

A Better Burrard Peninsula

Movement's vision for transit in
Vancouver, Burnaby and New Westminster



MOVEMENT



Table of Contents

Part One: Who We Are	.....	p. 2
Part Two: What We Want	.....	p. 3
Part Three: What We Have	.....	p. 4
Part Four: What We Aspire To Be	.....	p. 6
<i>Special Focus Area: Downtown</i>	.....	<i>p. 23</i>
<i>Additional Suggestions</i>	.....	<i>p. 30</i>
Part Five: Conclusion & Acknowledgements	.....	p. 34
Appendices	.....	p. 35
<i>Appendix A: New bus routes and extensions</i>	.....	<i>p. 35</i>
<i>Appendix B: Key delay hotspots</i>	.....	<i>p. 37</i>
<i>Appendix C: Opportunities for bus priority</i>	.....	<i>p. 39</i>



Part Two: What We Want

When thinking about the transit network in the Burrard Peninsula, we considered three broad goals. Transit should be:



Convenient

Competitive with other modes such as driving. Transit should be frequent and fast.



Accessible

Available and reliable at all times of the day, throughout the year.



Dependable

Day or night, transit should be there to provide a smooth and seamless journey.

When transit is convenient, dependable, and accessible, it provides a compelling alternative to driving and allows people of all income levels and abilities to access high quality mobility. With these goals in mind, we evaluated the current network to see where it does well and where it needs improvement.

Part Three: What We Have

It is important to note that Metro Vancouver has a strong transit network compared to its peers, which has led to a system with much higher ridership than many larger cities across North America. Here are some of the **strengths** of the current network:



Frequent grid in Vancouver facilitates transfers, and allows fast and direct trips along important corridors.



SkyTrain provides a backbone for our transit network, creating fast, frequent, and reliable regional transportation.



Bus network complements SkyTrain network, and many key bus interchanges are located at SkyTrain stations.



RapidBus network provides reliable express options to cross parts of the city not served by SkyTrain.



Routes generally follow major roads for their length, making it easy to understand where buses run and lowering the barrier to understanding the network.



Express transit is often accompanied by frequent local transit, meaning that local residents still receive the benefit of rapid transit if they are far away from a station.



NightBus provides a skeleton overnight service, allowing people to go to and from downtown throughout the night.



Vast majority of the Peninsula is covered by bus service of some kind, making nearly every corner of the study area accessible by transit.

Although our current network provides a strong foundation, we think there are many **areas for improvement**:



Frequent grid does not exist east of Victoria Drive, leaving huge gaps in the frequent transit network in East Vancouver, Burnaby and New Westminster.



Many historical bus routings remain despite decades of change, creating unintuitive routes and leaving many areas of the city underserved.



Circuitous routes in East Vancouver and Burnaby result in slow and indirect travel, reducing transit's competitiveness with driving and degrading rider experience.



Some major corridors and areas have no bus service at all, most notably on E 1st Ave, W 33rd Ave, Musqueam lands, Royal Oak Ave, and 54th/57th Ave.



Limited bus priority at locations where buses are regularly subject to delay from vehicle traffic, leading to slow and unreliable buses as well as high operating costs.



Bus network collapses when it snows, making transit difficult to depend on and leaving riders stranded.



Express Bus/RapidBus network is sparse, leaving many riders in Burnaby and New Westminister with only slower local buses.



Millennium Line does not have consistent parallel local service, making trips along the Millennium Line corridor difficult for those who live far from a station.



Frequent Transit Network (FTN) standard is only every 15 minutes, making the frequent bus grid less useful because of long transfer times.



NightBus network is limited and confusing, and many daytime routes end too early into the night.



Downtown transit corridors are unreliable, lack capacity and priority, and create delays that propagate to other parts of the network.

Part Four: What We Aspire to Be

Although the Burrard Peninsula transit network of today has many problems, we believe in a system that is accessible, convenient, and dependable. In the following section, we will outline our suggestions for fixing the most prevalent problems. We approached the network from a rider's perspective, being mindful of both the new rider's experience with exploring the system and the well-traveled rider's habits.

Our solutions are rooted in feedback we've heard from riders and experiences we've had as transit riders. We drew upon previous TransLink plans, as well as documents and best-practices from other cities and agencies. Although we strived to provide suggestions for fixing the problems we've identified, it is more important that these problems are resolved through whatever solutions are ultimately practical and feasible.

1



Frequent grid does not exist east of Victoria Drive

2



Many historical bus and streetcar routings still remain despite decades of change; and

3



Circuitous routes in East Vancouver and Burnaby result in slow and indirect travel

Problem:

The Frequent Transit Network (FTN) grid stretches between Victoria Drive in the east and Macdonald Street in the west, leaving parts of East Vancouver, Burnaby, and New Westminister with infrequent and circuitous service. In these areas, transit to and from locations far from SkyTrain is often not competitive with driving or cycling, and riders are stuck with slow connections to rapid transit. The current network east of Victoria Dr has no bus routes that go from the top of the peninsula to the bottom.

Extending the frequent grid eastward would allow more of the Burrard Peninsula to be served by high frequency and direct bus routes. This would give residents several options to go north-south to SkyTrain or RapidBus, or east-west across the region, reducing the number of required transfers required to reach many destinations.

Our Solution:

Extend the Frequent Transit Network (FTN) grid eastward, stretching from Dunbar Street in Vancouver to North Road in Burnaby. There are many possible ways to create intuitive north-south routes across the Burrard Peninsula. One possible set of routes is laid out in [Appendix A](#) and shown in [Figures 1 & 2](#), but other street combinations can provide similar connectivity. The purpose of describing a potential set of routes is to show that it is possible to create a coherent, frequent grid across the peninsula extending east at least to North Road.

4



Some major corridors and areas have no bus service at all

Problem:

Major corridors and areas lack bus service. Here are the major gaps we identified:

- East 1st Avenue
- 54th Ave/57th Avenue
- Royal Oak Avenue
- W 33rd Avenue
- Musqueam First Nation

Our Solution:

Create new bus routes along 54th/57th Avenue and Royal Oak Avenue. Create a new route from Commercial-Broadway Station serving East 16th Avenue and W 33rd Avenue, terminating at the Musqueam First Nation lands. Extend the 23 along 1st Avenue to terminate at Brentwood Town Centre. These routes are shown in [Figures 1 & 2](#).

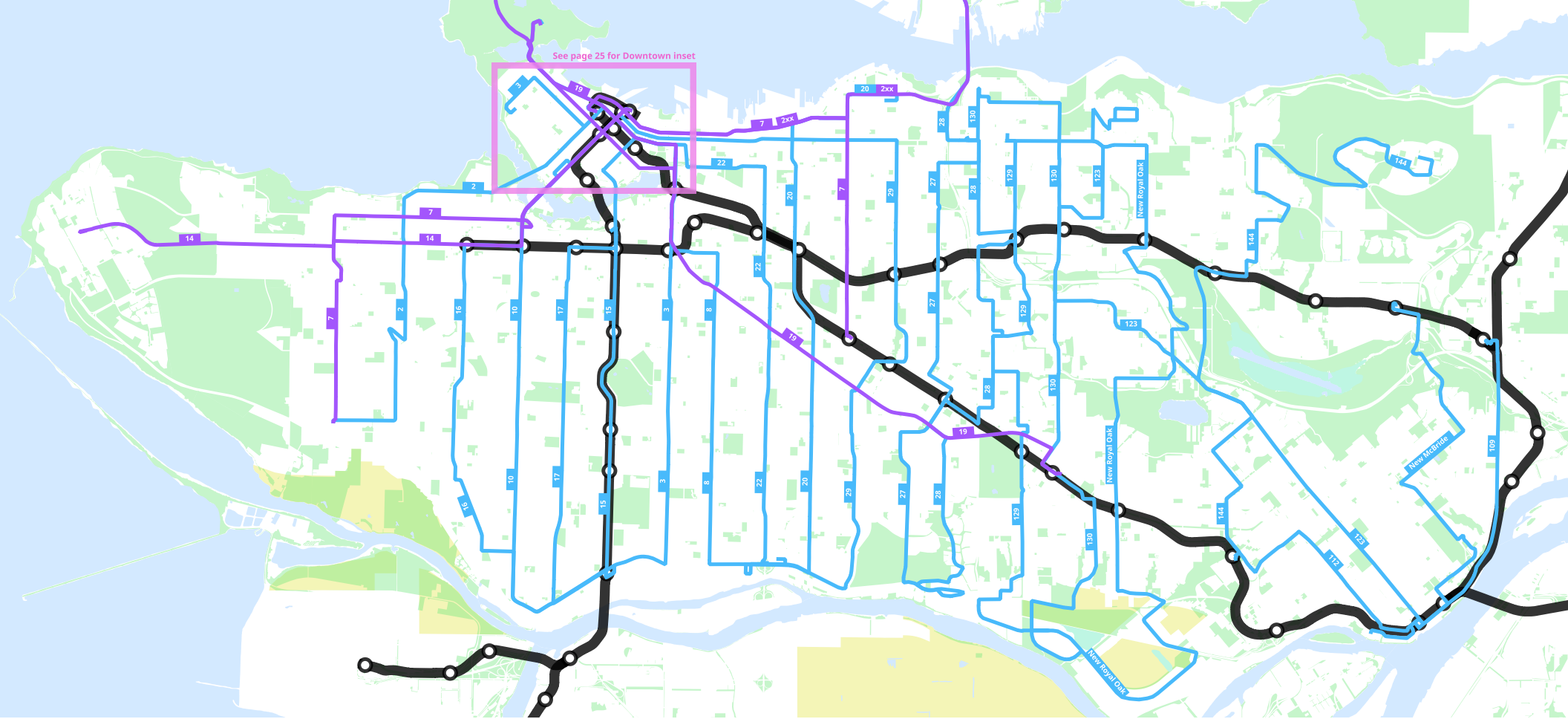


Figure 1. Proposed North-South and Radial Local Bus Network

North-South Routes

- | | | |
|---------------------|-----------------------|--------------------------|
| 2 Macdonald | 16 Arbutus | 28 Boundary |
| 3 Main | 17 Oak | 29 Renfrew-Elliot |
| 8 Fraser | 20 Victoria | 109 Columbia |
| 10 Granville | 22 Knight | 112 12th Street |
| 15 Cambie | 27 Rupert-Kerr | 123 Canada Way |

