



City of Richmond

Report to Committee

To: General Purposes Committee **Date:** October 5, 2023
From: Lloyd Bie, P.Eng. **File:** 10-6480-03-01/2023-
Director, Transportation Vol 01
Re: **TransLink Bus Rapid Transit Program – Update on Proposed Richmond Corridor**

Staff Recommendation

1. That, as presented in the staff report titled “TransLink Bus Rapid Transit Program – Update on Proposed Richmond Corridor” dated October 5, 2023 from the Director, Transportation, the following be endorsed:
 - i. The resolution for Bus Rapid Transit commitment by the City as identified in Attachment 2; and
 - ii. The R7 RapidBus corridor, as identified in Figure 3, in Richmond in principle.

Lloyd Bie, P.Eng.
 Director, Transportation
 (604-276-4131)

Att. 2

REPORT CONCURRENCE		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Policy Planning	<input checked="" type="checkbox"/>	
Engineering	<input checked="" type="checkbox"/>	
SENIOR STAFF REPORT REVIEW	INITIALS:	APPROVED BY CAO

Staff Report

Origin

In June 2022, the TransLink Board and the Mayors' Council on Regional Transportation adopted Transport 2050: 10-Year Priorities (10YP). The 10YP (2025 to 2035) has identified up to nine potential corridors for RapidBus or Bus Rapid Transit investment throughout the region that will be implemented in phases.

Staff have been working with TransLink on developing alignment options for the planned RapidBus in Richmond (referred to as the R7 corridor) connecting City Centre to the Expo Line at Burnaby - Metrotown. The R7 RapidBus project is part of the next phase of RapidBus improvements in the region. TransLink is currently exploring a priority-setting process to identify the first phase of Bus Rapid Transit (BRT) lines to build. Bus Rapid Transit is new to the region. The project is considering upgrading the planned R7 RapidBus corridor to a BRT with fully traffic separated and dedicated bus lanes.

TransLink notes that municipal support for building a Bus Rapid Transit project in a host municipality will be an important criteria used to prioritize which Bus Rapid Transit projects advance. The City received TransLink's recommended resolution on September 7, 2023 seeking Council endorsement by October 16, 2023 to demonstrate support of Bus Rapid Transit on the R7 corridor (Attachment 1). The key component of the requested Bus Rapid Transit endorsement is the commitment for reallocation of existing traffic lanes for dedicated bus-only lanes.

TransLink is also seeking endorsement from the City for a preferred alignment for the Richmond segment of the R7 RapidBus corridor.

This report addresses TransLink's requests.

This report supports Council's Strategic Plan 2022-2026 Strategy #2 Strategic and Sustainable Community Growth:

Strategic and sustainable growth that supports long-term community needs and a well-planned and prosperous City.

2.4 Enhance Richmond's robust transportation network by balancing commercial, public, private and active transportation needs.

Background

Table 1 provides definitions of the transit-related terminology used in this report.

