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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

METRO VANCOUVER REGIONAL DISTRICT
FINANCE AND INTERGOVERNMENT COMMITTEE

REGULAR MEETING

Wednesday, November 10, 2021
1:00PM
28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia

A G E N D A[1]

1. ADOPTION OF THE AGENDA

1.1 November 10, 2021 Regular Meeting Agenda
That the Finance and Intergovernment Committee adopt the agenda for its regular meeting scheduled for November 10, 2021 as circulated.

2. ADOPTION OF THE MINUTES

2.1 October 13, 2021 Regular Meeting Minutes *pg. 5*
That the Finance and Intergovernment Committee adopt the minutes of its regular meeting held October 13, 2021 as circulated.

3. DELEGATIONS

4. INVITED PRESENTATIONS

4.1 Tamara Vrooman, President and Chief Executive Officer, and Heather Deal, Director, Vancouver Airport Authority Board *pg. 10*
Subject: The Future of YVR

4.2 Dylan Casola, Senior Manager, Low Carbon Fleet Programs, Coast Mountain Bus Company, and Ralf Nielson, Director, Enterprise Sustainability, TransLink *pg. 14*
Subject: Low Carbon Fleet Program (LCFP) Overview

4.3 Olga Kuznetsova, Vice President, Finance, and Tilan Kiriwaththuduwa, Manager, Capital Assets and Government Funding, TransLink
Subject: 2022 Application for Federal Gas Tax Funding from the Greater Vancouver Regional Fund

[1] *Note: Recommendation is shown under each item, where applicable.*

5. REPORTS FROM COMMITTEE OR STAFF

5.1 TransLink Application for Federal Gas Tax Funding for 2023 Depot Infrastructure, Fleet Replacement, and Fleet Design *pg. 29*

That the MVRD Board approve $358.48 million in funding from the Greater Vancouver Regional Fund for the following transit projects proposed by TransLink in its Application for Federal Gas Tax Funding as attached to the report dated September 29, 2021, titled "TransLink Application for Federal Gas Tax Funding for 2023 Depot Infrastructure, Fleet Replacement, and Fleet Design":

1. Marpole Transit Centre – Implementation
2. 2023 Conventional Bus – Replacement
3. 2023 HandyDART Vehicle Purchase – Replacement
4. 2023 Community Shuttle Purchase – Replacement
5. Next Generation SeaBus Design

5.2 Award of Contract Resulting from Request for Proposal (RFP) No.20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services *pg. 111*

That the GVWD Board:

a) approve the award of a contract for Phase A work in an amount of up to $7,018,783 (exclusive of taxes) to Hatch Limited resulting from Request for Proposal (RFP) No. 20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services, subject to final review by the Commissioner; and

b) authorize the Commissioner and the Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

5.3 Iona Island Wastewater Treatment Plant Projects – Revised Design Concept *pg. 117*

That the GVS&DD Board endorse the revised design concept for the Iona Island Wastewater Treatment Plant projects, as presented in the report dated October 27, 2021 titled "Iona Island Wastewater Treatment Plant Projects – Revised Design Concept"; and direct staff to finalize the project definition report for Board approval in March 2022.

5.4 CAO's Report on Long Term Financial Planning

Verbal Update

Designated Speaker: Jerry W. Dobrovolny, Commissioner/Chief Administrative Officer

- Review of financial policies and frameworks related to the longer term financial planning and budget impacts for members
- Engage the Regional Staff Advisory Committees (RAAC, RFAC, REAC) in the above discussions
- Update the Asset Management Plans for Water Services and Liquid Waste Services
- Ongoing commitment for continuous improvement
- Continue with intergovernmental strategies to support ongoing advocacy for predictable, equitable cost-sharing on critical infrastructure projects
- Continued annual review of the capital program
- Establishment of the Enterprise Risk Management (ERM) Program

5.5 Manager's Report *pg. 178*

That the Finance and Intergovernment Committee receive for information the report dated October 21, 2021, titled "Manager's Report".

6. INFORMATION ITEMS

7. OTHER BUSINESS

8. BUSINESS ARISING FROM DELEGATIONS

9. RESOLUTION TO CLOSE MEETING

Note: The Committee must state by resolution the basis under section 90 of the Community Charter on which the meeting is being closed. If a member wishes to add an item, the basis must be included below.

That the Finance and Intergovernment Committee close its regular meeting scheduled for November 10, 2021 pursuant to the *Community Charter* provisions, Section 90 (1) (i), (g) and 90 (2) (b) as follows:

"90 (1) A part of the meeting may be closed to the public if the subject matter being considered relates to or is one or more of the following:

(g) litigation or potential litigation affecting the regional district;

(i) the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose; and

90 (2) A part of a meeting must be closed to the public if the subject matter being considered relates to one or more of the following:

(b) the consideration of information received and held in confidence relating to negotiations between the regional district and a provincial government or the federal government or both and a third party."

10. ADJOURNMENT/CONCLUSION

That the Finance and Intergovernment Committee adjourn/conclude its regular meeting of November 10, 2021.

Membership:

Buchanan, Linda (C) - North Vancouver City
Dhaliwal, Sav (VC) - Burnaby
Booth, Mary-Ann - West Vancouver
Brodie, Malcolm - Richmond
Coté, Jonathan - New Westminster
Dingwall, Bill - Pitt Meadows
Froese, Jack - Langley Township
Hurley, Mike - Burnaby
McCallum, Doug - Surrey
McCutcheon, Jen - Electoral Area A
McEwen, John - Anmore
Stewart, Kennedy - Vancouver
Stewart, Richard - Coquitlam
West, Brad - Port Coquitlam

METRO VANCOUVER REGIONAL DISTRICT
FINANCE AND INTERGOVERNMENT COMMITTEE

Minutes of the Regular Meeting of the Metro Vancouver Regional District (MVRD) Finance and Intergovernment Committee held at 1:00 p.m. on Wednesday, October 13, 2021 in the 28th Floor Boardroom, 4730 Kingsway, Burnaby, British Columbia.

MEMBERS PRESENT:
Chair, Mayor Linda Buchanan*, North Vancouver City
Vice Chair, Councillor Sav Dhaliwal, Burnaby
Mayor Mary-Ann Booth*, West Vancouver
Mayor Malcolm Brodie*, Richmond
Mayor Jonathan Coté*, New Westminster
Mayor Bill Dingwall*, Pitt Meadows
Mayor Jack Froese*, Langley Township
Mayor Mike Hurley*, Burnaby (arrived at 1:06 p.m.)
Mayor Doug McCallum*, Surrey (arrived at 1:15 p.m.)
Mayor John McEwen*, Anmore
Mayor Richard Stewart*, Coquitlam (arrived at 1:08 p.m.)
Mayor Brad West*, Port Coquitlam

MEMBERS ABSENT:
Director Jen McCutcheon, Electoral Area A
Mayor Kennedy Stewart, Vancouver

STAFF PRESENT:
Jerry W. Dobrovolny, Chief Administrative Officer
Amelia White, Legislative Services Supervisor, Board and Information Services

1. ADOPTION OF THE AGENDA

1.1 October 13, 2021 Regular Meeting Agenda

It was MOVED and SECONDED
That the Finance and Intergovernment Committee:
a) amend the agenda for its regular meeting scheduled for October 13, 2021 by withdrawing Item 4.1 - Olga Kuznetsova, Vice President, Finance, and Tilan Kiriwaththuduwa, Manager, Capital Assets and Government Funding, TransLink and Item 5.1 – TransLink Application for Federal Gas Tax Funding for 2023 Depot Infrastructure, Fleet Replacement, and Fleet Design; and
b) adopt the agenda as amended.

CARRIED

*denotes electronic meeting participation as authorized by Section 3.6.2 of the *Procedure Bylaw*

2. ADOPTION OF THE MINUTES

2.1 September 8, 2021 Regular Meeting Minutes

It was MOVED and SECONDED
That the Finance and Intergovernment Committee adopt the minutes of its regular meeting held September 8, 2021 as circulated.

CARRIED

3. DELEGATIONS

No items presented.

4. INVITED PRESENTATIONS

4.1 Olga Kuznetsova, Vice President, Finance, and Tilan Kiriwaththuduwa, Manager, Capital Assets and Government Funding, TransLink

Pursuant to Item 1.1 of the agenda, this item was withdrawn.

5. REPORTS FROM COMMITTEE OR STAFF

5.1 TransLink Application for Federal Gas Tax Funding for 2023 Depot Infrastructure, Fleet Replacement, and Fleet Design

Pursuant to Item 1.1 of the agenda, this item was withdrawn.

5.2 2022 – 2026 Financial Plan Overview

Jerry Dobrovolny, Commissioner/Chief Administrative Officer and Dean Rear, Chief Financial Officer/General Manager, Financial Services provided a verbal report on the 2022-2026 Financial Plan highlighting the use of reserves, debt amortization, overall household impact, and the projected operating and capital budgets.

1:06 p.m. Mayor Hurley arrived at the meeting.
1:08 p.m. Mayor R. Stewart arrived at the meeting.

Presentation material titled "2022-2026 Financial Plan Overview" is retained with the October 13, 2021 Finance and Intergovernment Committee agenda.

It was MOVED and SECONDED
That the Finance and Intergovernment Committee receive for information the October 13, 2021 verbal report from Jerry Dobrovolny, Chief Administrative Officer and Dean Rear, General Manager, Financial Services/Chief Financial Officer regarding the "2022-2026 Financial Plan Overview".

CARRIED

1:15 p.m. Mayor McCallum arrived at the meeting.

5.3 2022 – 2026 Financial Plan – Allocated Programs

Report dated October 6, 2021, from Jerry Dobrovolny, Commissioner/Chief Administrative Officer and Dean Rear, Chief Financial Officer/General Manager, Financial Services, presenting the Finance and Intergovernment Committee with the 2022-2026 Financial Plans for the allocated programs including Corporate Services, External Relations, Financial Services, Human Resources, Indigenous Relations, Legislative Services and Project Delivery for the Committee's consideration.

Members were provided with a presentation on the Allocated Programs highlighting the budget overview, operating expenditures, and the financial plan summary.

Presentation material titled "2022-2026 Financial Plan – Allocated Programs" is retained with the October 13, 2021 Finance and Intergovernment Committee agenda.

It was MOVED and SECONDED

That the Finance and Intergovernment Committee endorse the 2022-2026 Financial Plan for the Allocated Programs as presented in the report dated October 6, 2021, titled "2022-2026 Financial Plan – Allocated Programs", and forward it to the Metro Vancouver Board Budget Workshop on October 20, 2021 for consideration.

CARRIED

5.4 2022 – 2026 Financial Plan – Regional District Service Areas

Report dated October 6, 2021, from Jerry Dobrovolny, Commissioner/Chief Administrative Officer and Dean Rear, Chief Financial Officer/General Manager, Financial Services, presenting the Finance and Intergovernment Committee with the 2022-2026 Financial Plan for Regional District Service Areas of E911 Emergency Telephone Service, General Government Administration, General Government Zero Waste Collaboration Initiatives, Regional Emergency Management, Regional Economic Prosperity, Regional Employers Services, Regional Global Positioning System and Sasamat Fire Protection for the Committee's consideration.

Members were provided a presentation on the Other Regional District Services highlighting the budget overview and operating expenditures.

Presentation material titled "2022-2026 Financial Plan – Other Regional District Services" is retained with the October 13, 2021 Finance and Intergovernment Committee agenda.

It was MOVED and SECONDED

That the Finance and Intergovernment Committee endorse the 2022-2026 Financial Plan for the Regional District Service Areas as presented in the report dated October 6, 2021, titled "2022-2026 Financial Plan – Regional District Service Areas", and forward it to the Metro Vancouver Board Budget Workshop on October 20, 2021 for consideration.

CARRIED

5.5 Award of Contract Resulting from Request for Proposal (RFP) No. 20-354: Annacis Water Supply Tunnel – Construction

Report dated September 29, 2021, from Roy Moulder, Director, Purchasing and Risk Management, Financial Services and Murray Gant, Project Manager, Major Projects, advising the Finance and Intergovernment Committee of the results of the Request for Proposal No. 20-354: Annacis Water Supply Tunnel – Construction, and recommending award of contract in the amount of up to $287,842,000 (exclusive of taxes) to Traylor-Aecon General Partnership.

It was MOVED and SECONDED

That the GVWD Board:

a) approve the award of a contract in an amount of up to $287,842,000 (exclusive of taxes) to Traylor-Aecon General Partnership resulting from Request for Proposal (RFP) No. 20-354: Annacis Water Supply Tunnel – Construction, subject to final review by the Commissioner; and

b) authorize the Commissioner and the Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

CARRIED

5.6 Manager's Report

Report dated September 28, 2021, from Jerry Dobrovolny, Commissioner/Chief Administrative Officer, providing the Finance and Intergovernment Committee with an update on the Committee's 2021 Work Plan.

It was MOVED and SECONDED

That the Finance and Intergovernment Committee receive for information the report dated September 28, 2021, titled "Manager's Report".

CARRIED

6. INFORMATION ITEMS

No items presented.

7. OTHER BUSINESS

No items presented.

8. BUSINESS ARISING FROM DELEGATIONS

No items presented.

9. RESOLUTION TO CLOSE MEETING

It was MOVED and SECONDED
That the Finance and Intergovernment Committee close its regular meeting scheduled for October 13, 2021 pursuant to the *Community Charter* provisions, Section 90 (1) (g) and (i) as follows:

"90 (1) A part of the meeting may be closed to the public if the subject matter being considered relates to or is one or more of the following:

(g) litigation or potential litigation affecting the regional district; and

(i) the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose."

CARRIED

10. ADJOURNMENT/CONCLUSION

It was MOVED and SECONDED
That the Finance and Intergovernment Committee adjourn its regular meeting of October 13, 2021.

CARRIED
(Time: 2:08 p.m.)

_____ _____

Amelia White, Linda Buchanan, Chair
Legislative Services Supervisor

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The Future of YVR

Vancouver Airport Authority presentation to Metro Vancouver

November 2, 2021

Vancouver Airport Authority President and CEO Tamara Vrooman, accompanied by Metro Vancouver's nominee to the Airport Authority's Board of Directors, Heather Deal, will join the Finance and Intergovernmental Committee to present on the Future of YVR. This report to provides Committee members with an overview of Vancouver International Airport's (YVR) response to the challenges resulting from the global COVID-19 pandemic and 2021 Strategic Plan and 2030 Net Zero Roadmap, which is positions YVR to deliver on its public interest mandate to serve our community and the economy that supports it.

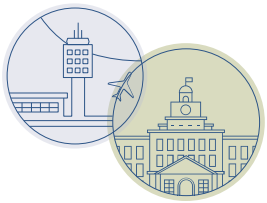
Ms. Vrooman will touch on these topics in her brief speaking remarks and looks forward to engaging with the Committee to discuss topics of interest to local representatives.

SUPPORTING THE COMMUNITY THROUGH THE COVID-19 PANDEMIC

Throughout the COVID-19 pandemic, YVR—together with Musqueam, airline and airport partners—has cared for our community while remaining open to support essential travel and the movement of goods. The hallmark of our efforts is the YVR TAKEcare health and safety program, which helps people move through the airport safely and with confidence. TAKEcare places industry-leading health, safety and cleaning practices and protocols at the forefront of airport processes.

During the early months of the COVID-19 crisis, the B.C. Public Service, Vancouver Airport Authority, Canada Border Services Agency and federal public health officials came together in a common service to implement the B.C. government's health screening and self-isolation checkpoints at YVR. In addition to screening returning travellers, YVR collaborated with the B.C. Ministry of Agriculture, Food and Fisheries to develop an empathetic arrival process to safely welcome temporary foreign agriculture workers into B.C. These workers are crucial to our local farming community and are integral in safeguarding our province's food supply. The program recognized the stressful journey they faced and provided appropriate support upon their arrival at YVR and during their mandatory quarantine period. The program was so successful, the BC government extended the program again to support the 2021 growing season.

YVR is also host to one of the largest COVID-19 testing facilities in the province. Operated by Vancouver Coastal Health and located on the site of YVR's jetSet parking facility, the site tripled testing capacity in Richmond. As B.C.'s mass vaccination efforts started, we were pleased to again partner with the BC government, deploying YVR Caretakers into the community to help deliver a safe well-organized vaccine clinic at the River Rock Casino. Through our vaccine clinic partnership, YVR workers supported 160,000+ vaccinations. These numbers are a direct result of a team effort, one that perpetuated a positive impact on the community from start to finish.



PASSENGER AND CARGO MOVEMENTS

Year-over-year passenger traffic at YVR was 7.3 million—down 72% from 2019. As BC reopens to domestic travel, passenger traffic has steadily increased with air carriers adding increased frequencies and destinations. While there is pent up demand for travel, and we are seeing more passengers come through the airport as vaccination rates increase and travellers have more confidence to travel. That said, we expect 2021 to be another challenging year with depressed passenger numbers. YVR continues to be one of only 10 airports in Canada permitted to receive international flights at this time. We expect transborder travel to recover next, followed by international travel. Canadian airports anticipate that passenger numbers will not return to pre-COVID levels until 2025.

In contrast to passenger traffic, cargo was a bright spot in 2020 and 2021—demonstrating the importance of air linkages. While volumes were down 20% over 2019, the decline was lessened because of the impact of increased e-commerce activity and expanded movement of personal protective equipment and other critical supplies by air. Through May 2021, cargo traffic is up 11.7% from 2020, again largely being driven by the e-commerce boom.

2021 STRATEGIC PLAN: POSITIONING YVR FOR THE FUTURE

Given the high degree of uncertainty in B.C.'s post-pandemic recovery, Vancouver Airport Authority has adopted a one-year strategic plan that will guide the airport in becoming a gateway to the new economy, in service of our community. YVR's 2021 Strategic Plan has six focus areas:

Strengthening the Core

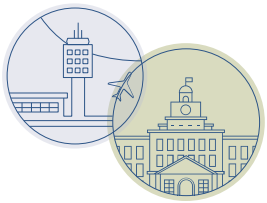
2021 will be a key year to get our operational house in order. We are examining every aspect of our operations, including our asset management program; seeking to be more efficient across all operational areas, including passenger experience, departure punctuality, baggage connections and cargo; and continuing to prioritize environmental sustainability, working to reach net-zero carbon emissions by 2030.

Staying Ahead of COVID

The path to a post-pandemic world cannot go over, around or alongside COVID-19. The only way forward is to go through. We are continually adapting to evolving travel requirements related to the pandemic while preparing thoughtfully for the return of passengers in a new era of travel. We are investing in digital and data-enhanced technologies to respond to COVID and invest to ensure we understand the future travel experience and what our partners need from us. Finally, timely and targeted data investments will ensure we have the right information to stay ahead of, and adapt to, the challenges of navigating through the pandemic to ensure YVR is designed to thrive in the future.

Climate: YVR's Net Zero 2030 Commitment

Aviation is energy-intensive and depends almost exclusively on fossil fuels. While airlines have made great strides in reducing fuel use by purchasing the latest and most fuel-efficient jets, airlines are faced with the reality that practical, low and zero emissions airplanes designed to carry hundreds of passengers long distances remain decades into the future. It's against this challenging backdrop that YVR has an opportunity to play an outsized and immediate role in reducing greenhouse gas emissions, and ensure airports are ready for the sustainable aircraft and operations of the future.



In 2020, we achieved carbon neutrality with the purchase of carbon offsets for our direct, indirect, and corporate travel emissions from the Darkwoods Forest Offset Project, located in British Columbia. Looking ahead, we made the bold commitment to become net zero carbon by 2030. We released our full 2030 roadmap on October 7, 2021, balances innovative approaches with practical actions that YVR will take to full remove carbon from our operations. Our roadmap also leaves room for new capabilities and operational efficiencies that will be realized through emerging clean technology and YVR's Digital Twin investment.

We also play a role in advocating for the broader decarbonization of air travel, advancing clean technologies and supporting BC-based companies to scale up locally and create good local jobs. Through our BioPortYVR initiative, we are working closely with our airline partners, and provincial and federal governments to advance policies needed to develop a production and supply chain of low carbon aviation fuels in British Columbia. Our vision is for YVR to be the first Canadian low carbon aviation fuel hub in Canada. We also recently announced a partnership with General Fusion to relocate its global headquarters to Sea Island where the company will more than quadruple its workforce over the next few years.