Radial Routes

- | | |
|--------------------------------|-------------------------|
| 129 Patterson | 7 Dunbar-Nanaimo |
| 130 Willingdon | 14 West Broadway |
| 144 Kensington-Sperling | 19 Kingsway |
| NEW Royal Oak | |
| NEW McBride | |

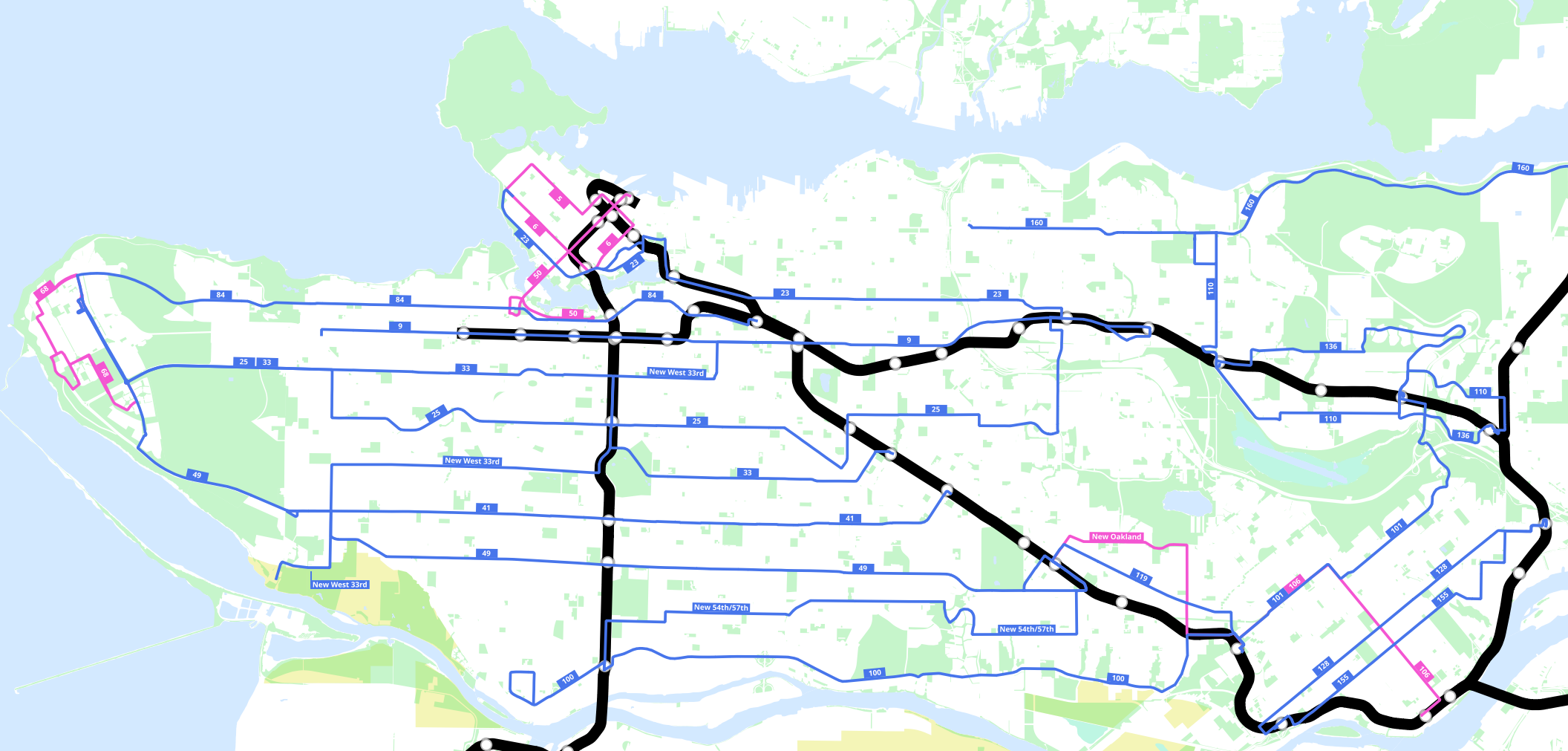


Figure 2. Proposed East-West and Coverage Local Bus Network

East-West Routes

- 9** Broadway
- 23** 1st Avenue
- 25** King Edward
- 33** East 33rd Avenue
- 41** 41st Avenue
- 49** 49th Avenue
- 84** 4th Avenue Express
- 100** Marine
- 101** 16th Avenue
- 110** Government
- 119** East Kingsway
- 128** 8th Avenue

Coverage Routes

- 5** Robson
- 6** Davie
- 50** South False Creek
- 68** UBC
- 106** 6th Street
- NEW** Oakland

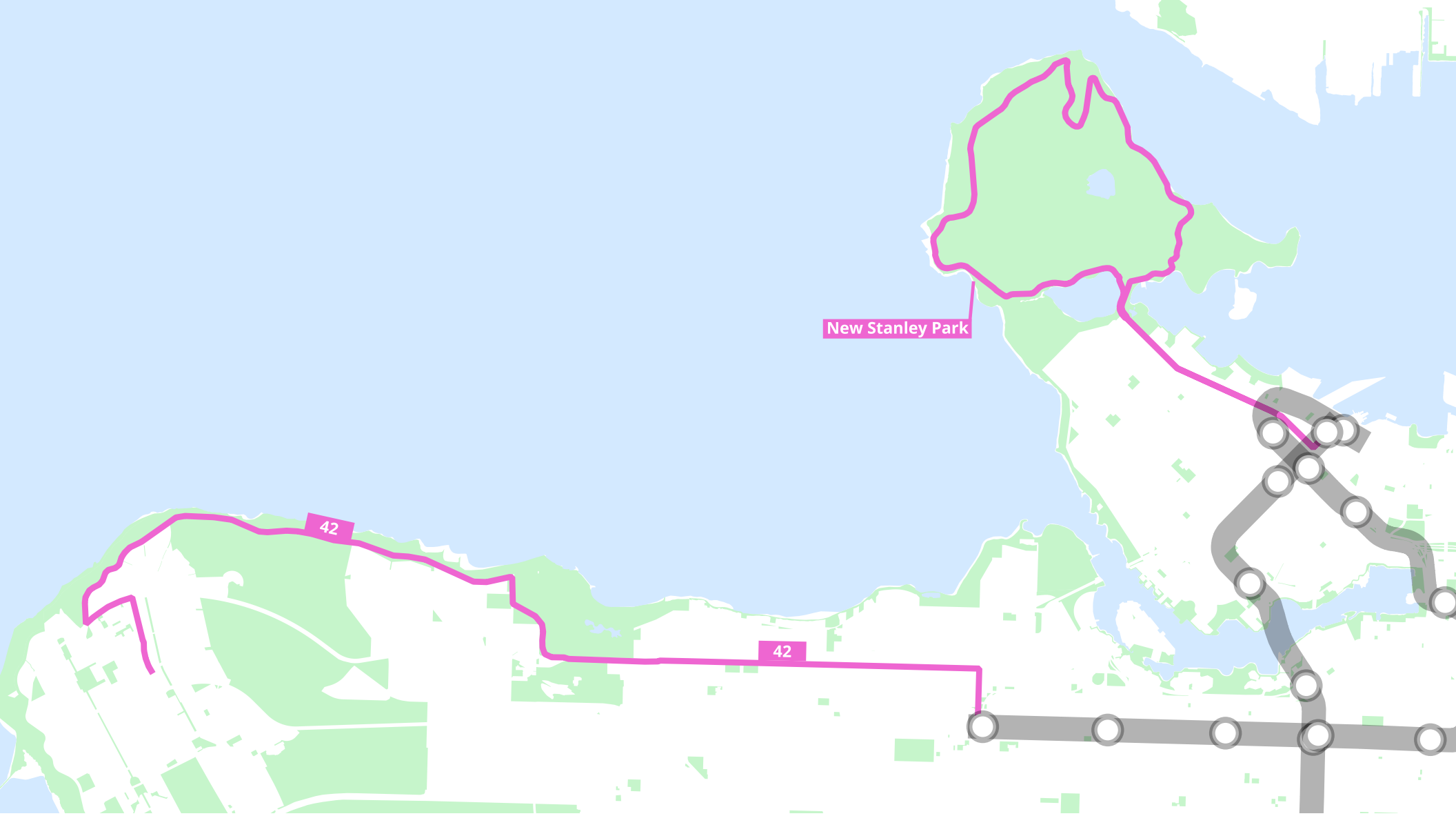


Figure 3. Proposed Special Bus Network

East-West Routes

- 42 Spanish Banks
- NEW Stanley Park

In addition, some parks and beaches are currently difficult to access using transit. Create special routes to make important destinations like Stanley Park and Spanish Banks more accessible (*Figure 3*). These routes would potentially have different service spans and scheduling than most other routes.

