

February 14, 2020

Honourable Bill Morneau
Minister of Finance
House of Commons
Ottawa, Ontario K1A 0A6

Sent via e-mail: bill.morneau@parl.gc.ca

Dear Minister Morneau,

On behalf of the Metro Vancouver Mayors' Council on Regional Transportation, I want to share with you our submission to your department's pre-budget consultation process that outlines our near-term priority areas on which we can work with you to advance our shared goals around issues such as climate change, economic growth and making life more affordable for Canadians..

Over the past four years, Metro Vancouver has benefited from a strong partnership between federal, provincial and regional governments which has seen historic investments in public transit in this region. Our transit plan -- the [10-Year Vision for Metro Vancouver Transit and Transportation](#) -- is already underway, but despite significant improvements in service we can't keep up with demand. Between 2016 and the end of 2019, Metro Vancouver ridership will have grown by more than 20% -- well beyond any other transit system in North America.

Nowhere else in the country will you find a region more ready to get on with moving to zero emission transit fleets together with building transit infrastructure and supportive policies to incentivize the modal shift this country needs to meet GHG reduction targets in the transportation sector. Our region, which hosts the largest export gateway in the country, and has led the nation in economic growth over the last decade, depends on continuous improvement in sustainable mobility to keep goods and people moving and remain competitive with our global competitors. Fortunately, and uniquely, Metro Vancouver has a regional consensus among 23 communities on region-wide, long-term integrated land use and transportation planning to support this continuous improvement. Furthermore, the Province of BC has already committed a 40% capital funding share of all remaining projects in the region's transit expansion plan -- more generous than any other province.

A smart planning environment, technical expertise, a supportive provincial government and strong demand create ideal conditions for your government to make an immediate commitment to help us accelerate completion of the final phase of the 10-Year Vision and work with us to quickly initiate a national electric bus transition program, so we can incentivize more sustainable, affordable transportation choices.

Our attached pre-budget submissions echoes and reinforces the commitment made by the Prime Minister in his mandate letter to Minister McKenna to introduce a permanent, direct federal funding mechanism for modern public transit and a funding program to support the transition to emissions-free battery electric buses.

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Most importantly as a near-term priority, our submission calls on the government to work with us to provide transition funding of \$685 million over the next 5-7 years to bridge the funding gap between current federal transit infrastructure programs – which in our region are already 92% allocated to projects that are in procurement or in Treasury Board approval – and the final phase of our 10-Year Vision. These investments are critical to responding to surging ridership growth and will avoid costly delays to nearly shovel ready projects.

My colleagues, Vancouver Mayor Kennedy Stewart and Langley Mayor Jack Froese, were in Ottawa last week to meet with Minister McKenna, Minister Wilkinson and other MPs and party leaders to discuss our submission, and we also welcomed Minister McKenna here in Vancouver this week to show her our system and plans. In addition to our submission, this letter provides some ideas on how federal funding programs could be designed to maximize the impact on transit planning here.

Permanent Transit Fund

The Mayors' Council supports the Federation of Canadian Municipalities in calling for a permanent federal funding allocation that would deliver \$34 billion for the 10-year plan (2028-29 to 2037-38) with \$30 billion in allocation-based funding and at least \$4 billion for the complimentary merit-based stream, with consistent funding of \$3.4 billion each year during the 10-year period.

Although a Permanent Transit Fund (PTF) in 2028 (or sooner) may seem a long way off, because TransLink secures funding for transit expansion plans 10 years into the future, a properly designed PTF that provides revenue certainty to TransLink now will allow us to “bank” on future PTF revenues and commit to future projects now rather than waiting until 2027. A “bankable” PTF requires a federal funding program design enshrined and protected in legislation by 2022, with signed long-term federal-provincial agreements by 2023, similar to how the permanent Gas Tax Fund was set up starting in 2012.

Transition funding for Phase Three Plan

A future Permanent Transit Fund will provide critical funding for projects beginning in the last half of the 2020s. In the interim, all but \$196 million of the federal transit funding currently available to Metro Vancouver from ICIP – 92% of our share – is already allocated to specific projects either in procurement or waiting for Treasury Board approval, leaving the estimated “Phase Three Plan” projects listed in our attached budget submission without a federal cost-sharing contribution beyond the \$196 million in remaining ICIP funding.

The Mayors' Council urges the Government of Canada to work in partnership with the Metro Vancouver region to identify \$685 million in transition funding that will help bridge the gap ahead of the implementation of a Permanent Transit Fund – so we can complete Phase Three of the 10-Year Vision. This funding commitment is needed by Spring 2021 to allow us to approve the Phase Three Plan as scheduled, with expenditures expected to occur between 2022 and 2028.

Electric bus transition fund

Based on what we have heard in meetings with federal leaders and officials about the commitment to develop an electric bus fund, we wish to highlight several key issues:

1. Transitioning bus fleets to emissions-free technology involves much more than procuring new vehicles. Prior to the first large delivery of electric battery buses at TransLink, we must install the necessary charging infrastructure, which entails modifications to our bus maintenance and storage facilities, upgrades to the electricity grid in partnership with BC Hydro, and training maintenance staff and bus operators. This work must start well before the new fleet arrives and represents over half of the projected \$447 million incremental costs of transitioning TransLink's bus fleet to battery electric technology. Any federal program must be designed to support charging infrastructure and must be delivered quickly enough so this work can get started at the same time as new vehicles are ordered.
2. We have heard several references to "cost parity" between electric and conventional buses being reached by 2025. This analysis does not account for the high upfront costs of installing charging infrastructure which is over half of the total incremental cost of our transition strategy.
3. TransLink already leverages private sector capital, including through green bonds and in the past through P3s, and fully utilizes the room available in our debt financing limits. We are open to exploring additional innovative financing tools, including with the Canadian Infrastructure Bank, but caution that although these measures may reduce the near-term demand on public funds, all financing still eventually needs repayment, and usually at higher interest costs. Our estimated \$447 million in incremental costs over 10 years to transition our bus fleet to electric battery technology assumes cash payment, and will increase if financing tools are used.
4. We have also heard reference to 2024 as a possible deadline beyond which federal funding could only be used to procure emissions free buses. Although TransLink is likely to be able to meet this deadline, we are much further ahead in planning for this transition than most agencies. A premature deadline could force some transit agencies or manufacturers to rush the process, resulting in an uneven, even rocky transition. In addition, even our own analysis shows that accelerating our own transition strategy too much risks missing some of the cost and quality improvements expected as the technology matures over the next five years.
5. At the same time, moving quickly to initiate the transition to electric battery buses is critical given the 15-20 year lifespan of transit buses. Buses being delivered today will still be in service in 2035 or even 2040. A new federal program to support this transition will need to provide maximum flexibility to facilitate quick initial procurements starting before the end of 2020 if we hope to meet the public's expectations for fast action on climate change.

Finally, there are important trade-offs to consider and balance between accelerating the transition to electric buses and continuing to expand and improve transit service. As you know, the transportation sector is unlikely to meet 2030 targets for GHG emission reductions solely from converting private and commercial fleets to zero emission vehicle technology. Achieving a 40% reduction in GHG emissions by 2030 from the transportation sector will also require reducing total vehicle kilometers travelled, which requires a modal shift towards active transportation options, especially transit.

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Transit agencies may have difficulty in absorbing the incremental costs to electrify their fleets at the same time as investing in planned transit expansion designed to attract new riders or meet growing ridership. This trade-off is particularly acute in Metro Vancouver where we have seen transit ridership grow by more than 20% since 2016 which has outpaced our ability to bring new service online, even with the historic federal and provincial investments in transit through PTIF and ICIP. Only working in partnership with senior governments can we collectively fully fund the incremental costs of electric bus transition and continued transit expansion.

TransLink has spent over two years preparing an electric bus transition strategy and is ready to initiate procurement of the strategy's first stages – including new electric bus vehicles and the construction of a new bus depot to service electric buses – in Fall, 2020. However, without securing a commitment for at least the first \$100 million (of the total \$447 million) in necessary senior government contributions by then, TransLink will be faced with the need to continue expanding our service to meet surging ridership and cover the incremental costs of the electric bus transition with only our own limited revenues, potentially leaving both of these important objectives short-changed.

TransLink's expert staff are available to consult with federal officials on the technical details of a national transition strategy. A more detailed briefing note on our electric bus transition strategy is attached for more detailed background and has been shared with federal officials.

TransLink's CEO and staff are available at any time to provide your officials with more detail on any of these recommendations or to your government's program design. My colleagues and I plan to be in Ottawa frequently over the year to raise awareness of our region's unique challenges and opportunities, and we would welcome the opportunity to meet when you are available.

Sincerely,

A handwritten signature in black ink, consisting of a large, stylized initial 'J' followed by a long, horizontal flourish.

Mayor Jonathan X. Côté
Chair

cc. Minister Catherine McKenna, Minister of Infrastructure and Communities
Terry Beech, MP, Burnaby North-Seymour, and Chair, Pacific Caucus
Hon. Selina Robinson, Minister Responsible for TransLink, Province of B.C.
Members of the Mayors' Council and TransLink Board
Councillor Bill Karsten, President, Federation of Canadian Municipalities

Attached: Pre-Budget Submission; Briefing Note on Low-Carbon Fleet Strategy



RENEWING THE GOVERNMENT OF CANADA'S PARTNERSHIP WITH METRO VANCOUVER:

INVESTMENTS TO ADDRESS GROWING DEMAND FOR PUBLIC TRANSIT



**MAYORS'
COUNCIL**

On Regional Transportation

Submission to the Government Canada for Budget 2020/2021
February 4, 2020

RECOMMENDATION 1:

That the Government design a national **Permanent Transit Fund** of \$3.4 billion annually and enshrine and protect it in legislation by 2021, to put federal transit infrastructure funding on a long-term, predictable track by 2027 or earlier. This will allow transit agencies to better plan infrastructure and services, and for Metro Vancouver would deliver approximately \$375 million annually to support future regional transit expansion in underserved and fast-growing areas.

RECOMMENDATION 2:

That the Government provide **transition funding** to bridge the gap in advance of a Permanent Transit Fund, for regions such as Metro Vancouver that have already allocated existing infrastructure funds and that have shovel-ready projects designed to meet growing public demand. Transition funding of \$685 million by mid-2021 is required in Metro Vancouver as the federal share of the final “Phase Three Plan” of transit expansion in the current 10-year plan.

