City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	August 22, 2019
From:	Lloyd Bie, P.Eng. Director, Transportation	**File:**	01-0154-04/2019-Vol 01
Re:	**Transport 2050 - Phase 1 Consultation**		

Staff Recommendation

That the attached report titled "Transport 2050 – Phase 1 Consultation" dated August 22, 2019 from the Director, Transportation be forwarded to TransLink for consideration as part of its Phase 1 consultation for the development of Transport 2050.

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

Att. 3

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Parks Services	☑	
Engineering	☑	
Sustainability	☑	
Policy Planning	☑	
Recreation	☑	
Project Development	☑	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	**INITIALS:** CJ	**APPROVED BY CAO**

Staff Report

Origin

TransLink is leading the phased development of Transport 2050, an update of the current Regional Transportation Strategy (Transport 2040) for Metro Vancouver. At the same time, Metro Vancouver is developing Metro 2050, an update to the regional growth strategy. Together, these strategies will shape the region over the next 30 years.

For Phase 1, TransLink is seeking "big ideas" that will make Metro Vancouver's transportation system work better for everyone today and into the future. As TransLink is responsible for transit service in the region, the Phase 1 consultation provides an opportunity for the City to identify desired outcomes, particularly with respect to new rapid transit routes. As such, this report also responds to the following referrals arising from discussion of the staff report titled "Potential Transit Exchange as part of Steveston Community Centre and Branch Library Replacement Project" at the July 2, 2019 meeting of the General Purposes Committee:

That staff comment on possible LRT terminus options and potential routes in Steveston.

That staff prepare options for LRT across Richmond to an LRT Transit Tunnel at Massey Tunnel utilizing the Shell Road Railway Line from Bridgeport, or a connection to the Canada Line, or a combination of both.

This report supports Council's Strategic Plan 2018-2022 Strategy #5 Sound Financial Management:

5.4 *Work cooperatively and respectfully with all levels of government and stakeholders while advocating for the best interests of Richmond.*

This report supports Council's Strategic Plan 2018-2022 Strategy #6 Strategic and Well-Planned Growth:

6.3 *Build on transportation and active mobility networks.*

Analysis

Transport 2050

Transport 2050 is an opportunity for the region to prepare for potential factors that will fundamentally change how residents move around, such as climate change and increased automation, and ensure that the benefits of new mobility options are both sustainable and equitable. Development of Transport 2050 will be in three phases and will be completed in Fall 2020 prior to the completion of Metro 2050, which is anticipated in 2022.

Phase 1: Share values and ideas, develop vision (Spring-Summer 2019)

In May 2019, TransLink launched the first phase of public engagement seeking input on residents' values, transportation priorities and ideas for the future of transportation in the region. As of early August 2019, over 14,000 surveys have been completed and over 1,600 ideas shared at transport2050.ca. Phase 1 consultation ends in September 2019.

Phase 2: Consider ideas and trade-offs (Spring 2020)

During Phase 2 engagement, TransLink will present different options for future transportation. These options will include projects, policies and programs drawn from Phase 1 feedback. As the options will offer different benefits and costs, input will be sought on how to weigh the choices.

Phase 3: Draft new Regional Transportation Strategy (Fall 2020)

In Phase 3, TransLink will share the draft strategy. Following Phase 3 engagement, TransLink will take the strategy to the Mayors' Council on Regional Transportation for approval.

Phase 1 Ideas for Richmond

For the Phase 1 consultation, staff have developed a number of ideas and concepts for transportation improvements in Richmond (Attachment 1). The concepts generated provide a transportation system that accommodates a growing regional population and economy with modes and policies that are sustainable, equitable, safe, and reliable. The City's paramount objective is to achieve mode shifts such that at least 50% of all trips in Richmond are by transit and active transportation by 2050, consistent with the goals of the following key City plans:

- *Official Community Plan* (OCP): in addition to the afore-mentioned mode shift targets, the OCP and the City Centre Area Plan identify higher density development along Frequent Transit Network[1] (FTN) corridors, reinforcing the land use-transportation link.

- *Community Energy and Emissions Plan* (CEEP): the existing CEEP and the current CEEP renewal focus on a wide range of greenhouse gas (GHG) emission reduction initiatives. Given that light duty vehicle gasoline use contributed 42.6% of total GHG emissions in Richmond in 2015, new and upgraded low carbon travel options are necessary to help the City achieve its GHG emission reduction targets.

Rapid Transit

The transit-related ideas are grounded in three principles of transit network design and management:

1. maximize ridership,
2. encourage long-term ridership growth, and
3. provide access to transit service across the region.

