road with the Busway, and No. 3 Road without the Busway (Figure 2). The following scenarios address potential alignment designs for each of the main segment, and options for the north and south termini.

Figure 2 - Streetcar Alignment on No. 3 Road (Part 1 of 3)

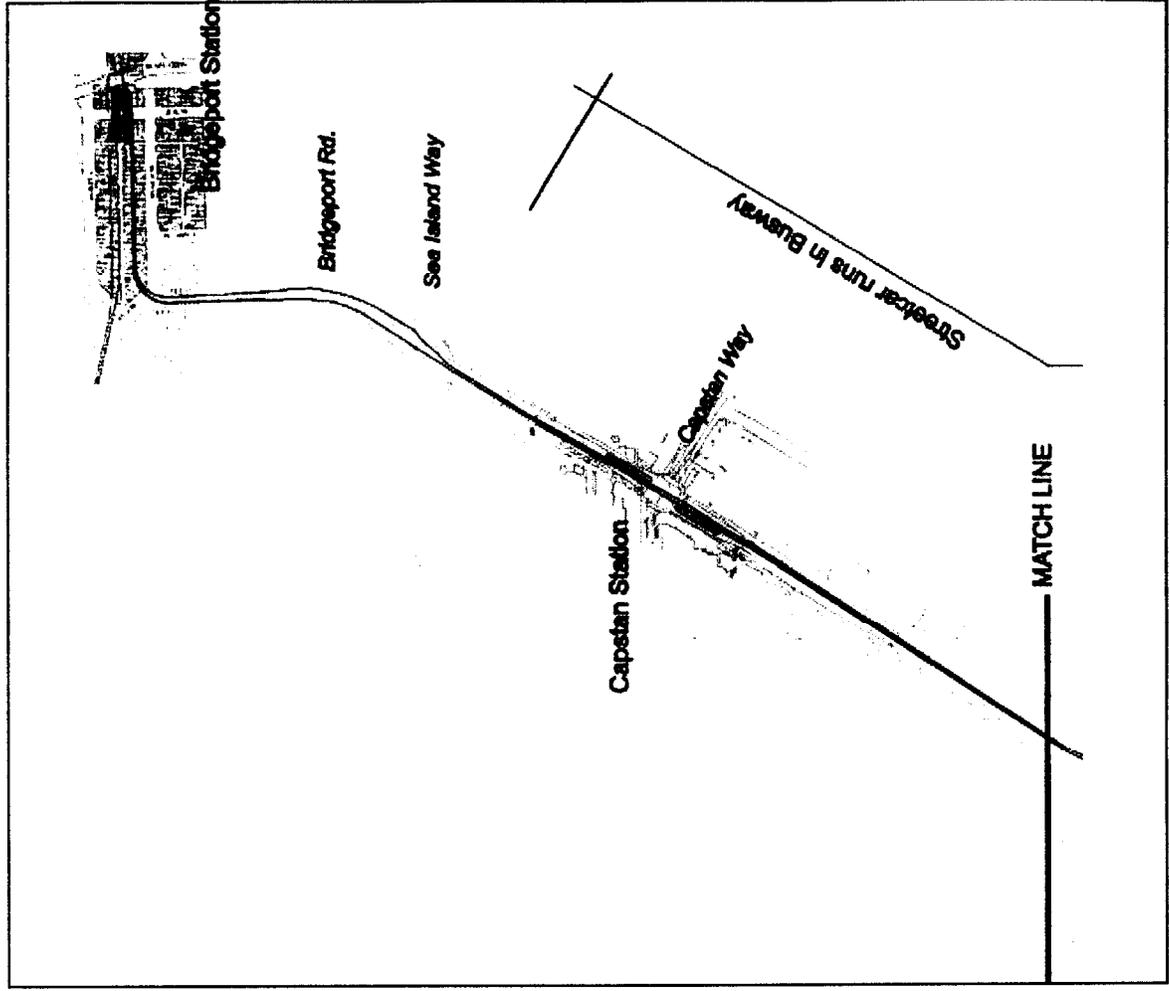


Figure 2 - Streetcar Alignment on No. 3 Road (Part 2 of 3)