RECOMMENDATION 3:

That the Government provide funds to accelerate **conversion of bus fleets to emissions-free battery-electric technology** by 2040. TransLink’s Low-Carbon Fleet Strategy requires \$225 million in federal investment to enable the plan to convert about 50% of its bus fleet to battery-electric propulsion by 2030.



INTRODUCTION

Collaboration between the Government of Canada and local governments is critical to achieving progress on our country's most pressing issues and priorities – including climate change, productivity growth and making life more affordable for Canadians.

Over the past four years, Metro Vancouver has benefited from a strong partnership between federal, provincial and regional governments which has led to transformative investments in public transit. Our region's transit plan – [the 10-Year Vision for Metro Vancouver Transit and Transportation](#) – is now underway with \$2.4 billion in federal funds from the *Public Transit Infrastructure Fund (PTIF)* and the *Investing in Canadian Infrastructure Program (ICIP)*. Already 92% of these funds are allocated to specific projects in Phase One and Two of the plan, with most projects already in service, in procurement or under construction. Despite significant improvements in service, including more buses and SkyTrain vehicles, our transit system can't keep up with surging public demand. Over the past three years, Metro Vancouver transit ridership increased by 20% – well beyond any other transit system in North America. This record-setting growth represents a unique challenge not faced by other major Canadian cities: how to plan for increasing public demand when the current federal funding environment is not yet designed to respond quickly enough to regions struggling to stay ahead of ridership growth.

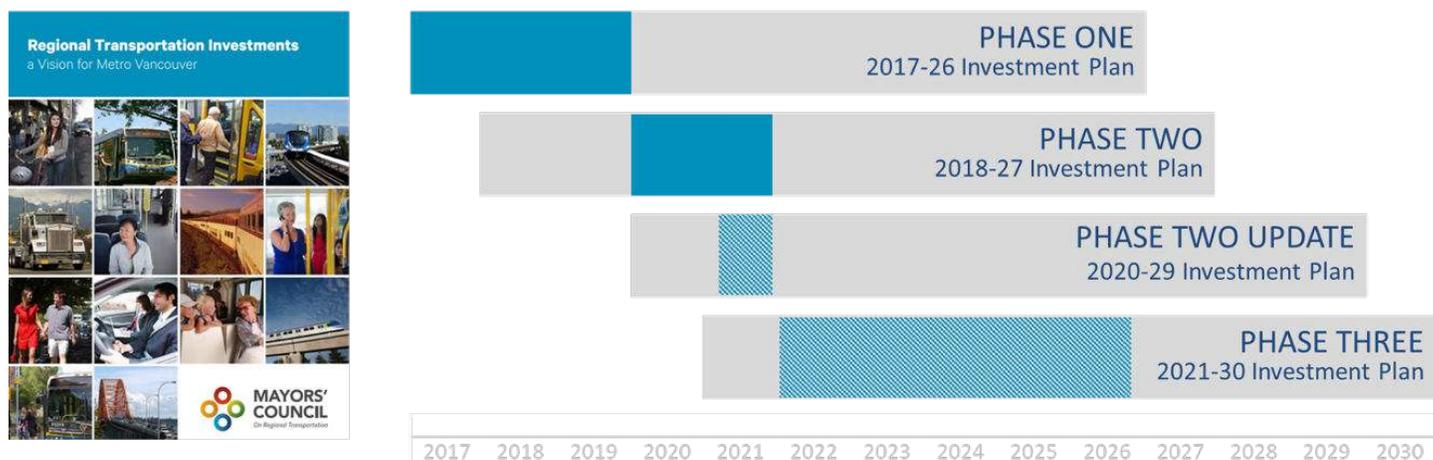
The [Mayors' Council on Regional Transportation](#) is pleased to provide recommendations to the Government of Canada on smart investments in transportation infrastructure that should be considered for the 2020/2021 and 2021/22 budgets. Our proposals respond to the urgency of adding capacity to Metro Vancouver's transit system, while providing the stability and predictability needed for good long-term transit planning by making federal transit funding permanent, and ensuring that we can move quickly to reduce the GHG emissions associated with transit through conversion of fleets to battery electric buses.



10-YEAR VISION FOR TRANSIT AND TRANSPORTATION

Developed by the Mayors' Council in 2014, the 10-Year Vision for Metro Vancouver Transit and Transportation (the 10-Year Vision) is a strategy designed to keep the region moving. The Vision is a transit and transportation plan that reflects agreement by 23 local governments across Metro Vancouver, and is supported by the largest coalition of community, environmental and business stakeholders in B.C.'s history.

The 10-Year Vision is unique in Canada. It is a region-wide, integrated plan – from rail to buses to roads and bridges – that supports our 30-year [Regional Transportation Strategy](#) and Regional Growth Strategy. The 10-Year Vision will be rolled out in three phases, each timed to the delivery of new projects and services.



The remaining projects in the 10-Year Vision include:

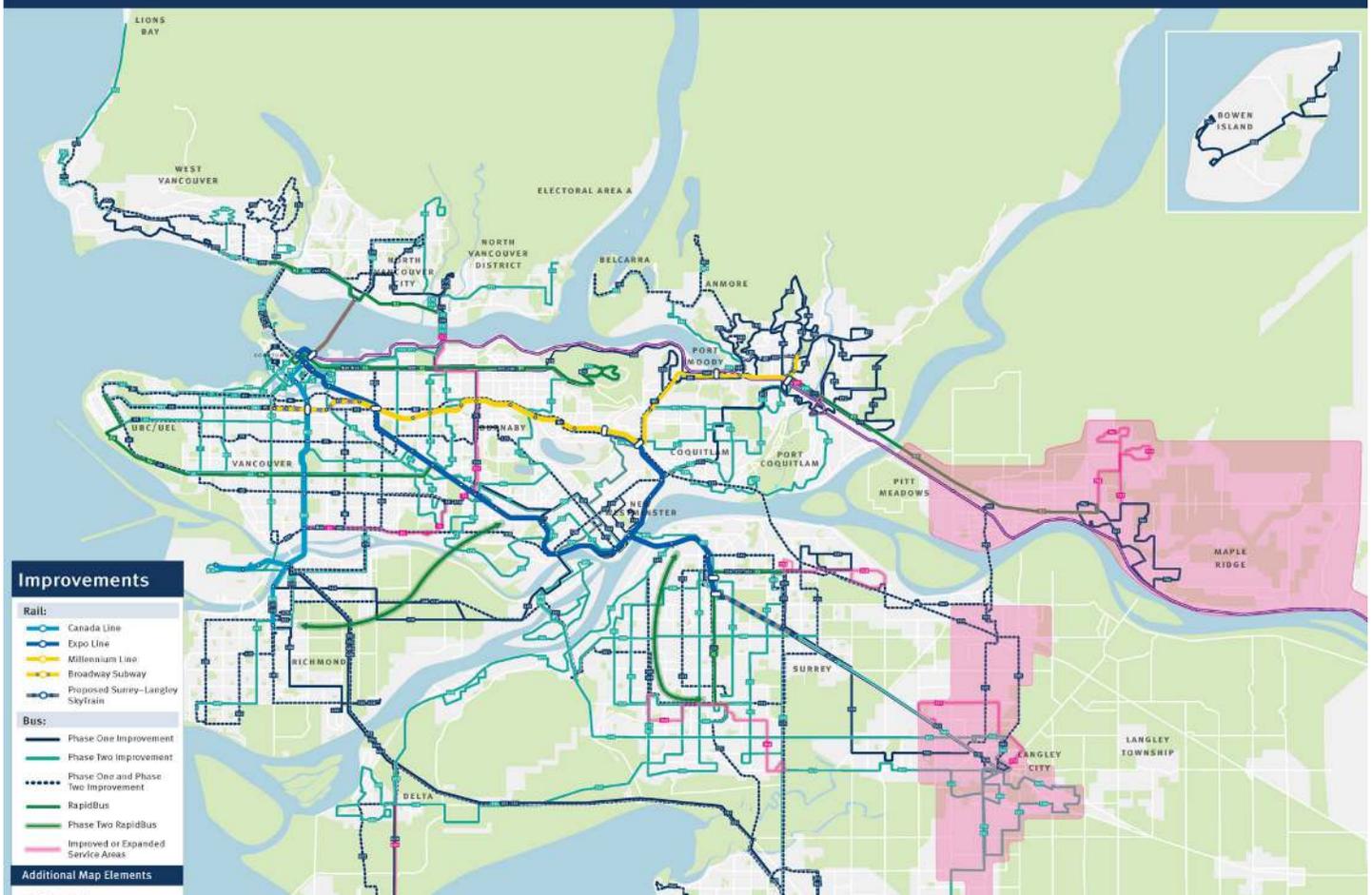
- Completing the new Surrey-Langley SkyTrain extension all the way to Langley
- Increasing bus and HandyDART service in every corner of the region
- Upgrading SkyTrain by adding more rail cars, increasing frequency and making station upgrades on the existing system
- Building 5 new high-capacity and high-frequency express bus routes in Pitt Meadows and Maple Ridge, Langley, White Rock, Surrey, North Vancouver, Burnaby and Vancouver
- Increased funding for regional cycling and walking networks
- Improving road conditions for drivers through continued upgrades to the Major Roads Network

**See appendix for full 10-Year Vision dashboard*

The Transport 2050 plan will identify projects and services beyond the 10-Year Vision that are needed to respond to coming trends, challenges and priorities, potentially including higher capacity transit in areas currently underserved by rapid transit.