5



Limited bus priority where buses are regularly subject to delay from vehicle traffic

Problem:

Bus priority helps buses avoid traffic and delay, making them faster, more reliable, and cheaper to operate. A lack of bus priority is responsible for one of the biggest gaps in transit quality in the Burrard Peninsula. Even the most well-used routes such as the 25, 49, and R4 consistently struggle with bunching and delay. These delays also erode the Frequent Transit Network standard, with many routes coming less frequently than the standard suggests during peak hours. However adding bus priority can be politically challenging, as many municipalities prioritize parking and private vehicle throughput over bus reliability.

Our Solution:

Define key corridors and hotspots where delay occurs regularly, where unreliability can propagate across the transit network, and where delay impacts the largest number of people. The provincial government and TransLink should incentivize adding bus priority in these places by helping municipalities cover the cost.

Define key locations where there are opportunities to significantly improve bus speed and reliability. These are locations where streets could be redesigned, street space could be reallocated, turns could be restricted, or other actions taken to enable buses to get around vehicle traffic.

Our suggestions for these locations are listed in *Appendix B* and shown in *Figure 4*.

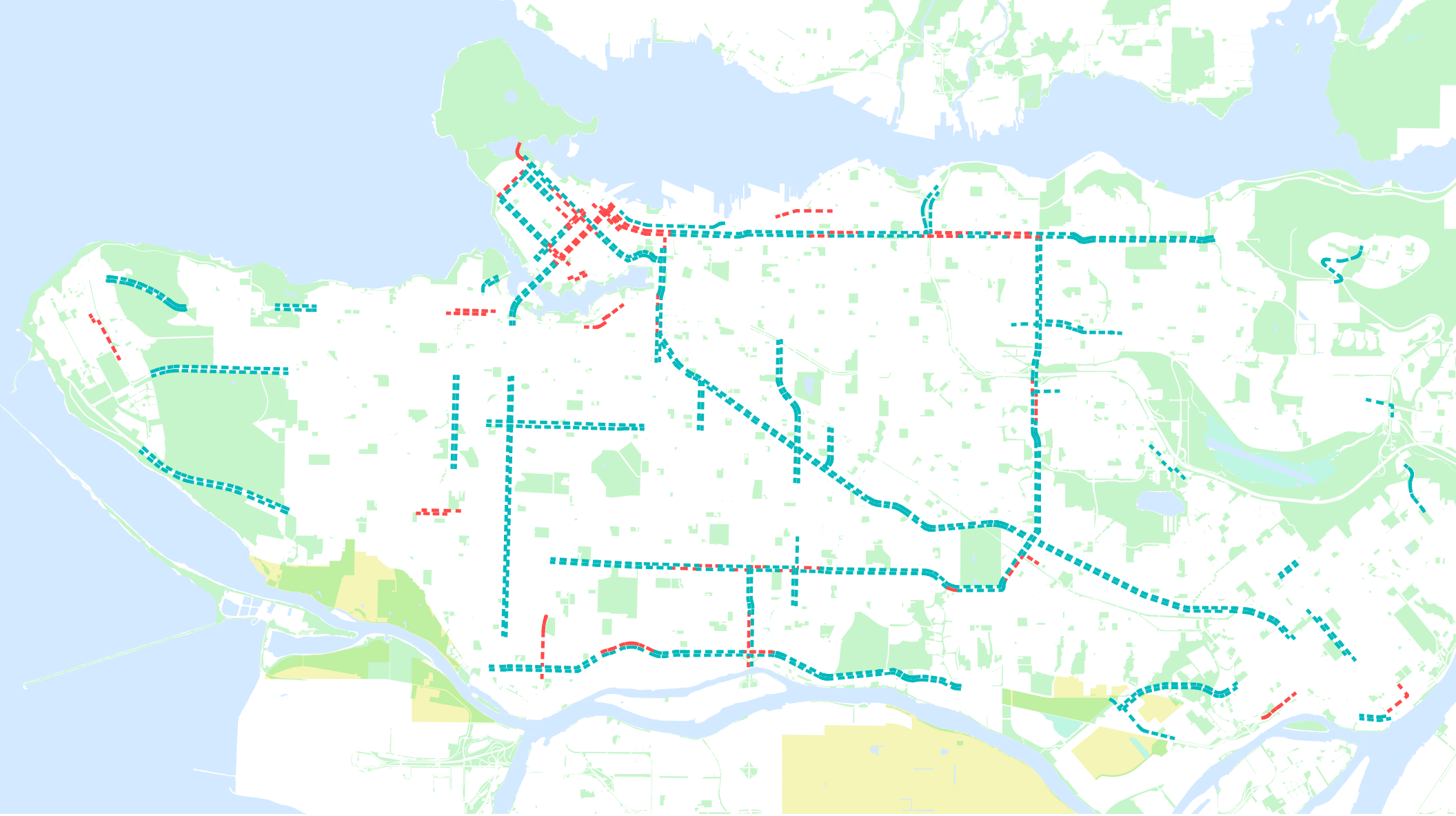


Figure 4. Proposed Bus Priority Network

- **Issue**
Hotspots of transit delay or slow speed
- **Opportunity**
Opportunities to reallocate road space

There are several locations where there is an opportunity to use existing road space to improve bus speed and reliability. Many of these locations have excess capacity compared to nearby sections of road, where extra general traffic lanes may encourage speeding and other poor driver behaviour. In other instances, there are opportunities to adopt transit priority measures that exist elsewhere, like centre-running bus lanes, turn restrictions, contraflow bus lanes, or bus bulges. Combined HOV and bus lanes can be redesigned as bus-only lanes or to provide more effective bus priority. These types of solutions might be considered on the example corridors identified in [Appendix C](#).

6



Bus network collapses when it snows

Problem:

As snowy weather is an annual occurrence in Metro Vancouver and winter storms are becoming more severe, our transit system needs to be as reliable as possible at these times. It is important that transit be a reliable way to get around when it snows, especially since driving in the snow can be stressful and dangerous.

Our Solution:

Create an adverse weather network, with alternative routings for bus routes that run on steep hills. This keeps the transit network nimble and able to respond to snow in a way that's predictable to riders. This should be accompanied by a Snow Action Plan that dictates how to respond snow quickly and consistently.



Express Bus/RapidBus network is sparse

Problem:

RapidBus provides a great express bus network, allowing for much faster trips along major corridors. However, with only 3 lines serving the peninsula, many parts of the region do not have access to RapidBus and are only served by slower local bus routes.

Our Solution:

Expand the RapidBus network. Because RapidBus routes are cheaper to operate than local bus routes, RapidBus could be rolled out more extensively across the peninsula using resources reallocated from the local routes they run alongside and resources saved from bus priority implementation. RapidBus projects will also provide a compelling case for local governments to consider adding bus priority to major corridors as they are more visible than local bus improvements.

- A. Create a Victoria Drive RapidBus,** mirroring the route of the 20, with a terminus in either Richmond or the River District. This would relieve the overcrowded route 20, and provide fast and reliable service to a corridor plagued with delay and bunching. It would improve access to Hastings Street, the Drive, Commercial-Broadway, and Fraserview. It would also provide some relief for the Canada Line. This is a planned RapidBus route in the Transport 2050 10 Year Priorities.
- B. Create a Marine Drive RapidBus.** This route could begin at Marine Drive Station or in Marpole, travel along Marine Way and Southridge Dr to end at 22nd Street Station. This would improve access to the River District, Southgate City, and Market Crossing in the Big Bend. This would relieve a frequent and busy bus, and provide a fast connection between the Canada Line and the Expo Line in the south part of the city. There is available right of way for significant bus priority along this corridor, and RapidBus/BRT is planned for this corridor in the Transport 2050 10 Year Priorities.