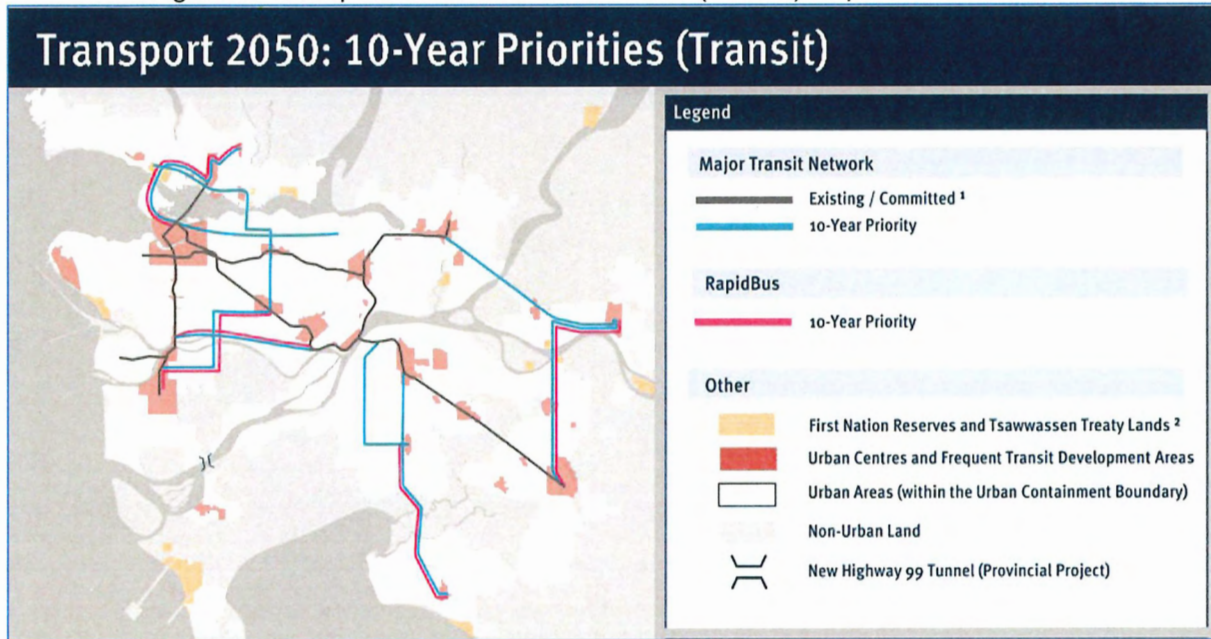
Table 1: Transit Related Terminology

Types of Transit Services		
RapidBus	RapidBus is a TransLink brand for an express bus designed to be at least 20 per cent faster than local bus service. Time savings are achieved by introducing higher frequency service and fewer bus stops. RapidBus has transit priority in approximately 30 per cent of the length of the corridor through provision of measures including dedicated bus lanes, queue jump lanes, signal priority, fewer stops, and all door boarding and street redesigns. The RapidBus project for Richmond is referred to as the R7.	
Rapid Transit	Rail Rapid Transit (RRT)	Metro Vancouver's rapid transit system currently includes the Rail Rapid Transit (RRT) Expo, Millennium, and Canada Lines. The benefit of these transit lines is the capacity and reliability gained through grade separation from traffic compared to surface level transit.
	Bus Rapid Transit (BRT)	Bus Rapid Transit (BRT) is bus service that has fully traffic separated and dedicated bus lanes on nearly the entire corridor and passenger stations at the bus stops. BRT is not grade-separated from traffic like Rail Rapid Transit.
Bus Priority Measures		
Queue Jump Lanes	Dedicated transit lanes (similar to approach lanes) or shared turn pockets paired with transit signal priority that allow transit vehicles to bypass traffic at an intersection to avoid traffic queues.	
Bus Signal Priority	Traffic signal operation that allows approaching buses to override normal operation of the traffic light in favor of the approach with the arriving bus.	
Turn Restrictions	Vehicles waiting to turn left or right at intersections can hold up traffic and delay buses if there is no turning lane. Banning turns at specific intersections can speed up travel times for buses and traffic.	
All Door Boarding	Buses where passengers are allowed to enter through any door to speed up boarding and alighting times.	
Bus Priority Lanes	Lanes reserved for buses marked by signage or paint markings. May operate during certain parts of the day (such as the rush hour) or all day.	
HOV Lanes	A traffic lane reserved for buses or vehicles with several occupants.	
General Purpose Lane	Traffic lanes available for use by the general public without any restrictions.	

Analysis

TransLink’s Transport 2050: 10 Year Priorities (2025 to 2035) has identified up to nine potential corridors for RapidBus in the region (Figure 1).

Figure 1: Transport 2050: 10-Year Priorities (Transit) RapidBus Corridors



The corridor identified for RapidBus service implementation in Richmond is between Richmond-City Centre and the Expo Line in Burnaby via Knight Street Bridge. This route is referred to as the R7. Staff have been working with TransLink on route alignment planning which is the first step in a RapidBus process.

Since Transport 2050, TransLink is looking to advance two to four RapidBus corridors to Bus Rapid Transit and is exploring development of Bus Rapid Transit service on the R7 corridor. A Bus Rapid Transit project would upgrade the planned R7 RapidBus. The key difference is that a Bus Rapid Transit service requires a fully dedicated bus lane across the length of the corridor with transit stations replacing conventional bus stops.