Gateway to the New Economy

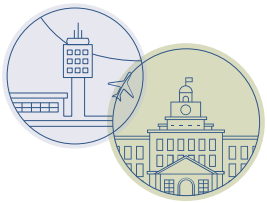
As we navigate out of the pandemic, we are moving beyond our traditional role and focusing on aligning to the future growth and needs of our community and economy: to become our region's Gateway to the New Economy. In April 2021, we announced the "Innovation Hub @ YVR"—a platform through which YVR will connect and collaborate with local businesses and our community to lead innovation and the economic recovery. Early partners in this initiative include BCIT who will use the airport as a living lab for its Internet of Things program.

YVR has invested in creating a digital twin of the airport terminal, Sea Island and Musqueam lands—the most advanced 3D airport reality model in North American and probably the world. The digital twin will allow us to model and monitor the airport business in ways that enable faster, better business decisions. The platform is also available to third parties and partners, including local governments, service providers and infrastructure operators, to test how new systems or processes will work in a "live" environment.

We are also advocating to modernize Canada's Foreign Trade Zone Points into an optimized Free Trade Zone regime that would allow British Columbia and local communities attract new value-added investments, create jobs for local workers and support new business opportunities, while generating up to $410 million in direct GDP to British Columbia's economy.

Purpose through People

YVR is a people business, and we continue to ensure that we have a supported workforce where team members can build their careers. Working together, we will ensure our customers and community continue to inform the decisions we make and that we are building a resilient, authentic, adaptable and empathetic culture to embrace the short- and long-term opportunities in our industry.



Financial Sustainability

We start 2021 with the single biggest operating deficit and debt burden in the history of YVR. So, while we work to achieve other strategic goals this year, we must do so in a way that improves our financial resilience. The Airport Authority took several steps to ensure YVR's financial sustainability during the height of the pandemic, including consolidating terminal operations to cut costs in line with passenger volumes. We are appreciative of the federal government support it received in the form of waived and deferred rent payments.

We will continue to see operating losses in 2021-22, requiring us to fund airport operations with debt. Pre-COVID, 90% of our revenues were passenger-related. To future proof our financial stability in service to the community, we are exploring ways to diversify our revenue streams and better utilize our significant industrial land base. Through better underutilization of the land on Sea Island, YVR can help meet the need for large trade and transportation related sites identified in Metro Vancouver's 2020 Regional Industrial Lands Inventory and in support of BC's economic recovery plans.

CONCLUSION

The Airport Authority has made good use of the last 16 months to strengthen our operations, diversify, digitize, green and improve YVR. Incorporating innovations and learnings arising from our pandemic response, we will continue to adapt to ensure an efficient, frictionless experience from curb to cloud for our passengers.

Metro Vancouver's economic recovery depends on a strong, sustainable YVR, and we are committed to fulfilling our purpose of serving the community and the economy that supports it. Further, we recognize the opportunity and obligation to work in partnership with the Musqueam Indian Band upon whose traditional lands YVR operates. We will continue to incorporate their traditional knowledge into our thinking and business practices as we move forward together.

Low Carbon Fleet Program (LCFP) Overview

November 10, 2021

Metro Vancouver Finance & Intergovernmental Affairs Committee

Together all the way

Coast Mountain Bus Company

Overview

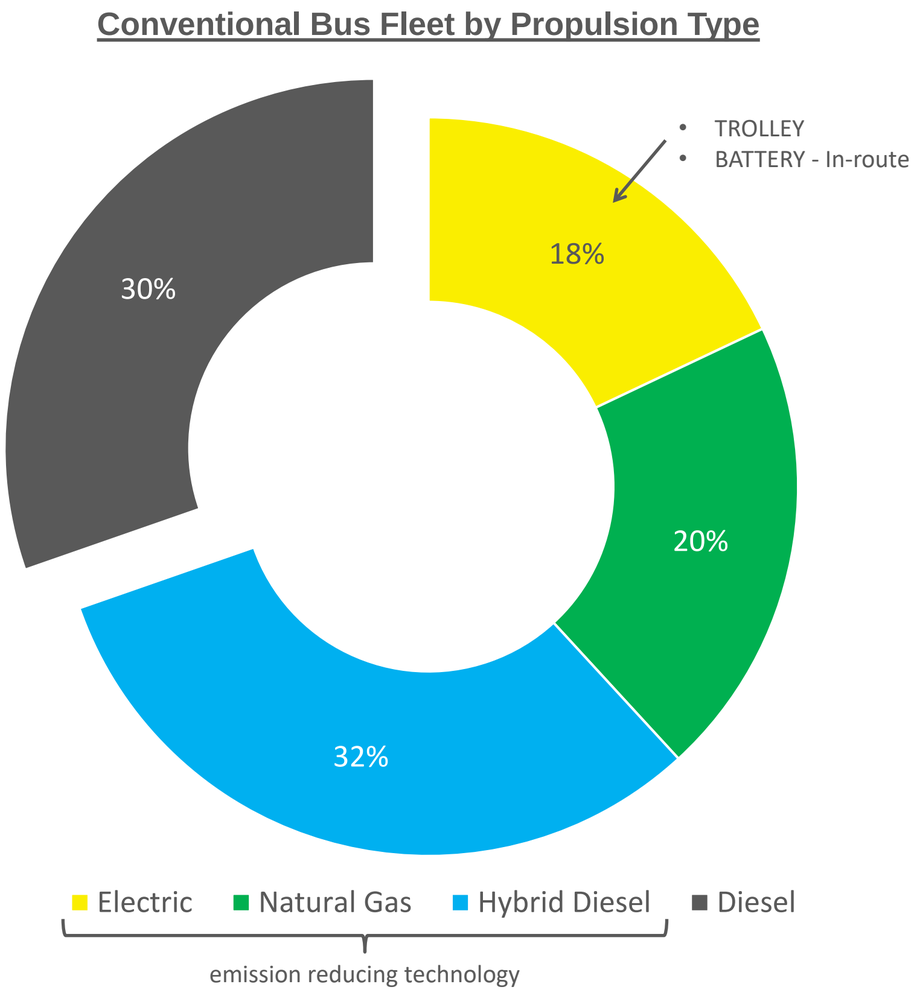
1. Our Targets
2. Bus Fleet Composition
3. Fleet Emissions Projection
4. Technologies Assessed
5. Renewable Natural Gas
6. Conventional Bus Transition Plan
7. Emerging Opportunities

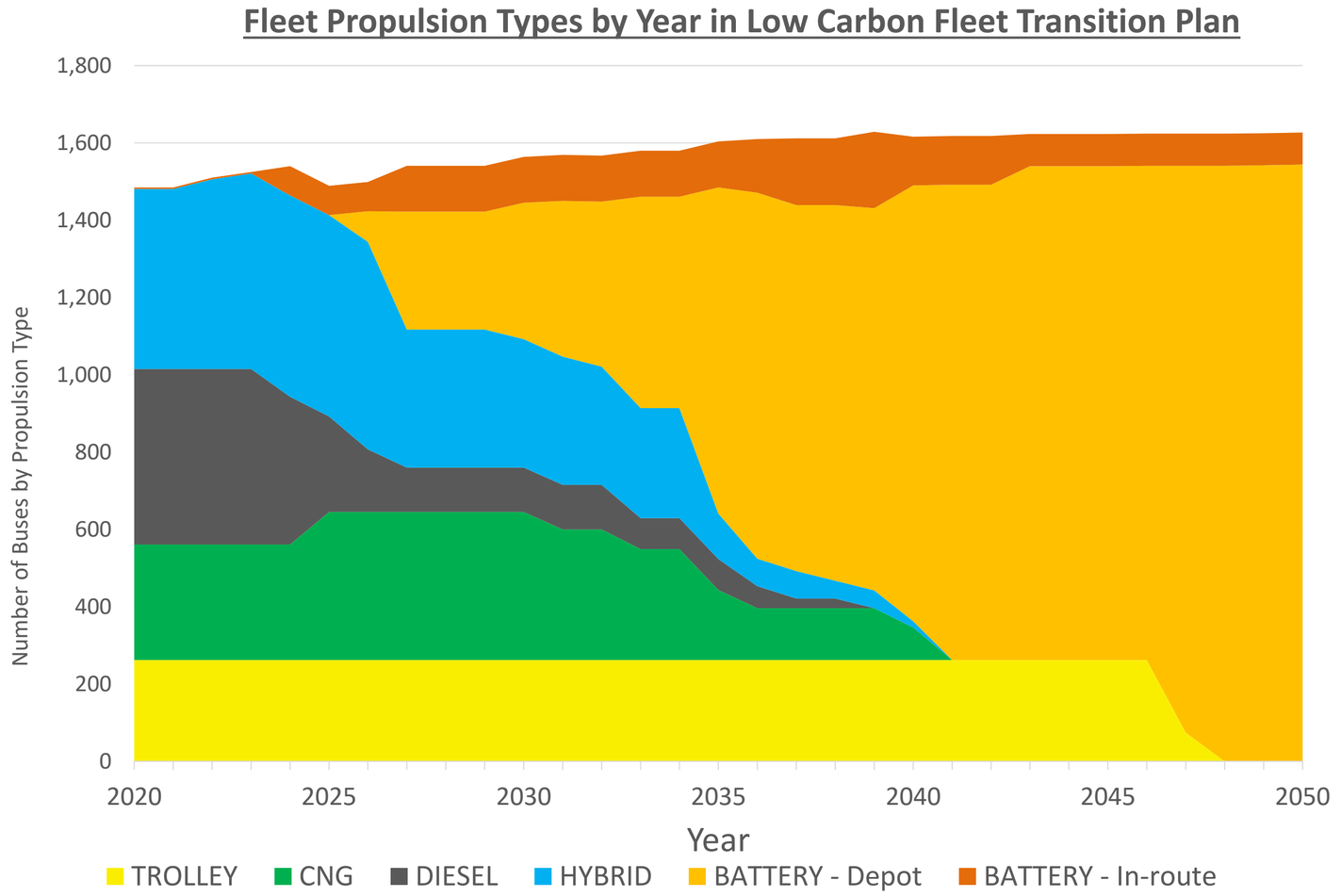
TransLink's Sustainability Commitment

Targets:

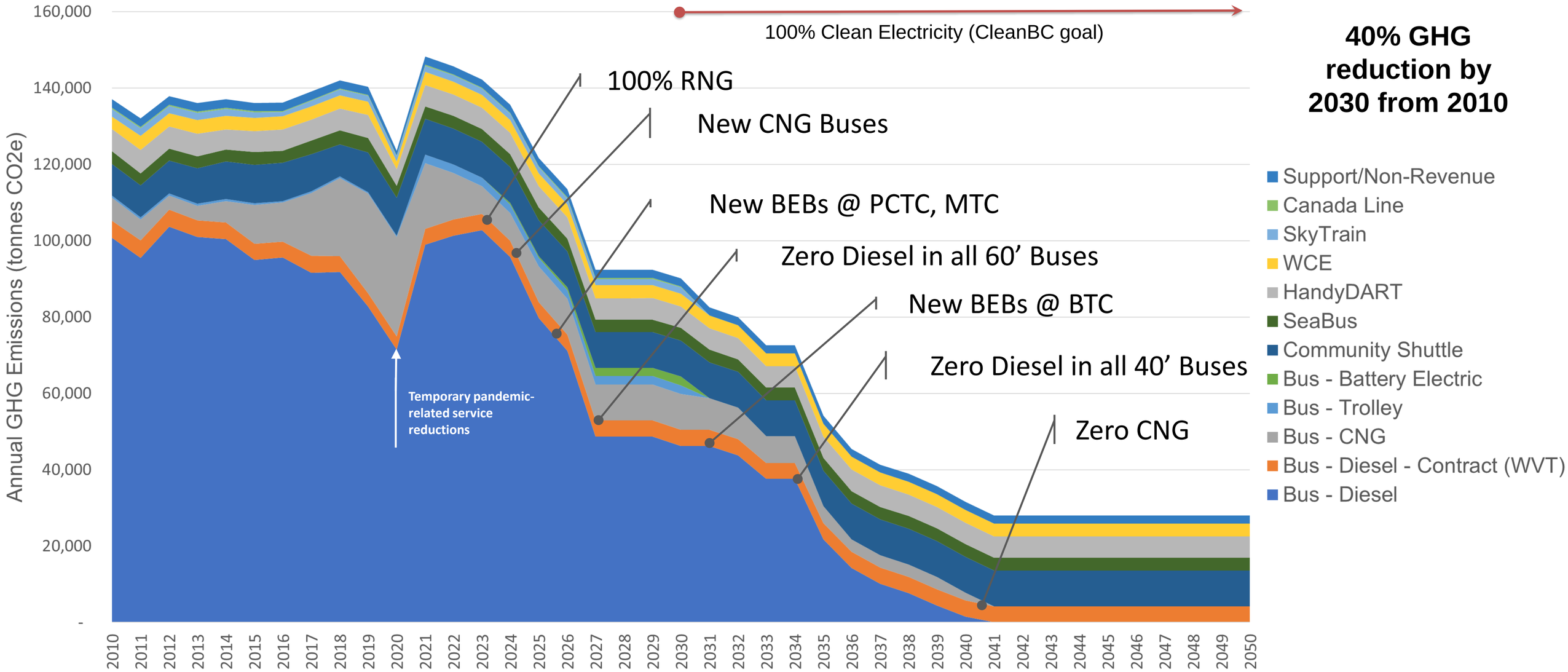
1. *Achieve an 80% reduction of corporate GHG emissions by 2050*
2. *Utilize 100% renewable energy in all operations by 2050*

Conventional Bus Fleet Composition





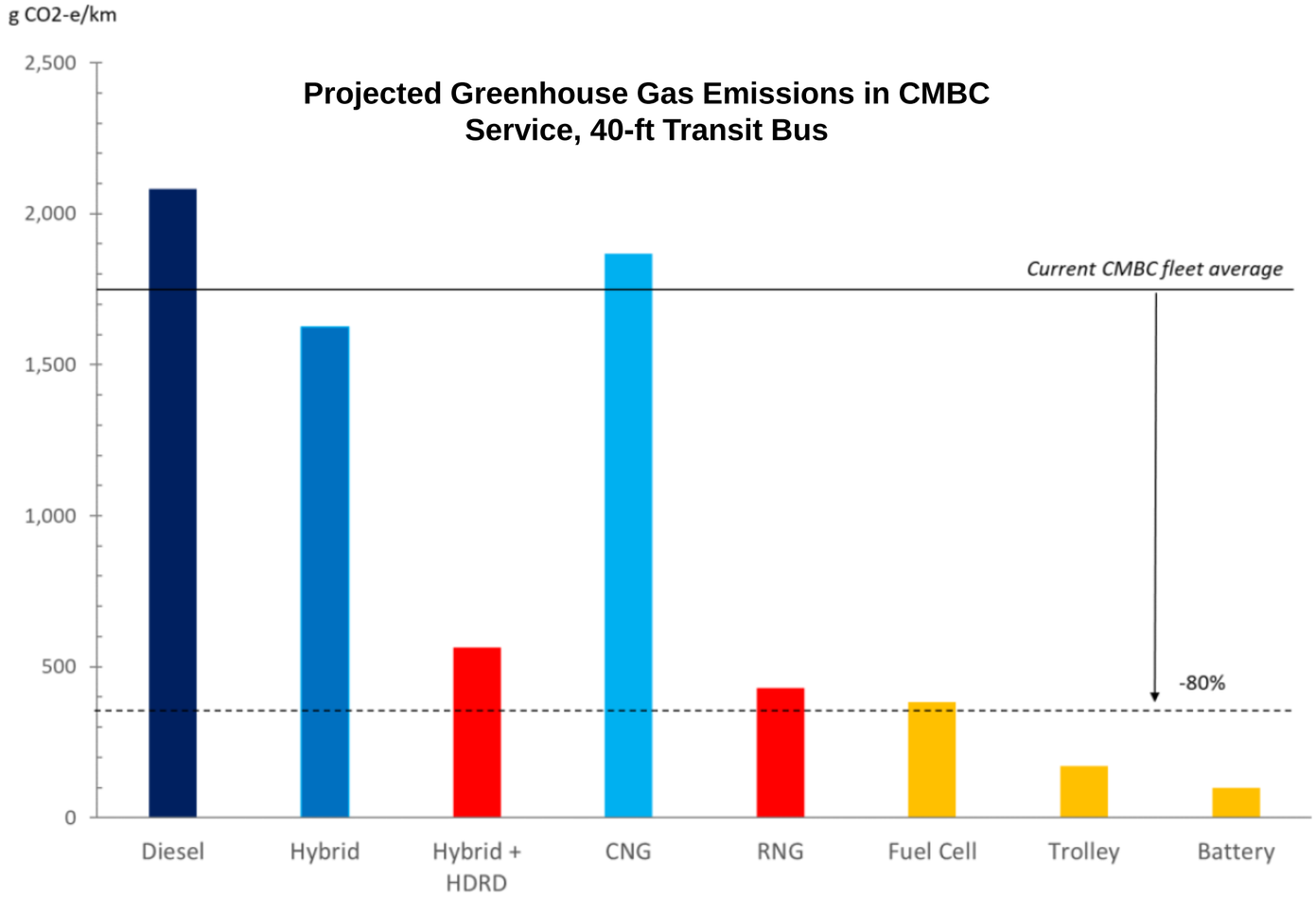
Overall Fleet Emissions Projections



40% GHG reduction by 2030 from 2010

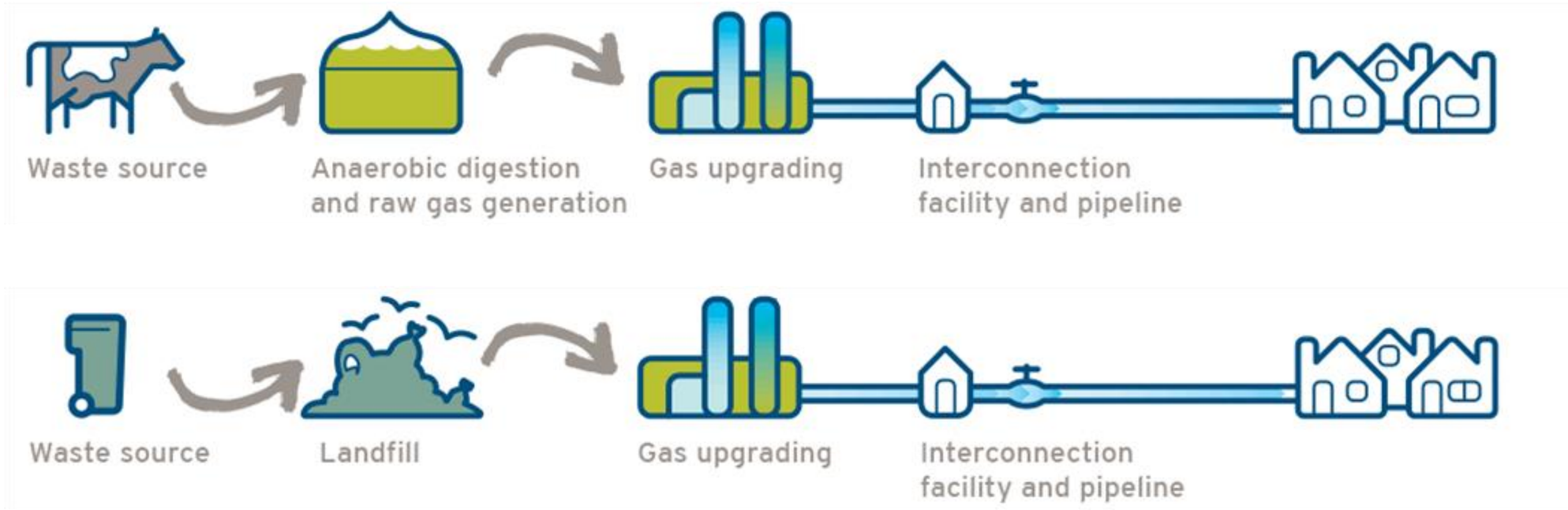
Low Carbon Technologies Assessed

- Hydrogenated-Derived Renewable Diesel (HDRD)
- Renewable Natural Gas (RNG)
- Hydrogen Fuel Cell
- Electric Trolleys
- Battery Electric



What is Renewable Natural Gas (RNG)?