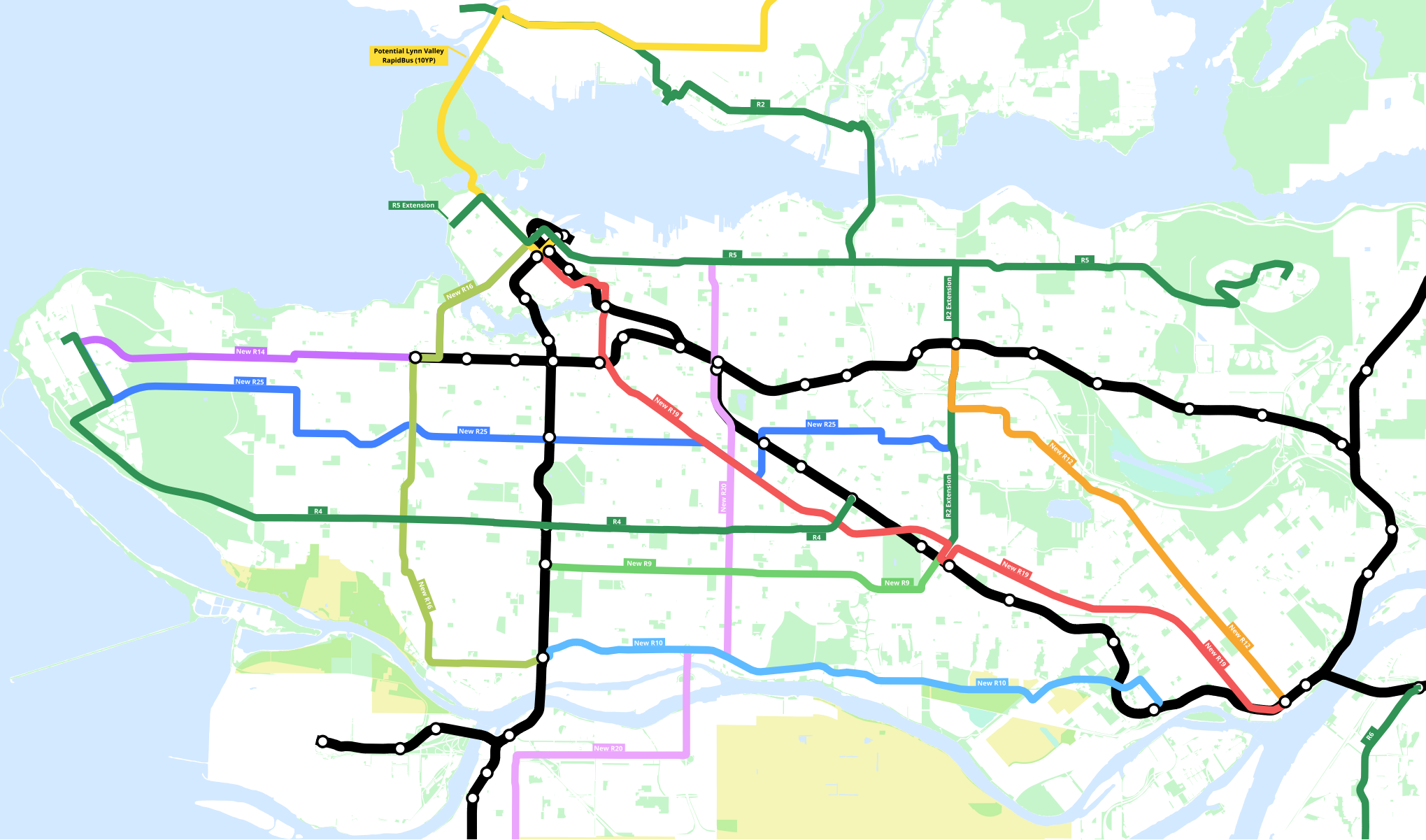


Figure 5. Proposed RapidBus Network

- | | | |
|---|------------------------------------|-------------------------------------|
| R2 Extended Marine-Willingdon RapidBus | R12 New Canada Way RapidBus | R25 New King Edward RapidBus |
| R4 Existing 41st Avenue RapidBus | R14 New Broadway RapidBus | |
| R5 Extended Hastings RapidBus | R16 New Arbutus RapidBus | |
| R9 New 49th Avenue RapidBus | R19 New Kingsway RapidBus | |
| R10 New Marine Drive RapidBus | R20 New Victoria RapidBus | |

- C. Create a 49th Avenue RapidBus**, mirroring the route of the 49 between Metrotown on the Expo Line and Langara-49th Station on the Canada Line. This would provide sorely needed relief to route 49 by bringing fast and reliable express service to 49th Avenue. Ridership on 49th Avenue is very high, and the adjacent R4 RapidBus is also in need of relief. Adding effective bus priority on this constrained corridor will require changes in street design and allocation of street space to buses. A 49th Avenue RapidBus would provide faster travel between the Expo and Canada Lines as well as improve access to Punjabi Market, Fraserview, and Langara College.
- D. Create a Canada Way RapidBus or interim limited-stop route**, mirroring the route of the 123. This route would improve access to Uptown New Westminster, Deer Lake and BCIT. It would also provide faster crosstown trips between New Westminster and North Burnaby. A RapidBus on this corridor is a 10-Year Priority in Transport 2050.
- E. Create a King Edward Avenue RapidBus or interim limited-stop route**, mirroring the route of the 25. This route would relieve a very overcrowded, slow and unreliable bus. It would improve access to BCIT, Burnaby Hospital, Little Mountain, and BC Children's Hospital. It would also help relieve the R4 RapidBus by providing a parallel fast and frequent alternative.
- F. Create an Arbutus Street RapidBus**, starting at Burrard Station, travelling down Burrard Street, Broadway, Arbutus Street, West Boulevard, Angus Drive, West 70th Avenue, and SW Marine Drive to terminate at Marine Drive Station. This route would relieve a busy bus, and improve transit service within Downtown. It would also provide RapidBus service to Granville Island, Kerrisdale, and Marpole as well as providing relief for the Canada Line.
- G. Extend the Hastings Street RapidBus into the West End** from its existing terminus at Burrard Station. This would provide reliable express service to the West End and Coal Harbour, and relieve downtown journeys from the North and West Vancouver buses that run on Georgia Street.

H. Create a Kingsway RapidBus, following the route of the 19 between Waterfront and Metrotown, then running down Kingsway and 12th Street to terminate at New Westminster Station. This route would provide high quality and fast bus service to many underserved communities that are near the Expo Line but further than walking distance from it. The Kingsway corridor is densifying in Vancouver and Burnaby, and at present lacks a single continuous bus route from New West to Vancouver. This new RapidBus would facilitate trips between growing communities along Kingsway, including Chinatown, Mount Pleasant, Norquay, Collingwood, Metrotown, Edmonds, and Uptown New Westminster.

Together with the existing R4, extended R2 RapidBus, and SkyTrain, these routes provide the peninsula with a RapidBus supergrid, and an express overlay of the frequent grid.

8



Millennium Line does not have consistent parallel local service within the Burrard Peninsula

Problem:

Rapid transit should be accompanied by frequent local transit where there are residents or destinations along the route. This ensures that people with mobility challenges or residents who do not live near a rapid transit station keep local transit benefits when rapid transit is implemented.

Some parts of the Millennium Line do not have any frequent local service despite having significant employment and residential uses along the street. It is important that the increasing density of the corridor be served with frequent local transit. This is especially important on the Millennium Line west of Holdom, which has wide rapid transit stop spacing and either no or infrequent local transit.

Our Solution:

Provide local bus service on Lougheed Highway where there are adjacent residents and jobs, and make accessing the stops safe from both sides of the street. Extend route 9 to Brentwood Town Centre or Holdom Station.

9



The Frequent Transit Network (FTN) standard is only every 15 minutes

Problem:

The Frequent Transit Network (FTN) is a network of high frequency routes, which run every 15 minutes or better. This standard should be raised to every 10 minutes. This would make it easier to “turn up and go” – reducing average wait times to around 5 minutes. It would also mitigate the transfer penalty by facilitating quick transfers between routes on the frequent grid.

Our Solution:

Increase service on existing FTN routes within the Burrard Peninsula to every 10 minutes or better throughout the day to reduce wait times and overcrowding, with the eventual goal of raising the system-wide Frequent Transit Network (FTN) standard to every 10 minutes or better.



NightBus network is limited and confusing

Problem:

Overnight transit in the Burrard Peninsula is limited, with only a handful of infrequent routes providing skeleton service. Additionally, NightBus routes have confusing routings which are often significantly different than their numbers might suggest. For example, the route of the N17 is completely unrelated to the route of the 17. Another example is route N22, which provides night service along the route of the 2.

Many people in the Burrard Peninsula do not live on the NightBus network, and those who do are often constrained by low frequencies. Additionally, although outside the study area, YVR Airport is a large 24-hour employment centre, with travel demand throughout the night. Both employees and visitors should have dependable night transit to the rest of the Metro Area.

Our Solution:

Provide frequent NightBus service that mirrors SkyTrain lines and proposed RapidBus corridors, connects regional town centres, and connects destinations that operate at all hours like hospitals, industrial areas, and the airport.

Remove the requirement for all NightBus services to terminate downtown, allowing more intuitive routes and greater coverage of the Burrard Peninsula.

Aim to have all NightBuses stop in the same locations as their daytime local counterparts, so that NightBus routes are easily understood by people who use routes during the daytime without needing to look at a map. Extend daytime routes by combining them together to form longer NightBus routes.

NightBuses should run more frequently, with service every 30 minutes or better. There should not be any large gaps in service span between daytime routes and NightBus routes. Riders should know if they see a NightBus stop that a bus will come in a reasonable time.