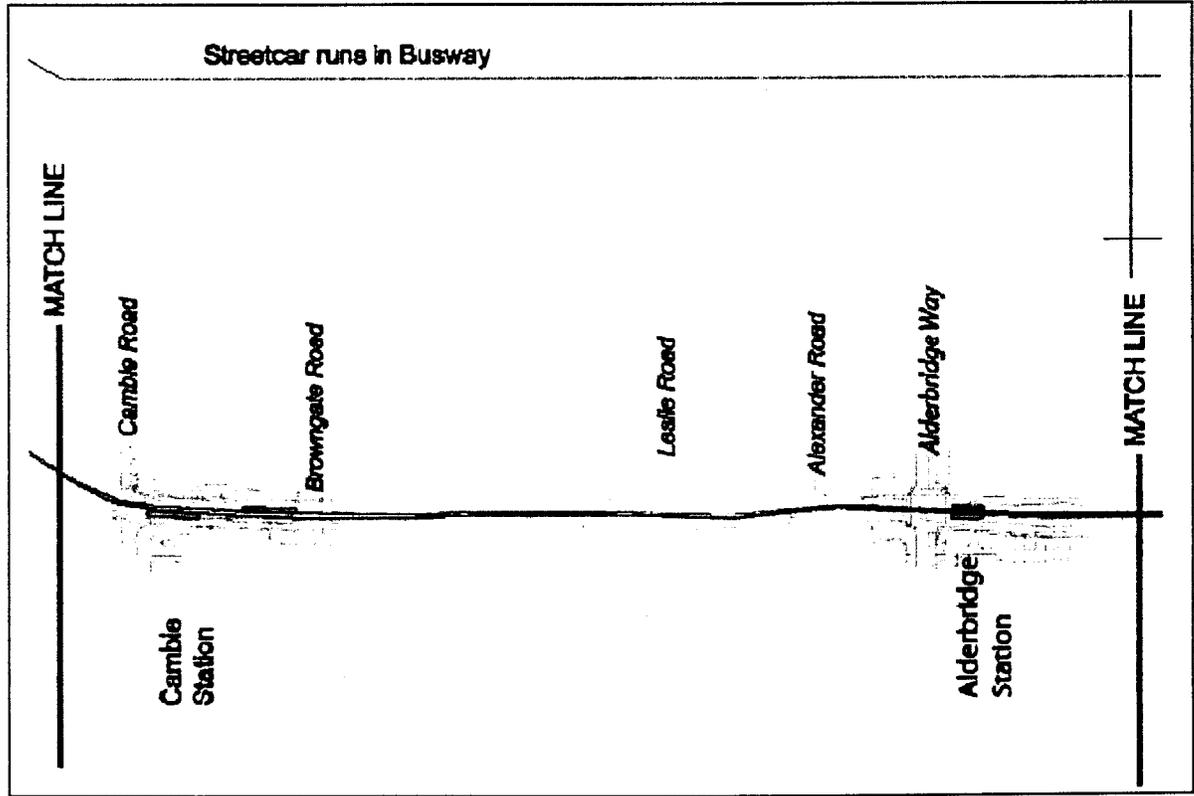
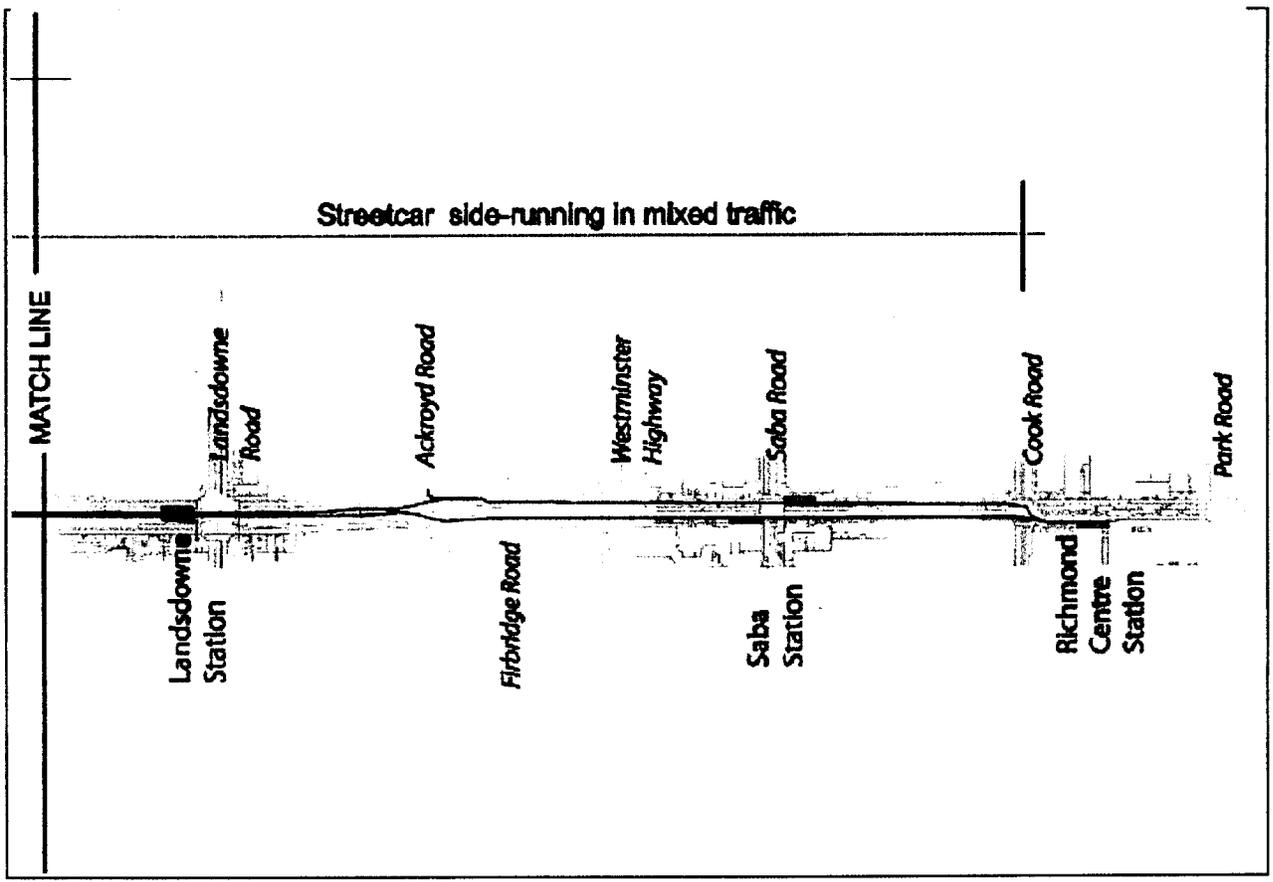