Rapid transit technologies can range from bus- to rail-based (Attachment 2). Given the higher cost of rail- or bus-based rapid transit relative to conventional bus services, ridership is a key consideration to ensure an effective and productive service. Thus, the deployment of rapid transit service typically follows a progression over time from conventional bus, conventional bus with FTN service levels, bus rapid transit, and rail rapid transit (LRT or ALRT/SkyTrain) as ridership grows.

[1] Frequent Transit Network (FTN) denotes transit service that operates at least every 15 minutes in both directions throughout the day and into the evening, every day of the week.

To that end, higher density and active areas with a mix of uses generate greater transit demand and justify higher levels of service. Bus rapid transit services could potentially be upgraded to rail rapid transit as population and employment densities increase along the corridors.

Transport 2040 identifies a future FTN concept where the proposed rapid transit routes can be either bus or rail (Attachment 3). The FTN concept shown in Richmond is consistent with the Mobility and Access chapter of the OCP. The proposed ideas below go beyond Transport 2040 and TransLink's Southwest Area Transport Plan (SWATP).[2]

Connection to South of the Fraser River

Consistent with Transport 2040, a new rapid transit service is needed that will connect the Canada Line to the south of the Fraser River region via the planned new Massey Crossing. Staff have identified three potential alignment options through Richmond (Table 1). All alignment options will have implications for adjacent land use to better support rapid transit.

Table 1: Preliminary Comments on Rapid Transit Alignment Options from Richmond to South of the Fraser River

Option	Alignment	Land Use & Ridership	Current Transit Use
Bridgeport Station via Highway 99	• Reallocation of shoulder bus lanes to operation in centre median • Use of existing Ministry of Transportation & Infrastructure right-of-way (ROW) • Relatively low impact to road users	• Corridor has relatively lower density and mixed uses • Primarily serves regional trips	• 9 bus routes currently operate on Highway 99 • Combined average daily weekday boardings of 15,900 passengers
Bridgeport Station via CN Rail Lulu Island Spur	• Primarily use of existing CN Rail ROW that currently has 4 trains per day • Notice on CN Rail website identifies section between Steveston Highway and Vulcan Way-Viking Way to be dismantled but timing is unclear • Relatively low impact to road users	• Corridor lacks higher density and mixed uses • Primarily serves regional trips	• N/A
Richmond-Brighouse Station via No. 3 Road-Steveston Highway	• OCP and SWATP identify FTN service levels along these corridors • Given existing ROW widths, alignment will likely require change in the use of travel lanes, median treatments and/or additional property for stations	• Corridor has relatively higher density and mixed uses including Broadmoor and Ironwood future neighbourhood centres[3] • Primarily serves local trips	• 403 bus ranked #44 out of 213 bus routes in region for ridership (2018) • Average daily weekday boardings of 6,360 passengers

[2] The Southwest Area Transport Plan, developed by TransLink in partnership with the City and endorsed by Council in March 2018, serves as a blueprint for how resources can best be allocated over the next decade to improve transit and transportation in the area.

[3] Per the OCP, future neighbourhood service centres are densified shopping centres that accommodate the retail, restaurant, office, personal service, business, arts, culture, entertainment, recreational, institutional and community facility and service needs of area residents and may include residential uses.

Connections to North of the Fraser River

- *Upgrade of Canada Line*: As part of the fully funded Phases 1 and 2 of the Mayors' Council's 10-Year Vision, Canada Line capacity will increase by up to 30% with the deployment of 24 new cars starting in 2021. Further upgrades are required to meet continued growing demand and maximize the quality of experience so that riding the train is a comfortable and convenient option. Improvements include lengthening the platforms to accommodate longer trains, complementary station upgrades to improve passenger circulation and provide public washrooms, and doubling the single track south of Lansdowne Station to increase capacity.

  Phase 3 (Years 6-10) of the 10-Year Vision, which is currently unfunded, identifies Canada Line station upgrades to "improve capacity, accessibility, and customer amenities" (total of $52.4 million in 2015$) but does not provide any details of the scope of improvements.

- *City Centre-Vancouver via Granville Street*: This alignment mirrors the former 98 B-Line service and provides a complementary service to the Canada Line along a high demand corridor[4] that improves access to/from Vancouver while also enhancing resiliency in the transit network. The existing #10 bus route that operates along Granville Street provides FTN level service and in 2018 ranked #17 out of 213 bus routes in the region in terms of average daily weekday boardings (15,860 passengers).