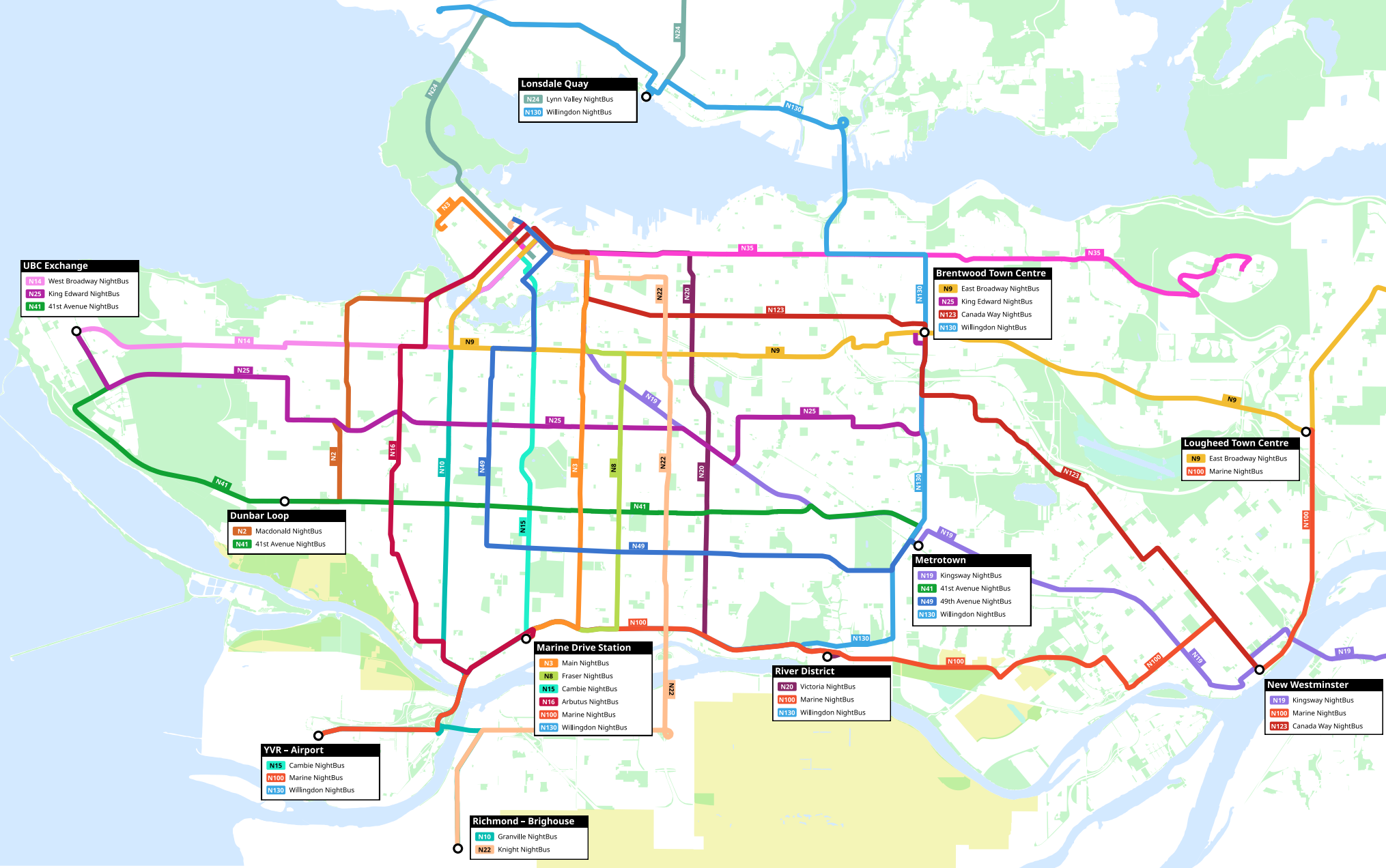


Figure 6. Proposed NightBus Network

- | | | | |
|-------------------------------|-----------------------------------|---------------------------------|---------------------------------|
| N2 Macdonald NightBus | N14 West Broadway NightBus | N22 Knight NightBus | N49 49th Avenue NightBus |
| N3 Main NightBus | N15 Cambie NightBus | N24 Lynn Valley NightBus | N100 Marine NightBus |
| N8 Fraser NightBus | N16 Arbutus NightBus | N25 King Edward NightBus | N123 Canada Way NightBus |
| N9 Broadway NightBus | N19 Kingsway NightBus | N35 Hastings NightBus | N130 Willingdon NightBus |
| N10 Granville NightBus | N20 Victoria NightBus | N41 41st Avenue NightBus | |

Provide coverage using north-south routes. This allows most NightBus routes to terminate downtown, where demand is highest.

Create new circumferential NightBus routes that provide east-west or radial service outside of downtown, allowing connections between other NightBus routes and direct connections between regional town centres including Ambleside, Lonsdale, Brentwood, Metrotown, and Richmond without having to go back downtown

- ◆ Create a new N100 Marine NightBus route, providing service to the Production Way SkyTrain branch and Royal Columbian Hospital, which were previously unserved by NightBus. This route would also provide additional NightBus connections to the airport, allowing people living in New Westminister and South of the Fraser to more easily access the airport during the night.
- ◆ Create a new N123 Canada Way NightBus route, providing additional service from downtown to Brentwood and New Westminister. This route also increases NightBus coverage in East Vancouver and Central Burnaby.
- ◆ Create a new N130 Willingdon NightBus route, providing radial service between the North Shore, Burnaby, and Southeast Vancouver. This route connects all but one NightBus routes, facilitating trips between regional centres. It would also provide direct service to the airport from the North Shore, Brentwood, Metrotown, and the River District.
- ◆ Create new N16 Arbutus NightBus, N22 Knight NightBus, and N49 49th Avenue NightBus routes to increase coverage, and provide NightBus service to previously underserved communities. Terminate new route N22 in Richmond to provide additional regional NightBus service.
- ◆ Create new N25 King Edward NightBus and N41 41st Avenue NightBus routes to provide east-west service within Vancouver, better connect UBC with the rest of the region, and facilitate transfers between other NightBus routes.
- ◆ Replace the N17 NightBus with a new N14 West Broadway NightBus, which provides NightBus service between downtown and UBC via West Broadway.

- ◆ Re-number the existing N22 Macdonald NightBus to N2 Macdonald NightBus
- ◆ Extend route N15 to terminate at the airport, and modify route N10 to skip the airport and run directly to Richmond (and possibly continue onwards).
- ◆ Modify route N20 to terminate at the River District.

Our proposed NightBus network is also designed to provide 24-hour service to all major hospitals in the study area (Vancouver General Hospital, BC Children's Hospital, both old and new St Paul's Hospitals, Burnaby Hospital, and Royal Columbian Hospital).

Electric buses, including In-Motion Charging Trolleybuses, should be prioritized for NightBus. With increased frequencies, buses could cause noise pollution during the night. Since electric buses are quieter, this ensures people living along NightBus routes can get a good night's sleep.

Travel times between major hubs on our proposed NightBus network provide an opportunity to create a timed transfer system. This would not only facilitate transfers between NightBuses, but also reduce wait times for transfers where riders might not feel comfortable waiting during the night.

Special Focus Area: Downtown

Downtown Vancouver presents both a unique challenge and a unique opportunity for transit. Because of its location west of the population centre of Metro Vancouver and the surrounding geographical barriers, many bus routes are constrained to only a handful of corridors. In particular, we identified the following problems with the transit network downtown:

- ◆ The high concentration of routes on only a small set of corridors means delay on any of these corridors has widespread effects on the reliability of buses across the entire Burrard Peninsula. For example, issues with trolley wires on Granville could affect buses in downtown, UBC, South Vancouver, East Vancouver, and along Hastings.
- ◆ Lack of layover space downtown means that splitting long and unreliable routes like the 7 and 16 is much more difficult. With the implementation of the Broadway Millennium Line extension, trips on these buses all the way through downtown will make less sense, and there will be less justification for keeping the routes combined.
- ◆ Most routes operating downtown are either designed to go *to* downtown or *through* downtown. This can make getting *around* downtown on transit slow and painful. The two routes that circulate downtown, routes 5/6 and 23, are notoriously overcrowded and slow. Routes that terminate downtown typically terminate in the central part of downtown, meaning a transfer is required to visit other parts of downtown. For example, someone riding route 20 going to the West End has to transfer to route 5 at Cambie St.
- ◆ The mismatch in routings east and west of the Downtown Eastside forces buses to make extra turns, which creates delay and makes the bus network less legible. For example, westbound Powell buses become Pender buses at Hastings and eastbound Pender buses become Cordova buses at Homer or Hastings. There is an opportunity to consolidate routes to similar destinations on the same streets to increase the effective frequency at each stop.

- ◆ Common corridors provide very high frequency service but only on a limited set of corridors. For example, the common corridors along Granville, Georgia, and Pender/Cordova/Hastings facilitate trips down those corridors, but travelling to other parts of downtown not on those corridors can be difficult.
- ◆ Routes that travel through downtown towards a common destination do not always follow the same streets, so frequency of combined routes is effectively lower for a rider waiting at a stop than the total service provided to that destination. For example, buses to Mount Pleasant travel along both Pender Street and Cordova Street before turning on Main Street.
- ◆ Bus routing changes on Granville Street are confusing to riders. Bus stops on Granville require long and complicated explanations, reducing network legibility, and making downtown bus routes difficult to understand.

However, the concentration of people, jobs, shopping, tourists and transit downtown poses a unique opportunity to make high-value transit investments, and drive increased ridership. With the Expo Line, Canada Line, and SeaBus bringing so many people downtown, and the relative sparsity of rapid transit downtown, strong local bus routes are needed to ensure people can use transit to quickly and reliably get to their destination.

Our Solution:

Solving the challenges presented by the downtown transit network is not easy. Notably, fixing the most serious problems will require reallocation of road space and investment by the City of Vancouver in bus priority. However, this investment is necessary to create a more sustainable city centre, and drive sustainable transportation mode share even higher than it is today. Downtown Vancouver has the potential to be a model for sustainable transportation in North America, and we urge both the City and TransLink to pursue this future.

Strengthening Connections

To solve both the inconvenience of getting around downtown on transit and the lack of layover space, we propose moving the termini of several routes farther into downtown. This will minimize transfers, provide higher frequency and capacity to existing routes, and provide more route options. Route 16 should be split in two and each half should terminate at the far end of downtown. Routes 5/6 should be kept, providing a dedicated circumferential route for downtown.

At least one route (for example, route 7) should continue to extend across the downtown peninsula to provide continuous service between Kitsilano and the Downtown Eastside. One route (for example, route 3) should extend into the West End to improve connections between the West End and Chinatown.

The majority of the downtown peninsula does not have rapid transit access, including west of Thurlow St (excluding the 257, which serves a specific purpose and for which local trips should be discouraged). Planned projects for rapid transit west of Thurlow are limited to RapidBus lines to West and North Vancouver in Transport 2050's 10-year priorities. To mitigate this, the R5 RapidBus should be extended further west across the downtown peninsula, ideally serving the West End. This will require improved transit priority along Pender and West Georgia, which will also help to reduce reliability issues for routes to the North Shore and beyond. Along with stronger local buses, this will ensure higher quality and faster regional journeys to the West End without requiring a transfer. An improved R5 RapidBus will also build ridership for a potential future Hastings Street rapid transit line.