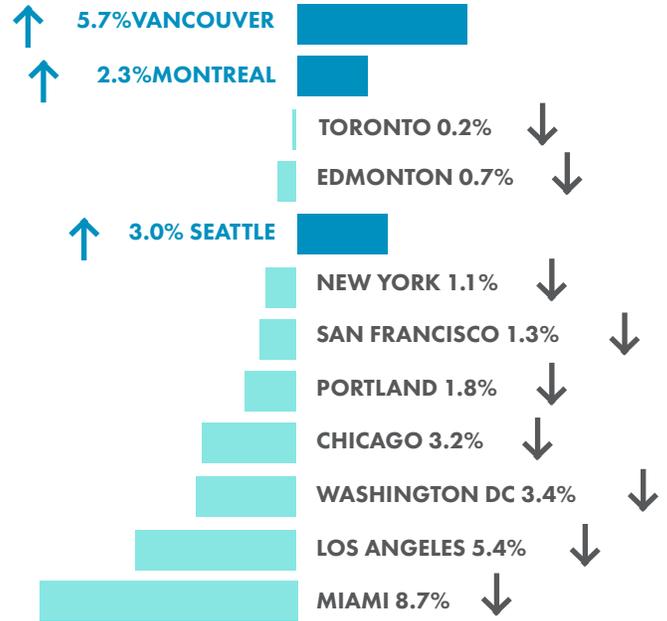
BY 2021, THE MAYORS' COUNCIL'S 10-YEAR VISION WILL HAVE ADDED THE EQUIVALENT OF ALL OF VICTORIA'S BUS SERVICE TO METRO VANCOUVER

Map of Phase 1 & 2 Improvements



RESPONDING TO GROWING DEMAND

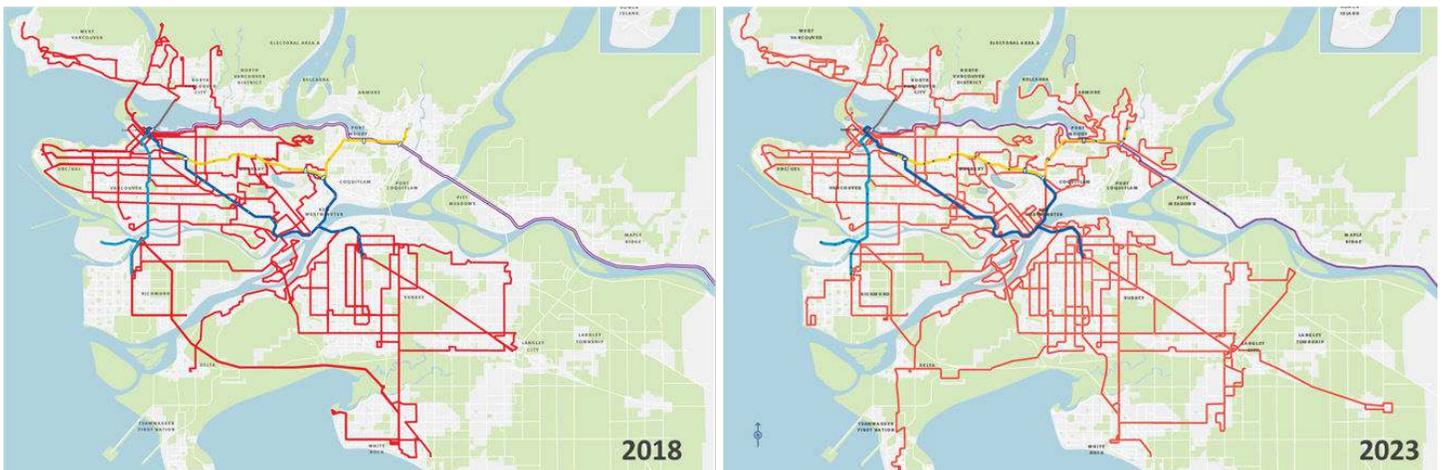
Metro Vancouver’s population is forecast to grow by one million people over the next 20 years. This growth will put pressure on our transportation infrastructure, adding to the problem of road congestion and overcrowding on transit that is already frustrating residents and businesses across the region. Over the past three years, Metro Vancouver transit ridership increased by 20% – well beyond any other transit system in North America. At the same time, through integrated land-use and transportation planning, a provincial carbon tax and a regional fuel tax to support transit, and continuous transit service improvements, we are supporting and incenting residents to make a modal shift to public transit and active transportation for the benefit of our environment, our health and our local economy. Moving forward with the completion of the 10-Year Vision, without delay, is critical for our region’s future.



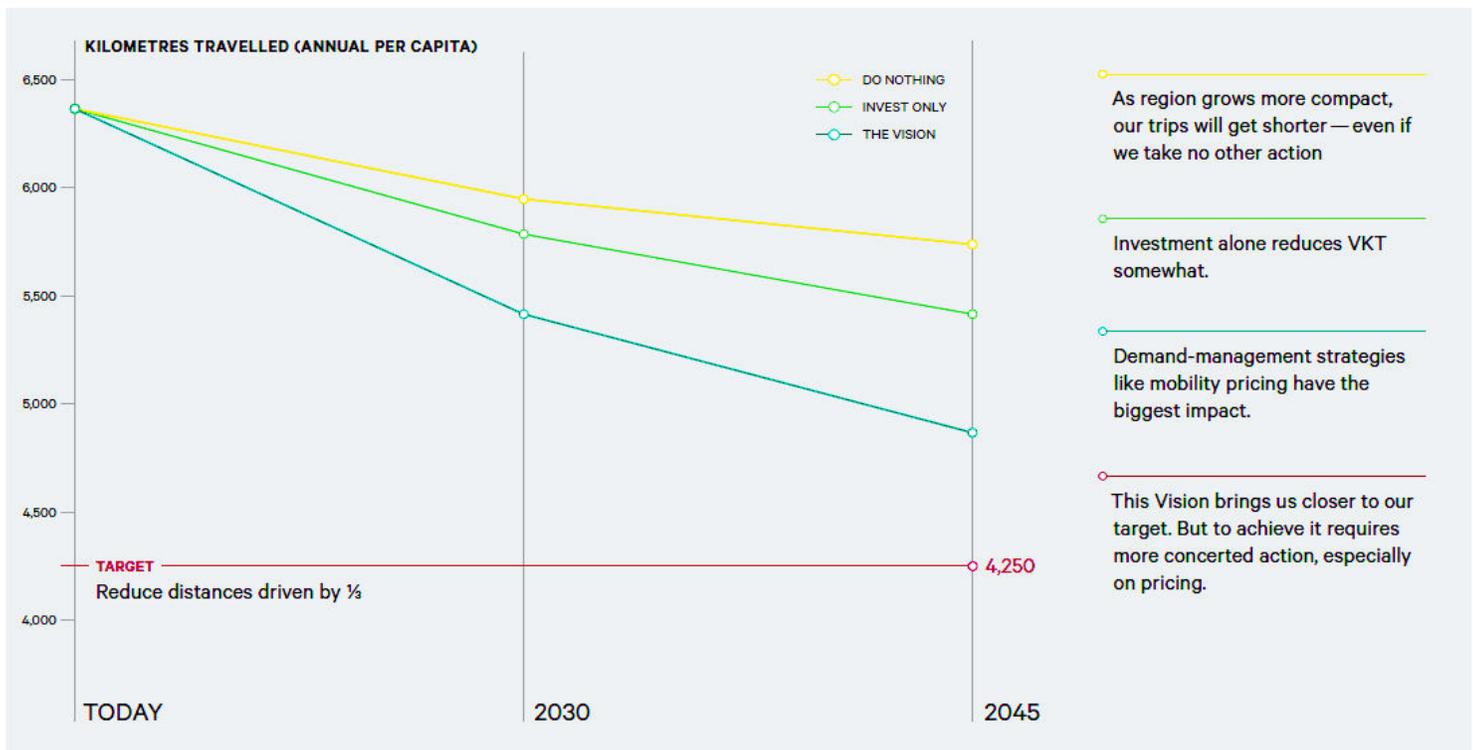
TRANSIT RIDERSHIP CHANGE 2016-2017

Overcrowding is getting worse...not better

The number of routes experiencing some level of overcrowding is forecasted to **more than double by 2023** if Phase Three Plan not approved by 2021



- PROTECTING OUR ENVIRONMENT** – We owe it to future generations to invest in sustainable transportation today and into the future. Public transportation is a critical element of Metro Vancouver’s overall plans to address climate change and we need to move forward now to support our overall reduction efforts. In regional plans going back to the early 1990s, right up to the current 10-Year Vision, regional leaders have committed to developing comprehensive road pricing to reduce congestion and road usage and to support transit investments. Only road pricing is capable of delivering meaningful reductions in per capita vehicle kilometers travelled and energy use from transportation. However, an essential precursor to moving to pricing road usage is ensuring that the transit network can provide a real alternative mobility option. The road to lower energy use from sustainable transportation starts with better transit.