Figure 2 - Streetcar Alignment on No. 3 Road (Part 3 of 3)



Under the design variant, which has the streetcar operating similar to the RAV at-grade option, a center stop could be located between Park Road and Cook Road. To reduce cost and right-of-way impact to the east side of No. 3 Road, a single track on the west side of center platform could be constructed. This would require some widening of the street to the west by 2 meters and impacting The Richmond Center's parking.

A curb-running streetcar could operate very similar to the existing bus operations. The streetcar, when transitioning from the median to the curbside, would stop all traffic movements at Ackroyd Road by actuating a streetcar only traffic signal phase (Figure 5). The southbound track would operate similar to the B-line operation at the intersection. The northbound track would require a new streetcar only lane, which could also double as an exclusive right turn lane.

South Terminus (Richmond Center/City Hall)

The streetcar would terminate at the existing transit only lane south of Cook Road adjacent to the

southbound lanes of No. 3. Road. Northbound streetcar travelling from the south terminus would preempt all traffic movements at the intersection of No. 3 Road and Cook Road, traversing the intersection to the northbound lanes of No. 3 Road.

North Terminus (Bridgeport)

The north end of the streetcar system would terminate at the proposed RAV Bridgeport station (Figure 6). The tracks would continue on No. 3 Road to Beckwith Road where it will turn south, leaving the public right-of-way. A new signal at the intersection of No. 3 Road and Beckwith would be installed. At this point the tracks would converge into a single track, terminating at a new streetcar platform adjacent to the RAV station. We have assumed a consistent elevation at these stations. It is also possible that the northbound RAV vehicle would share the platform with the streetcar. The tracks could be extended at this location to access the maintenance facility.