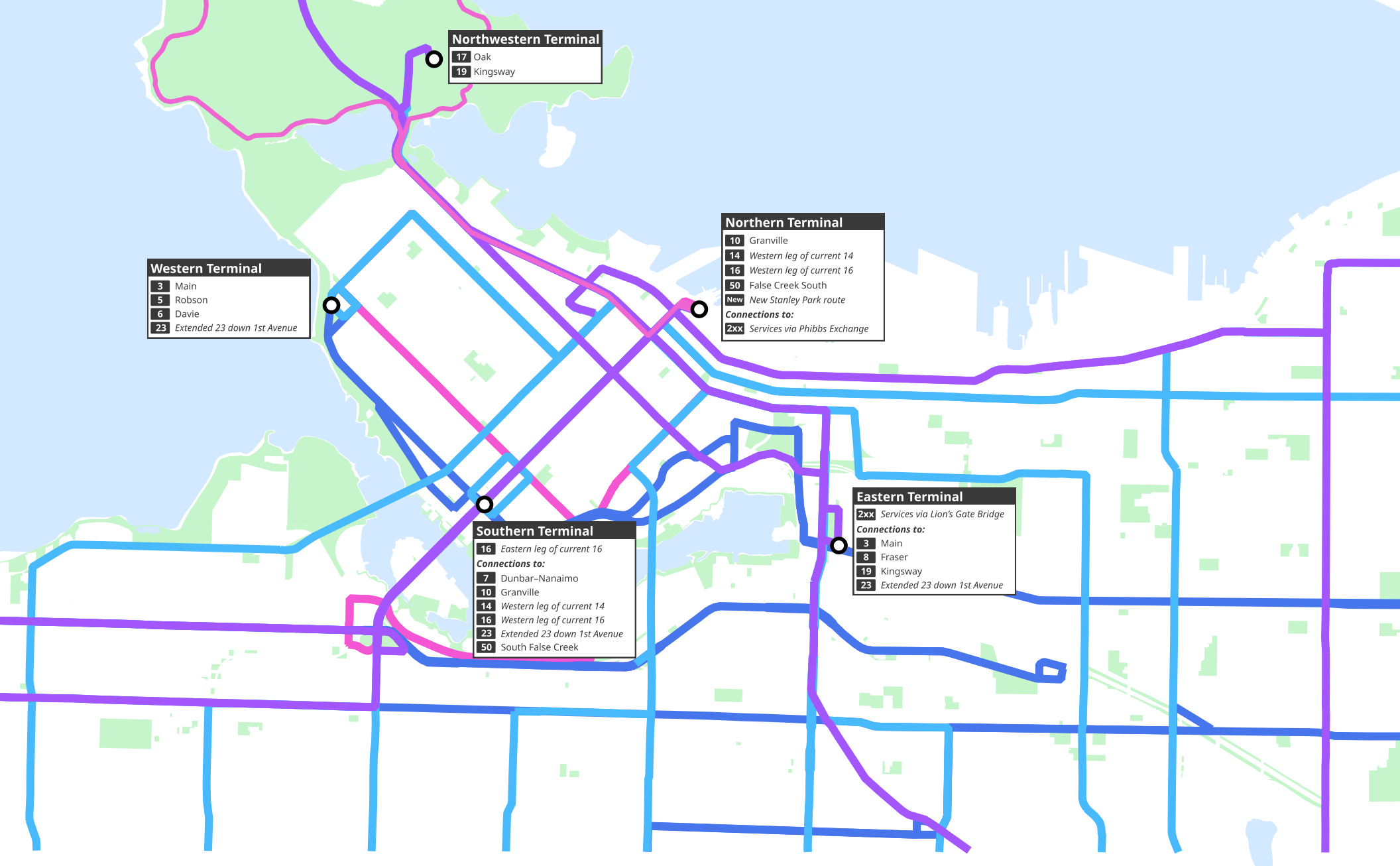


Figure 7. Proposed Downtown Local Bus Network

- East-West Primary
- Radial
- North-South Primary
- Loop or Coverage Gap

Layover Space

Due to limitations with layover space, not all routes will be able to extend through downtown. Routes should be strategically chosen to ensure access deeper into downtown is distributed among routes from every direction. A thorough review of potential opportunities for layover space downtown should be conducted, including strategic locations where closing the road to general vehicle traffic would increase layover capacity. Extending more routes to the Stanley Park Loop should be considered due to the high draw of visitors to Stanley Park, and the underutilization of the current loop. Bus terminal and layover facilities adjacent to downtown should also be considered to strengthen the tie between downtown and the surrounding areas served by local bus routes. In particular, layover space for terminating routes should be prioritized for the following areas:

- ◆ English Bay (providing a terminus in the west)
- ◆ Stanley Park (providing a terminus in the northwest)
- ◆ Waterfront Station (providing a terminus in the north)
- ◆ Main Street Station (providing a terminus in the east)
- ◆ Downtown South (providing a terminus in the south)

Bus Speed and Reliability

To ensure the routes travelling through downtown are fast and reliable, significant transit priority should be considered on all major common corridors, including Granville/Howe/Seymour, Davie, Denman, Robson, Georgia, Expo/Pacific/Beach, and Pender/Hastings/Cordova. According to TransLink's *Bus Speed and Reliability Report (2023)*, downtown is a large source of delay. Because so many routes terminate and travel through downtown, investments in transit priority downtown are especially impactful, and will create positive effects across the Burrard Peninsula. Our suggestions for where transit priority should be added are listed in *Appendices B & C*, and shown in *Figure 8*.

With the success of the Granville Street transit mall, more streets across downtown should be considered for conversion to transit only, at least in part. Due to high potential ridership and available rear lane access, Robson St and Davie St are especially strong candidates for partial transit-only conversion. Modal filters should also be strongly considered, to allow only buses, cyclists, and pedestrians to pass through some sections or intersections.

If the City of Vancouver plans to pedestrianize Granville Street, high quality bus priority along Seymour St and Howe St would be crucial for ensuring speed and reliability for the many bus routes that use the corridor today and in the future.

West Georgia is a wide street where buses are subject to frequent, predictable delays from vehicle traffic. This street has sufficient width to create dedicated space for bus lanes, which could make it possible for buses to avoid delays approaching Denman eastbound and the existing bus queue jumper westbound. Bus priority here would likely significantly benefit riders on the North Shore by providing more reliable service. This would also make it possible to extend other routes across the downtown peninsula (like the R5 RapidBus and route 17) that are currently not feasible with the poor quality bus infrastructure here that would make extended routes too unreliable.

Where buses run on one-way streets, conversion to contraflow bus lanes should be considered. Streets with contraflow bus lanes are two-way streets in which one lane allows only buses to travel in one direction and general traffic and buses can travel in the other direction. These prevent conflict with right-turning cars, which are a source of delay on streets with curbside bus lanes.

With contraflow bus lanes on Cordova Street, North Shore routes via Phibbs Exchange and route 7 should be consolidated to run in both directions on Cordova. This would improve bus speed and reliability by reducing the number of turns on these routes, and would improve network legibility.