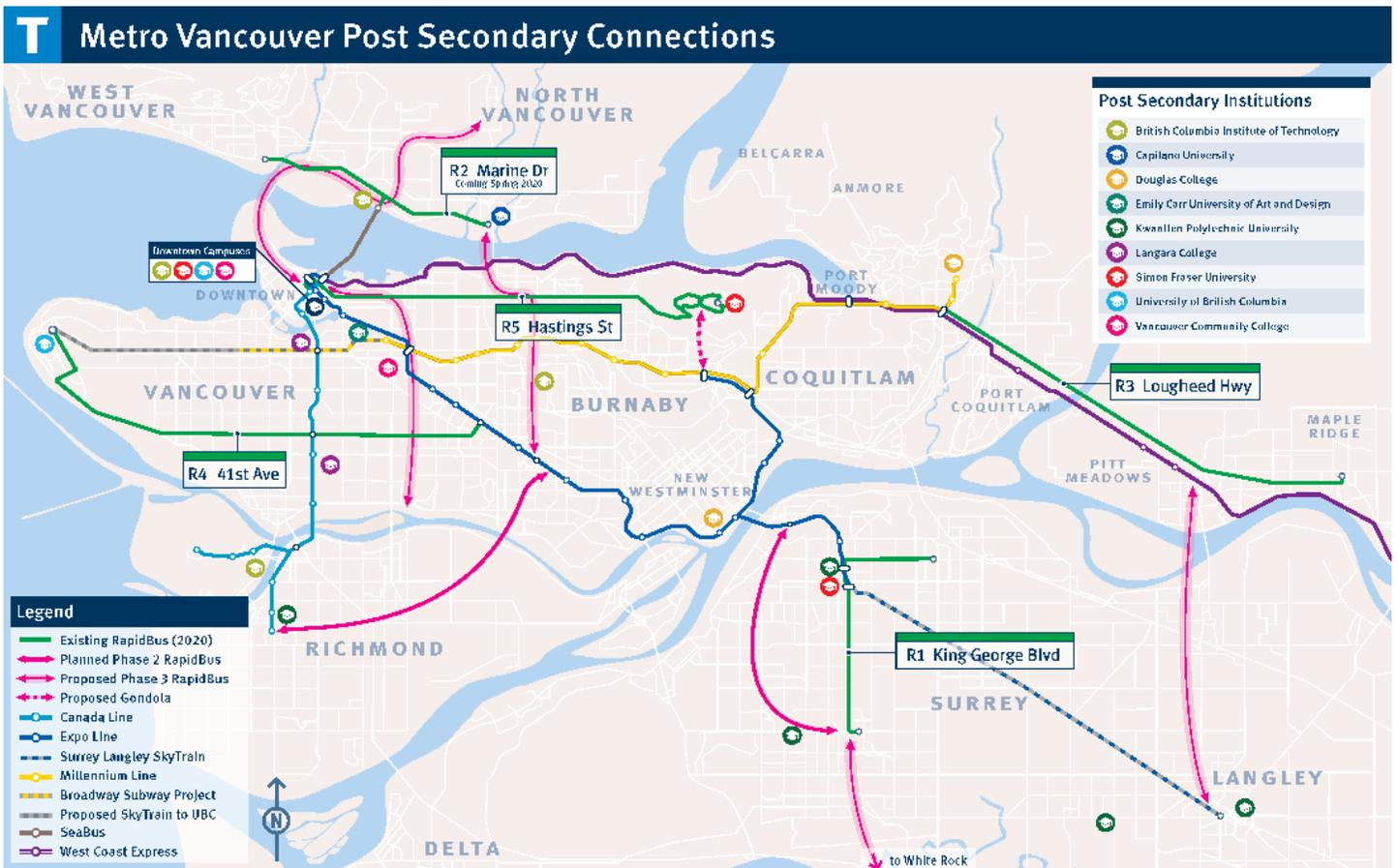


- SUPPORTING A GROWING ECONOMY** – As Canada’s primary Asia-Pacific gateway, the ability to efficiently and effectively move both people and goods across the Metro Vancouver region is not just positive for commuters – it also supports and benefits both the local and Canadian economies. Investments in public transit are critical to support a strong workforce in our region. Public transit helps connect people to better jobs and makes it easier for businesses to stay in the region. According to the Greater Vancouver Board of Trade, congestion costs the Metro Vancouver economy more than \$1.4 billion annually, slows the movement of goods into and out of Canada’s largest port, and makes it more difficult for businesses to recruit and retain the workers they need to compete globally.

- IMPROVING AFFORDABILITY** – Transportation is a key consideration in planning for affordable housing across the region. Metro Vancouver is getting it right when it comes to planning for land use and transportation in tandem, so we can improve affordability and quality of life. Public transit is a critical resource for low income households, seniors as well as new immigrants and refugees making the transition to life in Canada.



- CONNECTING CENTRES OF INNOVATION** – Continuing to diversify the economy and improve lagging productivity relies on a commitment to innovative and advanced education. Some of the region’s most congested bus routes are those connecting with major post-secondary institutions. Expanding bus service and investing in alternative modes of transportation will help connect these centres of innovation that help drive our economy.



PUTTING INFRASTRUCTURE DOLLARS TO WORK

The Metro Vancouver region's readiness to move forward with building the next phase of planned transit infrastructure makes us unique compared with Canada's other urban centres. We have a regional consensus among 23 communities on long-term integrated land use and transportation planning. We also have a supportive provincial government, with the Province of B.C. already committed to a 40% capital funding share for all remaining projects in the 10-Year Vision.



A smart planning environment, supportive provincial government and strong demand create ideal conditions for the Government of Canada to make an immediate commitment to help us accelerate completion of the final phase of the 10-Year Vision. This will incentivize more sustainable transportation choices and avoid falling behind ridership growth.

Of the \$2.4 billion in federal funding provided to Metro Vancouver from PTIF and ICIP since 2016, 92% has been allocated to specific projects, with almost all either already in service, in procurement or under construction. Most other cities in Canada lag far behind this metric. This region's exploding ridership growth is driving high public support for continued investment, regional unity behind integrated transportation and land-use planning priorities, strong support from the provincial government. Metro Vancouver also has a track record



of on-time and on-budget project delivery. This national leadership in ridership growth, transportation planning, provincial support and project management puts Metro Vancouver in a unique position in Canada and offers the Federal Government an opportunity to adapt its funding programs to support and incentivize good practices.

CONTINUING A SUCCESSFUL PARTNERSHIP

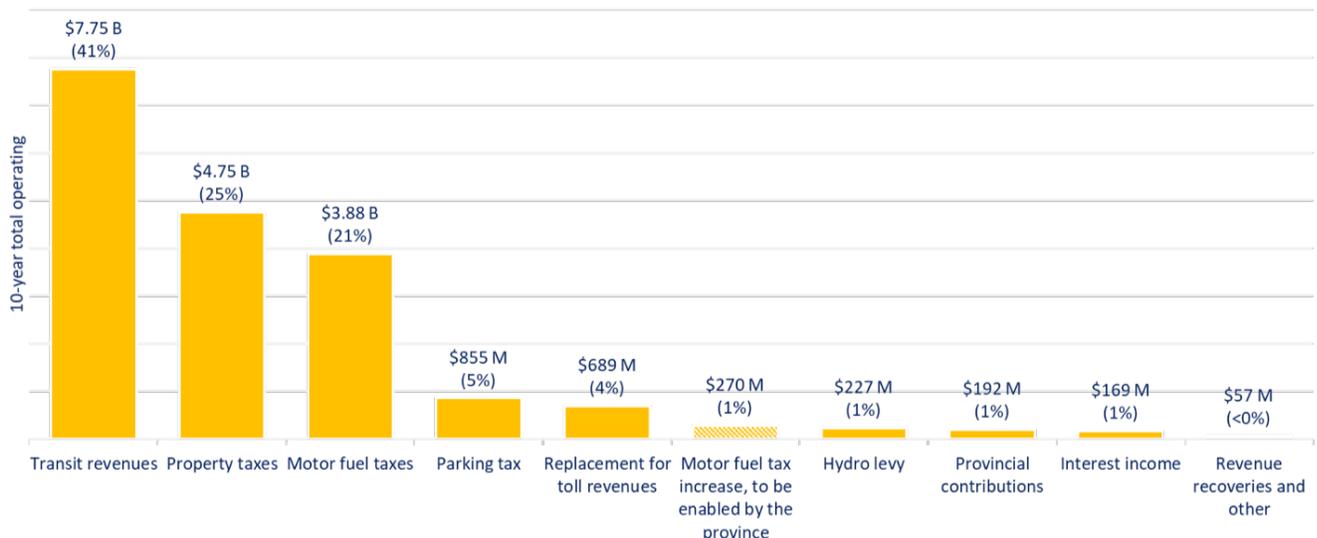
The Mayors' Council is asking the Federal Government to renew its partnership with B.C. and regional leaders to quickly allocate funding to expedite completion of the 10-Year Vision and maintain the momentum on nation-leading transit expansion and ridership growth.



Of this region's original federal transit funding of \$2.4 billion provided in 2017 and 2018, all but \$196 million currently available to Metro Vancouver has been allocated to specific projects that are in procurement or will be in procurement shortly or are in service. This means that the remainder of our 10-Year Vision projects – including extending Skytrain to Langley, building the Burnaby Mountain gondola, and additional rapid bus lines – are without a federal cost-sharing contribution.

By spring 2021, Metro Vancouver will need to approve the next phase of the 10-Year Vision in order to stay on its long-term transit planning trajectory and avoid gaps in service expansion which could compromise the region's ability to sustain its modal shift towards active and sustainable transportation options. The Province of B.C. has made a commitment to a 40% capital cost share of these projects, and the region is developing its own funding strategy for its share of capital and 100% of operating expenses. TransLink relies on the most diverse set of revenue tools out of any Canadian transit agency to fund transit service and expansion, including dedicated fuel and parking taxes, a hydro levy, development levies, property taxes and North America's third highest farebox cost recovery.

Translink Regional Revenue Sources, 2018



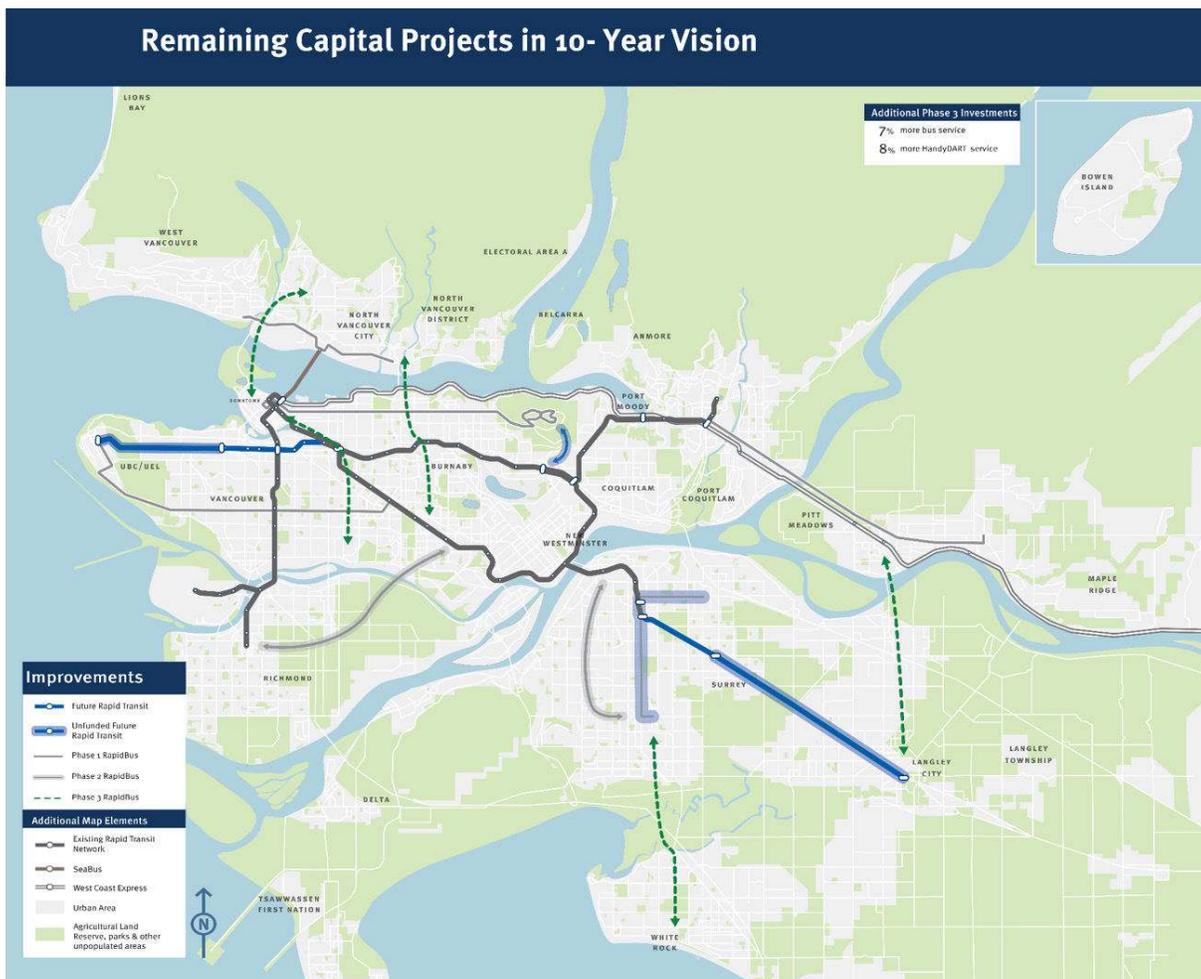
Note: figures in chart are in year-of-expenditure dollars.