The RAV Definition Phase Final Report, shows a design

that requires the proposed Bridgeport platform to be 3 meters above the existing ground. The reason stated in the report is that the special trackwork requires a significant amount of tangent on both sides of the platform. Since the streetcar would not connect to the RAV tracks, only the south side special trackwork would be required. This would allow the platform to drop an additional 2-2.5 meters closer to the ground by locating the vertical curve on the north side closer to the platform.

A streetcar system along No. 3 Road would be constructed to match the existing physical characteristics and cross sections. Lane geometry would remain the same except for isolated locations. The streetcar track slab would be a shallow depth design minimizing impacts to the utilities. Impacts to the existing traffic would be similar to the PGS impacts. Right-of-way impacts would be less with the streetcar project since it could operate in mixed traffic and negotiate tighter geometry.

Figure 5 - Typical Section of Side-running Streetcar

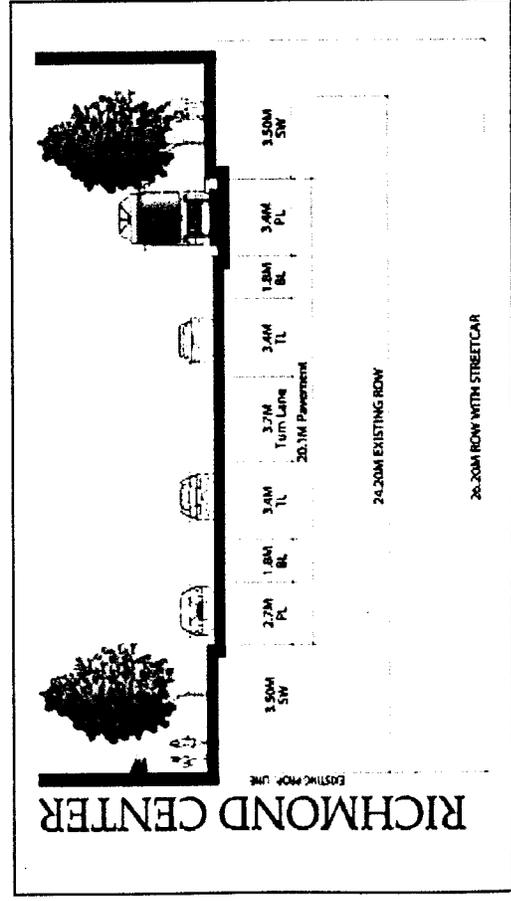
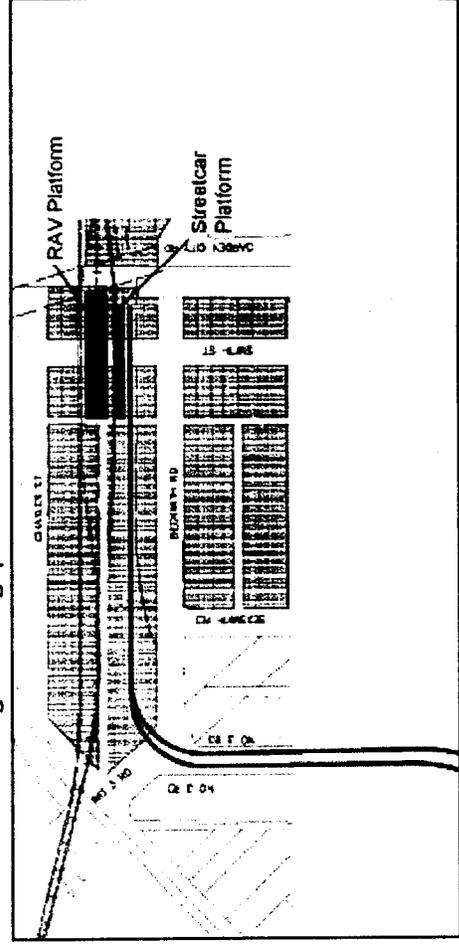


Fig 6 - Bridgeport Streetcar Terminus and Connection



Streetcar Ridership and Operations

URS reviewed the current projections for ridership developed for the RAV project. This review focused on the estimates developed for the At-Grade (AG) alternative (known in the ridership analysis as the Partially Grade Separated) for years 2010 and 2021. No new ridership estimates were developed. Rather an analysis was performed on the current work. In addition, we have provided general observations regarding ridership levels for a streetcar application.