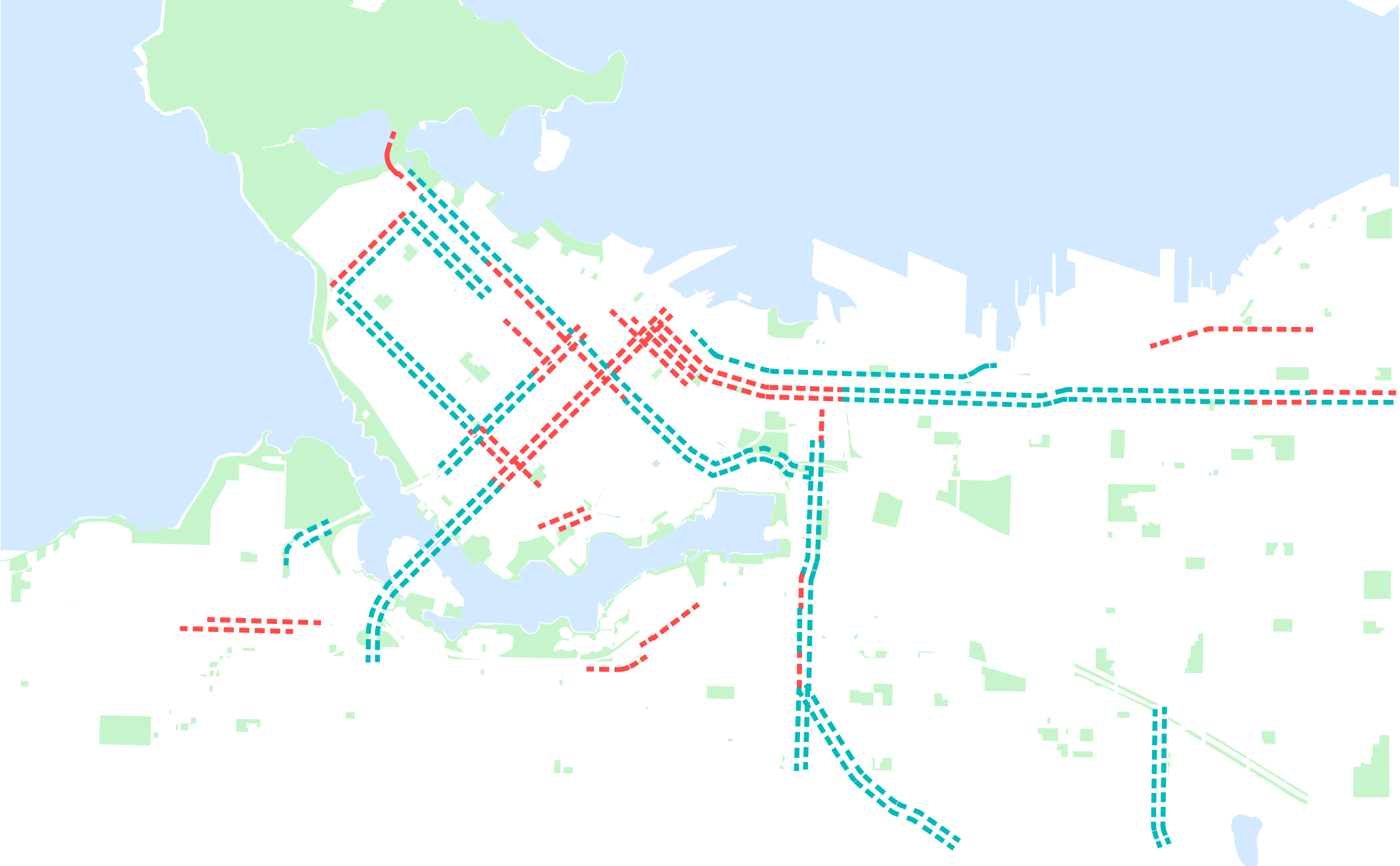


Figure 8. Proposed Downtown Bus Priority Network

- Issue**
Hotspots of transit delay or slow speed

- Opportunity**
Opportunities to reallocate road space

Physical Infrastructure

Due to high passenger volumes and the high concentration of tourists and residents downtown, we should put our best foot forward for transit infrastructure. All transit infrastructure downtown should be high quality, intuitive, accessible, and available. Despite high passenger volumes, bus infrastructure downtown can be unpleasant, inadequate, and unintuitive. To fix this, we suggest:

- ◆ Significantly improving wayfinding at bus stops, including route maps, system maps and real-time displays. For inspiration, we recommend Uytæ Lee's bus stop map concepts: [How to Fix Bus Stop Signs: Uytæ Lee's Stories About Here](#)
- ◆ Significantly improving the rider experience at bus stops, aiming for every stop to have weather protection, a garbage can, a bench, lighting, and a safe way to cross the street.
- ◆ Improvements to communication and wayfinding at SkyTrain stations downtown, including in-station bus countdown screens as seen in other cities.
- ◆ If the selective routing on Granville and Howe/Seymour remains, consider adding real-time countdown screens that also show if the stop is in service or not, and directs passengers to the correct stop if it's not.

Additional Suggestions

Comments on Individual Routes

In addition to the broad problems identified above, there are also issues with individual routes that should be addressed:

14 Hastings

Despite being part of the Frequent Transit Network (FTN), route 14 almost entirely duplicates other FTN routes. This creates inflexibility on the corridors that are served by route 14 as the baseline FTN standard prevents cutting route 14 below policy headways, even in cases where there would still be FTN service on that corridor. To address this issue, service from the eastern segment of route 14 should be reinvested into other routes along the corridor, allowing greater flexibility and control over which parts of the corridor receive the most frequent service. An R5 RapidBus stop at Hastings and Windermere should be added to serve the section of Hastings Street served only by route 14, and provide fast and reliable transit service to the Playland entrance.

16 Arbutus-Renfrew

The western terminus of the 16, currently Granville and 64th Ave, should be extended to connect the 16 with Marine Drive Station or Marpole Loop. Alternatively or in addition, a new Arbutus RapidBus should connect the Canada Line to Marpole and Kerrisdale. This would increase access to the southwest corner of Vancouver, and provide additional frequent service between Marpole Village, Marpole Loop, and Marine Drive Station.

4 Powell, 7 Dunbar-Nanaimo, and 20 Victoria

The FTN service provided along the common corridor of the 4 and 7 leads to inadequate service on the portions of the two routes which are not shared (and inconsistent headways on the portion that is shared). This disproportionately affects route 7, which has substantial portions that do not meet the service levels required to be considered part of the Frequent Transit Network. This leads to inadequate service on both Nanaimo Street and Dunbar Street.

Service from the eastern portion of route 4 should be re-allocated to route 7 to increase frequency on Nanaimo Street. The portion of route 4 which is not on the common corridor will be served with a redirection of route 20. A new RapidBus on Commercial/Victoria should connect Commercial Drive and Victoria Drive to downtown, following a similar route to the current route 20. This would provide a faster connection where route 20 duplicates other local routes on Hastings Street. A shorter route 20 would likely be more reliable with less bunching compared to the present route.

Layover Space

Many major bus terminals and exchanges are nearing or at layover capacity. While we considered these constraints in this proposal, we recognize that terminal capacity may impose limits on specific solutions for bus routes. We identified the following locations that potentially need more layover space to enable better bus network design:

- ◆ Marine Drive Station and Marpole Loop
- ◆ Kootenay Loop
- ◆ Brentwood Town Centre Station
- ◆ Metrotown Station
- ◆ River District
- ◆ New Westminster
- ◆ Glenlyon Business Park
- ◆ Various locations downtown

However, the solutions to limited layover space might not be all physical. Through strategic use of through-running, interlining, and on-street layovers, demand for layover space at major terminals could be spread out across multiple locations.

Regional Bus Network

Although this Area Transport Plan focuses on the Burrard Peninsula, many people who work and play in the area live outside the study area. It is important that the Area Transport Plan takes these people into account.

A regional express bus network should be considered, with buses primarily running on highways. Great examples of this type of bus already exist in the TransLink network in routes 555 and 620. These buses offer high quality, reliable and fast service between communities with travel times competitive with driving. Because of their close access to highways, the following anchors within the Burrard Peninsula should be considered for regional bus network hubs:

- ◆ Lougheed Town Centre
- ◆ Brentwood Town Centre
- ◆ Kootenay Loop
- ◆ 22nd Street Station

These regional buses would provide fast and frequent transit connections between the Burrard Peninsula and its neighbours. In particular, because of their highway connections, the North Shore, Surrey, Delta, Langley, Pitt Meadows and Maple Ridge are well suited for this potential network. TransLink should also collaborate with the province, BC Transit, BC Ferries, and other entities to create seamless interregional and intercity connections.

All-Door Boarding

We strongly urge TransLink to implement all-door boarding system-wide. This policy change would allow riders to board more quickly, and spread passenger load equally throughout buses. This would have positive impacts on bus reliability by decreasing stop dwell time, and increase passenger satisfaction by allowing riders to more easily access empty parts of the bus.

This has already been implemented on RapidBus, the 99 B-Line and select other routes with positive results.

Pedestrian Access

Every transit trip starts by walking or rolling, therefore widespread sidewalk access is crucial for the success of transit. We urge all municipalities to prioritize constructing sidewalks around transit stops and to provide a safe crosswalk to every bus stop. Additionally, we also urge TransLink and municipalities to strive for Vision Zero, a goal to have zero traffic-related deaths. We fully support the implementation of safe streets, including proposals that re-allocate road space or remove parking. Road safety is important for protecting the health of the entire community, including transit riders, pedestrians, cyclists, and drivers.

SkyTrain Expansion

SkyTrain provides excellent regional transportation across Metro Vancouver, and we support expanding the network to UBC, the North Shore, and beyond. Automation and full grade separation have resulted SkyTrain being frequent, fast, and reliable, and we urge TransLink to continue pursuing these characteristics in new lines and extensions.

Part Five: Conclusion & Acknowledgements

We strongly believe in a positive future for transit in the Burrard Peninsula, and across the region. We support municipalities and TransLink in addressing the problems we identified, and providing a better rider experience and a more cohesive transportation network. On behalf of riders, and as riders ourselves, we will continue to identify problems with the network and push for solutions to these problems. We urge all agencies involved to be ambitious with both plans and implementation. Bold action in the past has led us to the good network we have today, and we need to continue that momentum to create a truly world-class region.

We acknowledge all the people keeping our region moving and on transit. We would also like to give a special acknowledgement to the bus operators, station attendants, and transit supervisors, who are on the front lines of many of the problems outlined in this document.

Thank you for your consideration,

◆ The **MOVeMENT** Team

For all figures:

- ◆ *Contains information licensed under the Open Government Licence – British Columbia.*
- ◆ *Contains information licensed under the Open Government Licence – Metro Vancouver.*
- ◆ *Route and arrival data used in this product or service is provided by permission of TransLink. TransLink assumes no responsibility for the accuracy or currency of the Data used in this product or service.*

Created by John Ivison and Mike Feaver, with additional input from other Movement members.

Thank you to the designers of the 1996 Metro Vancouver Livable Region Plan, which was an inspiration for this document.