RECOMMENDATION 1: PERMANENT TRANSIT FUND

The Mayors' Council supports the Federation of Canadian Municipalities in calling for a permanent federal funding allocation that would deliver \$34 billion for the 10-year plan (2028-29 to 2037-38) with \$30 billion in allocation-based funding and at least \$4 billion for the complimentary merit-based stream, with consistent funding of \$3.4 billion each year during the 10-year period.

Although a Permanent Transit Fund (PTF) in 2027 may seem a long way off, because TransLink secures funding for transit expansion plans 10 years into the future, a properly designed PTF that provides revenue certainty to TransLink now will allow the agency to “bank” on future PTF revenues and commit to future projects now rather than waiting until 2027. A “bankable” PTF requires a federal funding program enshrined and protected in legislation and with signed long-term federal-provincial agreements, similar to how the permanent Gas Tax Fund was set up starting in 2012.

RECOMMENDATION 2: TRANSITION FUNDING TO COMPLETE PHASE THREE OF THE 10-YEAR VISION



A future Permanent Transit Fund will provide critical funding for projects beginning in the last half of the 2020s. In the interim, all but \$196 million of the federal transit funding currently available to Metro Vancouver from ICIP is already allocated to specific projects, leaving these upcoming 10-Year Vision projects without a federal cost-sharing contribution:

CAPITAL PROJECTS REMAINING IN THE 10-YEAR VISION	EST. TOTAL CAPITAL COST	FEDERAL CONTRIBUTION (Budget 2020/21 - 2021/22)	FEDERAL CONTRIBUTION (Budget 2023/24)
Complete the Surrey-Langley Skytrain project from Fleetwood to Langley	\$1.63B	\$330M*	
Accelerate conversion of bus fleet to emissions-free battery electric technology by 2040	\$450M	\$225M	
5 New Rapid Bus Corridors	\$150M	\$50M	
Burnaby Mountain Gondola	\$200M	\$90M	
SkyTrain, SeaBus, Bus and West Coast Express modernization & capacity improvements	\$1.05B	\$215M	\$125M
Rapid Transit to connect Newton and Guildford to Surrey City Centre	\$450M		\$150M

** All except \$196M of Metro Vancouver's ICIP allocation has already been directed to specific projects, all of which is either in procurement or will be in procurement by mid-2020. The \$196M in remaining funds will be allocated to this upcoming project alongside a proposed additional federal investment of \$330M to complete the federal share of 40% of eligible project costs.*

To stay on track, in Budget 2020/21 or 2021/22, federal transition funding of \$685 million is required to support the next phase of our transit expansion starting in early 2023, and \$225 million is required to accelerate conversion of TransLink's bus fleet to emissions-free battery electric technology with procurement to begin by 2021.

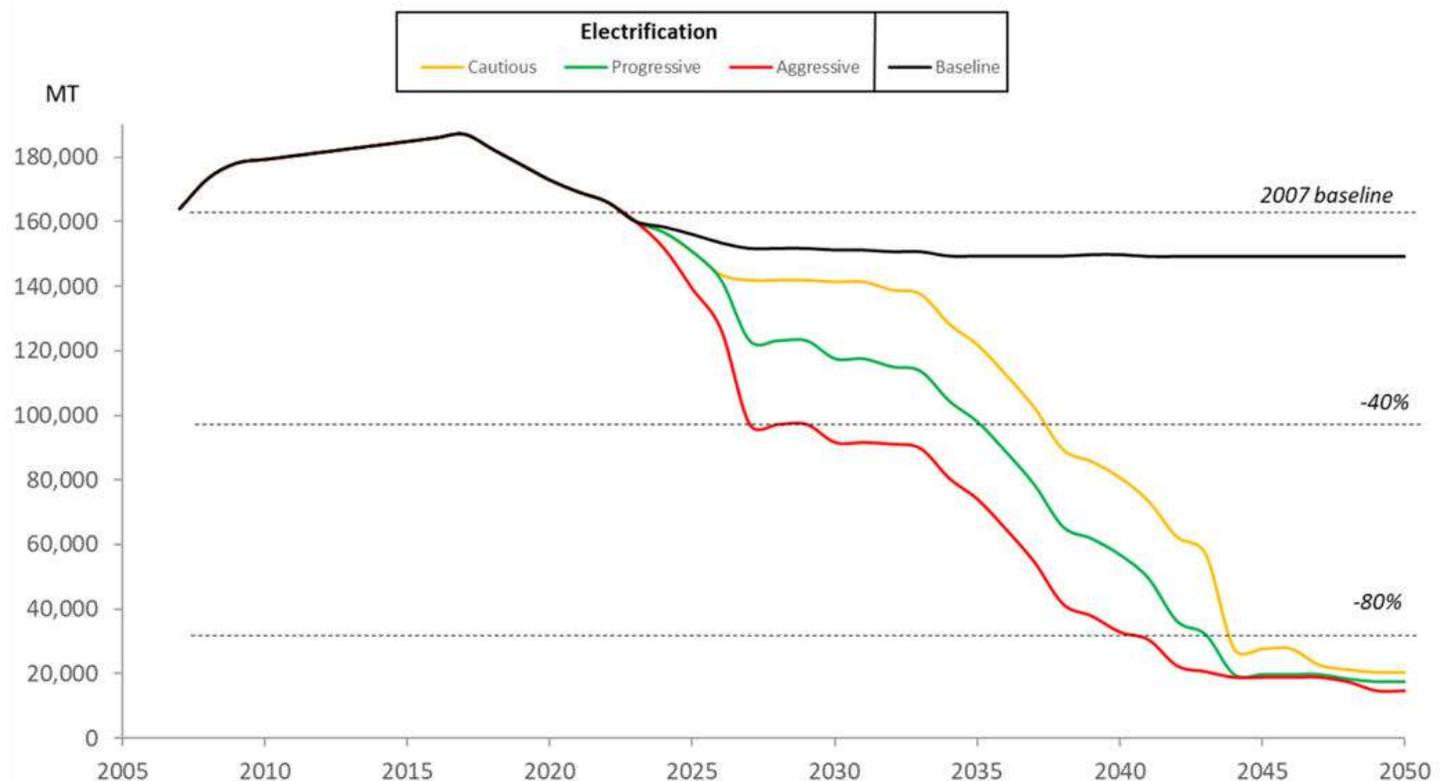
The Mayors' Council on Regional Transportation urges the Government of Canada to work in partnership with the Metro Vancouver region to identify transition funding that will help bridge the gap ahead of the implementation of a Permanent Transit Fund – so we can complete Phase Three of the 10-Year Vision.

RECOMMENDATION 3:

CONVERSION OF TRANSIT FLEETS TO BATTERY ELECTRIC BUSES

In his recent mandate letter to the Minister of Infrastructure and Communities, Prime Minister Justin Trudeau called upon the Minister to “ensure that new federal investments in public transit are used to support zero-emission buses and rail systems starting in 2023 and work with municipalities to address any exceptional circumstances.”

Over the next decade, TransLink has the opportunity to transition approximately 50 per cent of our bus fleet to clean, zero-emission, electric buses, with full conversion complete by 2040. If this opportunity is missed, internal combustion engines must instead be procured, making any meaningful GHG reductions from TransLink operations over the next two decades challenging. This includes procuring 591 e-buses by 2029, including our existing trolley-electric fleet and four e-buses. The benefits include zero tailpipe emissions and more than a 40 per cent GHG reduction from the fleet by 2030. This trajectory will allow us to reach a 2050 target of 80% GHG reduction and 100% renewable energy.



TransLink does not have a funding source for the transition to electrification and if we had to make this transition with our current approved funding, we would be competing with transit expansion to do so. In order to convert Metro Vancouver's bus fleet by 2040, TransLink requires \$248 million for charging infrastructure and \$199 million for the purchase of battery-electric buses. Support from the Government of Canada is critical.



TransLink's Low Carbon Fleet Strategy

In October 2018, the Mayors' Council and TransLink's Board of Directors approved two environmental sustainability targets:

- *An 80 per cent reduction of greenhouse gas (GHG) emissions by 2050; and*
- *Utilize 100 per cent renewable energy in all operations by 2050.*

Beginning in 2023, TransLink will start to replace retiring diesel and CNG 40-ft and 60-ft transit buses with battery-electric buses. Between 2023 and 2030, TransLink may elect to replace some retiring buses with new hybrid-electric buses, but after 2030 all retiring buses will be replaced with battery buses to achieve complete electrification of the fleet by 2050.

For TransLink to achieve its targets, electrification of the fleet will be capital intensive and will require leveraging capital contributions from senior government sources, such as the federal Green Infrastructure Fund.

Lower Emissions and Cleaner Air

Even the most cautious implementation plan by TransLink on its fleet transition will see an estimated 19 per cent GHG reduction from baseline numbers by 2029 – representing 56,000-tonnes of greenhouse gases. By 2050, fleet transition would achieve an 80 percent reduction in GHG emissions.

The transition to electric buses also provides human health benefits by eliminating particulate matter and nitrogen oxides – common urban air pollutants. Compared to diesel-hybrid buses, battery electric buses are expected to reduce annual nitrogen oxide (NOx) by 26,000 g per bus and particulate matter (PM) by 3,500 g per bus.