Biomethane from organic waste: agricultural, landfill, wastewater treatment, wood, residential or commercial organic waste



Benefits of RNG

- Emissions are reduced when methane (CH4) is captured and repurposed as RNG, rather than being released directly into the atmosphere
- Renewable Natural Gas is carbon neutral, because it does not contribute any net carbon dioxide into the atmosphere
- Acknowledged in BC’s Low Carbon Fuel Standard
- CleanBC Roadmap to 2030 committed to develop increased production capacity for made-in-B.C. renewable fuels to 1.3 billion litres per year by 2030

BC RNG Producers

- Lulu Island Wastewater Treatment Plant, Metro Vancouver
- Fraser Valley Biogas
- Glenmore Landfill
- Salmon Arm Landfill
- Seabreeze Dairy Farm
- Surrey Biofuel Facility

Seabreeze Dairy Farm

Surrey Biofuel Facility

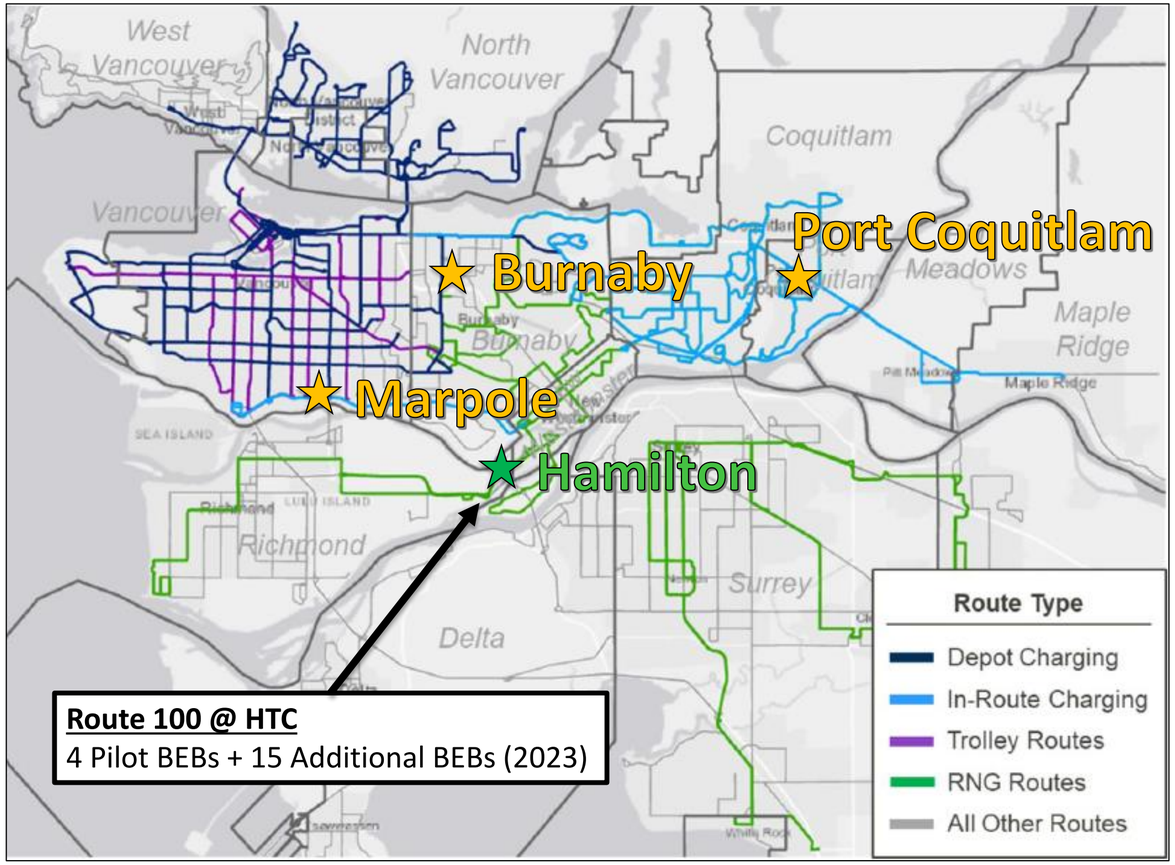
Fraser Valley Biogas

Upcoming projects:

- City of Vancouver landfill, Delta, BC
- REN Energy International, Fruitvale, BC
- Hartland Landfill, CRD

Conventional Bus Transition Plan

- Prepare facilities and infrastructure to support battery electric buses
- Replace retiring fleet with lower carbon intensity options (including RNG)

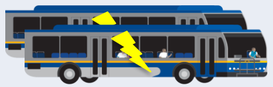
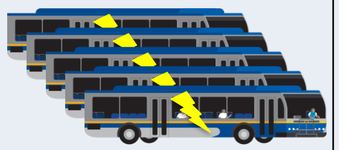
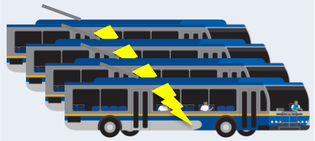
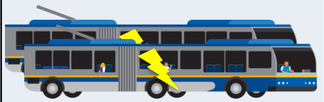


Location	In-Service for BEBs
Port Coquitlam Transit Center	2025
Marpole Transit Center	2025
Burnaby Transit Center	2029

Experience Operating BEBs

- TransLink successfully demonstrated interoperability of buses and charging infrastructure
- Pilot has helped to inform future vehicle and infrastructure requirements
- Implementation timelines are longer than typical bus replacement projects to allow for infrastructure implementation and pilot buses
- Market is changing rapidly

Fleet Replacement Schedule

Year	2021	2022	2023	2024	2025	2026	2027	2028
To Be Retired	0	0	107 - 40’	126 - 40’ 16 - 60’	69 – 40’	197 – 40’ 39 – 60’	Trolley 188 - 40’	Trolley 74 – 60’
Repl. Type & Qty.	N/A	15 – 40’ 	57 - 40’  50 - 40’ CNG 	84 - 40’  16 - 60’ 	79* - 40’ 	217* - 40’  45* - 60’ 	188 - 40’ Trolleys 	74 - 60’ Trolleys 
Base Location	N/A	Hamilton Transit Centre	Port Coquitlam Transit Centre	Hamilton / Surrey / Port Coquitlam Transit Centre	Marpole Transit Centre	Marpole Transit Centre	Vancouver Transit Centre	Vancouver Transit Centre

*Indicates fleet size increased by 15% to account for range impacts of depot charging

Emerging Opportunities

- SeaBus
  - Electric alternative is feasible for new or retrofit vessels
  - Funding requested to design Next Generation vessel
- Community Shuttle
  - Electric alternatives not currently feasible
  - Market options offer 2/3 range, 2x cost, require operator reclassification
- HandyDART
  - Electric alternatives not currently feasible
  - Market options offer 2/3 range, 2x cost, require operator reclassification
- Highway Coach/Double Decker – fuel cell/electric
  - Existing fleet is new and not due for replacement for more than a decade
  - Fuel cell technology may provide sufficient range if technology develops
- Non-Revenue Fleet
  - Planned assessment will identify opportunities for electrification

Reference Slide

Overview of Renewable Fuels

Renewable Natural Gas (RNG)

- RNG is biogas collected from landfills, wastewater treatment, & manure digesters
  - ✓ Processed to pipeline quality
  - ✓ Can be used in current buses
- RNG is available from supplier in BC
  - ✓ Sourced from local landfills
  - ✓ Sold at incremental cost of $7.00/GJ (~2x)
  - ✓ Carbon credits could generate up to $10/GJ
  - ✓ With carbon credits, the net cost to TransLink will be on par or lower than current NG costs

Hydrogenated-Derived Renewable Diesel (HDRD)

- Made via hydrogenation of vegetable oils using normal refinery processes
  - ✓ Not bio-diesel
  - ✓ Can be used in current buses
- Production cost is $0.26 to $0.40 per liter more than petroleum diesel, but
  - ✓ Up to $0.05/L lower carbon tax
  - ✓ Up to $0.31/L carbon credit
  - ✓ Net cost should be on par with diesel
- Available in Vancouver at wholesale
- Could be made available to fleets
- Sourced from Singapore

Renewable fuels provide GHG reductions with little or no infrastructure requirements or range limits during transition to electrification

To: Finance and Intergovernment Committee

From: Mark Seinen, Senior Planner, Regional Planning and Housing Services

Date: September 29, 2021 Meeting Date: November 10, 2021

Subject: **TransLink Application for Federal Gas Tax Funding for 2023 Depot Infrastructure, Fleet Replacement, and Fleet Design**

RECOMMENDATION

That the MVRD Board approve $358.48 million in funding from the Greater Vancouver Regional Fund for the following transit projects proposed by TransLink in its Application for Federal Gas Tax Funding as attached to the report dated September 29, 2021, titled "TransLink Application for Federal Gas Tax Funding for 2023 Depot Infrastructure, Fleet Replacement, and Fleet Design":

1. Marpole Transit Centre – Implementation
2. 2023 Conventional Bus – Replacement
3. 2023 HandyDART Vehicle Purchase – Replacement
4. 2023 Community Shuttle Purchase – Replacement
5. Next Generation SeaBus Design

EXECUTIVE SUMMARY

TransLink is requesting approval of five projects for Federal Gas Tax funding from the Greater Vancouver Regional Fund totaling $358.48 million. This is TransLink's largest Greater Vancouver Regional Fund (GVRF) funding request to date – about three times the typical request – and would draw 86 percent of available GVRF funds, leaving approximately $57.3 million in reserve. The majority of the $358.48 million would be used to design and construct a new electrified depot, Marpole Transit Centre, that would ultimately house up to 350 battery-electric buses. TransLink also proposes: three replacement projects, comprising 50 CNG buses, 46 HandyDart vehicles and 27 Community Shuttles; and funding for electric SeaBus design. The application is broadly consistent with the MVRD Board's policies on regional growth management, air quality, and climate protection, along with the Board's interest in economic prosperity.

PURPOSE

To present for MVRD Board consideration TransLink's application for funding from the GVRF under Metro Vancouver's Federal Gas Tax Fund Expenditures Policy (*GVRF Policy*) (Reference 1).

BACKGROUND

On September 24, 2021, Metro Vancouver received TransLink's application for GVRF funding (Attachment 1). With this application, TransLink is seeking approval of five projects for Federal Gas Tax Funding from the GVRF for depot infrastructure, transit fleet replacement, and transit fleet design. The MVRD Board has approval authority over requests for GVRF funding, including any scope changes. The Union of British Columbia Municipalities (UBCM) holds the federal gas tax funds and transfers the funds to TransLink upon formal notification by the MVRD Board of its approval of applications per the *GVRF Policy*.

Continuous investment in the expansion and modernization of the transit system is critical to achieving the MVRD Board's regional growth management, environmental, and economic objectives. Since adopting the *GVRF Policy* in May 2016, the MVRD Board has approved approximately $839 million in GVRF funds to TransLink for eligible regional transportation projects. At the end of 2020, there remained $415.8 million in unallocated GVRF funds available.

In June 2021, the Federal Gas Tax Fund was renamed to the Canada Community-Building Fund. This administrative change does not affect the terms of the *GVRF Policy*.

GREATER VANCOUVER REGIONAL FUND POLICY REQUIREMENTS

The *GVRF Policy* sets out the application process, information requirements, and evaluation criteria that are to be used to evaluate and respond to TransLink's request for GVRF funding. TransLink's proposed projects were evaluated under these guidelines, which include requirements for projects to quantify emissions reduction benefits and integrate with *Metro 2040*.

Project eligibility for GVRF funding is determined by the *Administrative Agreement on the Federal Gas Tax Fund in British Columbia* (Reference 2). Public transit is an eligible project category, including expenditures associated with procurement, planning, design, construction, or renovation of capital assets.

THE FUNDING REQUEST

TransLink is seeking approval of GVRF funding for five projects totaling $358.48 million. This is the largest gas tax funding request TransLink has made under the current gas tax agreement; it would require about 86 percent of available GVRF funds, leaving approximately $57.3 million unallocated.

Table 1 shows the amounts requested in previous years, which have ranged from about $120 million to $155 million.

Table 1 – Previous GVRF Funding Requests

FIC Meeting Date	GVRF Funding Request ($ millions)
September 23, 2016	127.18
April 28, 2017	121.28
October 27, 2017	121.15
October 26, 2018	142.10
October 16, 2019	149.10
January 20, 2021	154.13
October 13, 2021	**358.48**

The motivation for TransLink's large funding request is the Marpole Transit Centre, a significant infrastructure project that will provide ultimate capacity for up to 350 battery-electric buses. This is

a substantial investment in transit infrastructure that will, as documented in Table 2 and TransLink's application materials (Attachment 1), have long-term region wide greenhouse gas reduction benefits.

Proposed Projects

The project descriptions, including costs and GVRF funding requests, are set out in Table 2. One project is for design and construction of new Marpole Transit Centre to support the eventual deployment of up to 350 battery-electric buses. Three projects involve replacement of existing transit fleet (Projects 2, 3 and 4). The fifth project is for electric SeaBus design. The projects are identified in TransLink's *2018-2027 Investment Plan* and its *Low Carbon Fleet Strategy*.

Table 2 – Project Descriptions

Project	Scope	Units	($ millions)	
			Cost	GVRF Funding Request
1. Marpole Transit Centre	Facility design and construction	1	308.17	298.10
2. 2023 HandyDART Vehicle Purchase – Replacement	HandyDART vehicles	46	6.96	6.77
3. 2023 Community Shuttle Vehicle Purchase – Replacement	Community Shuttle vehicles	27	6.90	6.66
4. 2023 Conventional Bus – Replacement	CNG buses	50	46.05	44.44
5. Next Generation SeaBus Design	Vehicle design	1	2.65	2.51
Total			**370.73**	**358.48**

Project Locations

The projects are to be deployed in the following locations:

- Upgrades to Marpole Transit Centre in south Vancouver will improve transit services operating out of that depot and contribute to reduced greenhouse gases region-wide;
- CNG bus replacements will operate out the Port Coquitlam and Hamilton Transit Centres, which together serve multiple subregions;
- Replacement HandyDART and Community Shuttle vehicles will be deployed throughout the region; and
- The Next Generation SeaBus will serve the existing route between Vancouver and Lower Lonsdale in the City of North Vancouver.

Project Timelines

TransLink's applications for GVRF funding are typically made about two years in advance of initiation of the project or service. The current application includes projects with service initialization / project initiation in 2023.

METRO VANCOUVER ANALYSIS

A summary of analysis based on the prescribed evaluation criteria contained in the *Federal Gas Tax Fund – Greater Vancouver Regional Fund Application Guide* is presented below.

Screening Criteria - TransLink's application is complete and meets the screening criteria for eligibility, consistency with regional plans and alignment with TransLink's corporate policies. The projects represent a significant contribution towards the transit service expansion, state of good repair and electrification commitments set out in the *2018-2027 Investment Plan* and the *Low Carbon Fleet Strategy.*

Integrated Criteria - The projects score "good" or better on integrated criteria relating to Regional Growth Strategy, Transportation Performance, Regional Environmental Objectives and Economic Development.

Assessment of Evaluation Criteria - Table 3 assesses the five projects in TransLink's application as a whole. Individual projects might score higher or lower if they were assessed separately. For example, Project 1 will significantly reduce greenhouse gases by upgrading depot infrastructure to house the battery-electric bus fleet, while Projects 2 and 3 will have negligible emissions benefits since they are like-for-like replacements of existing gasoline-powered vehicles. Overall Regional Environmental Objectives criteria have been assessed as "good."

Table 3 – Assessment of Evaluation Criteria

Criterion	Description	MV Assessment
Screening Criteria		
Eligible Project Category	Local roads and bridges, including active transportation, OR public transit, as set out in the 2014 Administrative Agreement, Schedule B.	**Meets criterion -** All projects are public transit infrastructure (Eligible Project Category 7).
Eligible Expenses	As set out in the 2014 Administrative Agreement, Schedule C.	**Meets criterion -** All scope items, including design work, qualify as Eligible Expenditures.
Plan Consistency	Projects must be consistent with TransLink's Capital Plan, *10-Year Investment Plan, the Regional Growth Strategy, and the Regional Transportation Strategy.*	**Meets criterion -** The projects are identified in TransLink's 2018-2027 Investment Plan and Low Carbon Fleet Strategy and are consistent with long-range regional plans.
Corporate Policies	Projects must be consistent with applicable TransLink policies such as sustainability, environmental responsibility, emissions, and infrastructure.	**Meets criterion -** The projects are broadly consistent with TransLink policies such as reaching a carbon neutral transit fleet by 2050.
Integrated Criteria: Regional Growth Strategy		
Supports the Regional Growth Strategy	The degree to which the project assists in achieving the goals in the *Regional Growth Strategy* and directions set out in the *Metro Vancouver Board Strategic Plan.*	**Good -** The projects will support a compact urban form and benefit growing neighbourhoods and subregions.

Urban Centres and Frequent Transit Development Areas	Where applicable, the project is located in, or demonstrates tangible benefits to, the overall performance of Urban Centres and Frequent Transit Development Areas.	**Excellent -** The SeaBus project is a move toward improved connectivity between Lonsdale Regional City Centre and Vancouver Metro Core. The conventional bus, HandyDart and Community Shuttle replacement projects benefit the entire region, often serving as feeder routes into Urban Centres. The Marpole Transit Centre project will improve transit system capacity around the Canada Line, with greenhouse gas reduction benefits for the entire region.
Integrated Criteria: Transportation Performance		
Headline Targets	Demonstrates tangible beneficial effects on vehicle kilometres travelled and/or walk/ cycle/ transit/ multiple occupancy vehicle mode share.	**Good -** These projects support a state of good repair, which can translate into customer retention. However, none of the projects provide new system capacity that would meaningfully influence modal splits or VKT.
Other Transportation Outcomes	Demonstrates tangible beneficial effects on vehicle congestion, transit passenger congestion, transit ridership, transportation safety, and/or goods movement for the duration of the project.	**Good -** These projects improve passenger experience and increase service reliability, which support transit ridership and safety.
Project Type	Demonstrated value of the project type.	**Excellent -** Upgrading assets at the end of their service life is an essential investment in safety and system cost-effectiveness.
Integrated Criteria: Regional Environmental Objectives		
Supports the Climate 2050 Strategic Framework and Integrated Air Quality and Greenhouse Gas Management Plan	Contributes to the achievement of regional climate action and air quality goals, including directions set out in the *Metro Vancouver Board Strategic Plan*, the *Regional Growth* Strategy, *Climate 2050,* and the *Integrated Air Quality and Greenhouse Gas Management Plan.*	**Good -** The Marpole Transit Centre will advance regional air quality and emissions reduction objectives by providing depot capacity for a battery-electric bus fleet of up to 350 vehicles. The electric SeaBus design will eventually reduce CO2 emissions by an estimated 1,130 tonnes per year and reduce diesel fuel use by 430,000 litres per year. However, the HandyDart and Community Shuttle projects will be like-for-like replacements of existing gasoline-powered vehicles, and the performance of the CNG bus replacements will largely depend on whether renewable natural gas (RNG) is used.
Quantifiable Emissions Impacts	Achieves quantifiable beneficial impacts on greenhouse gas and common air contaminant emissions relative to baseline transit vehicles, and lowers the emissions profile of the transit fleet.	**Good -** Estimated emissions reductions are provided for the Marpole Transit Centre and future electric bus deployment and for the SeaBus replacement, demonstrating the impact of these proposed projects in quantitative terms. However, no emissions impact is estimated for the HandyDart and Community Shuttle projects, suggesting that

		there are no quantified emissions impact from these proposed replacements. While newer vehicle models in a like-for-like replacement may result in modest emissions reductions relative to older vehicles, this impact is not quantified. The emissions impact from the like-for-like CNG bus replacement will depend on the fuel type used.
Integrated Criteria: Economic Development		
Supports Regional Prosperity	Contributes to a regional transportation system that moves people and goods and aligns with regional prosperity.	**Good -** The projects modernize the transit system to encourage mode shift and enhance safety.

Summary of the Evaluation

The proposed projects meet all of the Screening Criteria, and score mixed results on the Integrated Criteria.

- *Regional Growth Strategy* - Since the projects are primarily replacement, rather than expansion, they make only minor contributions to the regional growth objectives of *Metro 2040.*
- *Transportation Performance* - While the projects support a state of good repair, service reliability and safety, they do not expand service, so there will be minimal benefits for congestion, ridership, goods movement, VKT or mode share.
- *Regional Environmental Objectives* - Two of the projects (the new Marpole Transit Centre and Next Generation SeaBus Design) will contribute to significant long-term greenhouse gas reductions. However, the two gasoline replacement projects will have no greenhouse gas benefits. The environmental performance of the CNG bus replacement project will depend on the extent to which renewable forms of natural gas (i.e. RNG rather than CNG) are used.