TransLink Request for Bus Rapid Transit Municipal Commitment

TransLink has requested the City’s endorsement of a recommended resolution to demonstrate support for Bus Rapid Transit implementation by October 16, 2023 (Attachment 1). This commitment will help the Mayors’ Council direct Bus Rapid Transit infrastructure investments to where they will be most successful and fastest to implement. A future investment plan for the first phase (2 to 4 projects) of Bus Rapid Transit projects is scheduled in 2025.

The R7 corridor includes segments in Vancouver and Burnaby as well as Richmond. At this time, staff have not seen either City endorse TransLink’s recommend resolution in support of Bus Rapid Transit.

Table 2 summarizes the key areas of municipal commitment for Bus Rapid Transit requested by TransLink:

Table 2: TransLink Bus Rapid Transit Requirements

BRT Implementation Component	Municipal support sought by TransLink and the Mayors' Council
Corridor right of way	<p>Commitment to a near continuous exclusive transit lane for the length of the BRT corridor, achieved primarily through reallocation of existing road space, with the possibility to expand road right of way where required and feasible.</p> <p>Road space reallocation required to deliver near continuous transit lane could include reallocation from general purpose traffic lanes, parking lanes, roadway shoulders, or other depending on the specific corridor context.</p>
Other transit priority actions	Support for other transit priority measures including turn restrictions, driveway, access changes, and signal priority to ensure buses operate without delay from other vehicles.
Municipal staff and elected official support	Enthusiastic BRT council champion identified. Dedicated senior staff and support team at municipality to facilitate implementation.
Procedural and engagement activities	Commitment to prioritize political processes, partner with TransLink to co-lead and champion public engagement activities, and expedite reviews and approvals.
Supportive policies and plans	<p>Commitment to proactively update municipal plans and policies and advance the principles of Transit Oriented Communities Design Guidelines to support the outcomes of the project.</p> <p>Commitment to focus population and job growth in the corridor while preserving and expanding affordable housing across the affordability spectrum through policies, zoning, expedited approvals and both in-kind and financial incentives.</p>
Supportive infrastructure	Commitment to enhance supportive infrastructure including proactive completion of sidewalks, cycling network, station areas, and public realm.

Staff's Recommended Bus Rapid Transit Resolution

Staff have reviewed TransLink's recommended resolution and support the required components for a Bus Rapid Transit service in Richmond, with one recommended revision and one clarification. TransLink's requirement for an exclusive transit lane for the length of the corridor achieved through reallocation of existing road space presents concerns for degradation of service for other road users along the R7 corridor. Staff recommend the City's commitment for a dedicated transit lane be replaced with a High Occupancy Vehicle (HOV) lane.

The clarification is that the City's support does not include financial support for Bus Rapid Transit infrastructure upgrades.

Staff's recommended resolution is included in Attachment 2 and is discussed below.

Corridor Right of Way - Reallocation of Traffic Lanes

TransLink’s Bus Speed and Reliability Study provides strategies to improve travel time and reliability of transit service through implementation of various transit priority measures. The study provides the travel time savings through implemented bus speed and reliability projects from 2019 to 2022.

Results of the study indicate that a combination of several of the bus priority measures will yield significant travel time savings without having to take away a traffic lane (Table 3).

Table 3: Bus Priority Measure Travel Time Benefits

Transit Priority Measure	Travel time savings (Weekdays)
RapidBus Route	24 - 35%
Bus Stop Reduction	5 - 10%
Queue Jump/ Approach Lanes at Intersection	15% to 35%
In-lane Bus Stops (no bus stop pullout)	Up to 15%
Traffic Signal Upgrade	Up to 20%
Vehicle Turn Restrictions	~10%
Bus/ (BAT)* Lanes in between Bus Stops	Up to 15%

*Bus-only lanes, or shared with "business access" traffic that turns across bus lanes (BAT lanes)

The largest gains in bus travel time savings are achieved by RapidBus routes with fewer bus stops, queue jump lanes and bus signal priority. Staff believe a transit system for Richmond’s Arterial roads that packages a suite of transit enhancements will achieve significant travel time savings for buses while balancing the needs of other traffic on the R7 corridor. The incremental bus travel time savings (15 per cent reduction) achieved by a dedicated bus lane in between bus stops will disproportionately penalize other traffic (passenger cars, freight) on the R7 route.