The Mayors' Council is composed of representatives from each of the 21 municipalities within the transportation service region, as well as Electoral Area 'A' and the Tsawwassen First Nation, and collectively represents the viewpoints and interests of the citizens of the region.

Chair - Jonathan Cote
Mayor of the City of
New Westminster

Vice Chair - Jack Froese
Mayor of the Township
of Langley

Gary Ander
Mayor of the Bowen
Island Municipality

Ken Baird
Chief of the Tsawwassen
First Nation

Neil Belenkie
Mayor of the Village
of Belcarra

Mary-Ann Booth
Mayor of the District of
West Vancouver

Malcolm Brodie
Mayor of the City of
Richmond

Linda Buchanan
Mayor of the City of
North Vancouver

Bill Dingwall
Mayor of the City
of Pitt Meadows

George Harvie
Mayor of the City of
Delta

Mike Hurley
Mayor of the City of
Burnaby

Mike Little
Mayor of the District of
North Vancouver

Doug McCallum
Mayor of the City
of Surrey

Jen McCutcheon
Director of Electoral
Area A

John McEwan
Mayor of the Village of
Anmore

Ron McLaughlin
Mayor of the Village
of Lions Bay

Mike Morden
Mayor of the City of
Maple Ridge

Kennedy Stewart
Mayor of the City of
Vancouver

Richard Stewart
Mayor of the City of
Coquitlam

Rob Vagramov
Mayor of the City of
Port Moody

Val van den Broek
Mayor of the City of
Langley

Darryl Walker
Mayor of the City of
White Rock

Brad West
Mayor of the City of
Port Coquitlam

Completing the 10-Year Vision for Metro Vancouver Transit & Transportation

ENTIRE 10 YEAR VISION		APPROVED/UNDERWAY FUNDED Phase One	Phase Two	REMAINING INVESTMENTS UNFUNDED Phase Three
 BUS SERVICE	<ul style="list-style-type: none"> 25% increase 12 B-Lines 10 new service areas 	<ul style="list-style-type: none"> 10% increase 5 new B-Lines 5 new service areas 	<ul style="list-style-type: none"> 8% increase 2 new B-Lines 3 new service areas + 4 additional service areas 	<ul style="list-style-type: none"> 7% increase 5 new B-Lines 2 new service areas
 SEABUS SERVICE	<ul style="list-style-type: none"> 1 new SeaBus 10-minute peak frequency; 15-minute all day 	<ul style="list-style-type: none"> 1 new SeaBus 10 minute peak frequency; 15-minute all day 	<ul style="list-style-type: none"> 7% increase 	<ul style="list-style-type: none"> 8% increase
 HANDYDART SERVICE	<ul style="list-style-type: none"> 30% increase 	<ul style="list-style-type: none"> 15% increase 	<ul style="list-style-type: none"> 7% increase 	<ul style="list-style-type: none"> 8% increase
 SKYTRAIN & WEST COAST EXPRESS (WCE)	<ul style="list-style-type: none"> 164 Expo/Millennium Line cars 24 Canada Line cars 10 WCE cars + locomotives Upgrades of power and control systems, stations 	<ul style="list-style-type: none"> 56 Expo/Millennium Line cars 24 Canada Line cars 2 new + 6 refurbished WCE locomotives Upgrades to Expo/Millennium & Canada Line Stations and systems 	<ul style="list-style-type: none"> 108 Expo/Millennium Line cars (including Broadway Extension) Upgrades to Expo/Millennium Stations and systems 	<ul style="list-style-type: none"> Upgrades to Expo/Millennium Stations 10 WCE cars Upgrades to Canada Line Stations and systems
 MAJOR PROJECTS	<ul style="list-style-type: none"> Millennium Line Broadway Extension South of Fraser Rapid Transit (SOFRT) Pattullo Bridge Replacement 	<ul style="list-style-type: none"> Pre-construction of Broadway Extension Pre-construction of Stage 1 of SOFRT (Surrey-Newton-Guildford LRT) Design for Pattullo Bridge replacement 	<ul style="list-style-type: none"> Construction of Broadway Extension Construction of Stage 1 of SOFRT (Surrey-Newton-Guildford LRT) Construction of Pattullo Bridge replacement (by the province) Planning for Stage 2 of SOFRT (Surrey-Langley Line) Planning for rapid transit to UBC Point Grey campus Planning for a potential gondola to SFU Burnaby campus 	<ul style="list-style-type: none"> Planning + construction of Stage 2 of SOFRT (Surrey-Langley Line)
 MAJOR ROADS NETWORK (MRN)	<ul style="list-style-type: none"> MRN upgrades: \$200M MRN seismic: \$130M MRN expansion: 1% annual increase + one-time 10% increase 	<ul style="list-style-type: none"> \$50M (25% of Vision) \$32.5M (25% of Vision) MRN expansion: 1% annual increase + one-time 10% increase 	<ul style="list-style-type: none"> \$40M (20% of Vision) \$26M (20% of Vision) 	<ul style="list-style-type: none"> \$110M (55% of Vision) \$71.5M (55% of Vision)
 WALKING & CYCLING	<ul style="list-style-type: none"> Regional Cycling: \$97M TransLink-owned Cycling: \$34M Walking Access to Transit: \$3.5M 	<ul style="list-style-type: none"> \$30M (31% of Vision) \$12M (35% of Vision) \$12.5M (36% of Vision) 	<ul style="list-style-type: none"> \$24M (25% of Vision) \$9M (27% of Vision) \$10M (29% of Vision) 	<ul style="list-style-type: none"> \$43M (44% of Vision) \$13M (38% of Vision) \$12.5M (36% of Vision) 9 upgraded transit exchanges
 TRANSIT EXCHANGES	<ul style="list-style-type: none"> 13 new or expanded transit exchanges 	<ul style="list-style-type: none"> 4 updated transit exchanges 		
 MOBILITY INNOVATION	<ul style="list-style-type: none"> Integrated travel planning + payment New technologies + services 	<ul style="list-style-type: none"> Vanpool pilot Innovation Lab to explore mobility concepts 	<ul style="list-style-type: none"> Pilot and field test flexible shared-use services 	<ul style="list-style-type: none"> Scale flexible shared-use services

TRANSLINK LOW CARBON FLEET STRATEGY

Briefing Note | January 23, 2020

EXECUTIVE SUMMARY

In October 2018, TransLink adopted two significant environmental targets: an 80 per cent reduction of greenhouse gas (GHG) emissions by 2050, and to utilize 100 per cent renewable energy in all operations by 2050. Although ambitious, our analysis indicates that meeting these targets is possible with zero and low-carbon fuels and technologies, but it means that bold action is required through policy decisions, investment planning, and funding support.

Our emerging strategy is to begin electrifying our bus fleet early next decade, and to use renewable fuels as we transition. Our electric trolley bus fleet makes up 17 per cent of our fleet, and is already zero-emission, and has no tailpipe air pollutants (nitrogen oxide, NO_x and particulate matter, PM). In order to electrify our bus fleet commencing in the 2021 procurement year, now is the time to begin planning and procuring charging infrastructure for our new transit centre scheduled to open in 2023, and for one of our existing transit centres to convert to all-electric in 2026. We will also need to consider on-route charging for select routes within Metro Vancouver during this timeframe.

If we were able to purchase only zero-emission battery-electric buses throughout the next decade (635 buses¹), we can reduce our lifecycle GHG emissions by over 40 per cent (~90,000 tonnes CO₂e) and eliminate air pollutants from these buses. In order to do so, we require in the order of **\$248M for the charging infrastructure and \$199M for the purchase of the battery-electric buses.**

TransLink does not have a funding source for the transition to electrification and if we had to make this transition with our current approved funding, we would be competing with transit expansion. It is important that TransLink continue to expand our bus fleet, thereby eliminating car trips and reducing GHG emissions in the region and at the same time, move forward with replacing buses with internal combustion engines to battery-electric buses, thereby reducing our own environmental footprint. TransLink, the region and the province will achieve a double benefit with respect to GHG emissions and air quality, aligning with the CleanBC strategy.

DISCUSSION

Transportation accounts for over 35 per cent of all greenhouse gas emissions in Metro Vancouver. TransLink plays a particularly important role in reducing emissions in the region by expanding and improving products and services to grow transit ridership, ease traffic congestion, and reduce single-occupancy vehicle kilometers traveled; by promoting compact, active, pedestrian- and transit-oriented communities; and by supporting non-motorized travel.

As one of the region's largest consumers of diesel fuel and operator of a fleet of heavy-duty vehicles, TransLink also plays an important role in reducing emissions in our own operations.

In October 2018, the Mayors' Council and TransLink's Board of Directors approved two environmental sustainability targets:

- An 80 per cent reduction of greenhouse gas (GHG) emissions by 2050; and
- Utilize 100 per cent renewable energy in all operations by 2050.

¹ Includes a 15% replacement ratio for depot charged buses, and 5% for on-route charged buses.

Our commitments align with federal and provincial legislation, specifically BC's *Climate Change Accountability Act* which includes legislated targets for reducing greenhouse gases by at least 40 per cent below 2007 levels by 2030, 60 per cent by 2040, and 80 per cent by 2050.

Low Carbon Fleet Strategy

Phase One of the 10-Year Mayors' Vision of the 2017-2026 Investment Plan committed TransLink to manage the system to be more efficient and customer-focused. Within this commitment, TransLink committed to developing a Low Carbon Fleet Strategy (LCFS) with the goal of reducing fleet emissions across the region of Metro Vancouver. In July 2017, TransLink began the development of the LCFS with the goal of:

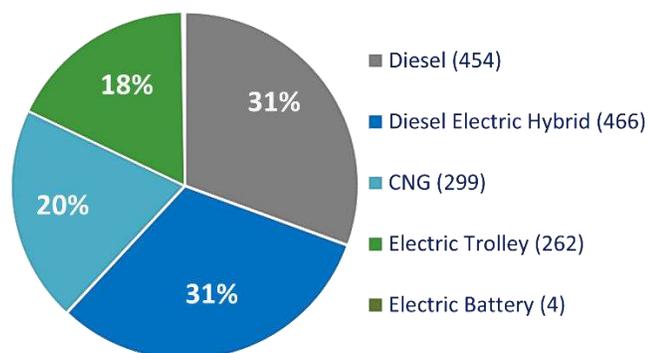
- Comparing bus technologies and fuels that:
 - are expected to be commercially available in 2020 and later years;
 - can significantly reduce fleet GHG emissions; and
 - will be consistent with projected future funding and CMBC service requirements.
- Identifying the level of additional funding that would be required to meet an 80 per cent reduction of GHG emissions from our revenue bus fleet by 2050.