- *City Centre-New Westminster via Highway 91A*: Upgrade of the existing #410 bus service that connects to the Expo Line at 22nd Street Station. The #410 currently provides FTN level service and in 2018 ranked #12 out of a total of 213 bus routes in terms of average daily weekday boardings (18,510 passengers).

Connections within Richmond

Consistent with Transport 2040, the existing bus service linking the City Centre and Steveston is proposed to be upgraded to a higher tier of bus- or rail-based rapid transit. Staff have identified two potential alignment options (Table 2). Both alignment options will have implications for adjacent land use to better support rapid transit.

Table 2: Preliminary Comments on Rapid Transit Alignment Options from City Centre to Steveston

Option	Alignment	Land Use	Current Transit Use
Westminster Highway-No. 1 Road	• Consistent with current RTS and SWATP that identify corridors for FTN service • Given existing ROW widths, alignment will likely require change in the use of travel lanes, median treatments and/or additional property for stations	• Serves area with relatively higher residential density and employment including Terra Nova and Seafair future neighbourhood centres	• 401 bus ranked #33 out of 213 bus routes in region for ridership (2018) • Average daily weekday boardings of 9,130 passengers

[4] Per TransLink, the corridor served by the #10 bus route has a population of 101,000 and employment of 135,000.

Option	Alignment	Land Use	Current Transit Use
Granville Avenue-Railway Avenue	• Use of existing ROW (road and former interurban corridor) • Relatively low impact to road users	• Corridor has relatively lower density and mixed	• 406 bus ranked #46 out of 213 bus routes in region for ridership (2018) • Average daily weekday boardings of 6,020 passengers

Should transit ridership between the City Centre and Steveston continue to grow and warrant the progression of higher orders of transit service from bus rapid transit to rail rapid transit, the location of a rail terminus in Steveston depends upon the rapid transit alignment and the ultimate site of the planned transit exchange upgrade (identified in Phase 3 of the Mayors' Council's 10-Year Vision).

New Forms of Transit Service

- *On-Demand Transit*: This service can be seen as a hybrid of regular public transit services (fixed route, fixed schedule) and personalized taxi services (flexible route, flexible schedule). TransLink recently completed a pilot program on Bowen Island in July-August 2019 that involved passengers using a smartphone app, web browser, or phone to book a seat on the on-demand shuttles servicing the island. This type of service may be appropriate in low density areas of Richmond that are underserved by transit such as residential areas within the Agricultural Land Reserve and/or industrial areas such as Mitchell Island and Fraserport.

- *Water-based Services*: Increasing residential, commercial and industrial development along both sides of the north arm of the Fraser River presents an opportunity for fixed route ferries or on-demand water taxis to serve both commuter and recreational trips. The City Centre Area Plan (CCAP) identifies water taxi access at a number of locations along the Middle Arm of the Fraser River between Oval Village and Bridgeport Village. Seamless links to transit services at each stop will be critical to ensure first-/last-mile connectivity.

Active Transportation

- *New and Upgraded Crossings*: As an island city, water crossings designed for cyclists and pedestrians are a necessary component of an active transportation network to support local and regional trips. As the Massey Crossing project team has confirmed that pedestrian and cycling facilities will be part of the planned new Massey Crossing, additional proposed new and upgraded links include:

    - Richmond-Vancouver via Sea Island: Pedestrians are not permitted on the existing Arthur Laing Bridge, which is under the jurisdiction of the Vancouver Airport Authority (VAA), and the existing shoulder bike lanes do not provide any physical protection from adjacent vehicle traffic. A new separate pedestrian-cyclist crossing in this corridor will increase the safety and comfort level of users and provide a more direct connection to the Arbutus Greenway in Vancouver. The YVR 2037 Master Plan does not identify this connection.

    - City Centre-Sea Island: The CCAP identifies a new pedestrian-cycling bridge at Aberdeen Village in the vicinity of the west end of Cambie Road to Sea Island across the Middle Arm of the Fraser River near BCIT. If built, the planned new bridge will enhance

connectivity to the City Centre and the Canada Line for Burkeville residents and BCIT students who currently have relatively limited transit access.

- Dinsmore Bridge: Gilbert Road on either side of the Dinsmore Bridge has bike lanes but the bridge itself has no cycling facilities and a sidewalk on the south side only. The bridge is under the jurisdiction of VAA and while the YVR 2037 Master Plan identifies "replace or upgrade the Dinsmore Bridge to seismic standards while maintaining a two lane structure with the addition of separated cycling and pedestrian pathways," the YVR Master Plan does not indicate a timeline for this work.