Appendices: Appendix A

New bus routes and extensions to extend the frequent grid

- A.** Extension of route 20 south on Victoria, connecting to the proposed Marine Drive RapidBus, and potentially to an expanded node at the Knight Street Bridge bridgehead where riders can connect to route 430 and Richmond routes 405 and 407.
- B.** Extension of route 16 south on Clarendon and Elliott (replacing and extending the 29 to connect to Marine Drive), and potentially to an expanded node at the Knight Street Bridge bridgehead where riders can connect to route 430 and Richmond routes 405 and 407.
- C.** Extension of route 8 east on Marine Drive to an expanded node at the Knight Street Bridge bridgehead where riders can connect to route 430 and Richmond routes 405 and 407.
- D.** Extension of route 27 south on Kerr to River District, connecting
 - a.** Hastings R5 RapidBus at Boundary
 - b.** Millennium Line at Rupert Station
 - c.** Proposed King Edward RapidBus at Rupert and E 22nd
 - d.** Expo Line and 41st Avenue R4 RapidBus at Joyce Station
 - e.** Proposed Marine Drive RapidBus at Marine Drive and Kerr
- E.** New route between Burnaby Heights and River District, connecting
 - a.** Hastings R5 RapidBus at Gilmore
 - b.** Millennium Line at Gilmore Station
 - c.** Proposed King Edward RapidBus at Boundary and E 22nd/Kincaid
 - d.** Expo Line and 41st Avenue R4 RapidBus at Joyce Station
 - e.** Proposed Marine Drive RapidBus at Marine Drive and Marine Way

- F.** Extension of route 129 south on Patterson to Glenlyon business park, connecting
 - a.** Hastings R5 RapidBus at Boundary
 - b.** Millennium Line at Gilmore Station
 - c.** Proposed King Edward RapidBus at Burnaby Hospital
 - d.** Expo Line at Patterson
 - e.** Proposed Marine Drive RapidBus at Patterson and Marine Drive

- G.** New route between Capitol Hill and Metrotown (providing local service to complement the proposed RapidBus routes on Willingdon), connecting
 - a.** Hastings R5 RapidBus at Willingdon
 - b.** Millennium Line, proposed Canada Way, King Edward RapidBuses at Brentwood Station
 - c.** Expo Line at Metrotown

- H.** New route between Capitol Hill and the South Slope, connecting
 - a.** Hastings R5 RapidBus at Holdom
 - b.** Millennium Line at Holdom Station
 - c.** Proposed Canada Way RapidBus at Canada Way and Douglas
 - d.** Expo Line at Royal Oak Station
 - e.** Proposed Marine Drive RapidBus at Patterson and Marine Drive

- I.** New route on East 16th Avenue and West 33rd Avenue, connecting
 - a.** Millennium Line, Expo Line, and proposed Victoria RapidBus at Commercial–Broadway
 - b.** Canada Line and proposed King Edward RapidBus at King Edward Station
 - c.** Proposed Arbutus RapidBus at 33rd and Arbutus
 - d.** 41st Avenue R4 RapidBus at Dunbar and 41st
 - e.** Musqueam First Nation lands

Appendices: Appendix B

Key delay hotspots

Burnaby

- ◆ Central Boulevard westbound approaching Willingdon Avenue
- ◆ Hastings Street in Burnaby Heights
- ◆ Willingdon Avenue approaching Canada Way
- ◆ Willingdon Avenue northbound approaching Central Boulevard

New Westminster

- ◆ Carnarvon eastbound and 6th Street northbound approaching Royal Avenue
- ◆ Stewardson Way westbound approaching the Queensborough Bridge

Vancouver

- ◆ Burrard Street approaching Georgia Street and Robson Street
- ◆ Davie Street eastbound approaching Howe and westbound approaching Burrard
- ◆ Denman Street southbound approaching Davie Street
- ◆ Dundas Street westbound approaching Victoria
- ◆ E 49th Avenue in both directions approaching Fraser
- ◆ E 49th Avenue in both directions approaching Victoria
- ◆ E 49th Avenue in both directions approaching Knight
- ◆ E 49th Avenue eastbound approaching Boundary
- ◆ Granville Street in Downtown Vancouver
- ◆ Knight Street north- and southbound approaching the Knight Street Bridge
- ◆ Main Street southbound approaching 2nd Avenue
- ◆ Main Street southbound approaching 7th/Kingsway
- ◆ Main Street northbound in Chinatown
- ◆ Marine Drive westbound approaching Knight Street
- ◆ Marine Drive westbound approaching Yukon Street

Vancouver *(continued)*

- ◆ Oak Street southbound approaching 70th Avenue
- ◆ Pacific Boulevard on the downtown peninsula
- ◆ Robson Street eastbound approaching Burrard
- ◆ W 4th Avenue westbound approaching Arbutus
- ◆ W 4th Avenue eastbound approaching Burrard
- ◆ W 6th/2nd Avenue approaching Cambie
- ◆ W 41st Avenue in Kerrisdale
- ◆ West Georgia Street eastbound approaching Denman
- ◆ West Georgia Street eastbound approaching Burrard and Granville
- ◆ West Hastings Street in Downtown Vancouver
- ◆ West Pender Street in Downtown Vancouver

UBC

- ◆ Wesbrook Mall approaching University Boulevard

Appendices: Appendix C

Opportunities for bus priority

Burnaby

- ◆ Byrne Road/Southridge Drive: Bus lanes
 - ◇ *Has more lanes than the roads that lead to it that can be repurposed for transit priority.*
- ◆ Canada Way: Queue jumper bus lanes
 - ◇ *Has predictable delays at particular intersections.*
- ◆ Cariboo Road: Bus lane
 - ◇ *Has a segment with more lanes than the road that leads to it and that can be repurposed for transit priority.*
- ◆ Gaglardi Way: Bus lanes
 - ◇ *Has more lanes than the roads that lead to it that can be repurposed for transit priority.*
- ◆ Lougheed Highway: Bus lanes
 - ◇ *Has a segment with more lanes than elsewhere and very long light cycles at some intersections that can lead to uneven headways and unnecessary delays if a bus misses a light.*

Burnaby & Vancouver

- ◆ 49th Avenue/Imperial Street: Bus lanes
 - ◇ *Has bus lanes in some segments.*
 - ◇ *Has very high bus ridership and overcrowding.*
- ◆ Kingsway: Bus lanes
 - ◇ *Has bus lanes in some segments at some times already, and these can be extended in length and duration or improved by placing the bus lane in the centre to avoid conflicts with right-turning vehicles.*
- ◆ Marine Drive: Bus lanes
 - ◇ *Is wide with delays leading to particular intersections and unsafe traffic speeds and lane-changing behaviour.*

New Westminster

- ◆ 8th Street: Bus lanes or queue jumpers
 - ◇ *Has a segment with more lanes than elsewhere that can be repurposed for transit priority.*
- ◆ Columbia Street: Bus lanes
 - ◇ *Has a segment with more lanes than elsewhere that can be repurposed for transit priority.*

Vancouver

- ◆ Arbutus Street: Bus lanes
 - ◇ *Has a lengthy segment between 16th Avenue and 33rd Avenue that has more lanes than elsewhere that can be repurposed for transit priority.*
- ◆ Burrard Bridge: In-lane bus stops
 - ◇ *Bus bulges would provide better bus priority than a bus pull-out stop.*
- ◆ Burrard Street on the downtown peninsula: Centre-running bus lanes
 - ◇ *Left-turns are already heavily restricted except at a few intersections.*
- ◆ Cassiar Connector: Bus lanes
 - ◇ *Highway onramp has predictable delays resulting from bridge congestion and, unlike most other bridge onramps in the region, lacks a bus queue jumper northbound.*
 - ◇ *Highway offramp has multiple lanes, one of which can be repurposed for transit priority.*
- ◆ Cordova Street: Contraflow bus lane
 - ◇ *Enables wider route network legibility improvement, provides more effective priority than a right lane bus lane would, and reduces the number of delay-inducing bus turning movements.*
- ◆ Fraser Street: Bus lanes
 - ◇ *Has a wide segment with more lanes than elsewhere and high ridership.*
- ◆ Granville Street: Bus lanes
 - ◇ *Has bus lanes in some segments at some times already, and these could be extended in length and duration or improved by placing the bus lane in the centre to avoid conflicts with right-turning vehicles.*
 - ◇ *Has a busway that lacks signal priority in a context that is similar to that in cities elsewhere where effective signal priority prevents buses from ever waiting at minor intersections (similar to the context at Robson, Helmcken, and Drake).*

Vancouver *(continued)*

- ◆ King Edward Avenue: Bus lanes
 - ◇ *Has a lengthy middle segment with more lanes than elsewhere that can be repurposed for transit priority.*
- ◆ Knight Street: Bus lanes
 - ◇ *Has predictable delays resulting from bridge congestion and, unlike most other bridges in the region, lacks a queue jumper both northbound and southbound.*
 - ◇ *Has unsafe traffic speeds and dangerous lane-changing behaviour (passing on the right at intersections) that can be made safer by reallocating space to transit (and by permitting use of the right lane through arterial intersections only by trucks and buses).*
- ◆ Main Street: Bus lanes
 - ◇ *Has bus lanes in some segments at some times already, and these could be extended in length and duration or improved by placing the bus lane in the centre to avoid conflicts with right-turning vehicles.*
- ◆ Nanaimo Street: Bus lanes
 - ◇ *Has a wide segment with dangerous intersections and unsafe traffic speeds that can be made safer by reallocating space to transit.*
- ◆ Pacific Boulevard: Redesign for new street with transit priority built in
 - ◇ *Is planned to be rebuilt, and the design should incorporate centre-running bus lanes.*
- ◆ Robson Street, Denman Street, Davie Street: Bus bulges
 - ◇ *Robson Street has a segment where the bus stops in the only traffic lane, providing an unobstructed path free of car traffic as the bus leaves each stop.*
 - ◇ *In-traffic stops at bulges should be extended to the full length of these streets where buses operate.*
- ◆ Victoria Drive/Commercial Drive: Bus lanes
 - ◇ *Has very high bus ridership and crowding.*
- ◆ W 4th Avenue: Bus lanes
 - ◇ *Has a wide segment that has more lanes or capacity than elsewhere, leading to unsafe driver behaviour.*
- ◆ West Georgia Street: Centre- or side-running bus lane
 - ◇ *Has a wide segment with effective priority in only one direction.*

Vancouver & UBC

- ◆ 16th Avenue: Bus lanes
 - ◇ *Has a lengthy segment at its western end that has more lanes than elsewhere that can be repurposed for transit priority.*

UBC

- ◆ Chancellor Boulevard: Bus lanes
 - ◇ *Has a segment that has more lanes than the roads leading to it on both ends.*