The first phases of the LCFS analysis have concluded that the use of renewable fuels in existing buses can provide a cost-effective way to get early GHG reductions, but only significant electrification can achieve the 80 per cent reduction of GHG emissions by 2050. While current electric buses are more expensive than diesel buses, costs are projected to come down as the technology matures. Life-cycle cost parity for electric battery buses is expected by model year 2025 or sooner. While there will be fuel savings and a reduction of maintenance costs, the life-cycle fleet costs for electrification over the next 30 years are projected to be on par compared to diesel primarily because of the cost of charging infrastructure. Transitioning to battery electric buses will require significant charging infrastructure development and changes to bus operations.

Bus Fleet Composition and Procurement Plan

TransLink's bus fleet is operated and managed by Coast Mountain Bus Company (CMBC). Currently, CMBC operates 1,485 buses of which more than 45 per cent is all-electric trolleys, diesel-electric hybrid or battery-electric buses (refer to Figure 1, below).

Figure 1: Current CMBC Bus Fleet Composition (1,485 buses)



CMBC generally replaces vehicles after 17 years of operation and/or over 1M kilometers. At present, as older diesel vehicles are phased out, they are replaced with either compressed natural gas (CNG) or diesel-electric hybrid vehicles.

Table 1 below outlines CMBC’s Bus Procurement Plan over the next 10 years (2020-2029). In addition to the 40-ft and 60-ft buses, the current trolley fleet of 262 buses has been in service since 2006 and is scheduled for replacement in the 2027–2028 timeframe. These buses are already powered by electricity and therefore, have equivalent carbon emissions to battery buses. There is a strong business case to maintain the current trolley system for one more procurement cycle while focus is made on transitioning the older generation diesel and hybrid buses to zero emission.

Table 1: CMBC Bus Procurement Plan²

		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	TOTAL
40-ft	Procurement	0	57	126	69	197	0	0	17	0	17			483
	Baseline	0	9	19	10	16	0	0	3	0	3			60
	Incr - depot charge	0	66	145	79	213	0	0	20	0	20			543
	TOTAL													
Expected Service			0	66	145	79	213	0	0	20	0	20	543	
60-ft	Procurement	0	0	16	0	39	0	0	25	0	0			80
	Baseline	0	0	2	0	6	0	0	4	0	0			12
	Incr - depot charge	0	0	18	0	45	0	0	29	0	0			92
	TOTAL													
Expected Service			0	0	18	0	45	0	0	29	0	0	92	
TOTAL BUSES	Procurement	0	66	163	79	258	0	0	49	0	20			635
	Expected Service			0	66	163	79	258	0	0	49	0	20	635

OPPORTUNITY

The CleanBC strategy outlines specific actions to meet BC’s 2030 GHG reduction goals by shifting away from fossil fuels and towards clean and renewable energy. The current plan outlines action that will achieve 75 per cent of its GHG reduction goals, and the remaining 25 per cent is to be determined. One of the sectors identified as a strong potential in making up the 25 per cent is cleaner public transportation. TransLink can help the province meet its goals.

Over the next decade, TransLink has the opportunity to transition approximately 50 per cent of our bus fleet to clean, zero-emission electric buses. If this opportunity is missed and internal combustion engines are procured, realizing any meaningful GHG reductions over the next two decades will be a challenge.

² This Fleet Procurement Plan includes an additional 15% more buses for depot charged buses and 5% more buses for on-route charged buses. This Plan only includes replacement buses, and not expansion. 50 replacement compressed natural gas (CNG) buses have been excluded in the 2021 procurement year to fully utilize the existing fueling infrastructure. It is assumed TransLink will procure renewable natural gas for these buses.

Recommended Technology Pathway 2020-2050

The recommended technology pathway for bus and fuel purchases between 2020 and 2050 includes:

- Beginning in 2023, start to replace retiring diesel and CNG 40-ft and 60-ft transit buses with battery-electric buses. Between 2023 and 2030, TransLink may elect to replace some retiring buses with new hybrid-electric buses, but after 2030 all retiring buses should be replaced with battery buses to achieve complete electrification of the fleet by 2050;
- With the evolution in battery technology, depot charging may be sufficient for many routes. On-route charging may also be used for selected routes.
- Replace the existing trolley bus fleet with new trolley buses at the end of their useful life, in 2027-2028, and continue to operate the trolley bus system in the short and medium term. After 2040, re-evaluate the option of replacing trolley buses with battery buses.
- After 2030, TransLink should assess commercial availability and cost of long-range battery buses and hydrogen fuel cell buses as potential options for replacing retiring highway coaches; and
- After 2030, TransLink should assess commercial availability and cost of battery shuttle buses as a potential option for replacing retiring shuttle buses in later years.

Fleet Electrification Transition Costs - 2020-2050

All costs are at the planning level and will be revised during future analytical and design phases.

Through 2050, the modeled fleet electrification scenario will require \$1.47 billion (nom \$) in additional capital funding, compared to baseline fleet replacement with hybrid electric, CNG, and trolley buses. However, there will be a net operating cost savings of \$994 million (nom \$). This would result in a total net total cost of \$473 million to electrify the fleet (an increase of 2.3 per cent).

Fleet Electrification Transition Costs – 2020 - 2029

Three options for electrification investments between 2020 and 2029, were developed and are described below:

Cautious: This is the least aggressive and lowest cost option, in recognition that funding is not yet secured, and that the technology is continuing to evolve rapidly, such that moving at a measured pace may result in lower net costs over the long term.

Progressive: This is a faster pace of investment which achieves greater GHG reductions over the next 10 years while still managing technology risk.

Aggressive: This is the most aggressive and most costly option representing the fastest possible turn-over of the fleet to battery-electric buses without retiring existing buses early. This option achieves maximum GHG reductions over the next 10 years, but also incurs a greater level of financial and technology risk.

Table 2 below summarizes the 2020 - 2029 bus fleet electrification details and costs associated with each of the three investment options. Further details on each Option are provided in Appendix A. It is important to note that the options are not exclusive, and TransLink could start on the path to Progressive and transition to Aggressive by or before 2030.

Table 2: Bus Fleet Electrification Plan and Costs 2020 – 2029³

METRIC		CAUTIOUS	PROGRESSIVE	AGGRESSIVE
Electric Buses Purchased *		95	314	635
In-route Chargers Installed		1	4	17
Depot Chargers Installed at		MTC	MTC	MTC and BTC
Routes Electrified	Depot Charging	30% of MTC routes	100% of MTC routes	100% of MTC routes 80% of BTC routes
	In-route Charging	Route 100	Routes 100, 159, 169, 188	Route 100 95% of PTC routes
CAPITAL INVESTMENT 2020-2029 (nom \$ mill)	Buses	\$37	\$110	\$199
	Infrastructure	<u>\$58</u>	<u>\$89</u>	<u>\$248</u>
	TOTAL	\$95	\$199	\$447

*To be confirmed as battery technology evolves.

** All costs and savings are planning level estimates and will be revised with future analytical and design work.

***Exclusive of construction and financing costs.

Capital funding requirements from 2021-2029 for the Aggressive electrification option are provided in Appendix B.

There will be operational savings with each of the investment options noted above. The estimated operational savings range from \$27M to \$124M and are dependent upon several key cost assumptions around maintenance and fuel costs.

³ MTC = Marpole Transit Centre, BTC = Burnaby Transit Centre, PTC = Port Coquitlam Transit Centre

GHG / Air Emissions

Figure 2 below summarizes the expected GHG reductions by 2050 associated with each of the capital investment options. All three investment options enable TransLink to reach an 80 per cent reduction of GHG emissions by 2050 and have varying reductions over the next 10 years. Details on GHG reductions to 2030 from our 2007 baseline are provided in Table 3 below.

Figure 2: Estimated GHG Reductions by 2050

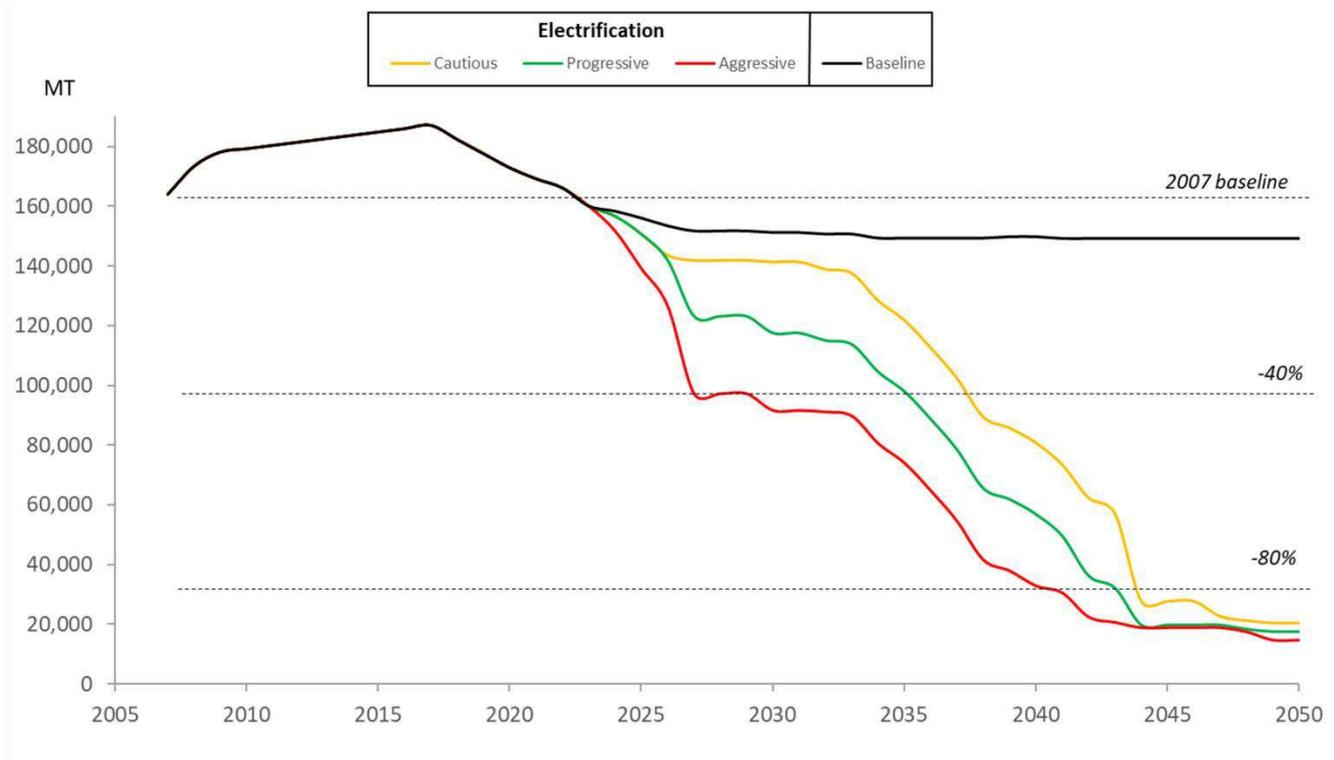


Table 3: Estimated GHG Reductions (2020-2030)