Assumptions:

- Alignment - The same alignment as the AG Richmond segment of the RAV project
- Service Frequency – A 6 minute service frequency
- Stations- Five stations (including the termini) with one additional future station.

Observations

- The 6-minute frequency assumed for the RAV AG alternative for 2010 and 2021 is driven by the system capacity required to accommodate ridership in the Bridgeport to Waterfront segment. The streetcar option can accommodate anticipated ridership levels with the same frequency of service in 2010 and 2021 (note: the mix of single car and double car trains would need to adjusted over time). This factor is neutral in comparing the AG and streetcar options.

- Station Spacing - For purposes of this evaluation, the station locations for the streetcar option are assumed to be the same as the AG alternative and therefore this factor is also neutral.

- Travel Time – With the number and location of stations identical to the (AG) alternative and the vehicle operating characteristics very similar, the travel time for the streetcar and AG alternatives are likely to be close to the same, again resulting in this factor being virtually neutral.

- Transfers – The AG alternative provides a single seat ride from Richmond Centre to the Waterfront Station. The streetcar option will introduce a transfer at Bridgeport for those individuals accessing the system by auto or as pedestrians at any one of the five Richmond stations. For those arriving at any one of the Richmond stations by bus, an additional transfer is introduced into any trip destination north of Bridgeport. The impact of this transfer is already accounted for in the AG alternative ridership estimates. In comparison to the AG option, the added transfer with the streetcar would add travel time and therefore would result in a somewhat lower projected ridership level. Moderating the level of difference in estimated

daily ridership levels between the AG and streetcar options is the fact that a portion of the outbound AG trips will require passengers to either transfer at Bridgeport or forgo the first available (non-Richmond) train in preference of boarding a Richmond-bound train.

In summary, the primary factors impacting ridership, with the exception of an added transfer(s), would be similar for the AG and streetcar options. It can be anticipated that the ridership for a streetcar option extending from the Bridgeport Station to Richmond Centre would slightly less than the RAV AG alternative. With the potential of future extensions of the streetcar line, the ridership, particularly for local trips within Richmond, could be anticipated to increase beyond the levels projected in our years for a RAV AG option terminating at the Richmond Centre.

Order of Magnitude Cost Estimate

ITEMS OF WORK AND MATERIALS	TOTAL QUANTITY	UNIT	UNIT PRICE (in US \$)	TOTAL PRICE
Mobilization	1	LS	90,000.00	90,000.00
Demolition				
Utilities	1361	RM	250.00	340,250.00
Roadwork	3320	RM	690.00	2,290,800.00
Platforms (new)	1	EA	53,300.00	53,300.00
Platform Mod	11	EA	10,000.00	110,000.00
Signing and Striping	1	LS	60,000.00	60,000.00
Traffic light (new)	1	EA	100,000.00	100,000.00
Traffic light (mod)	14	EA	20,000.00	280,000.00
Landscape	1	LS	10,000.00	10,000.00
Trackwork*	6840	TM	750.00	5,130,120.00
Special Trackwork	2	EA	65,000.00	130,000.00
Traction Electrification	6840	TM	850.00	5,814,136.00
Substations	4	EA	350,000.00	1,400,000.00
Subtotal Construction estimate				15,808,606.00
Margins	Percent			
Construction Contingency	20.00%		Subtotal	3,161,721.20
				18,970,327.20
Softcost (mobilization, traffic control, QA/QC, Contaminated soils)	11.50%		Subtotal	2,181,587.63
				21,151,914.83
Engineering and Administration	30.00%		Subtotal	6,345,574.45
				27,497,489.28
Vehicle allowance (6)				15,000,000.00
Maintenance Facility Allowance				4,000,000.00
ROW Allowance				2,000,000.00
GST (not included)				
		Total		48,497,489.28 US\$
Conversion to Canadian Dollars based on 1.28 conversion factor				62,076,786.27 CD\$
		Cost per Kilometer		17,311,837.32 per KM