ALTERNATIVES

1. That the MVRD Board approve $358.48 million in funding from the Greater Vancouver Regional Fund for the following transit projects proposed by TransLink in its Application for Federal Gas Tax Funding as attached to the report dated September 29, 2021, titled "TransLink Application for Federal Gas Tax Funding for 2023 Depot Infrastructure, Fleet Replacement, and Fleet Design":
    1. Marpole Transit Centre – Implementation
    2. 2023 Conventional Bus – Replacement
    3. 2023 HandyDART Vehicle Purchase – Replacement
    4. 2023 Community Shuttle Purchase – Replacement
    5. Next Generation SeaBus Design

2. That the MVRD Board endorse in principle the report dated September 29, 2021, titled "TransLink Application for Federal Gas Tax Funding for 2023 Depot Infrastructure, Fleet Replacement, and Fleet Design" and refer it to the Mayors' Council on Regional Transportation for comment prior to final consideration by the MVRD Board.

FINANCIAL IMPLICATIONS

Each of TransLink's proposed projects includes a risk assessment that identifies potential risk factors and mitigation approaches. For the Marpole Transit Centre project, these risks include potential permitting delays and cost overruns. To address these risks, TransLink has committed to engaging closely with the relevant parties (City of Vancouver, Province of British Columbia, and BC Hydro) on site design and servicing, while building a contingency allowance into the project that is sufficient to absorb price fluctuations.

If the MVRD Board approves alternative one, the UBCM will be notified within seven business days of the Board's decision to approve $358.48 million in GVRF funding for all of the projects in TransLink's application. This alternative would exhaust about 86 percent of available GVRF funds, leaving approximately $57.3 million unallocated.

If the MVRD Board approves alternative two, the Metro Vancouver staff report and recommendations, along with the TransLink application, would be forwarded to the Mayors' council further consideration that would offer greater GHG reduction benefits to the region, or such other evaluation criteria as requested by the Board, to final consideration by the Board.

CONCLUSION

TransLink is requesting approval of five projects for Federal Gas Tax funding from the GVRF, totaling $358.48 million. TransLink proposes a significant new transit facility, Marpole Transit Centre; three replacement projects, comprising 50 CNG buses, 46 HandyDart vehicles and 27 Community Shuttles; and funding for electric SeaBus design. Staff recommend that the MVRD Board approve the requested gas tax funding, as the application is consistent with the prescribed evaluation criteria contained in the *Federal Gas Tax Fund – Greater Vancouver Regional Fund Application Guide*, and generally consistent with the MVRD Board's policies on regional growth management, air quality, and climate protection as well as the Board's interest in economic prosperity.

Attachment

1. TransLink, *Application for Federal Gas Tax Funding*, dated September 24, 2021 *(Doc# 48037724)*

References

1. Federal Gas Tax Fund Expenditures Policy (*GVRF Policy)*
2. Administrative Agreement on the Federal Gas Tax Fund in British Columbia

47413025

To: Jerry Dobrovolny, Chief Administrative Officer, Metro Vancouver

From: Christine Dacre, Chief Financial Officer, TransLink
Geoff Cross, Vice President, Transportation Planning and Policy, TransLink

Date: September 24, 2021

Subject: 2022 Application for Federal Gas Tax Funding from the Greater Vancouver Regional Fund

PURPOSE

TransLink is requesting the Metro Vancouver Regional District (Metro Vancouver) approve $358.48 million in Federal Gas Tax Funds (FGTF) from Greater Vancouver Regional Fund (GVRF). The largest project funded in the 2022 application, the Marpole Transit Centre, will support the expansion of bus service levels within Metro Vancouver, in accordance with Mayors' Council Vision and the 10-year Investment Plan, and the electrification of the bus fleet. The Mayors' Council has directed TransLink to electrify its bus fleet; in support of the electrification of the fleet, Marpole Transit Centre will be built as 100% electric ready. This facility will be designed for the operation and maintenance of 350 40' Equivalent Battery Electric Buses and to service a diesel fleet at opening.

In addition, this application includes funding requests for replacement of 50 CNG Conventional Buses, 46 HandyDART vehicles, 27 community shuttles and a Next Generation SeaBus design project. These replacement vehicles are critical to ensuring the transit fleet remains in a state of good repair and the reliability of the transit system is maintained.

The funding requests for projects detailed in this application are consistent with the 2018 Investment Plan (2018 Plan), approved by the TransLink Board and Mayors' Council in June 2018. These projects have also received endorsement in September 2021 from the Board and Mayors council to be funded by the GVRF and to be included in the 2022 Investment plan currently under development. Furthermore, the Marpole Transit Centre project included in this application is essential to TransLink's Low Carbon Fleet Strategy (LCFS) and two significant Board approved sustainability targets: to reduce GHG emissions by 80 per cent by 2050, and to utilize 100 per cent renewable energy in all operations by 2050.

Both the 2018 Investment Plan (2018 Plan) and the Low Carbon Fleet Strategy were approved by the TransLink Board and endorsed by the Mayors' Council. The 2018 Plan and LCFS advance the goals identified in TransLink's Regional Transportation Strategy, Metro Vancouver's Regional Growth Strategy and Metro Vancouver's new Climate 2050 goals.

This application is the administrative process to access the funding outlined per the Administrative Agreement on Federal Gas Tax Fund in British Columbia approved in 2014.

This request will support the region's environmental policies, specifically:

- Metro Vancouver's *Integrated Air Quality and Greenhouse Gas Management Plan* (*IAQGGMP*) strategies:
    - Strategy 1.4 – Reduce air contaminant emissions from cars, trucks, and buses; and
    - Strategy 3.3 – Reduce the carbon footprint of the region's transportation system.
    - Ensuring infrastructure, ecosystems, and communities are resilient to the impacts of climate change.

- *Metro Vancouver 2040: Shaping Our Future* (*Metro 2040*) actions to encourage transportation infrastructure that reduce energy consumption and greenhouse gas emissions and improve air quality:
    - Action 3.3.6 – That TransLink pursue reductions of common air contaminants and greenhouse gas emissions from on-road transportation sources in support of regional air quality objectives and greenhouse gas reduction targets; and
    - Action 3.3.7 – That TransLink manage its transit fleet and operations with the goal of increasing fuel efficiency and reducing common air contaminants and greenhouse gas emissions over time, in support of the Regional Growth Strategy and Air Quality Management Plan.

- *Metro Vancouver's Climate 2050 goals* to ensure our infrastructure, ecosystems, and communities are resilient to the impacts of climate change, and pursue a carbon neutral region by 2050.

BACKGROUND

Since the GVRF program began in 2005, TransLink has received $1,457.7 million in funding to expand and modernise the transit network. Interest earned on funds received, which must be used for approved GVRF projects, totalled $57.7 million at December 31, 2020. Currently, there is $470.4 million in funds available to TransLink. Metro Vancouver Regional District and its member municipalities have specified that their portion of GVRF funding go to public transportation, with a small amount going to the Community Works Fund. A summary of the funds and usage is provided below:

Greater Vancouver Regional Fund
(as of December 31, 2020)
In millions

Approved GVRF Funds	1,457.721
Interest earned on funds received	57.723
Unapproved GVRF Funds[1]	415.781
Total Gas Tax Funds	**1,931.225**
Less	
Funds applied to completed projects	(542.311)
Funds applied to active and approved in principle projects[2]	(904.067)
Interest allocated to completed projects	(14.488)
Funds Available for use	**470.359**
Proposed project Funding[3]	**(358.477)**
Funds Remaining[4]	**111.883**

As required in this application process, Appendix A includes a summary of TransLink's strategic plan, the 2018 Investment Plan, including the projects funded or anticipated to be funded by the GVRF as well as other funding anticipated in the 2018 Plan. Additionally, Appendix B provides a short description of the categories listed in the 2018 Investment Plan (Appendix A). A revised GVRF utilization plan will be published in the 2022 Investment plan.

[1] On January 29, 2021, TransLink's 2021 application for $154M of GVRF funding was approved by the Metro Vancouver Board of Directors.
[2] See table 1a for Active projects and 1b for Approved in Principal projects that have previously received GVRF funding up to December 31, 2020.
[3] See table 2 for Projects requesting GVRF funding in this application.
[4] GVRF program is expected to receive a top-up of $140M in 2021 in addition to the regular allocation.

Active Projects

Table 1a below shows the status of active projects with GVRF funding. The total forecasted project cost for active projects is $888.017 million, with $808.103 million in GVRF funds approved for these projects. At December 31, 2020, project costs incurred totalled $698.068 million, with $596.385 million in GVRF funds spent.

Table 1a: Active Projects

Active Projects with GVRF Funding	# of Vehicles	Forecast Final Cost	Approved Funding	Costs to Date	Funds Spent	Unspent Funds
Hamilton Transit Centre	N/A	135.057	84.978	135.057	84.978	-
2nd SeaBus Replacement	1	21.183	19.697	20.124	19.285	0.412
SkyTrain Mark I Vehicle Refurbishment	N/A	26.121	24.360	26.121	14.501	9.859
2014 Conventional Bus	45	25.035	24.391	25.035	24.391	-
2014 HandyDART Vehicle	65	7.594	7.523	7.594	7.523	-
Surrey Transit Centre - CNG Facility Retrofit	N/A	15.797	4.000	15.797	4.000	-
Metrotown - Trolley Overhead Rectifier Replacement	N/A	4.379	4.725	4.379	4.233	0.492
Automated Train Control Equipment Replacement	N/A	4.834	4.500	4.834	4.500	-
2016 Conventional 40' Bus Replacement	85	18.973	19.090	18.573	18.046	1.044

2016 Community Shuttle Vehicle Replacement	20	3.112	3.560	3.112	3.075	0.485
2017 Conventional Bus Replacement	106	110.810	105.985	110.565	104.349	1.636
2017 HandyDART Vehicle Replacement	35	4.313	5.013	4.307	4.208	0.805
2018 Conventional Bus Replacement	92	65.531	61.925	65.046	61.925	-
2018 40' Conventional Bus Purchases - Expansion	94	91.550	85.584	91.550	85.584	-
2018 60' Conventional Bus Purchases - Expansion	11	15.590	17.316	15.590	15.404	1.912
Electric Battery Bus Purchases - Pilot	4	9.435	6.892	8.681	6.892	-
2018 HandyDART Vehicle Replacement	40	5.128	5.605	5.123	5.048	0.557
2018 HandyDART Vehicle Purchases - Expansion	13	1.802	2.193	1.802	1.778	0.415
2018 Community Shuttle Vehicle Replacement	20	3.722	3.830	3.722	3.620	0.210

2018 Community Shuttle Vehicle Purchases - Expansion	12	2.101	3.175	2.101	2.057	1.118
2019 Double Decker Bus Purchase – Replacement	27	35.226	30.000	33.181	30.000	-
2019 Conventional Bus Expansion - double decker	5	6.083	5.670	6.062	5.846	(0.176)
2019 Conventional Bus Expansion - 60' hybrid	47	68.759	68.130	68.529	66.085	2.045
2019 HandyDART Vehicle Purchase – Replacement	40	5.372	5.200	5.372	5.200	-
2019 HandyDART Vehicle Purchase – Expansion	10	1.419	1.350	1.419	1.350	-
2019 Community Shuttle Purchase – Replacement	49	10.891	10.800	10.891	9.537	1.263
2020 Conventional - Replacement	25	32.367	31.590	3.377	2.956	28.634
2020 Conventional - Expansion	61	100.836	97.784	0.126	0.016	97.768
2020 HandyDart - Replacement	42	6.300	6.130	-	-	6.130
2020 HandyDart - Expansion	10	1.600	1.559	-	-	1.559

2020 Community Shuttle - Expansion	9	2.100	2.391	-	-	-
2021 Conventional 60-ft and 40-ft Bus Purchase – Expansion	78	16.440	15.856	-	-	-
2021 HandyDART Vehicle Purchase – Replacement	42	6.498	6.380	-	-	-
2021 Community Shuttle Vehicle Purchase – Replacement	62	12.119	13.690	-	-	-
Mark 1 500-800 Refurbishment	N/A	9.943	17.230	-	-	17.230
Total	**1,150**	**888.017**	**808.103**	**698.068**	**596.385**	**173.400**

Approved in Principle Projects

Table 1b below shows the projects with GVRF funding which are approved in principle as at December 31, 2020 for a total of $95.964 million. GVRF funding for these projects was approved by the Board of Directors of Metro Vancouver Regional District on November 1, 2019[5].

Table 1b: Approved in Principle Projects

AIP Projects with GVRF Funding	# of Vehicles	Approved Funding
2021 Conventional 60-ft and 40-ft Bus Purchase – Expansion	78	91.964
2021 HandyDART Vehicle Purchase – Expansion	10	1.560
2021 Community Shuttle Vehicle Purchase – Expansion	9	2.440
Total	**97**	**95.964**

PROPOSED PROJECTS AND FUNDING

This application is requesting $358.480 million for five projects, as shown in Table 2. The projects are consistent with the 2018 Investment Plan and the 10-Year Vision. Detailed project descriptions are included in Appendix C.

Table 2: Summary of Projects, Total Costs, and Gas Tax Funding Request

Projects	Scope	($millions)	
		Total Project Budget	Requested Gas Tax Funding
Marpole Transit Centre - Implementation (Phase 4)	Facility Improvement	308.170	298.100
2023 Community Shuttle Replacements	27 Community shuttle buses	6.900	6.660
2023 Conventional Bus Replacement (50 40' CNG Buses)	50 CNG buses	46.050	44.440
2023 HandyDART Vehicle Replacement	46 HandyDART vehicles	6.960	6.770
Next Generation SeaBus Design	Design	2.650	2.510
Total	**124 vehicles**	**370.730**	**358.480**

[5] On January 29, 2021 an additional 8 projects were approved for GVRF funding totalling $154.13M.

Fleet Propulsion Selection

All vehicle projects are evaluated based on vehicle purchase cost, fuel and maintenance cost, life-cycle cost, emissions of GHG, NOx, Hydrocarbon and particulate matter (PM), and aspects of vehicle performance and customer and driver environment such as noise and ride quality. Route characteristics such as topography and average route speed (based on bus stop spacing and traffic conditions) can affect the performance of different technologies. Fuel infrastructure and depot space are considerations in fleet deployment. TransLink considers all these factors in identifying the most advantageous propulsion technology for different vehicle projects, consistent with financial and environmental goals and policies. Based upon the most current information and policy direction, diesel propulsion is no longer a preferred option for any of our operations compared to CNG, hybrid-electric or full zero emission battery-electric, except for highway routes except for highway routes and where alternative propulsion is not available. Diesel propulsion is still the preferred option for highway routes as CNG or diesel-hybrid would have higher capital cost but marginal emissions reduction due to higher operating speeds.

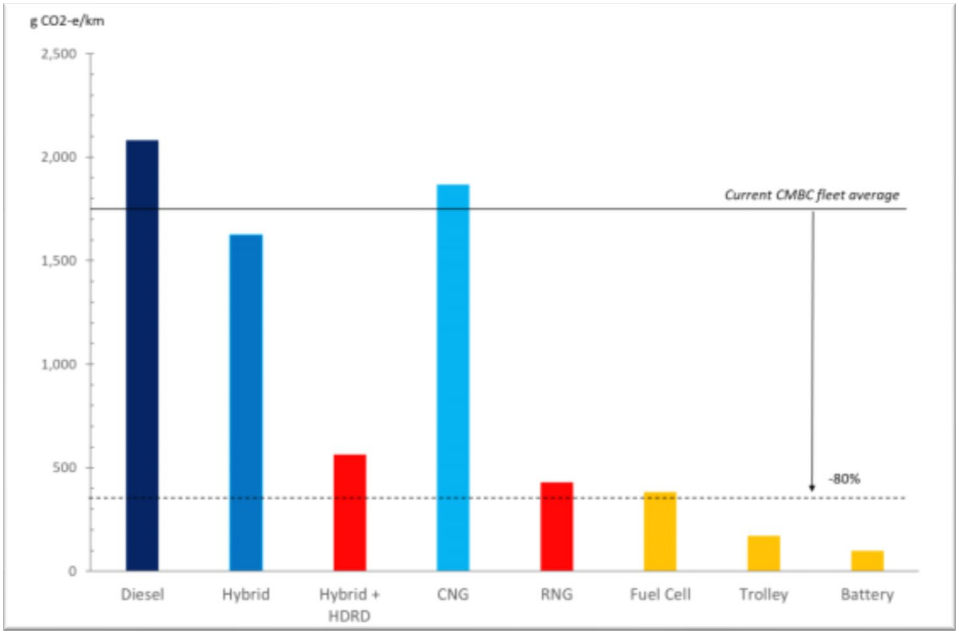
Fleet procurement projects are brought to an internal steering committee to ensure alignment with the Investment Plan and Regional Transportation Strategy, consider operational aspects to fleet deployment, prioritize projects, and submit business cases and project financials. Projects are then reviewed by TransLink's Senior Executive team to ensure that the business cases and financials are sound, and to evaluate the projects against TransLink's affordability criteria. The final list of recommended capital projects is submitted to the Board of Directors for approval within the Annual Capital Budget.

Selection of propulsion technology for vehicle replacement projects in this application also considers the following:

- Hybrid and battery-electric propulsion for HandyDART and Community Shuttle vehicles are not currently market ready or suitable for the service needs. TransLink's team consistently performs market scans for these options and will recommend these when deemed viable. These vehicles are built on the back of Van chassis and a battery electric option is not current available in the market. There are other buses that are smaller versions of a 40" standard bus available as battery electric but they are orders of magnitude more expensive (360% more expensive) and have a very small service window before requiring recharging.

- Replacing the diesel direct drive Burrard Beaver SeaBus with Next Generation battery-electric propulsion SeaBus vessel will result in zero tailpipe greenhouse gas and criteria air contaminant emissions. This project is estimated to reduce CO2 emissions from SeaBus operations by 1,130 tonnes CO2 / year while reducing diesel fuel used by 430,000 liters per year.

Figure 1: Emission profiles of various propulsion types



Project Summaries

Marpole Transit Centre – Implementation (Phase 4): This project will design, procure and install the charging infrastructure required to operate and maintain 350 40' on-route charged battery-electric buses and to service a diesel fleet at opening.

2023 Community Shuttle Purchase - Replacement: This project will procure twenty-seven (27) community shuttles to replace vehicles that have reached the end of useful life and to modernize the vehicle fleet.

2023 Conventional Bus Replacement: This project will procure fifty (50) 40' CNG buses to replace vehicles that have reached the end of useful life and to modernize the vehicle fleet.

2023 HandyDART Vehicle Purchase Replacement: This project procures forty-six (46) HandyDART vehicles to retire vehicles that have reached the end of useful life. These new vehicles will support maintaining transit system reliability for HandyDART trips.

Next Generation SeaBus Design: This project will cover the design phase that will ultimately allow us to replace the Burrard Beaver Seabus with a New Generation battery-electric Seabus vessel.

Deployment of Proposed Projects
Replacement vehicles will service areas as set out in Table 3 below.

Table 3: Deployment of Proposed Replacement Vehicle Projects

Project Type	# of Replacement Vehicles for 2022/23 (Current Application)	Service Areas for 2022/23 Vehicles
Community Shuttle Purchase – Replacement	27	Region-wide
Conventional CNG Bus Purchase - Replacement	50	NE Sector*
HandyDART Vehicle Purchase – Replacement	46	Region-wide

*CNG buses are limited to garages that have CNG fuelling capability: Hamilton, Poco and Surrey

BENEFITS

Improving Accessibility
The continued transition of stepless low-floor community shuttles across the system will improve accessibility with a front door deployable ramp and kneeling feature that is presently not available with existing high-floor shuttle vehicles. This will support *Goal 2 – Support a sustainable Economy* and *Goal 4 – Develop Complete Communities* of *Metro 2040*, by enabling people of all abilities to access transportation to get to and from work as well as access to range of services and amenities.