METRIC	CAUTIOUS	PROGRESSIVE	AGGRESSIVE
Total GHG Reduction 2020 – 2030 (MT)	56,000	137,000	269,000
Annual GHG Reduction in 2030 (MT)	9,800	33,600	59,500
Annual GHG Reduction 2030 vs 2007	14%	28%	44%

The transition to electric buses also eliminates particulate matter and nitrogen oxides, common urban air pollutants. Compared to diesel-hybrid buses, battery electric buses are expected to reduce annual nitrogen oxide (NOx) by 26,000 g per bus and particulate matter (PM) by 3,500 g per bus.

CHALLENGES

Transitioning to a low carbon fleet will require support from our municipal partners, the province and the federal government. Some of the key federal and provincial actions include policies that increase the supply of zero emissions vehicles and that increase the availability of renewable fuels. While the long-term targets are achievable, there are challenges to achieving them:

Funding support:

- For TransLink to achieve its targets, electrification of the fleet will be more capital intensive and will require leveraging capital contributions from external sources, such as the Green Infrastructure Fund, or funding earmarked to support CleanBC.

BC's low carbon fuel program – compliance credits:

- The ownership of electricity credits under BC's low carbon fuel program is currently designated to BC Hydro. While BC Hydro has been an excellent partner in the development of TransLink's low carbon fleet strategy, they do not have a program dedicated to reinvesting the revenue gained from the sale of their compliance credits back into clean transportation. TransLink estimates that revenue gained through the electrification of our bus fleet would be equal to approximately \$250M over the next 30 years. If TransLink was provided ownership of the electricity credits, the revenue would directly advance clean transportation fuels in the province.

Technology advancements:

- While the pathway to a low carbon fleet doesn't depend on new technologies, existing technologies are expected to improve in quality and/or price over time. For example: the cost of batteries for electric buses is expected to drop almost 50 per cent in the next ten years. If the availability and cost of renewable fuels doesn't improve over time, it will be difficult to justify the transition. Conversely, if existing technologies advance faster than anticipated and/or new technologies emerge, achieving the targets will become easier.

Power Resiliency:

- For a full fleet roll-out of electric buses, TransLink will have to develop contingency plans for maintaining some level of bus charging even if grid power is disrupted to one or more charging locations. Information provided by BC Hydro indicates that their system has historically been very reliable. Between 2015 and 2018, 70 percent of all circuits had annual outage time of less than 5 hours, and 90 percent had annual outage time of less than 10 hours. In addition, for 86 percent of circuits average outage time per incident was less than an hour. Most outages were caused by either weather or vehicle damage. Given the high reliability of the system, the recommended alternative is to use mobile diesel generator(s) that can be moved between locations as needed, rather than providing fixed back-up generation at every charging location.
- For depot charging one or more 750 kW mobile generators would be required, with each providing the ability to supply power to up to 15 buses charging concurrently overnight at a depot. For in-route charging one or more 450 kW mobile generators would be required⁴, with each providing the ability to supply power to one in-route charger.
- The number of chargers required would depend on the number of electric buses deployed, and the likelihood of losing power at each charging location separately, and at multiple locations simultaneously. TransLink will work with BC Hydro to further evaluate historical trends and to project future needs.

⁴ It may also be possible to develop a mobile battery pack system that could power an in-route charger for 12-hours or more.

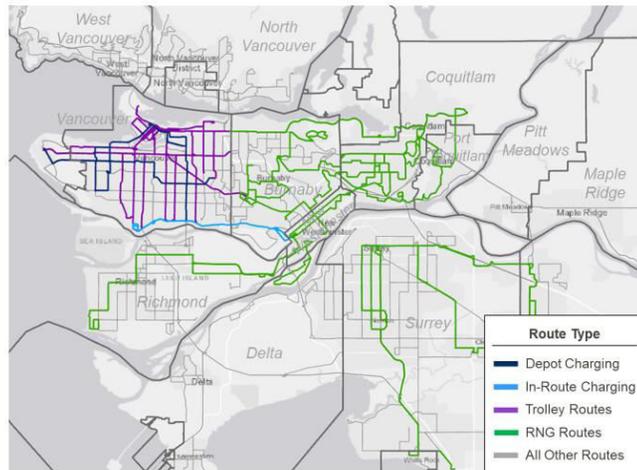
Appendix B: Further Information on Electrification Options

Cautious Fleet Electrification (2020-2029)

- Open new MTC as “electric ready” for 100% depot charging and install 80 chargers
- Convert Route 100 to full electric operation by adding one more charger
- Purchase 95 electric buses
- **Incremental capital investment of \$95 million required**

Benefits

- Including trolleys, 26% of transit buses electrified by 2030
- 2030 fleet GHG reduced by 14% compared to 2007
- Projected operating cost savings of \$27 million



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T Together all the way

MJB & A

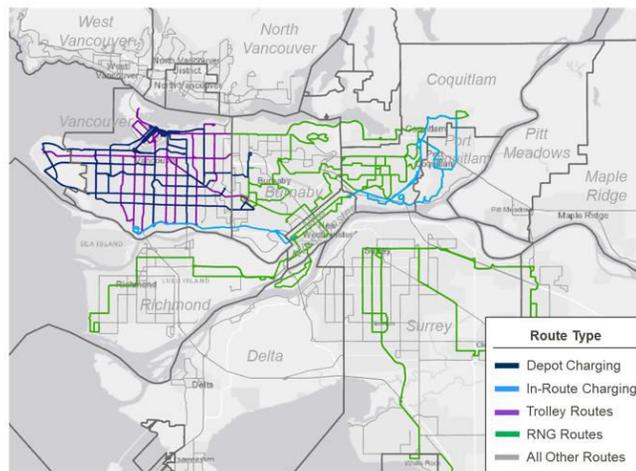


Progressive Fleet Electrification (2020-2029)

- Open new MTC as 100% depot charging with 280 chargers
- Convert routes 100, 159, 169, 188 to full electric operation by adding 4 in-route chargers
- Purchase 314 electric buses
- **Incremental capital investment of \$199 million required**

Benefits

- Including trolleys, 41% of transit buses electrified by 2030
- 2030 fleet GHG reduced by 28% compared to 2007
- Projected operating cost savings of \$67 million



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T Together all the way

MJB & A

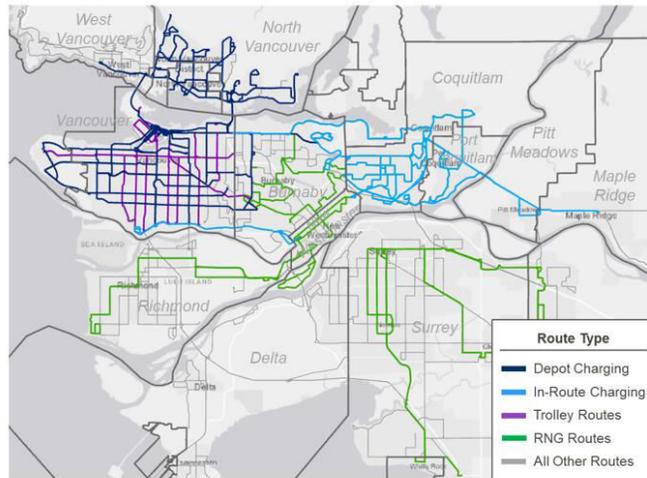


Aggressive Fleet Electrification (2020-2029)

- Open new MTC as 100% depot charging with 280 chargers
- Expand BTC with 267 depot chargers to accommodate 80% of routes
- Convert Route 100 and most PTC routes to electric operation by installing 17 in-route chargers
- Purchase 635 electric buses
- **Incremental capital investment of \$447 million**

Benefits

- Including trolleys, 64% of transit buses electrified by 2030
- 2030 fleet GHG reduced by 44% compared to 2007
- Projected operating cost savings of \$124 million



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Appendix A: LCFS Funding Requirements

LCFS Funding Requirements

The total capital investments required to meet the GHG reductions that aligns with the provincial targets is approximately **\$450M** and includes:

- **\$200M** for the procurement of 635 battery-electric buses (incremental costs from diesel-hybrid and compressed natural gas), and
- **\$250M** is for infrastructure investments, including designing and operating 100 per cent of routes out of Marpole Transit Centre, 80 per cent of the routes out of Burnaby Transit Centre, and 95 per cent of the routes from Port Coquitlam Transit Centre as electric. All costs are planning level estimates and will be revised with future analytical and design work. Costs are exclusive of construction and financing costs.

PROJECTS	PROJECT DESCRIPTION	2021	2022	2023	2024	2027	2029
Marpole Transit Centre	Make ready for full depot electrification; installation of SAE J3105 chargers	\$50.1M	\$23.0M	\$7.2M			
Burnaby Transit Centre	Make ready for full depot electrification; depot expansion and installation of SAE J3105 chargers				\$56.9M	\$76.1M	
On-Route Chargers	Install on-route chargers and depot maintenance chargers		\$3.3M	\$29.8M			
Buses (incremental cost to diesel-hybrid)	On-route and depot charged battery-electric buses	\$23.2M	\$59.0M	\$23.3M	\$64.5M	\$21.9M	\$7.2M
TOTAL FUNDS		\$74M	\$86M	\$61M	\$122M	\$98M	\$7M

4.