* Assumes Double Track

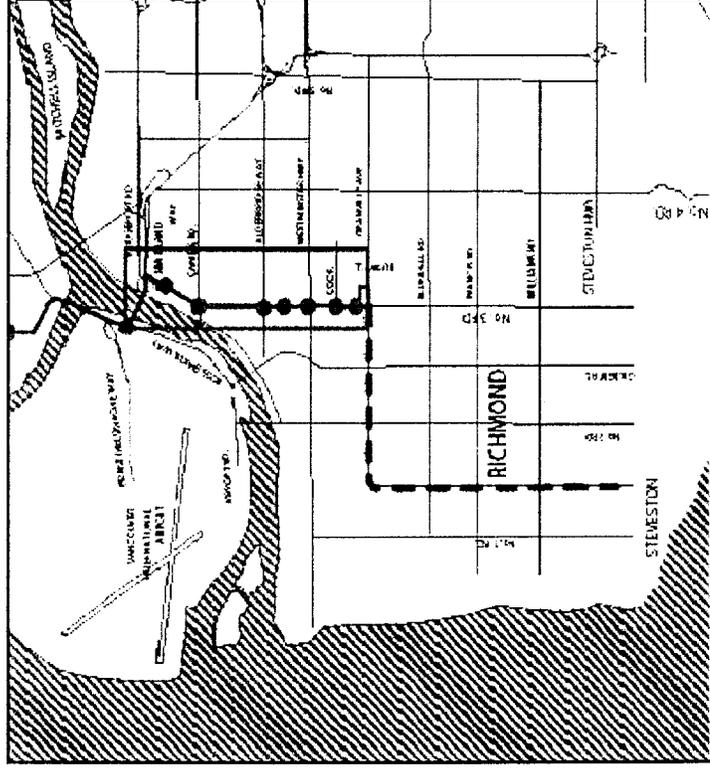
IV. Future Expansions

The question has been raised about expanding the proposed Streetcar System from its southern terminus at the Richmond Center to Steveston. We believe that it would be possible to extend the Streetcar system another 7.5 kilometers south to Steveston. Our belief is conditioned with the following assumptions; from the Richmond Centre the streetcar would turn west on Granville Ave., this segment (3.0 kilometers) would be in street, paved track section, running in mixed traffic. The streetcar would then turn south along Railway Ave (4.5 kilometers) and utilize the existing CP Right-Of-Way (ROW), south to Steveston. The Railway Ave. segment would be an "open tie and ballast" and operate in an exclusive ROW to Steveston. The conceptual cost for the Granville Ave. segment would be \$52 million (CAN\$) and the cost for the Railway Ave. segment would be \$58 million (CAN\$). Total cost would be approximately \$110 million (CAN\$). This conceptual cost assumes the following:

- Minor utility impacts
- Stops ever 500 metres
- Two new streetcar vehicles
- No expansion of the maintenance facility at Bridgeport
- Gated crossings along Railway Ave.
- GST is not included in the cost
- Minor allowance for isolated right-of-way impacts

- Does not include the cost of purchasing the CP ROW. However it is reasonable to assume that excess ROW and undeveloped land directly adjacent to the CP ROW would increase in value due to adjacency to the Streetcar. This may offset the cost of the purchase of the ROW.

In addition to the possible extension to Steveston, a streetcar system offers expansion capabilities that cannot be readily achieved with the RAV project. In particular the grid system of streets in Richmond is particularly suited to streetcar development. Streetcar is also more consistent with the planning and design ideas articulated in recently adopted Richmond plans.



Possible Streetcar Expansions

V. Conclusions

Streetcars can provide:

- A relatively low cost solution to providing a local surface transportation option.
 - Efficient operation in mixed traffic.
 - A less intrusive way to provide fixed-guide way transit in urbanized areas.
 - An excellent compliment to regional mass transit systems.
 - Can provide enhanced mobility in the urban core and replace short auto trips.
 - Spur economic redevelopment and private investment in areas adjacent to the system.
- Construction is less disruptive to local business.
 - Streetcar has slightly slower travel times (1 minute) than the RAV proposals. This is due to the inclusion of additional stations. Slower travel times can be offset by increased frequency.
 - Similar operating costs to light rail alternatives.
 - Ridership for the Streetcar maybe slightly than the projected RAV ridership projections, due to transfer penalties. Streetcar offers the opportunity to increase ridership through additional stations and system expansion.