- Knight Street Bridge: The existing sidewalks are relatively narrow and cannot comfortably accommodate both pedestrians and cyclists. The bridge is under the jurisdiction of TransLink; to date the agency has not identified any upgrades to the structure to better serve active transportation modes. Improved cycling connections to/from the bridge on the Richmond side will be a necessary complement.

- *Micro Mobility*: New and emerging micro mobility services such as dockless bike sharing and electric-assist bicycles and scooters (both private and shared) offer alternative options to complete the first-/last-mile to transit stations while also promoting safe, healthy, clean, and compact communities. In July 2019, TransLink released "Micromobility Guidelines" that were developed in collaboration with local municipalities including the City. The Guidelines provide a framework for regional coordination to ensure a unified and efficient system. Within this framework, there is an opportunity for TransLink to examine the need for consistent regulation by municipalities of micro mobility devices on different types of active transportation infrastructure given the speed and weight differentials of these devices compared to pedestrians and pedal cyclists.

Goods Movement

- *Urban Freight Delivery*: Given the increased use of home-delivery services, new methods of goods movement should be considered such as encouraging the electrification of urban freight vehicles that travel relatively shorter distances and the development of new distribution centres with electric vehicle charging stations.

- *Short Sea Shipping*: This concept would enable the movement of containers from existing marine container terminals by barge to a central logistics facility on the Fraser River for distribution. These operations would benefit businesses and communities across the region by minimizing truck traffic on roads and decreasing the environmental impacts of cargo movement. The Port of Vancouver recently secured grant funding from the federal government towards the development of a viable short sea shipping concept for the region.

New Technology

- *Mobility as a Service*: This concept (MaaS) is the integration of a range of public and private shared use transportation modes (e.g., public transit, ride-share, car-share, bike-share, taxi) into one application platform that allows the user to plan, book and pay for a trip through a single channel. Key to the development and deployment of a MaaS application is ensuring

that the application is an open platform that offers all information and mobility options available to a user.

- *Smart Transportation Systems*: The application of technologies (computers, electronic sensors and communication devices) in transportation to can improve safety and save time, money and energy. New developments in the convergence of automation, connectivity, electrification, and shared use mobility will provide opportunities to create a regional network of "smart" corridors that improve safety and reliability through the use of technology such as automated incident detection systems, vehicle-to-roadside communication systems, intersection cameras and real-time information on road conditions, real-time bus arrival times, and transit signal priority.

- *Regional Road Safety Plan*: Development of a coordinated regional approach to enhance road safety for all road users. For example, based on results in other jurisdictions, an aggressive expansion of intersection safety cameras for both red light and speed enforcement across the region would achieve a significant reduction in casualty crashes.[5] Coordination would be required with the Province, as the current red light camera and automated speed enforcement programs are within provincial jurisdiction.

Funding

- *Mobility Pricing*: This concept refers to a suite of fees for using transportation services such as transit fares and road usage charges. The City's OCP supports a shift to a more equitable user-pay system to manage travel demand at its source to reduce private vehicle trips. Mobility pricing on the road network would help generate funding to implement transportation improvements across the region, incentivize behaviour change and shift taxation away from the fuel sales tax, which is a declining revenue source due to increased vehicle efficiency and growing electric vehicle sales.

  In May 2018, the Mobility Pricing Independent Commission released a report that suggested principles for formulating a mobility pricing policy and descriptions of two high-level concepts: point charge and distance-based charge. As the City would be concerned with a point charge system at crossings, further assessment is required regarding affordability and equity impacts.

- *Ride-Hailing*: A number of studies conducted in US cities have found that ride-hailing services have led to increased congestion, higher traffic fatalities and declines in transit ridership.[6] The City of Vancouver's feedback to the Province regarding ride-hailing legislation includes exploration of a regional per trip levy to help minimize congestion that would be directed back towards transit and active transportation improvements. Such a fee should become part of a future larger mobility pricing framework within the region.

[5] An automated speed enforcement pilot program in Saskatchewan reduced vehicle speeds by 17% and speed related casualty collisions by 63%. Quebec reported reduced average speeds by 13.3 km/h and crashes by 15% to 42%.
[6] Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States, University of California Davis, October 2017. The New Automobility: Lyft, Uber and the Future of American Cities, Schaller Consulting, July 2018.

Financial Impact

None.

Conclusion

TransLink is seeking input from local municipalities for Phase 1 of the development of Transport 2050, which is the update of the current Regional Transportation Strategy (Transport 2040). This report identifies a number of ideas and concepts to improve Metro Vancouver's transportation system in line with local and regional goals to increase sustainable travel modes. Staff recommend that this report be forwarded to TransLink for consideration. With Council endorsement, staff will promote the ideas and concepts throughout the multi-phase Transport 2050 process.