Dedicated bus lanes are more easily implemented on roads that have a six-lane cross section, wide road shoulder, or where a parking lane along the curb can be reallocated for transit. For the four-lane Arterial road context in Richmond, a reallocation of one traffic lane in each direction for transit will result in a fifty per cent reduction in road capacity for other road users.

Staff have confirmed the current peak traffic volumes on the R7 corridor warrant two travel lanes in each direction. As the timeframe provided by TransLink for City comments on the Bus Rapid Transit requirements is limited, staff are still in the process of undertaking traffic analyses to quantify the impacts of bus only lanes. Preliminary analysis indicates a reduction in road capacity to a single travel lane in each direction for all vehicles, except buses, will increase traffic delay by at least 50 per cent.

On this basis, staff do not believe public perception will view the conversion of a traffic lane to a bus only lane as an efficient use of limited road capacity on City streets.

Other Transit Priority Actions

Staff support the other transit priority measures required for Bus Rapid Transit including turn restrictions, queue jump lanes, and traffic signal priority.

Staff also support High Occupancy Vehicle (HOV) lanes to increase lane utilization while reducing delay for buses compared to a General Purpose lane. TransLink’s recommended resolution does not consider HOV lanes. Staff have recommended HOV lanes to TransLink as a strategy to improve bus speed and reliability.

One of the benefits of a HOV lane as part of an initial Bus Rapid Transit implementation phase is that it can be monitored over time to assess traffic pattern changes and determine if travel demand along the corridor warrants a dedicated bus lane in the future.

Long Term Rapid Transit Objectives

The Canada Line has proven effective at encouraging transit trips and the development of high-density, mixed-use, and walkable environments. As Bus Rapid Transit is a new service being explored for the region, similar benefits have not been proven locally.

Bus Rapid Transit is an improved service that can be implemented in the short to medium term to provide better access to faster and more reliable buses in the region. As population in the region continues to grow, a Bus Rapid Transit system will provide bus speed and reliability benefits to increase transit ridership. Ultimately, a bus-based transit line will not have the ability to reach the high frequency and people moving capacity as a rail system that will be required in the future.

On this basis, staff are recommending the City’s support of Bus Rapid Transit based on the understanding this service is a transitional product in preparation for Rail Rapid Transit on the R7 route.

R7 Route (Richmond-City Centre to Expo Line – Burnaby)

Alignment planning is the first step in the RapidBus and Bus Rapid Transit process and will serve as input for bus priority and infrastructure design. Timing for the next project phase will be determined through the region-wide Bus Rapid Transit Action Plan in consideration of other priorities.

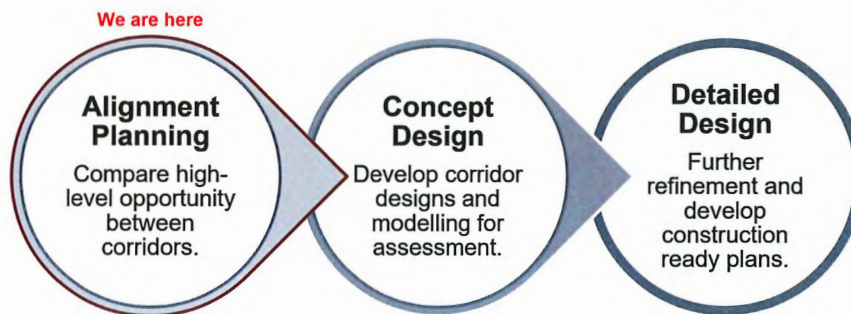


Figure 2: RapidBus Development Process

High Level Route Alignment Options

Based on initial screening and technical assessment of the existing and anticipated ridership and bus priority potential, three short-listed corridors have been examined for consideration in Richmond. The three potential corridors to connect City Centre via Garden City Road to Knight Street Bridge are Bridgeport Road, Cambie Road and Alderbridge Way.