Emissions Reduction

Table 4: Emissions Reductions from Vehicles Relative to Baseline Diesel Projects

Projects	Propulsion	GHG Approx. Impact	NOx Approx. Impact	PM Approx. Impact
2023 Community Shuttle Vehicle Purchase – Replacement	Gasoline	No material change as gasoline to gasoline No viable zero emission vehicles on the market	No change as gasoline to gasoline	No change as gasoline to gasoline
2023 Conventional Bus – Replacement (40' CNG)	CNG	No change as CNG to CNG	No change as CNG to CNG	No change as CNG to CNG
2023 HandyDART Vehicle Purchase – Replacement[1]	Gasoline	Estimated to be approx. 20% lower due to new engines and chassis in the newer vehicles No zero emission vehicles on the market	No change as gasoline to gasoline	No change as gasoline to gasoline
2023 –Next Generation SeaBus	Battery-Electric	1,130 Tonnes/yr reduction (100 per cent)[6]	Zero Emissions	Zero Emissions

[6] These benefits will be realized only if the Next Gen SeaBus is procured and put in service.

RISKS

This request for GVRF funding will allow TransLink to begin the construction phase of the Marpole Transit centre and begin the procurement process for vehicle projects by early 2022 to ensure deliveries in 2022 to 2024 timeframe.

If funding is not received in time:

- TransLink will have to delay construction of the Marpole Transit Centre and delay advancement of TransLink's LCFS and meeting TransLink's GHG reduction goals;

- TransLink will have to continue to rely on deferred retirement vehicles. Continued use of deferred retirement vehicles pose a risk to reliability, as well as further cost in terms of continued maintenance and additional equipment costs to keep them in service. Furthermore, this would result in higher greenhouse gas (GHG) and criteria air contaminant (CAC) emissions than new vehicles. TransLink may lose credibility among the general public if service is not reliable.

- People of limited abilities will continue to have challenges accessing the transportation network due to Community Shuttles not having stepless low floor access.

CONCLUSION

TransLink relies on the FGTF, made available through the GVRF, to be able to construct key infrastructure and modernize our vehicles that have reached the end of their useful life and are ready for replacement. Further, the approval of the requested application will allow for the advancement of TransLink's Low Carbon Fleet Strategy by supporting the construction of our flagstone Electric Transit Centre. As well as support procurement of the vehicles necessary to ensure TransLink's revenue vehicle fleets are in a state of good repair, avoiding increased maintenance costs and protecting the reliability of the transit system. The application supports Metro Vancouver's *Metro 2040* in supporting urban centres and frequent transit development areas and encouraging transportation choices. Finally, reduction of GHG and CAC emission supports the environmental goals of Metro Vancouver's *IAQGGMP* and *Metro 2040, Climate 2050 goals,* and TransLink's Low Carbon Fleet Strategy.

Appendix A

TransLink 2018-2027 Investment Plan Capital Program and Funding Sources

	Project Budget	Project Expenditure prior to 2017	2017 Project Expenditure	Final Forecast Cost	Forecast Cost to Complete	Other Funding	Approved GVRF Funding	Requested GVRF Funding	Planned future GVRF Funding	Total GVRF Funding
Bus										
Equipment	**20,698**	**732**	**998**	**36,084**	**34,354**	**(9,122)**	**-**		**-**	**-**
Facilities	**23,365**	**246**	**8,801**	**93,479**	**84,432**	**(16,313)**	**-**		**-**	**-**
Infrastructure										
Depots	256,435	8,238	16,414	257,834	233,182	(77,091)	(4,000)		-	(4,000)
Exchanges	69,703	771	20,416	120,495	99,309	(46,657)	-		-	-
Other	75,406	3,646	15,777	112,405	92,983	(22,588)	-		-	-
Trolley Overhead	20,676	918	4,353	103,083	97,812	(10,439)	(4,725)		(0)	(4,725)
Technology	**7,216**	**311**	**1,918**	**9,547**	**7,318**	**-**	**-**		**-**	**-**
Vehicle Non-Revenue	**488,890**	**(14)**	**1,884**	**21,642**	**19,773**	**-**	**-**		**-**	**-**
Vehicle - Revenue										
Conventional Buses	513,420	59,777	21,437	1,960,466	1,879,252	-	(530,413)	(132,584)	(1,173,084)	(1,836,081)
Community Shuttles	27,106	1,105	12,627	129,410	115,678	-	(35,714)	(2,000)	(84,279)	(121,993)
Handy Darts	34,323	285	163	109,735	109,287	-	(17,168)	(7,528)	(64,340)	(89,037)
Sea Bus	37,356	1,486	13,051	35,927	21,390	(17,001)	(19,697)		-	(19,697)
Corporate										
Equipment	**1,511**	**379**	**1,121**	**1,725**	**225**	**-**	**-**		**-**	**-**
Facilities	**17,620**	**2,235**	**33**	**8,220**	**5,952**	**-**	**-**		**-**	**-**
Infrastructure										
Bridges	27,310	1,362	3,738	27,546	22,446	-	-		-	-
Depots	1,201	18	844	862	-	-	-		-	-
Other	4,352	660	1,621	17,141	14,861	(3,241)	-		-	-
Major Construction	**23,754**	**(1,373)**	**20,874**	**19,501**	**-**	**-**	**-**		**-**	**-**
Technology	**54,204**	**3,985**	**25,220**	**230,621**	**201,416**	**-**	**-**		**-**	**-**
Vehicle Non-Revenue	**9,988**	**-**	**1,238**	**5,811**	**4,573**	**-**	**-**		**-**	**-**
Rail										
Equipment	**84,883**	**6,121**	**20,586**	**155,799**	**129,091**	**(35,975)**	**(4,500)**		**0**	**(4,500)**
Facilities	**666,465**	**1,444**	**2,623**	**593,455**	**589,388**	**(600,518)**	**-**		**-**	**-**
Infrastructure										
Other	4,696,180	8,473	57,387	4,832,043	4,766,183	(3,548,008)	-		-	-
Stations	416,437	63,998	72,265	422,658	286,395	(128,683)	-		-	-
Wayside	18,470	888	10,996	46,646	34,761	(7,128)	-		-	-
Technology	**48,869**	**2,412**	**3,246**	**52,743**	**47,084**	**(0)**	**-**		**-**	**-**
Vehicle Non-Revenue	**718**	**5**	**669**	**3,096**	**2,421**	**-**	**-**		**-**	**-**
Vehicle - Revenue										
Canada Line	88,000	-	44,000	88,000	44,000	(79,853)	-		-	-
Sky Train	1,064,925	54,428	43,907	1,230,239	1,131,904	(939,213)	(24,360)		(40,055)	(64,415)
West Coast Express	21,000	-	-	23,235	23,235	(20,750)	-		-	-
Roads and Bridges										
Infrastructure										
Bike	13,410	47	2,504	35,382	32,831	-	-		-	-
Bridges	37,192	14,373	6,477	56,350	35,501	(150,000)	-		-	-
Road Network										
Infrastructure										
Bicycle Infrastructure	58,722	155	33	93,396	93,208	-	-		-	-
Major Road Network	255,895	140	1,419	165,611	164,053	-	-		-	-
MRNB Pavement rehab and BICCS	53,013	-	31,936	293,505	261,569	-	-		-	-
Transit Priority Implementation Program	10,062	-	-	486	486	-	-		-	-
Grand Total	**9,248,774**	**237,252**	**470,576**	**11,394,180**	**10,686,353**	**(5,712,579)**	**(640,579)**	**(142,112)**	**(1,361,759)**	**(2,144,449)**

Note: The above summary has been updated since the release of TransLink's Phase Two Investment Plan for the following:

- Some Projects categorized as "Corporate" were reclassified as "Rail" to better align with those projects' scope

Appendix B

Descriptions of items in the Capital Program

TransLink 2018-2027 Investment Plan Project Summary	Project Descriptions
Bus	
Equipment	A wide variety of equipment required to maintain and manage TransLink's systems related to the bus network. Examples include communication on system and camera equipment replacement and SeaBus terminal elevator/escalator replacement.
Facilities	Includes improvement projects such as garage roof replacements, hoist replacements, SeaBus Maintenance Dock Expansion; and other projects related to mechanical and civil retrofits to facilities. Also includes PowerSmart upgrades partially funded by BC Hydro.
Infrastructure	
Depots	Includes the new bus depot expansion and improvement to existing depot such as the Hamilton Transit Centre.
Exchanges/Bus loops	Various repairs, replacements and upgrades to keep the exchanges/bus loops in a state of good repair. For example, replacement of lighting and security equipment, shelters and crew washroom facilities. Also includes projects related to priority B-Line corridors.
Other	Includes general projects related to bus infrastructure such as maintenance and rehabilitation of SeaBus Infrastructure and other facilities and paving replacement.
Trolley Overhead (TOH)	Includes projects related to maintenance of infrastructure related to the trolley buses such as cables, poles and rectifier buildings and equipment.
Technology	Includes replacement of the Bus Daily Operations Management System as well as other projects related to software modernization and replacement.
Non-Revenue Vehicles	Includes modernization of non-revenue generating vehicles used by Transit supervisors, security and maintenance staff.
Revenue Vehicles	
Conventional Buses	Fleet expansion and modernization of conventional buses to support maintenance of the transit system and realize benefits such as reduced congestion and emissions.
Community Shuttle	Fleet expansion and modernization of community shuttle vehicles to support maintenance of the transit system and realize benefits such as reduced congestion and emissions.
HandyDART	Fleet expansion and modernization of HandyDART vehicles to support maintenance of the transit system and provide mobility to those with accessibility issues.
SeaBus	Procurement of one additional SeaBus vessel, retrofit of an older SeaBus vessel and projects related to ensuring TransLink continues to meet Transport Canada safety standards and also to reduce maintenance and repair costs associated with ageing assets.

TransLink 2018-2027 Investment Plan Project Summary	Project Descriptions
Corporate	
Equipment	A wide variety of equipment such as Ad Panels and radios for Transit Police.
Facilities	Includes renovation and upgrades to offices and related facilities.
Infrastructure	
Bridges	Includes Pattullo Bridge Rehabilitation Construction
Depots	Infrastructure being built at the UBC Bus Terminal
Other	Includes various general projects related to corporate infrastructure such as efficiency improvement and compliance.
Technology	Includes projects related to upgrades of various IT applications and systems, security programs, data warehousing etc.
Vehicles Non-Revenue	Includes projects related to non-revenue generating vehicles such as TransLink Police cars and administration vehicles.
Rail	
Equipment	A wide variety of equipment required to maintain and manage the SkyTrain lines. Examples include power supply installations, automatic train control equipment, station equipment, passenger address systems etc.
Facilities	Includes projects related to maintaining and upgrading facilities such as the operations maintenance and control centre. Examples include space modernization, safety upgrades, yard track reconditioning, seismic upgrades and land improvement cost for the Expo and Millennium Upgrade Program.
Infrastructure	
Other	Includes other rail infrastructure projects related to station escalator replacements, upgrades of guideway and running rail infrastructure, seismic upgrades, and various projects related to the Millennium Line Broadway Extension and Surrey - Langley Light Rail Train.
Stations	Includes projects related to upgrading SkyTrain stations consisting of station upgrades such as the Burrard, Surrey Central and Joyce Collingwood stations as well as minor equipment upgrades such as roof replacements to ensure assets are maintained in a state of good repair.
Wayside	Includes projects related to the propulsion power system for SkyTrain.
Technology	Includes projects related to the upgrade of various software and systems related to the smooth running of the train system.
Non-Revenue Vehicles	Includes projects related to non-revenue generating vehicles used by SkyTrain staff to respond to emergency and routine maintenance.
Revenue Vehicles	
Canada Line	Includes projects related to fleet expansion of the Canada Line cars.
SkyTrain	Includes acquisition of additional SkyTrain cars for Expo and Millennium Line fleet expansion, the refurbishment, mid-life overhaul or replacement of older SkyTrain cars.
WCE	Includes fleet expansion of the West Coast Express cars and refurbishment of 6 locomotives.

TransLink 2018-2027 Investment Plan Project Summary	Project Descriptions
Roads and Bridges	
Infrastructure	
Bikes	Includes projects related to the TransLink owned bicycle infrastructure.
Bridges	Includes rehabilitation of the Pattullo Bridge, rehabilitation of the Knight Street Bridge as well as other projects related to the Westham Island Bridge.
Roads Network	
Infrastructure	
Bike Infrastructure	Includes TransLink's contribution to bicycle infrastructure programs for municipal owned pathways.
MRN	Consists of TransLink's contributions to municipalities for rehabilitation of the Major Road Network (MRN).
MRNB pavement rehab and Bicycle Infrastructure Capital Cost Sharing Program	Consists of projects in three major categories: 1) TransLink's contribution to the MRN Pavement rehabilitation, 2) Minor capital funding to complete and improve as well as encourage construction of more bicycle routes and remove existing barriers to cyclists, and 3) Funding for bicycle infrastructure improvements across the region

APPLICATION FOR FUNDING FROM THE GREATER VANCOUVER REGIONAL FUND FOR FEDERAL GAS TAX FUNDS

Project 1 Marpole Transit Centre

(Ref#222039)

A. 10-YEAR INVESTMENT PLAN

Please describe how the project fits within, and provides support to, the 10-Year Investment Plan

This project is a key regional transportation investment necessary to stay on the aggressive path outlined in TransLink's Low Carbon Fleet Strategy (LCFS). Transportation accounts for over 35% of all greenhouse gas (GHG) emissions in Metro Vancouver. As one of the region's largest consumers of diesel fuel and operator of a fleet of heavy-duty vehicles, TransLink plays an important role in reducing emissions in our own operations. The Low Carbon Fleet Strategy lays out a path for meeting TransLink's environmental targets.

Marpole Transit Centre (MTC) will develop infrastructure to operate, maintain, and store a fleet of approximately 350 forty-foot equivalent (FFE) battery electric buses (BEB). TransLink requires this infrastructure, to operate, maintain, and store an electrified fleet replacing existing diesel buses. This facility will also free up space at existing depots to help facilitate future electrification and future service expansion.

The facility is identified in the Investment Plan approved on June 28, 2018.

B. PROJECT DESCRIPTION

Please complete the following for each project proposed for expenditure from the GVRF.

1. **Executive Summary (not to exceed two pages)**

Project Overview

Currently, all existing transit centers on the Burrard Peninsula are at, or approaching, capacity:

In October 2013, a Bus Operations and Maintenance Facility Plan was prepared to support long-term planning of operating facilities. This Plan identified the need for a new transit center in Vancouver/Burnaby. Since Transit centers require a long lead time owing to the planning, site remediation and site preparation, TransLink started working on the development of the Marpole site into a new transit center, beginning with pre-design work in 2018.

The Mayors' Council has directed TransLink to electrify its bus fleet which requires building MTC to be 100% electric ready including charging infrastructure, BC Hydro power and infrastructure upgrades and energy management, and other systems.

Project scope includes complete design, early site works and implementation. This facility will be designed for the operation and maintenance of 350 FFE Battery Electric Buses and to service a diesel fleet during the transition to all-electric operation.

Tangible Benefits and Outcomes

MTC will be home to TransLink's expanding battery electric fleet, a key element of TransLink's Low Carbon Fleet Strategy. Implementation of MTC will also support mode-shift away from automobile travel to transit as envisioned in the Mayors' Council, ensuring that TransLink continues the important transition toward a greener and more efficient transit system and contributing towards a carbon neutral region by 2050.

When MTC opens in 2025, approximately 60% of its fleet will be BEB and 40% hybrid-diesel. Between 2025 and 2031, MTC's fleet would transition to 100% of its routes being served by BEBs.

Implementation of MTC has several key benefits:

- Enables service expansion;
- Provides storage and maintenance capacity;
- Reduced bus fleet emissions;
- Mode-shift away from automobile travel to transit which will reduce vehicle congestion and associated GHG emissions; and,
- Increased ridership and reduced transit passenger congestion.

Summary of the fleet transition and GHG reductions achieved is as follows:

	Baseline	**2025**	**2031**
Fleet	100% Hybrid Diesel-Electric (350)	60% Battery-Electric (210) 40% Hybrid Diesel Electric (140)	100% Battery Electric (350)
Diesel Fuel Use	11.1 million litres	4.4 million litres	None
Electricity Use		17.2 GWh	28.5 GWh
GHG Emissions	**30,000 tonnes**	**11,568 tonnes**	**114 tonnes**

Note: Based on 18.9 million km/year for the MTC bus fleet, diesel fuel efficiency of 58.35 liters/100 km (40' buses), 66.26 liters/100 km (60' buses), and energy efficiency of 1.51 kWh/km for BEB.

Without MTC and the proposed charging infrastructure, the BEBs could not be operated and maintained. As shown in the above analysis, MTC would result in **18,400 tonne (rounded) reduction in CO2e per year in 2025** when compared to a baseline scenario. **By 2031, MTC would result in a reduction of 29,886 tonnes CO2e per year** (equivalent to 25% of TransLink's 2020 revenue fleet GHG emissions). Along with the reduction in GHG emissions, there would be a

corresponding reduction in criteria air contaminants (CAC), thereby improving regional air quality and human health.

To assess the potential impact of the increased ridership attributed to MTC routes, TransLink estimated the potential corresponding reduction in vehicle kilometers travelled (VKT). Based on the 2017 TransLink Trip Diary, the average automobile trip length is 7.9 kilometres. Transit typically accounts for 43% of all transit, walking, and cycling mode-share. Assuming that 66% of transit trips are attributed to bus, the Region is targeting an increase of 284,000 bus trips per day by 2045, of which 71,000 (an assumed 25% of the total) would be additional trips generated on routes operated by MTC. Assuming that each trip replaces a single automobile trip, the equivalent vehicle kilometre travelled would be approximately 204.7 million kilometres per year (based on average trip length). Using an average gasoline consumption of 8.9/litres per 100 km, the automobiles would consume 18.2 million litres of gasoline per year and emit 42,000 (rounded) tonnes CO2e per year based on an output of 2.3 kg CO2e per consumed litre of gas. Therefore, by 2045, **GHG emissions reduction associated with anticipated increased ridership and mode-switching would be 42,000 (rounded) tonnes CO2e per year.**

TransLink's Bus Storage and Maintenance Plan was developed to ensure adequate storage and maintenance capacity for all conventional and customer transit fleet required to the meet the region's long-term objectives, plans and policies including service expansion and fleet electrification. The most recent update to this plan, in 2020, includes adjustments to account for the impact of pandemic-induced changes in ridership, revenues and associated peak vehicle requirements. The plan reconfirmed that the Marpole Transit Centre site, in south Vancouver, represents the best opportunity to address these objectives including a more efficient deployment of bus routes and minimizing deadheading costs relative to other alternatives. The project is designed to support a transition to an electric bus fleet which is in alignment with TransLink's low carbon fleet and sustainability goals. It will include infrastructure that will allow the installation of electric charging stations. By undertaking this project, TransLink will support the direct reduction of GHG and CAC due to the transition of its fleet to BEB. In addition, it will have knock-on impact to support increased ridership and corresponding reduction in automobile generated GHGs and CACs as well as the reduction in road congestion.

Project Budget, Expenses, and GVRF Funding Request

The project budget is $308,170,850 with a GVRF request of $298,100,000. Expenses covered by this budget primarily include;

- Marpole Transit Centre construction including: Maintenance garage; Operations and admin building; Parking structure (houses bus and staff parking and charging equipment); Bus wash facility; Wastewater treatment plant; Fuel infrastructure and building; and Farebox building
- Fuel infrastructure and building; and Farebox building

- Charging infrastructure and supporting electrical infrastructure

The funding requested in this application will be applied towards expenses considered eligible per the terms of the Administrative Agreement.

Steps taken by TransLink to identify, evaluate, and prioritize the proposed project for inclusion in the Application.

This project is identified for GVRF funding in the draft 2022 Investment Plan. Expansion Projects supporting the Mayors' Vision are prioritized through the annual capital planning process for inclusion in the Investment Plan and GVRF Applications. TransLink Capital management Committee, the Investment Plan Steering Committee and the Board has endorsed the inclusion of this priority project in the 2022 GVRF Application.

2. Project Name

Marpole Transit Centre

3. Project Need and Location

This project is a key regional transportation investment necessary to stay on the aggressive path outlined in TransLink's Low Carbon Fleet Strategy (LCFS). Transportation accounts for over 35% of all greenhouse gas (GHG) emissions in Metro Vancouver. As one of the region's largest consumers of diesel fuel and operator of a fleet of heavy-duty vehicles, TransLink plays an important role in reducing emissions in our own operations. The Low Carbon Fleet Strategy lays out a path for meeting TransLink's environmental targets.