Existing Conditions

- Streetcar can be constructed in the existing bus right-of-way along No. 3 Road.
- Adopted City of Richmond plans and policies direct future growth in the No. 3 Road corridor towards the types of densities that are most conducive to maximizing streetcar ridership.
- Street and Rail right-of way exists to expand streetcar south to Steveston.

The Streetcar Plan

- Streetcar can be competitive with other at-grade systems.
- The streetcar would operate in exclusive both the exclusive busway and in mixed traffic.
- Conceptual streetcar construction costs are estimated to be \$17,312,000.00 per kilometer along No. 3 Rd.
- Lower construction and operations cost per kilometer than LRT.

Future Expansion of the Streetcar System

- The streetcar system can easily be expanded south to Steveston by using a combination of in street running on No. 3 Rd. / Granville and utilizing the existing rail corridor along the west edge of Railroad Ave.
- The grid street system of Richmond lends itself to future expansion throughout the City.

Appendices

A. Related City of Richmond Planning Policies

Through adoption of policies and guidelines, the City of Richmond has adopted goals and measures that over time will create a walkable town center in downtown Richmond. The vision of the community is for No. 3 Road to become more pedestrian-oriented, and for the buildings in the corridor to be more dense, urban, and comprise a mixed use community center.

The Official Community Plan (1999)

- Includes land use zoning that allows dense development and mixed uses (cite).
- Includes development standards that limit the location and amount of parking, and set high standards for pedestrian amenities and accessibility.
- The transit element of the plan sets a goal to make strategic improvements to transit service by “combining various forms of transit” and “providing the local community with a more active role in planning and design of transit.”
- The City’s regional transit policy is to promote the Rapidbus/LRT to Vancouver (p. 62)
- Local policy is to enhance the east-west connections, link to neighborhood, destinations, and employment.
- Enhance city centre circulation for short trips.
- The Transit Network map identifies connections between Steveston and Riverpoint Rec Center as a major transit link, though no specific route is identified.

Richmond City Centre Area Plan – Adopted 2004

The Transportation section of the plan includes policies to reinforce the City Centre through local and regional transit connections. Policy 1.d directs the city to integrate plans for light rail “into the development of a well-linked and accessible City Centre” by connecting the downtown with Vancouver and connecting “key business areas in the city centre”. The policy also calls on the city to “support the use of conventional light rail transit which can operate at grade and complement the high-amenity, pedestrian character of Downtown.” (p. 15)

- Policies on City Infrastructure include: “Develop and operate services and their associated facilities to minimize impacts... on local livability and to complement local urban character and community identity.” (p. 26)
- Development Permit Guidelines promote streets for pedestrian activity, and designates that No. 3 Road between Landsdowne and Granville Avenue is part of the Special Pedestrian Area

City Centre Transportation Plan

- Identifies as problem # 1 - through traffic on No. 3 conflicts with local traffic
- Policy 2 – prepare for Rapid Transit at grade.
- Development Guidelines – encourage pedestrian environment, accessibility, etc.

Translink’s Richmond Area Transit Plan

- Translink’s area plan for the City of Richmond identifies short-term and long-term plans for developing a transit system to meet regional (commuter) and local (neighborhood and town center) needs. Many of the short-term recommendations related to implementing the 98 B-Line and related improvements. It also called for improved transit service within downtown (Richmond Centre) and between the city centre and other destinations (such as Riverpoint Recreation/Entertainment Complex).

B. Related Reports and Policy Documents

City of Richmond, BC. City Centre Area Plan. Plan Adoption February 16, 2004.

City of Richmond, BC. *City Centre Transportation Plan*.
<http://www.city.richmond.bc.ca/transportation/iplan.htm>

City of Richmond, BC. *Official Community Plan*. Adopted 1995.
http://www.city.richmond.bc.ca/ocp/ocp98/ocp98_index.htm

Richmond/Airport – Vancouver Rapid Transit Project. *Richmond T/2 Segment Project Definition Phase Final Report*. August 2002. Prepared for RAVCO by IBI Group.

Translink. *Richmond Area Transit Plan Summary Report*. September 2000.

Transports Canada. *98 B-Line Bus Rapid Transit Evaluation Study*, September 29, 2003. Prepared by IBI Group and Translink.