TransLink conducted a network analysis of the various RapidBus corridors. Key inputs included ridership potential, trip length, number of connections, bus travel time, stop locations, with land use considerations including population and job density. Alderbridge Way and Bridgeport Road corridors were eliminated as east-west segments based on their relatively lower population density, ridership, fewer destinations and lower potential trip generation.

The results of the analysis found that the Cambie Road corridor provides the greatest benefits to ridership and bus operations for the Richmond segment of the corridor (Attachment 2).

The alignment also supports the City’s Official Community Plan land uses, as it will serve City Centre (including the future Richmond Centre and Lansdowne redevelopment sites), West Cambie neighbourhood and the East Cambie Neighborhood Centre.

Combined with the potential alignments in Vancouver and Burnaby, the full R7 alignment could resemble Figure 3 below.

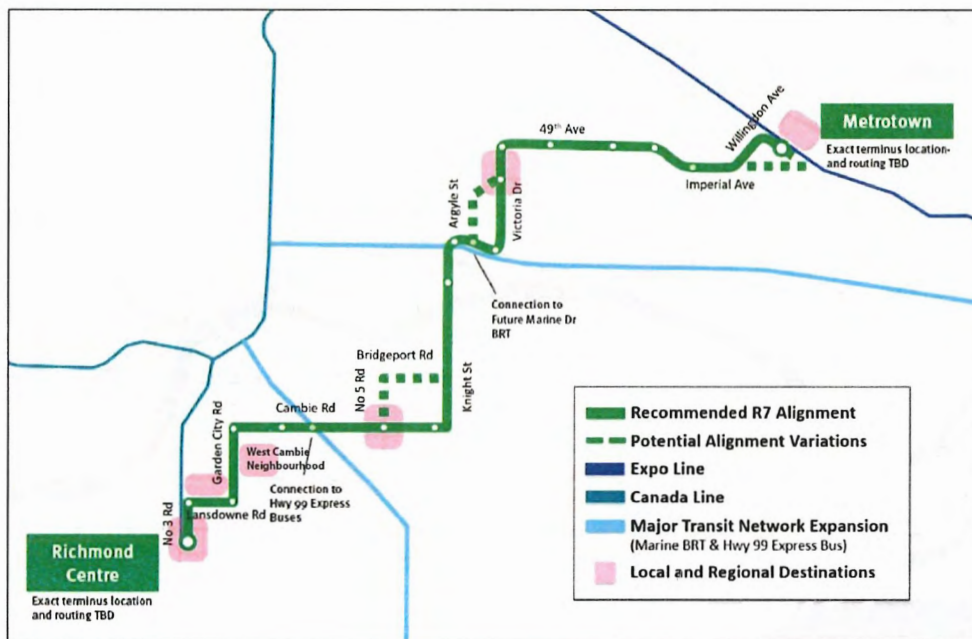


Figure 3: Potential Rapid Transit Route

Preferred Alignment Bus Priority Opportunities

Opportunity for road widening along the preferred alignment to facilitate the addition of bus lanes is limited. To achieve space for Bus Rapid Transit service, the typical midblock road right-of-way requirement is 30 metres and 37 metres at stations. Roads along the potential route with the necessary road right-of-way are sections of Lansdowne Road and Garden City Road.

Although additional space is offered by the wide centre medians on sections of these streets, consideration of the trees within these medians could limit the amount of road widening.

Even without road widening between bus stops, staff believe the other bus priority interventions can provide considerable travel time saving through prioritizing buses at the signalized intersections. Unlike long stretches of uninterrupted highway where an additional bus lane is beneficial to bypass congestion, it is staff's opinion of TransLink's Bus Speed and Reliability study that the majority of delay for buses is at traffic signals.

Staff have reviewed the preferred R7 corridor for potential intersection bus priority measures and the following will be the most feasible along the corridor:

- **Traffic Signal Priority:** Bus priority or transit signal priority includes various techniques to improve service and reduce delay for buses at signalized intersections. There is potential along the preferred R7 corridor for traffic signal operational changes even without dedicated bus lanes. This system would grant an early green or extend a green phase until the bus passes through the intersection.
- **Intersection Turn Restrictions:** This priority measure restricts right-turn movements at intersections along the RapidBus corridor during peak times. Buses will not have to wait behind turning vehicles, especially, in the downtown core where turning vehicles typically have to yield to pedestrians in the crosswalk.