Marpole Transit Centre (MTC) will develop infrastructure to operate, maintain, and store a fleet of approximately 350 forty-foot equivalent (FFE) battery electric buses (BEB). The facility will provide capacity that would enable to the peak vehicle fleet to grow by 17% from 2057 FFE today to 2407. TransLink requires this infrastructure, to operate, maintain, and store an electrified fleet to replace existing hybrid-diesel buses. This facility will also free up space at existing depots to help facilitate the electrification of existing depots and future service expansion.

The scope of this project is to construct a Transit centre which would be 100% electric ready to support TransLink's original Low Carbon Fleet Strategy plan; will be designed for the operation and maintenance of 350 40' Equivalent Battery Electric Buses; and will service a hybrid-diesel fleet that will be phased out by 2031. By establishing a transit center in South Vancouver, the project would enable the expansion of the bus fleet required to support electrification, while also promoting a more efficient deployment of bus routes and minimizing deadheading costs.

4. Project Eligibility (check one):

☐ **Local Roads and Bridges, including active transportation**
☒ **Public Transit**

5. Project Purpose (check one):

☒ **Expansion:** Expands the carrying capacity of people and/or goods movement.
☐ **State of Good Repair:** Replaces or modernizes assets to keep the regional transportation system in a state of good repair.
☐ **Operational Efficiency/Effectiveness:** Improves the efficiency or effectiveness of the regional transportation system.
☐ **Refurbishment:** Extend the useful life of assets to maximize the utility of the regional investment in the transportation system.
☐ **Other (please specify :_____)**

6. Project Type (check one):

☒ **Growth**
☐ **Upgrade**
☐ **Risk (Resilience)**
☐ **Maintenance**
☐ **Opportunity**

7. Project Staging:

Year(s) of Acquisition or Start of Construction	Year of Completion of Construction	Year of Service Initialization	Year(s) of Renewal	Year(s) of End of Service
2023	**2025**	**2025**	**N/A**	**N/A**

8. Has the project previously received funding through GVRF? Please explain.

No. This is the first application for GVRF funding for this project.

9. Was GVRF funding previously declined for the project? Please explain.

No. This is the first application for GVRF funding for this project.

10. Is the project anticipated to require additional future GVRF funding? If so, please explain.

No. TransLink is planning to complete this project within budget.

11. Project Cost + Funding

11.a Budget & Expenditures

Budget	Expenditures to Date	Forecast to Complete	Final Forecasted Cost	Variance (budget – final forecasted cost)
$308,170,850	**$0**	**$308,170,850**	**$308,170,850**	**$0**

11.b Project Funding

Prior Approved GVRF Funding	Current Year GVRF Funding Request	Other Funding – Specify source and whether confirmed/pending
$0	**$298,100,000**	**N/A**

11.c Project Budget Schedule

Item	2022	2023	2024	2025	2026
GVRF-funded Project Budget		**$84,540,000**	**$136,640,000**	**$76,920,000**	
Total Project Budget		**$87,310,910**	**$141,203,260**	**$79,656,680**	

12. Project Budget Rationale

Describe the types of proposed project expenses to be funded by the Greater Vancouver Regional Fund

a. Explain how the project reflects the intent of the GVRF

This project will provide the parking structure, operations and maintenance buildings, bus wash facilities, fuel infrastructure and charging infrastructure for 350 buses. Replacing diesel buses with battery-electric contributes to lowering the fleet's GHG emissions, NOx and diesel particulate matter which aligns with Metro Vancouver's IAQGGMP, Metro 2040 and Climate 2050 goals and supports GHG emissions targets approved by TransLink's Board and supported by Mayors' Council. Additionally, this project supports to improve overall mobility, affordability and other objectives of the Regional Growth Strategy and 10-Year Plan by investing in much needed public transit infrastructure.

b. In the absence of GVRF funding, can the project proceed with other funding sources? What risks do the other funding sources present to the project?

No. The other source of funding available to TransLink is the Investing in Canada Infrastructure Program (ICIP). However, the ICIP program has been exhausted due to cost escalations and scope expansions of other major projects funded by that program (Surrey Langley SkyTrain Line and Expo Millennium Line Upgrade Project). The federal government announced new funding programs to support Public Transit infrastructure, Permanent Transit Fund and the Zero Emission Transit Fund, however these funding programs will not be accessible by the time this project initiates for it to be eligible. Accordingly, GVRF was deemed the optimal funding source for the Marpole Transit Centre Project.

c. Identify potential risks – corporate and regional – of this project that could result in this project not being completed or being unsuccessful. Describe possible mitigation strategies to address these risks.

Risks	Potential Impact		Mitigations
The City of Vancouver **(CoV)** has expressed its desire to develop a public park adjacent to the Marpole site and has retained consultants to review options to provide space for a City park. The City requirements may hinder the Development Permit approval process.	**Financial:** Cost overruns due to potential redesign of facility at a later stage to address CoV concerns.	**Schedule:** Schedule delays in the permitting process.	Engage with CoV to define concerns and get requirements as early as possible. Discuss and streamline options with design consultants.
TransLink does not own the Water Lots bordering the Fraser River. Without the Water Lots, TransLink has no access to the shoreline. This will impact ability to raise the site or develop a flood protection dike/wall system.	**Financial:** A further 10m setback will apply to current site resulting in challenge to meet functional requirements and less space for transit centre. Cost overruns due to design of flood protection system.	**Schedule:** Schedule delays due to additional work for implementing comprehensive flood protection measures.	TransLink has approached Ministry of Forests, Lands, Natural Resource Operations (FLNRO) and CoV to purchase or lease the Waterfront Lots to develop flood protection system.
The existing BC Hydro infrastructure (sub-station) and site servicing needs to be upgraded to support 100% Electric Fleet. BC Hydro upgrades may not be ready in time for the transit centre.	**Financial:** Cost overruns due to work arounds to meet energy needs in the interim period. BC hydro may require us to pay for a portion of the upgrade costs to service the site.	**Schedule:** Transit centre may not be functional despite completion if energy needs are not met.	Engage closely with BC Hydro and design team to ensure roadblocks are efficiently handled and schedules are aligned.

d. How may the project cost vary as a result of changing external factors, such as interest rates and currency exchange rates?

Project costs may vary due to foreign exchange rate fluctuations (as parts may be procured from the USA) and vendor pricing. Construction cost escalations have also been observed in the recent years due to inflationary pressures on raw material such as lumber, steel and labour. These uncertainties are mitigated with a sufficient contingency allowance to absorb price and foreign exchange rate fluctuations.

e. How may foreseeable changes in investment, regulation, or policies from other orders of government affect the project?

Due to recent increases in senior government funding for public transit projects, many suppliers could experience larger demands to supply the infrastructure required to support the battery-electric vehicles. This may create a backlog with vendors, and if procurement is not initiated soon, could result in delay.

f. How may foreseeable changes in technology affect the project?

Changes in battery-electric bus and charging technology are expected to improve in performance and reduce in cost. The design of the facility will incorporate modular components to facilitate upgrading of electric charging equipment over time. Maintenance activities for battery electric buses are different than those of diesel and CNG buses with less reliance on consumables like filters and greater emphasis on replacing modular component parts. The facility design provides for roof access to battery buses and flexible maintenance spaces.

g. What other corporate or external factors could alter the project need, scope, budget, or timeline for project delivery?

Project site requires specific trades and equipment for execution. Pile rigs need to be sourced and with a lot of construction activity in the market, these could be in short supply. Availability of the pile rigs will be aligned with the project schedule as this could significantly impact the project timelines.

The global COVID-19 pandemic may also affect supply chains needed to purchase and install the required equipment (e.g., if further shutdowns occur). Budget may fluctuate due to parts pricing and/or foreign exchange rates.

h. Describe how the project lowers the emissions profile of the transit fleet, for both greenhouse gas and common air contaminant emissions and advances the fleet towards the region's greenhouse gas emissions reduction targets.

MTC would operate a fleet of approximately 350 FFE battery-electric buses which are projected to use 28.5 GWh of electricity annually, with associated annual GHG emissions of 114 (rounded) tonnes CO_2e or 1.4 kg CO2e/fully loaded passenger kilometer. Absent the purchase of the battery-electric buses, 350 FFE hybrid-electric buses operating over the same routes would be expected to use 11.1 million liters of diesel fuel with associated life cycle GHG emissions of 30,000 (rounded) metric tons CO_2e or 369.72 kg CO2e / fully loaded passenger kilometer. This project is estimated to enable reducing net GHG emissions from CMBC bus operations by 29,886 tonnes of CO_2e per year. This is equivalent to approximately 25% of TransLink's 2020 revenue fleet GHG emissions. This is a significant step in TransLink reaching its target of 80% reduction in GHG emissions by 2050 and contributing to Metro Vancouver's Climate 2050 goal of a carbon neutral region.

From an air quality perspective, the current hybrid-electric transit buses emit 0.14 grams per brake horsepower-hour (g/bhp-hr) of nitrogen oxides (NOx) and 0.002 g/bhp-hr of particulate matter (PM). By comparison, the only CACs that would be emitted by the planned BEBs would be due to the anticipated diesel-powered heating units within the buses. As such, the planned electrification would significantly reduce CACs emitted due to bus operation, thereby contributing to improved air quality in the region.

C. EVALUATION CRITERIA

Please describe how project achieves or works towards each criterion by identifying and reporting on relevant performance measures. Where appropriate, present quantitative information. Please do not exceed 10 pages per project.

Two types of evaluation criteria are identified: Screening Criteria, which represent requirements that are mandatory for any project for which GVRF funding is requested; and Integrated Criteria, which allow for a qualitative assessment of proposed projects based on high priority objectives that reflect the intent of the Federal Gas Tax Fund, of Metro Vancouver goals, and of the Mayors' Council Vision.

Criterion	Description	Assessment (To be completed by MV)
SCREENING CRITERIA		
Eligible Project Category	☐ Local roads and bridges, including active transportation ☒ Public transit	
Eligible Expenses	As set out in the 2014 Administrative Agreement (Schedule C) Eligible Item — Expenditure[1] Equipment and installation — $298,100,000 Total — $298,100,000 [1] *Per Schedule C, Section 1.1, Part a)*	
Plan Consistency	Projects must be consistent with TransLink's Capital Plan, 10-Year Investment Plan, the Regional Growth Strategy and the Regional Transportation Strategy. ☒ 10-Year Investment Plan ☒ Mayors' Council Transportation and Transit Plan ☒ Metro 2040: Shaping our Future ☒ Regional Transportation Strategy ☒ Low Carbon Fleet Transition Plan	
Corporate Policies	Projects must be consistent with applicable TransLink policies such as sustainability, environmental responsibility, emissions and infrastructure. ☒ Sustainability policy ☒ Environmental policy ☐ Emissions policy ☒ Infrastructure policy	

Criterion	Description	Assessment (To be completed by MV)
INTEGRATED CRITERIA		
Regional Growth Strategy		
Supports the Regional Growth Strategy	*The degree to which the project assists in achieving the goals in the Regional Growth Strategy and directions set out in the Metro Vancouver Board Strategic Plan.* ☐ Create a Compact Urban Area ☐ Support a Sustainable Economy ☒ Protect Environment and Respond to Climate Change Impacts ☒ Develop Complete Communities ☒ Support Sustainable Transportation Choices	
Urban Centres and Frequent Transit Development Areas	*Where applicable, the project is located in, or demonstrates tangible benefits to the overall performance of Urban Centres and Frequent Transit Development Areas.* This project is located in the highly urbanized Vancouver city. Once operational, this location will provide services to Metro Vancouver communities within TransLink's transportation service region, streamline several bus routes, and offer an environmentally responsible and sustainable transportation alternative to single occupant vehicle travel. The bus routes will link communities with business, institutional and social hubs and destinations, and facilitate the creation and expansion of Transit Oriented Developments (TODs). They will also provide collector and distribution services to Expo, Millennium, and Canada Lines, West Coast Express and SeaBus. The urban centres that will benefit the most due to proximity include Vancouver, Burnaby, New West and Richmond due to it being one of the most central facilities geographically located in our region.	

Criterion	Description	Assessment (To be completed by MV)
Transportation Performance		
Headline Targets	*Demonstrates tangible beneficial effects on vehicle kilometres travelled and/or walk/cycle/transit/multiple occupancy vehicle mode share.* The Region is targeting an increase of 284,000 bus trips per day by 2045, of which 71,000 (an assumed 25% of the total) would be additional trips generated on routes operated by MTC. Assuming that each trip replaces a single automobile trip, the equivalent vehicle kilometre travelled would be approximately 204.7 million kilometres per year (based on average trip length). Using an average gasoline consumption of 8.9/litres per 100 km, the automobiles would consume 18.2 million litres of gasoline per year, and emit 126,000 (rounded) tonnes CO2e per year. Therefore, by 2045, **GHG emissions reduction associated with anticipated increased ridership and mode-switching would be 42,000 (rounded) tonnes CO2e per year.** This project also helps achieve TransLink's target of 50% of trips made by sustainable modes as noted in the Regional Transportation Strategy.	
Other Transportation Outcomes	*Demonstrates tangible beneficial effects on vehicle congestion, transit passenger congestion, transit ridership, transportation safety, and/or goods movement for the duration of the project.* This project provides the infrastructure to support the electrification of bus routes within metro Vancouver. The facility will provide capacity that would enable to the peak vehicle fleet to grow by 17% from 2057 FFE today to 2407. Additional capacity will allow for future service expansion facilitating reductions in vehicle congestion and transit passenger congestion. Surplus capacity in the short term will facilitate renovation of existing bus transit centres to support the transition to battery electric bus operation.	

Criterion	Description	Assessment (To be completed by MV)
Project Type	*Demonstrated value of the project type (refer to section 6).* This project is critical infrastructure to achieve the electrification of the fleet envisioned in the Low Carbon Fleet Strategy and the green house reduction strategy to support Greater Vancouver Regional target of achieving a carbon neutral region by 2050. .	
Regional Environmental Objectives		
Supports the Climate 2050 Strategic Framework and Integrated Air Quality and Greenhouse Gas Management Plan	*Contributes to the achievement of regional climate action and air quality goals, including directions set out in the Metro Vancouver Board Strategic Plan, the Regional Growth Strategy, Climate 2050, and the Integrated Air Quality and Greenhouse Gas Management Plan.* The electrical charging infrastructure would support reduction in diesel fuel use by the bus fleet by transitioning to BEBs. This will reduce GHG and CAC emissions such as NOx and PM, thereby improving air quality in the region.	
Quantifiable Emissions Impacts	Implementation of MTC to support a battery-electric buses fleet, under TransLink's Low Carbon Fleet Strategy, would contribute reductions to revenue fleet GHG emissions as follows: • 18,400 tonne (rounded) reduction in CO2e per year in 2025 (compared to baseline); and, • 29,886 tonne reduction in CO2e per year in 2031 (equivalent to 25% of TransLink's 2020 revenue fleet GHG emissions). The mode share changes described above contribute additional emissions reductions in the region (42,000 (rounded) tonnes CO2e per year).	

Criterion	Description	Assessment (To be completed by MV)
Economic Development		
Supports regional prosperity	*Contributes to a regional transportation system that moves people and goods and aligns with regional prosperity.* This project provides the charging infrastructure to support 350 40'-equivalent battery-electric buses. The buses will contribute to keeping the people and goods moving in the region contributing directly to its prosperity. The project will also provide overall operations flexibility to shift services between transit centers as required for renovations or to respond to other major construction projects. This flexibility will benefit regional planning in terms of ability to serve growing markets and be responsive to land use changes.	

APPLICATION FOR FUNDING FROM THE GREATER VANCOUVER REGIONAL FUND FOR FEDERAL GAS TAX FUNDS

Project 2 2023 Community Shuttle Replacements
(Ref# 222008)

A. 10-YEAR INVESTMENT PLAN

Please describe how the project fits within, and provides support to, the 10-Year Investment Plan

This project is a state of good repair project included in the 2018 Investment Plan

B. PROJECT DESCRIPTION

Please complete the following for each project proposed for expenditure from the GVRF.

1. **Executive Summary (not to exceed two pages)**

Project Overview

TransLink's Community Shuttle service began in 2001 and, prior to pandemic, has expanded steadily. Currently, the shuttle fleet comprises approximately 13% of TransLink's rubber-tired revenue vehicle fleet and totals 206 vehicles. Approximately 79% of the Community Shuttle fleet is operated by CMBC with the remaining 21% operated by private contractors.

This project will replace twenty-seven (27) conventional gasoline powered community shuttles in the community shuttle fleet. The shuttles to be retired were purchased in 2018 with a life expectancy of five (5) years. The new low floor shuttles improve accessibility over the existing high floor shuttle fleet. Procurement of new vehicles will allow the retirement of shuttles that have reached the end of their useful life thereby maintaining transit system reliability. The new vehicles have a person and seat capacity of 21 (consistent with vehicles being replaced). This project is consistent with the 2018 Investment Plan, approved in June 2018 by the Mayors' Council and the TransLink Board. This project is also included in the draft 2022 Investment Plan.

TransLink strives to optimize its resource allocation by matching service to passenger demand, including allocating vehicles of an appropriate size to serve the demand on a route. This allocation is optimized through continuous review and planning processes that allocates resources where they are most needed. This process is informed by ridership data, which has been substantially enhanced with the deployment of Compass Card. TransLink has also undertaken recent work to determine optimal fleet propulsion technology on each route, which is interdependent with vehicle size.

The fleet propulsion technologies currently available to TransLink consist of only conventional gasoline engines, as hybrid gasoline, hybrid diesel or battery-electric propulsion are not available for these vehicles. Choices of vehicle size and propulsion types will continue to be optimized, as determined by the ongoing monitoring of ridership and propulsion technologies. This may result in the vehicle technology mix changing, if it is subsequently determined that a different mix will better optimize our resource allocation.

Tangible Benefits and Outcomes

The new vehicles will allow CMBC to maintain existing service, reduce downtime, avoid incremental operating and maintenance costs.

Project Budget, Expenses, and GVRF Funding Request

The project budget is $6,900,050 with a GVRF request of $6,656,660. Expenses covered by this budget primarily include vehicle procurement, ancillary on-board equipment and labour, and other miscellaneous project costs. The funding requested in this application will be applied towards expenses considered eligible per the terms of the Administrative Agreement.

Steps taken by TransLink to identify, evaluate, and prioritize the proposed project for inclusion in the Application

This project was identified for GVRF funding in the 2018 Investment Plan (Appendix A, Table 8). State of good repair projects are prioritized through the annual capital planning process for inclusion in the Investment Plan and GVRF Applications. This state of good repair project ensures that TransLink can continue to deliver the Community Shuttle services.

2. Project Name

2023 Community Shuttle Replacements (Ref# 222150)

3. Project Need and Location

The objectives are to maintain high quality customer service, minimizing maintenance and operating costs and continuing to provide reliable, fully accessible transit vehicles that are appropriate for routes on which they operate. Community shuttles operate throughout the region. The community shuttles help connect transit exchanges/ Urban Centres to their surrounding residential communities.

The criteria for achieving these objectives are avoidance of incremental maintenance and operating costs, reduced vehicle breakdowns and vehicle downtime, improved accessibility.

4. Project Eligibility (check one):

☐ **Local Roads and Bridges, including active transportation**
☒ **Public Transit**

5. Project Purpose (check one):

☐ **Expansion:** Expands the carrying capacity of people and/or goods movement.
☒ **State of Good Repair:** Replaces or modernizes assets to keep the regional transportation system in a state of good repair.

☐ **Operational Efficiency/Effectiveness:** Improves the efficiency or effectiveness of the regional transportation system.

☐ **Refurbishment:** Extend the useful life of assets to maximize the utility of the regional investment in the transportation system.

☐ **Other (please specify :_____)**

6. Project Type (check one):

☐ **Growth**

☐ **Upgrade**

☐ **Risk (Resilience)**

☒ **Maintenance**

☐ **Opportunity**

7. Project Staging:

Year(s) of Acquisition or Start of Construction	Year of Completion of Construction	Year of Service Initialization	Year(s) of Renewal	Year(s) of End of Service
2023	**2024**	**2024**	**N/A**	**2028**

8. Has the project previously received funding through GVRF? Please explain.

No. This is the first application for GVRF funding for this project.

9. Was GVRF funding previously declined for the project? Please explain.

No. This is the first application for GVRF funding for this project.

10. Is the project anticipated to require additional future GVRF funding? If so, please explain.

No. TransLink is planning to complete this project within budget.