J Caravan

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JC:jc

Att. 1: Transport 2050 Phase 1 Consultation – Ideas for Richmond
Att. 2: Types of Rapid Transit Technologies
Att. 3: Transport 2040 – Concept of Future Frequent Transit Network

Transport 2050 Phase 1 Consultation - Ideas for Richmond

Types of Rapid Transit Technologies

Bus Rapid Transit

About BRT

Driver-operated bus technology that provides faster, more frequent and more reliable service than conventional bus service such as B-Line or even frequent bus service. Unique branding sets BRT apart, making the system easy to identify and reflecting community character.

Power source: Diesel, compressed natural gas (CNG) or hybrid diesel-electric. Electric trolley buses can be used with overhead lines.

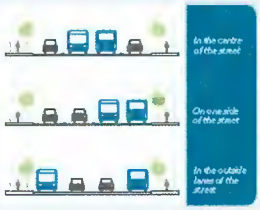
Right of way: Typically operates in the street but in separate lanes from other traffic at an average speed of 30 km/h. Most BRT systems run on the surface; however, they can also run in tunnels or on elevated structures.

Frequency: Typically high; as frequent as every 2 minutes. Dedicated lanes, moderately spaced stops and signal priority at intersections improve travel time and reliability.

Capacity: Typically medium; up to 3,500 passengers per hour per direction.

Vehicles: Typically 18 metre-long articulated buses. Vehicles use low-floor, kneeling technology and/or ramps for easy and universal accessibility.

Typical Operating Environments



BRT examples from around the world

BRT systems are in operation around the world in cities such as Ottawa, Toronto, Curitiba and Lyon.

Light Rail Transit

About LRT

Driver-operated rail technology using trains that utilize unique vehicle and station design to help the system integrate into the communities it serves.

Power source: Electric power from overhead lines.

Right of way: Typically operates in the street, but in separate lanes from other traffic at an average speed of 30 km/h. Most LRT systems run on the surface; however, they can also run in tunnels or on elevated structures.

Frequency: Typically high; as frequent as every 2 minutes. Dedicated rights of way, widely-spaced stops in lower-density areas and signal priority at intersections improve travel time and reliability.

Capacity: Typically high; up to 15,000 passengers per hour per direction.

Vehicles: Light Rail Vehicles (LRVs) range in size from 25 - 80 m long and can operate singly or in trains of up to four cars. Vehicles and platforms are designed to allow level boarding for easy and universal accessibility.

Typical Operating Environments

LRT examples from around the world

LRT systems are in operation around the world in cities such as Portland, Houston, Paris, Berlin and Lyon.

Rail Rapid Transit

About RRT

Driver-operated or driverless rail technology that has a high passenger capacity. RRT operates completely separated from other traffic, which improves travel time and reliability.

Power source: Electric power from a rail beside the track.

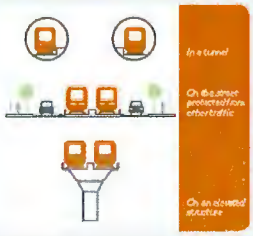
Right of way: Typically operates in a tunnel or on an elevated structure at an average speed of 40 km/h. Surface level operation is possible, however, it must be fully segregated for safety.

Frequency: Typically high; as frequent as every 2 minutes. Complete segregation from other traffic provides fast and reliable journeys.

Capacity: Typically high; Metro Vancouver's SkyTrain system is built to carry up to 25,000 passengers per hour per direction. Other systems around the world use different vehicles and operations to accommodate more passengers.

Vehicles: Mark II SkyTrain vehicles are 17 m long per car and can operate in 2- or 4-car trains. 3- and 5-car trains are possible in the future. Vehicles and platforms are designed to allow level boarding for easy and universal accessibility.

Typical Operating Environments



RRT examples from around the world

Metro Vancouver's Canada Line and SkyTrain are smaller examples. Large-scale RRT systems are found in major cities worldwide, including Toronto, New York, London, Tokyo, and Beijing.

Common features of rapid transit systems

BRT LRT RRT

Some examples of common features include:

- **Stations** are distinct and feature ticket vending machines, closed circuit TV for security, real-time information and wayfinding.
- **Tickets or electronic fare media** are purchased off the vehicle for faster, more efficient boarding.
- **Multiple doors and level boarding** make getting on and off rapid transit vehicles faster, more efficient, and universally accessible.
- Systems can be designed to **integrate with the communities they serve,** including station locations and how the stations and vehicles look.

Transport 2040: Concept of Potential Frequent Transit Network

Concept of Potential Frequent Transit Network