The degree of changes required to support the R7 RapidBus or Bus Rapid Transit in Richmond will require detailed analysis to fully explore the benefits of alternate strategies (HOV lanes, queue jump lanes, signal priority, etc.) as part of the next phase (concept design) of the RapidBus process

Preferred Alignment Further Study

During the concept design stage, corridor design and transportation modelling will determine opportunities and trade-offs for bus priority for each segment of the alignment.

The following project elements for the preferred alignment will also need to be further developed and assessed during the concept and detailed design planning stages.

- Specific RapidBus / BRT stop locations.
- Layover & terminus location & configuration at Richmond – City Centre.
- Configuration of transit service connection points, particularly to higher order transit at Hwy 99 and a direct on-off ramp to Knight Street Bridge via Cambie Road.

Staff recommend support of the R7 route in principle given that ongoing work may result in changes to the corridor as identified above. A RapidBus will significantly benefit transit passengers along this corridor even if Bus Rapid Transit designation cannot be achieved. TransLink's findings from existing RapidBus service are that they are more than 25 per cent faster than the previous local service.

Financial Impact

None.

Conclusion

The R7 RapidBus connecting the regional town centres of Richmond City Centre and Metrotown is identified in TransLink's Transport 2050: 10 Year Priorities. Staff have reviewed corridor options for the Richmond segment of the R7 route and the Cambie Road option emerged as the recommended R7 alignment.

The R7 is also being considered for Bus Rapid Transit by TransLink. TransLink is seeking support from the City to confirm commitment for the implementation of Bus Rapid Transit along the R7 corridor by October 16, 2023.

TransLink's proposed Bus Rapid Transit resolution includes converting one general purpose lane in each direction for buses only. As a dedicated bus lane will result in a fifty percent loss in road capacity for other traffic on the corridor, staff are recommending HOV lanes in each direction instead. This approach supports the objective of the Bus Rapid Transit project of shifting trips to transit while also balancing the limited road space for other vehicles on the R7 corridor.

The City's Bus Rapid Transit resolution will inform the Mayors' Council prioritization process for two to four Bus Rapid Transit projects to be implemented as part of the next investment plan scheduled in 2025.

Sonali Hingorani

Sonali Hingorani, P. Eng.
Manager Transportation Planning and New Mobility
(604-276-4049)

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Att. 1: TransLink's Recommended Council Resolution
2: Staff's Recommended Council Resolution

TransLink's Recommended Council Resolution

CITY OF RICHMOND RESOLUTION ON BUS RAPID TRANSIT ACTION PLAN

- A. **WHEREAS** TransLink and the Mayors' Council on Regional Transportation unanimously endorsed the *Access for Everyone Plan* (also called *Transport 2050: 10-Year Priorities*) in 2022 to urgently expand and improve transit throughout Metro Vancouver to support record-setting population growth, housing affordability, GHG emission reduction targets and reconciliation;
- B. **WHEREAS** the *Access for Everyone Plan* places a strong emphasis on quick and cost-effective, delivery of new at-grade rapid transit through nine new Bus Rapid Transit (BRT) corridors throughout the region;
- C. **WHEREAS** the *Access for Everyone Plan* identified a new BRT line along the Richmond City Centre to Metrotown-Burnaby Expo Line to enhance livability and transportation in the City of Richmond and describe other local and regional benefits;
- D. **WHEREAS** BRT requires the allocation of road space and reconfiguring of roads for successful implementation;
- E. **WHEREAS** Municipalities are the primary administrators of local and regional roads in the region and will be crucial partners in the successful implementation of future BRT corridors;
- F. **WHEREAS** TransLink and the Mayors' Council are currently undertaking a prioritization exercise to determine the order in which BRT corridors will be implemented that emphasizes a 'work with the willing' approach so that first phase of BRT projects can be built quickly and to a high quality, with maximum support from municipal and other local government partners, to serve as a showcase for this type of rapid transit to the rest of the region;