11. Project Cost + Funding

11.a Budget & Expenditures

Budget	Expenditures to Date	Forecast to Complete	Final Forecasted Cost	Variance (budget – final forecasted cost)
$6,900,050	$0	$6,900,050	$6,900,050	$0

11.b Project Funding

Prior Approved GVRF Funding	Current Year GVRF Funding Request	Other Funding – Specify source and whether confirmed/pending
$0	$6,656,660	N/A

11.c Project Budget Schedule

Item	2022	2023	2024	2025	2026	2027
GVRF-funded Project Budget		$6,036,560	$620,100			
Total Project Budget		$6,244,160	$655,890			

12. Project Budget Rationale

Describe the types of proposed project expenses to be funded by the Greater Vancouver Regional Fund

a. Explain how the project reflects the intent of the GVRF

This project ensures TransLink's assets are maintained in a state of good repair, so as to allow TransLink to efficiently and effectively provide transit service to the general public.

b. In the absence of GVRF funding, can the project proceed with other funding sources? What risks do the other funding sources present to the project?

No. TransLink relies on GVRF funding for replacement of its revenue vehicle fleets and plans its annual budgets accordingly. The other source of funding available to TransLink is the Investing in Canada Infrastructure Program (ICIP). The ICIP funding program is focused on infrastructure improvement related to capacity, quality and safety or, access to public transit systems. The projects chosen by TransLink for GVRF funding are better suited to GVRF funding compared to the other sources of funding.

c. Identify potential risks – corporate and regional – of this project that could result in this project not being completed or being unsuccessful. Describe possible mitigation strategies to address these risks.

TransLink requires these vehicles to be in service for 2023 in order to retire vehicles reaching the end of their useful service lives. There is an approximate lead time of 12 to 18 months between TransLink ordering the vehicles and those vehicles entering service. As such, it is important to have the funding in place to ensure the timely retirement of vehicles before they reach the end of their useful service lives.

If funding is not received in time, TransLink will have to rely on deferred retirement vehicles to deliver transit service. Continued use of deferred retirement vehicles poses a risk to reliability, as well as likely to result in incremental maintenance costs to keep them in service. This may result in lost opportunities to realize goals of reduced congestion, improved peak hour service and frequency. TransLink may lose credibility among the general public if service is not reliable as well as TransLink's ability to be accessible for people of all abilities. Further, use of deferred retirement vehicles could also result in higher CAC and GHG emissions than new vehicles as engines deteriorate.

d. How may the project cost vary as a result of changing external factors, such as interest rates and currency exchange rates?

Project costs may vary due to foreign exchange rate fluctuations (as vehicles are procured from the USA) and vendor pricing. These uncertainties are mitigated with a sufficient contingency allowance to absorb price and foreign exchange rate fluctuations.

e. How may foreseeable changes in investment, regulation, or policies from other orders of government affect the project?

Due to recent increases in senior government funding for public transit projects, many suppliers are experiencing larger demands to order vehicles. This may create a backlog with vendors, and if procurement is not initiated soon, could result in further delay in ordering and receiving vehicles.

f. How may foreseeable changes in technology affect the project?

This application is based on the new vehicles being powered by conventional gasoline engines. TransLink also has to consider that a number of these vehicles are operated and maintained by contractors who may not be able to support fueling or maintenance for a change in propulsion technology.

TransLink does not anticipate vendors coming out with alternative fuels for community shuttles that meet our needs to deliver reliable and cost-effective service to customers in the immediate future. TransLink continues to monitor the vehicle technology industry very closely to identify what options are available in the market, and to evaluate their suitability for its fleet.

g. What other corporate or external factors could alter the project need, scope, budget, or timeline for project delivery?

Project timeline may be affected by manufacturer's capacity and schedules, availability of parts and/or time for vehicle delivery from the manufacturer. The global COVID-19 pandemic may also affect supply chains needed to manufacture the shuttles (e.g. if further shutdowns occur). Budget may fluctuate due to parts pricing and/or foreign exchange rates.

h. Describe how the project lowers the emissions profile of the transit fleet, for both greenhouse gas and common air contaminant emissions and advances the fleet towards the region's greenhouse gas emissions reduction targets.

This is a like-for-like replacement. TransLink is currently focusing the Low Carbon Fleet Strategy (with support from the Mayors' Council), on the conventional bus fleet which makes up more than 80 per cent of fleet emissions. The conventional bus fleet transition to battery-electric buses is the biggest opportunity for GHG reductions, the main focus of the LCFS. Currently there are no suitable market ready battery-electric vehicles that meet the Community Shuttle needs. We consistently conduct market scans for readiness of battery-electric shuttles. When suitable battery-electric vehicles for this service are available, the LCFS working team will develop a transition plan away from gasoline vehicles. The baseline comparison is also gasoline vehicles as this is the only propulsion technology available that is suitable for this service. The 2020 Community Shuttle emissions from gasoline vehicles of 2,000 tonnes is expected to stay the same. This represents 1.5 per cent of TransLink's fleet emissions. It is expected that, when appropriate models are market ready, they will be incorporated into the fleet as part of the broader Low Carbon Fleet Strategy.

C. EVALUATION CRITERIA

Please describe how project achieves or works towards each criterion by identifying and reporting on relevant performance measures. Where appropriate, present quantitative information. Please do not exceed 10 pages per project.

Two types of evaluation criteria are identified: Screening Criteria, which represent requirements that are mandatory for any project for which GVRF funding is requested; and Integrated Criteria, which allow for a qualitative assessment of proposed projects based on high priority objectives that reflect the intent of the Federal Gas Tax Fund, of Metro Vancouver goals, and of the Mayors' Council Vision.

Criterion	Description	Assessment (To be completed by MV)
SCREENING CRITERIA		
Eligible Project Category	☐ Local roads and bridges, including active transportation ☒ Public transit	
Eligible Expenses	As set out in the 2014 Administrative Agreement (Schedule C) Eligible Item — Expenditure[1] Community Shuttles (27) — $6,417,000 On-board equipment — $239,660 Total — $6,656,660 *[1] Per Schedule C, Section 1.1, Part a)*	
Plan Consistency	Projects must be consistent with TransLink's Capital Plan, 10-Year Investment Plan, the Regional Growth Strategy and the Regional Transportation Strategy. ☒ 10-Year Investment Plan ☒ Mayors' Council Transportation and Transit Plan ☒ Metro 2040: Shaping our Future ☒ Regional Transportation Strategy	
Corporate Policies	Projects must be consistent with applicable TransLink policies such as sustainability, environmental responsibility, emissions and infrastructure. ☒ Sustainability policy ☒ Environmental policy ☐ Emissions policy ☐ Infrastructure policy – n/a	
INTEGRATED CRITERIA		
Regional Growth Strategy		
Supports the Regional Growth Strategy	*The degree to which the project assists in achieving the goals in the Regional Growth Strategy and directions set out in the Metro Vancouver Board Strategic Plan.* ☒ Create a Compact Urban Area ☐ Support a Sustainable Economy ☒ Protect Environment and Respond to Climate Change Impacts ☒ Develop Complete Communities ☒ Support Sustainable Transportation Choices	

Criterion	Description	Assessment (To be completed by MV)
Urban Centres and Frequent Transit Development Areas	*Where applicable, the project is located in, or demonstrates tangible benefits to the overall performance of Urban Centres and Frequent Transit Development Areas.* Community shuttles provide service to communities located outside of major bus routes and hubs and offer an environmentally responsible and sustainable transportation choice to single occupant vehicle travel. These vehicles transport passengers to Urban Centres and Frequent Transit Network (FTNs) to connect remote communities with populous destinations.	
Transportation Performance		
Headline Targets	*Demonstrates tangible beneficial effects on vehicle kilometres travelled and/or walk/cycle/transit/multiple occupancy vehicle mode share.* This is a like-for-like vehicle fleet replacement project with no change in service provided (i.e. incremental vehicle kilometers travelled or shift to walk/cycle/transit/multiple occupancy vehicle mode share).	
Other Transportation Outcomes	*Demonstrates tangible beneficial effects on vehicle congestion, transit passenger congestion, transit ridership, transportation safety, and/or goods movement for the duration of the project.* The replacement shuttles will be low-floor vehicles which will contribute to safety and accessibility.	
Project Type	*Demonstrated value of the project type (refer to section 6).* By maintaining TransLink's assets in a State of Good Repair, vehicles will have fewer breakdowns and service disruptions and operating costs will not increase.	
Regional Environmental Objectives		
Supports the Climate 2050 Strategic Framework and Integrated Air Quality and Greenhouse Gas Management Plan	*Contributes to the achievement of regional climate action and air quality goals, including directions set out in the Metro Vancouver Board Strategic Plan, the Regional Growth Strategy, Climate 2050, and the Integrated Air Quality and Greenhouse Gas Management Plan.* New vehicles built with year 2020 compliant gasoline engines will have lower GHG, NOx, thus reducing the emissions impact of the service provided by the project.	

Criterion	Description	Assessment (To be completed by MV)
	As such, this project supports IAQGGMP strategies 1.1 "Reduce emissions of and public exposure to diesel particulate matter", 1.4 "Reduce air contaminant emissions from cars, trucks, and buses".	
Quantifiable Emissions Impacts	*Achieves quantifiable beneficial impacts on greenhouse gas and common air contaminant emissions relative to baseline transit vehicles and lowers the emissions profile of the transit fleet. The information requirement for this criterion is fulfilled as follows:* 1. *For each transit vehicle project, provide a comparison of the emissions of the project versus the baseline vehicle.* 2. *For the application in aggregate, provide the:* • *Annualized transit fleet emissions in the current year;* • *Plus, incremental changes in transit fleet emissions with full deployment of any proposed expansion, modernized, or refurbished vehicles.* This is a like-for-like replacement. TransLink is currently focusing the Low Carbon Fleet Strategy (with support from the Mayors' Council) on the conventional bus fleet which make up more than 80 % of fleet emissions. Currently there are no suitable market ready battery-electric vehicles that meet the Community Shuttle needs. We consistently conduct market scans for readiness of battery-electric shuttles. The baseline comparison is also gasoline vehicles as this is the only propulsion technology available that is suitable for this service. The 2020 Community Shuttle GHG emissions from gasoline vehicles of 2,000 tonnes are expected to stay the same. This represents 1.5 % of TransLink's fleet emissions.	

Criterion	Description	Assessment (To be completed by MV)
Economic Development		
Supports regional prosperity	*Contributes to a regional transportation system that moves people and goods and aligns with regional prosperity.* Replacement of community shuttles will provide improved reliability of the Community Shuttle fleet, resulting in improved reliability to the regional transportation system, by offering reliable service to more remote communities not close to conventional bus routes and/or hubs. Passengers will continue to have reliable access to populous destinations for work and/or leisure activities, which would avoid otherwise having to rely on single occupant vehicle travel. Further, low-floor shuttles will improve safety and accessibility for people of all abilities.	

APPLICATION FOR FUNDING FROM THE GREATER VANCOUVER REGIONAL FUND FOR FEDERAL GAS TAX FUNDS

Project 3 2023 Conventional Bus Replacement (50 CNG Buses)
(Ref# 222009)

A. 10-YEAR INVESTMENT PLAN

Please describe how the project fits within, and provides support to, the 10-Year Investment Plan

This is a state of good repair project identified for GVRF duding in the 2018 Investment Plan. This project is also included in the draft 2022 Investment plan

B. PROJECT DESCRIPTION

Please complete the following for each project proposed for expenditure from the GVRF.

1. **Executive Summary (not to exceed two pages)**

Project Overview

This project replaces fifty (50) CNG buses with fifty (50) 40' CNG buses. Conventional buses have a life expectancy of 17 years/1,000,000 km. For this reason, the retiring 2006 service year 40' conventional CNG buses currently operating out of the Port Coquitlam Transit Centre (PTC) will be replaced on a one-for-one basis in 2023. The new buses will operate out of the Hamilton Transit Centre (HTC) and PTC which already have operating CNG facilities.

TransLink's corporate priority is to ensure a state of good repair. The purchase of fifty new CNG buses to replace retiring CNG buses is in alignment with this goal. The main benefit will be providing more reliable service with new buses, avoiding downtime and increasing maintenance costs associated with ageing vehicles.

Criteria for identifying vehicles due for retirement are based on a number of factors, including:

- Age (life expectancy of 17 years);
- Mileage (generally 1,000,000 km);
- State of repair/condition;
- Severity of service duty cycle; and
- Greenhouse gas and air emission reductions

This project is consistent with the 2018 Investment Plan, approved in June 2018 by the Mayors' Council and the TransLink Board. This project is also included in the draft 2022 Investment plan.
TransLink strives to optimize resources by matching service to passenger demand, including allocating vehicles of an appropriate size to serve the demand on a route. This allocation is optimized through continuous review and planning to distribute resources where they are most needed. This process is determined by ridership data, which has been substantially enhanced with the deployment of Compass Card. TransLink has also undertaken recent work to determine optimal fleet propulsion technology on each route, which is interdependent with vehicle size.

Tangible Benefits and Outcomes

The new vehicles will allow CMBC to maintain existing service, reduce downtime, avoid incremental operating and maintenance costs.

Project Budget, Expenses, and GVRF Funding Request

The project budget is $46,047,780 with a Greater Vancouver Regional Fund (GVRF) request of $44,440,000. Expenses covered by this budget primarily include vehicle procurement, ancillary on-board equipment and labour and other miscellaneous project costs. The funding requested in this application will be applied towards expenses considered eligible per the terms of the Administrative Agreement dated April 2014.

Steps taken by TransLink to identify, evaluate, and prioritize the proposed project for inclusion in the Application.

This project was identified for GVRF funding in the 2018 Investment Plan (Appendix A, Table 8). State of good repair projects are prioritized through the annual capital planning process for inclusion in the Investment Plan and GVRF Applications.

2. Project Name

2023 Conventional Bus Replacement (50 CNG Buses) (Ref# 222009)

3. Project Need and Location

The objectives are to maintain high quality customer service while minimizing maintenance and operating costs through continued provision of reliable, fully-accessible transit vehicles that are appropriate for routes on which they operate.

The criteria for achieving these objectives are: avoidance of incremental maintenance and operating costs, reduced vehicle breakdowns, less vehicle downtime, improved accessibility and fewer reservation cancellations.

Fifty new CNG buses will replace fifty existing CNG buses that are due for retirement. All 50 new CNGs will operate out of PTC and HTC as deemed optimal per the service plan.

4. Project Eligibility (check one):

☐ **Local Roads and Bridges, including active transportation**
☒ **Public Transit**

5. Project Purpose (check one):

☐ **Expansion:** Expands the carrying capacity of people and/or goods movement.
☒ **State of Good Repair:** Replaces or modernizes assets to keep the regional transportation system in a state of good repair.
☐ **Operational Efficiency/Effectiveness:** Improves the efficiency or effectiveness of the regional transportation system.
☐ **Refurbishment:** Extend the useful life of assets to maximize the utility of the regional investment in the transportation system.
☐ **Other (please specify :_____)**

6. Project Type (check one):

☐ **Growth**
☐ **Upgrade**
☐ **Risk (Resilience)**
☒ **Maintenance**
☐ **Opportunity**

7. Project Staging:

Year(s) of Acquisition or Start of Construction	Year of Completion of Construction	Year of Service Initialization	Year(s) of Renewal	Year(s) of End of Service
2023	**2024**	**2024**	**N/A**	**2041**

8. Has the project previously received funding through GVRF? Please explain.

No. This is the first application for GVRF funding for this project.

9. Was GVRF funding previously declined for the project? Please explain.

No. This is the first application for GVRF funding for this project.

10. Is the project anticipated to require additional future GVRF funding? If so, please explain.

No. TransLink is planning to complete this project within budget.

11. Project Cost + Funding

11.a Budget & Expenditures

Budget	Expenditures to Date	Forecast to Complete	Final Forecasted Cost	Variance (budget – final forecasted cost)
$46,047,780	**$0**	**$46,047,780**	**$46,047,780**	**$0**

11.b Project Funding

Prior Approved GVRF Funding	Current Year GVRF Funding Request	Other Funding – Specify source and whether confirmed/pending
$0	**$44,440,000**	**N/A**

11.c Project Budget Schedule

Item	2022	2023	2024	2025	2026	2027
GVRF-funded Project Budget		**$18,519,800**	**$25,920,200**			
Total Project Budget		**$19,042,210**	**$27,005,570**			

12. Project Budget Rationale

Describe the types of proposed project expenses to be funded by the Greater Vancouver Regional Fund

a. Explain how the project reflects the intent of the GVRF

This project ensures TransLink's assets are maintained in a State of Good Repair, allowing TransLink to efficiently and effectively provide transit service to the general public.

b. In the absence of GVRF funding, can the project proceed with other funding sources? What risks do the other funding sources present to the project?

No. TransLink relies on GVRF funding for replacement of its revenue vehicle fleets and plans its annual budgets accordingly.

The other source of funding available to TransLink is the Investing in Canada Infrastructure Program (ICIP). The ICIP funding program is focused on infrastructure improvement relating to capacity, quality and safety or, access to public transit systems. The projects chosen by TransLink for GVRF funding are better suited to GVRF funding compared to the other sources of funding.

c. Identify potential risks – corporate and regional – of this project that could result in this project not being completed or being unsuccessful. Describe possible mitigation strategies to address these risks.

TransLink requires these vehicles to be in service for 2023 in order to retire vehicles reaching the end of their useful service lives. There is an approximate lead time of 12 to 18 months between TransLink ordering the vehicles and those vehicles entering service. As such, it is important to have the funding in place to ensure the timely retirement of vehicles before they reach the end of their useful service lives.

If funding is not received in time, TransLink will have to rely on deferred retirement vehicles to deliver transit service. Continued use of deferred retirement vehicles poses a risk to reliability, as well as incremental maintenance costs to keep them in service. This may result in lost opportunities to realize goals of reduced congestion, maintain peak hour service and frequency.

d. How may the project cost vary as a result of changing external factors, such as interest rates and currency exchange rates?

Project costs may vary due to foreign exchange fluctuations (as vehicles are procured from the USA) and vendor pricing. These uncertainties are mitigated with a sufficient contingency allowance to absorb price and foreign exchange fluctuations.

e. How may foreseeable changes in investment, regulation, or policies from other orders of government affect the project?

Due to recent increases in senior government funding for public transit projects, many suppliers are experiencing larger demands to order vehicles. This may create a backlog with vendors, and if procurement is not initiated soon, could result in further delay in ordering and receiving vehicles.

f. How may foreseeable changes in technology affect the project?

This application is based on the new vehicles being powered by Compressed Natural Gas engines. TransLink also has to consider that a number of these vehicles are operated and maintained by contractors who may not be able to support fueling or maintenance for a change in propulsion technology. Advances in Renewable natural gas (RNG) extraction from waste continues to help reduce GHG emissions by capturing methane (CH4) and repurposing as RNG. Additionally,

TransLink does not have the charging infrastructure capacity to support replacing these 50 conventional buses with Batter electric buses until the completion of our Marpole Transit Centre.

g. What other corporate or external factors could alter the project need, scope, budget, or timeline for project delivery?

Project timeline may be affected by manufacturer's capacity and schedules, availability of parts and/or time for vehicle delivery from the manufacturer. The global COVID pandemic may also affect supply chains needed to manufacture the vehicles if further shutdowns are implemented. Budget may fluctuate due to parts pricing and/or foreign exchange.

h. Describe how the project lowers the emissions profile of the transit fleet, for both greenhouse gas and common air contaminant emissions and advances the fleet towards the region's greenhouse gas emissions reduction targets.

This is a like-for-like replacement of naturally gas powered vehicle. In 2019 Translink announced its partnership with FortisBC to source Renewable Natural Gas (RNG) for 100% of its natural gas fleet by 2024. RNG is a carbon neutral energy source as it does not contribute any net carbon dioxide into the atmosphere. Compressed natural gas vehicles, which make up roughly a fifth of TransLink's bus fleet, have close to 21% fewer emissions with 50% reduction in fuel costs versus diesel. RNG offers the same savings while further reducing emissions by an additional 80 per cent versus CNG. Overall reduction in the emission of atmospheric pollutants also helps to improve air quality of the region.

C. EVALUATION CRITERIA

Please describe how project achieves or works towards each criterion by identifying and reporting on relevant performance measures. Where appropriate, present quantitative information. Please do not exceed 10 pages per project.

Two types of evaluation criteria are identified: Screening Criteria, which represent requirements that are mandatory for any project for which GVRF funding is requested; and Integrated Criteria, which allow for a qualitative assessment of proposed projects based on high priority objectives that reflect the intent of the Federal Gas Tax Fund, of Metro Vancouver goals, and of the Mayors' Council Vision.