Be it resolved,

THAT the City of Richmond supports a BRT line featuring dedicated bus lanes, transit signal priority, enhanced customer amenities at stations and specialized vehicles to support fast, reliable, high-quality rapid transit to along the Richmond City Centre to Metrotown-Burnaby Expo Line;

THAT City of Richmond support for this project will include:

- Working with TransLink to finalize and sign a *Bus Rapid Transit Action Plan Commitment Framework* to partner with TransLink to expeditiously achieve a high quality BRT corridor;
- A commitment to deliver a BRT with near continuous exclusive transit lane along the length of the corridor, achieved primarily through reallocation of existing road space;
- Support for prioritizing transit, including willingness to reallocate space from parking, changes to property access, turn restrictions, and transit signal priority;
- Willingness to allocate, resources, and in-kind support;

- Appointing a BRT “Council champion,” a BRT internal staff lead, and dedicated staff team to support the project through all phases;
- Willingness to expedite processes, permits and approvals, and to co-lead and support public engagement;
- Aligning local plans and policies to support Transit Oriented Communities and implement supportive infrastructure including walking and cycling networks.

THAT City of Richmond direct staff to work expediently with TransLink and coordinate with adjacent municipalities towards the planning, design and implementation of BRT within the municipality;

THAT City of Richmond ask the Mayors’ Council to prioritize the corridor as a priority BRT project, based on the municipality’s readiness to support the project.

Staff's Recommended Council Resolution

CITY OF RICHMOND RESOLUTION ON BUS RAPID TRANSIT ACTION PLAN

- G. **WHEREAS** TransLink and the Mayors' Council on Regional Transportation unanimously endorsed the *Access for Everyone Plan* (also called *Transport 2050: 10-Year Priorities*) in 2022 to urgently expand and improve transit throughout Metro Vancouver to support record-setting population growth, housing affordability, GHG emission reduction targets and reconciliation;
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- J. **WHEREAS** BRT requires the allocation of road space and reconfiguring of roads for successful implementation;
- K. **WHEREAS** Municipalities are the primary administrators of local and regional roads in the region and will be crucial partners in the successful implementation of future BRT corridors;
- L. **WHEREAS** TransLink and the Mayors' Council are currently undertaking a prioritization exercise to determine the order in which BRT corridors will be implemented that emphasizes a 'work with the willing' approach so that first phase of BRT projects can be built quickly and to a high quality, with maximum support from municipal and other local government partners, to serve as a showcase for this type of rapid transit to the rest of the region;

Be it resolved,

THAT the City of Richmond supports a BRT line featuring High Occupancy Vehicle (HOV) lanes, transit signal priority, enhanced customer amenities at stations and specialized vehicles to support fast, reliable, high-quality rapid transit to along the Richmond City Centre to Metrotown-Burnaby Expo Line;

THAT City of Richmond support for this project will include:

- Working with TransLink to finalize and sign a *Bus Rapid Transit Action Plan Commitment Framework* to partner with TransLink to expeditiously achieve a high quality BRT corridor;
- A commitment to deliver a BRT with near continuous High Occupancy Vehicle (HOV) lanes along the length of the corridor;

- Support for prioritizing transit, including willingness to reallocate space from parking, changes to property access, turn restrictions, and transit signal priority;
- Willingness to allocate, resources, and in-kind support, but does not include financial support for infrastructure upgrades;
- Appointing a BRT “Council champion,” a BRT internal staff lead, and dedicated staff team to support the project through all phases;
- Willingness to expedite processes, permits and approvals, and to co-lead and support public engagement;
- Aligning local plans and policies to support Transit Oriented Communities and implement supportive infrastructure including walking and cycling networks.

THAT City of Richmond direct staff to work expediently with TransLink and coordinate with adjacent municipalities towards the planning, design and implementation of BRT within the municipality;

THAT City of Richmond ask the Mayors’ Council to prioritize the Richmond City Centre to Metrotown-Burnaby Expo Line as a priority BRT project, based on the municipality’s readiness to support the project.