Criterion	Description	Assessment
	SCREENING CRITERIA	
Eligible Project Category	☐ Local roads and bridges, including active transportation ☒ Public transit	Required

Criterion	Description	Assessment
Eligible Expenses	As set out in the 2014 Administrative Agreement (Schedule C) Eligible Item — Expenditure[1] Conventional Bus Replacement (50 CNG) — $43,500,000 On-board equipment — 940,000 Total — $44,440,000 [1] *Per Schedule C, Section 1.1, Part a)*	Required
Plan Consistency	Projects must be consistent with TransLink's Capital Plan, 10-Year Investment Plan, the Regional Growth Strategy and the Regional Transportation Strategy. ☒ 10-Year Investment Plan ☒ Mayors' Council Transportation and Transit Plan ☒ Metro 2040: Shaping our Future ☒ Regional Transportation Strategy	Required
Corporate Policies	Projects must be consistent with applicable TransLink policies such as sustainability, environmental responsibility, emissions and infrastructure. ☒ Sustainability policy ☒ Environmental policy ☒ Emissions policy ☐ Infrastructure policy – n/a	Required
INTEGRATED CRITERIA		
Regional Growth Strategy		
Supports the Regional Growth Strategy	*The degree to which the project assists in achieving the goals in the Regional Growth Strategy and directions set out in the Metro Vancouver Board Strategic Plan.* ☒ Create a Compact Urban Area ☐ Support a Sustainable Economy ☒ Protect Environment and Respond to Climate Change Impacts ☒ Develop Complete Communities ☒ Support Sustainable Transportation Choices	Poor/Good/ Excellent
Urban Centres and Frequent Transit Development Areas	*Where applicable, the project is located in, or demonstrates tangible benefits to the overall performance of Urban Centres and Frequent Transit Development Areas.* Buses provide services to Metro Vancouver communities within TransLink's transportation service region and offer an environmentally responsible and sustainable	Poor/Good/ Excellent

Criterion	Description	Assessment
	transportation alternative to single occupant vehicle travel. They link communities with business, institutional and social hubs and destinations, and facilitate the creation and expansion of Transit Oriented Developments (TODs). They also provide collector and distribution services to Expo, Millennium, Evergreen and Canada Lines, West Coast Express and SeaBus.	
	Transportation Performance	
Headline Targets	*Demonstrates tangible beneficial effects on vehicle kilometres travelled and/or walk/cycle/transit/multiple occupancy vehicle mode share* This is a like for like vehicle fleet replacement project with no change in service provided (i.e. incremental vehicle kilometers travelled or shift to walk/cycle/transit/multiple occupancy vehicles mode share).	Poor/Good/ Excellent
Other Transportation Outcomes	*Demonstrates tangible beneficial effects on vehicle congestion, transit passenger congestion, transit ridership, transportation safety and/or goods movement for the duration of the project.* This is a like for like vehicle fleet replacement project with no change in service provided. As such, there are no incremental benefits tor vehicle congestion, transit passenger congestion, transit ridership and/or transportation safety.	Poor/Good/ Excellent
Project Type	*Demonstrated value of the project type (refer to section 6).* By maintaining TransLink's assets in good repair, vehicles will have fewer breakdowns and service disruptions, operating costs will not increase, and pollutant emissions will be reduced.	Poor/Good/ Excellent
	Regional Environmental Objectives	
Supports the Climate 2050 Strategic Framework and Integrated Air Quality and Greenhouse Gas Management Plan	*Contributes to the achievement of regional climate action and air quality goals, including directions set out in the Metro Vancouver Board Strategic Plan, the Regional Growth Strategy Climate 2050, and the Integrated Air Quality and Greenhouse Gas Management Plan.* This is a like-for-like replacement and the baseline vehicles are CNG, as this is the technology that is	Poor/Good/ Excellent

Criterion	Description	Assessment
	deemed most optimal by TransLink for this particular tranche of vehicle replacements.	
Quantifiable Emissions Impacts	*Achieves quantifiable beneficial impacts on greenhouse gas and common air contaminant emissions relative to baseline transit vehicles and lowers the emissions profile of the transit fleet. The information requirement for this criterion is fulfilled as follows:* *1. For each transit vehicle project, provide a comparison of the emissions of the project versus the baseline vehicle. For the application in aggregate, provide the:* • *Annualized transit fleet emissions in the current year; Plus, incremental changes in transit fleet emissions with full deployment of any proposed expansion, modernized, or refurbished vehicles.* Like-for-like replacement, however it supports IAQGGMP strategies 1.1 "Reduce emissions of and public exposure to diesel particulate matter". This is a like-for-like replacement and the baseline vehicles are CNG powered. TransLink has entered into a phased agreement to purchase of Renewable Natural Gas (RNG) to fuel its fleet of Compressed Natural Gas (CNG) buses by 2024. RNG is a biogas collected from landfills, wastewater treatment plants and manure digesters that is captured, purified and injected into the natural gas supply. By purchasing RNG for our fleet it reduces TransLink's carbon footprint by both collecting methane and CO2 that may have otherwise been emitted into the atmosphere as well as reducing the amount of conventional natural gas needed. Fuel efficiency improvements in the new vehicles is expected to reduce consumption by 2-3%, which will also translate to GHG reductions.	Poor/Good/ Excellent
	Economic Development	
Supports regional prosperity	*Contributes to a regional transportation system that moves people and goods and aligns with regional prosperity.* Replacement of buses will provide improved reliability of the fleet, resulting in improved reliability to the regional transportation system. Passengers will continue to have reliable access to populous destinations for work and/or	Poor/Good/ Excellent

Criterion	Description	Assessment
	leisure activities, which would avoid otherwise having to rely on single occupant vehicle travel.	

APPLICATION FOR FUNDING FROM THE GREATER VANCOUVER REGIONAL FUND FOR FEDERAL GAS TAX FUNDS

Project 4 2023 HandyDART Vehicle Purchase – Replacement
(Ref# 222013)

A. 10-YEAR INVESTMENT PLAN

Please describe how the project fits within, and provides support to, the 10-Year Investment Plan.

This is a state of good repair project identified for GVRF funding in the 2018 Investment Plan. This project is also included in the draft 2022 Investment Plan.

B. PROJECT DESCRIPTION

Please complete the following for each project proposed for expenditure from the GVRF.

1. **Executive Summary (not to exceed two pages)**

Project Overview

HandyDART vehicles are operated and maintained by TransLink's contractors First Canada ULC and Nat's Repair. These vehicles provide a valuable service to people with disabilities and are booked through a reservation system, with each vehicle being able to accommodate up to 2 wheelchairs.

Criteria for identifying vehicles due for retirement are based on a number of factors including:

- Age (life expectancy of 7 years for microbuses and midibuses);
- Mileage (generally 250,000 km);
- State of repair/condition; and
- Severity of service duty cycle.

This project is to replace forty-six (46) HandyDART vehicles that have reached the end of service life and meet criteria for replacement, with 46 new vehicles consisting of 31 microbuses and 15 midibuses. This project is consistent with the 2018 Investment Plan, approved in June 2018 by the Mayors' Council and the TransLink Board.

These vehicles must be replaced when they reach end of service life, because maintenance costs and downtime will increase substantially, affecting passenger service reliability. By 2022, major components (e.g. engine, transmission), minor components (e.g. air conditioning, wheelchair lift), and chassis and body (e.g. cracked frames, rusted doorframes, rotting floors) will be worn out. This project is also included in the draft 2022 Investment Plan.

The vehicles due to retire were acquired in 2015 and 2016, have a median age of 7-8 years and median mileage of 250,000 km. The new vehicles will have a capacity of 8 passengers for microbuses and 12 passengers for midibuses (consistent with vehicles being replaced). TransLink strives to optimize its resource allocation by matching service to passenger demand, which includes allocating vehicles of an appropriate size to serve the demand on a route. Optimization is achieved through continuous review and process planning to allocate resources where they are most needed. TransLink has also undertaken recent work to determine optimal fleet propulsion technology on each route, which is interdependent with vehicle size.

The fleet propulsion technologies currently available to TransLink consist of only conventional gasoline engines, as hybrid gasoline, hybrid diesel or battery-electric propulsion are not available

for these vehicles. Although diesel engines are available for the 31 microbuses being acquired, they are not considered due to the high maintenance costs. Choices of vehicle size and propulsion types will continue to be optimized, as determined by the ongoing monitoring of ridership and propulsion technologies. This may result in the vehicle technology mix changing if it is subsequently determined that a different mix better optimizes our resource allocation.

Tangible Benefits and Outcomes

The new vehicles will allow CMBC to maintain existing service, reduce downtime, and avoid incremental operating and maintenance costs.

Project Budget, Expenses, and GVRF Funding Request

The project budget is $6,960,731 with a GVRF funding request of $6,771,000. Expenses covered by this budget primarily include vehicle procurement, ancillary onboard equipment and labour, and other miscellaneous project costs. The funding requested in this application will be applied towards expenses considered eligible per the terms of the Administrative Agreement.

Steps taken by TransLink to identify, evaluate, and prioritize the proposed project for inclusion in the application.

This project was identified for GVRF funding in the 2018 Investment Plan (Appendix A, Table 8) and is a state of good repair project. State of good repair projects are prioritized through the annual capital planning process for inclusion in the Investment Plan and GVRF Applications. This state of good repair project ensures that TransLink can deliver the HandyDART service outlined in the 2018 Plan.

2. Project Name

2023 HandyDART Vehicle Purchase – Replacement (Ref# 222013)

3. Project Need and Location

The objective is to maintain high quality customer service while reducing maintenance and operating costs and continuing to provide reliable, fully accessible transit vehicles.

The criteria for achieving these objectives are avoidance of incremental maintenance and operating costs, reduced vehicle breakdowns and vehicle downtime, improved accessibility and fewer reservation cancellations.

HandyDarts are a demand responsive service throughout the region; as such, they do not operate on specific routes.

4. Project Eligibility (check one):

☐ **Local Roads and Bridges, including active transportation**

☒ **Public Transit**

5. Project Purpose (check one):

☐ **Expansion:** Expands the carrying capacity of people and/or goods movement.
☒ **State of Good Repair:** Replaces or modernizes assets to keep the regional transportation system in a state of good repair.
☐ **Operational Efficiency/Effectiveness:** Improves the efficiency or effectiveness of the regional transportation system.
☐ **Refurbishment:** Extend the useful life of assets to maximize the utility of the regional investment in the transportation system.
☐ **Other (please specify :_____)**

6. Project Type (check one):

☐ **Growth**
☐ **Upgrade**
☐ **Risk (Resilience)**
☒ **Maintenance**
☐ **Opportunity**

7. Project Staging:

Year(s) of Acquisition or Start of Construction	Year of Completion of Construction	Year of Service Initialization	Year(s) of Renewal	Year(s) of End of Service
2023	**2024**	**2023**	**N/A**	**2030**

8. Has the project previously received funding through GVRF? Please explain.

No. This is the first application for GVRF funding for this project.

9. Was GVRF funding previously declined for the project? Please explain.

No. This is the first application for GVRF funding for this project.

10. Is the project anticipated to require additional future GVRF funding? If so, please explain.

No. TransLink is planning to complete this project within budget.

11. Project Cost + Funding

11.a Budget & Expenditures

Budget	Expenditures to Date	Forecast to Complete	Final Forecasted Cost	Variance (budget – final forecasted cost)
$6,960,731	$0	$6,960,731	$6,960,731	$0

11.b Project Funding

Prior Approved GVRF Funding	Current Year GVRF Funding Request	Other Funding – Specify source and whether confirmed/pending
$0	$6,771,000	N/A

11.c Project Budget Schedule

Item	2022	2023	2024	2025	2026	2027
GVRF-funded Project Budget		$6,088,000	$683,000			
Total Project Budget		$6,238,730	$722,001			

12. Project Budget Rationale

Describe the types of proposed project expenses to be funded by the Greater Vancouver Regional Fund

a. Explain how the project reflects the intent of the GVRF

This project ensures TransLink's assets are maintained in a state of good repair, to allow TransLink to efficiently and effectively provide transit service to those who have accessibility challenges.

b. In the absence of GVRF funding, can the project proceed with other funding sources? What risks do the other funding sources present to the project?

No. TransLink relies on GVRF funding for replacement of its revenue vehicle fleets and plans its annual budgets accordingly. The other sources of funding available to TransLink is the Investing in Canada Infrastructure Program (ICIP). The ICIP funding program is focused on infrastructure improvement relating to capacity, quality and safety or, access to public transit systems. The projects chosen by TransLink for GVRF funding are better suited to GVRF funding compared to the other sources of funding.

c. Identify potential risks – corporate and regional – of this project that could result in this project not being completed or being unsuccessful. Describe possible mitigation strategies to address these risks.

TransLink requires these vehicles to be in service for 2023 in order to retire vehicles reaching the end of their useful service lives. There is an approximate lead time of 12 to 18 months between TransLink ordering the vehicles and those vehicles entering service. As such, it is important to have the funding in place to ensure the timely retirement of vehicles before they reach the end of their useful service lives.

If funding is not received in time, TransLink will have to rely on deferred retirement vehicles to deliver transit service. Continued use of deferred retirement vehicles poses a risk to reliability, as well as increases incremental maintenance costs to keep them in service. Further, use of deferred retirement vehicles could also result in higher criteria air contaminant (CAC) and GHG emissions than new vehicles.

d. How may the project cost vary as a result of changing external factors, such as interest rates and currency exchange rates?

Project costs may vary due to foreign exchange rates fluctuations (as vehicles are procured from the USA) and vendor pricing. These uncertainties are mitigated with a sufficient contingency allowance to absorb price and foreign exchange fluctuations.

e. How may foreseeable changes in investment, regulation, or policies from other orders of government affect the project?

Due to recent increases in senior government funding for public transit projects, many suppliers are experiencing larger demands to order vehicles. This may create a backlog with vendors, and if procurement is not initiated soon, could result in further delay in ordering and receiving vehicles.

f. How may foreseeable changes in technology affect the project?

This application is based on the new vehicles being powered by conventional gasoline engines. TransLink needs to consider that these vehicles are operated and maintained by contractors who may not be able to support fueling or maintenance for a change in propulsion technology.

TransLink does not anticipate vendors providing alternative fuel/propulsion options for HandyDART vehicles that meet our needs to deliver reliable and cost-effective service to customers in the immediate future. TransLink continues to monitor the vehicle technology industry very closely to identify what options are available in the market, and to evaluate their suitability for its fleet.

Project timeline may be affected by manufacturer's capacity and schedules, availability of parts and/or time for vehicle delivery from the manufacturer. The global COVID-19 pandemic may also

affect supply chains needed to manufacture the vehicles if shutdowns occur. Budget may fluctuate due to parts pricing and/or foreign exchange rates.

g. What other corporate or external factors could alter the project need, scope, budget, or timeline for project delivery?

h. Describe how the project lowers the emissions profile of the transit fleet, for both greenhouse gas and common air contaminant emissions and advances the fleet towards the region's greenhouse gas emissions reduction targets.

This is a like-for-like replacement. TransLink is currently focusing the Low Carbon Fleet Strategy (LCFS) (with support from the Mayors' Council) on the conventional bus fleet which make up more than 80 per cent of fleet emissions. The conventional bus fleet transition to battery-electric buses is the biggest opportunity for GHG reductions, and the main focus of the LCFS. Currently there are no suitable market ready battery-electric vehicles that meet the HandyDART service needs. We consistently conduct market scans for readiness of battery-electric shuttles. When suitable battery-electric vehicles for this service are available, the LCFS working team will develop a plan to transition away from gasoline vehicles. The baseline comparison is also gasoline vehicles as this is the only propulsion technology available that is suitable for this service. The new HandyDART vehicles will have an upgraded chassis and a new engine that will result in approximately 20% lower fuel consumption and GHG emissions when compared to the vehicles being replaced.

C. EVALUATION CRITERIA

Please describe how project achieves or works towards each criterion by identifying and reporting on relevant performance measures. Where appropriate, present quantitative information. Please do not exceed 10 pages per project.

Two types of evaluation criteria are identified: Screening Criteria, which represent requirements that are mandatory for any project for which GVRF funding is requested; and Integrated Criteria, which allow for a qualitative assessment of proposed projects based on high priority objectives that reflect the intent of the Federal Gas Tax Fund, of Metro Vancouver goals, and of the Mayors' Council Vision.

Criterion	Description	Assessment (To be completed by MV)
SCREENING CRITERIA		
Eligible Project Category	☐ Local roads and bridges, including active transportation ☒ Public transit	
Eligible Expenses	As set out in the 2014 Administrative Agreement (Schedule C)	

Criterion	Description	Assessment (To be completed by MV)
	Eligible Item — Expenditure[1] HandyDART vehicles (46) — $6,679,000 On-board equipment — 92,000 Total — $6,771,000 *[1] Per Schedule C, Section 1.1, Part a)*	
Plan Consistency	*Projects must be consistent with TransLink's Capital Plan, 10-Year Investment Plan, Regional Growth Strategy and the Regional Transportation Strategy.* ☒ 10-Year Investment Plan ☒ Mayors' Council Transportation and Transit Plan ☒ Metro 2040: Shaping our Future ☒ Regional Transportation Strategy	
Corporate Policies	*Projects must be consistent with applicable TransLink policies such as sustainability, environmental responsibility, emissions and infrastructure.* ☒ Sustainability policy ☒ Environmental policy ☐ Emissions policy ☐ Infrastructure policy – n/a	
INTEGRATED CRITERIA		
Regional Growth Strategy		
Supports the Regional Growth Strategy	*The degree to which the project assists in achieving the goals in the Regional Growth Strategy and directions set out in the Metro Vancouver Board Strategic Plan.* ☐ Create a Compact Urban Area ☐ Support a Sustainable Economy ☒ Protect Environment and Respond to Climate Change Impacts ☒ Develop Complete Communities ☒ Support Sustainable Transportation Choices	
Urban Centres and Frequent Transit Development Areas	*Where applicable, the project is located in, or demonstrates tangible benefits to the overall performance of Urban Centres and Frequent Transit Development Areas.* HandyDART vehicles provide a valuable service to the community for people with disabilities. The service promotes greater mobility for social connectivity, running errands, attending appointments and improving	

Criterion	Description	Assessment (To be completed by MV)
	quality of life. The vehicles also connect disabled people to the current transit network of train stations and bus hubs. HandyDART service operates throughout TransLink's service area.	
	Transportation Performance	
Headline Targets	*Demonstrates tangible beneficial effects on vehicle kilometres travelled and/or walk/cycle/transit/multiple occupancy vehicle mode share.* This is a like-for-like vehicle fleet replacement project with no change in service provided (i.e. incremental vehicle kilometers travelled or shift to walk/cycle/transit mode share).	
Other Transportation Outcomes	*Demonstrates tangible beneficial effects on vehicle congestion, transit passenger congestion, transit ridership, transportation safety, and/or goods movement for the duration of the project.* This is a like-for-like vehicle fleet replacement project with no change in service provided. As such, there are no incremental benefits to vehicle congestion, transit passenger congestion, transit ridership and/or transportation safety.	
Project Type	*Demonstrated value of the project type (refer to section 6).* By maintaining TransLink's assets in good repair, vehicles will have fewer breakdowns and service disruptions, and operating costs will not increase.	
	Regional Environmental Objectives	
Supports the Climate 2050 Strategic Framework and Integrated Air Quality and Greenhouse Gas Management Plan	*Contributes to the achievement of regional climate action and air quality goals, including directions set out in the Metro Vancouver Board Strategic Plan, the Regional Growth Strategy, Climate 2050, and the Integrated Air Quality and Greenhouse Gas Management Plan.* This is a like-for-like replacement and the baseline vehicles are gasoline, as this is the technology that is currently available to TransLink. However, the new HandyDART vehicles will have an upgraded chassis and new engine that will result in approximately 20% lower fuel consumption and GHG emissions.	

Criterion	Description	Assessment (To be completed by MV)
Quantifiable Emissions Impacts	*Achieves quantifiable beneficial impacts on greenhouse gas and common air contaminant emissions relative to baseline transit vehicles and lowers the emissions profile of the transit fleet. The information requirement for this criterion is fulfilled as follows:* 1. *For each transit vehicle project, provide a comparison of the emissions of the project versus the baseline vehicle.* 2. *For the application in aggregate, provide the:* • *Annualized transit fleet emissions in the current year;* • *Plus, incremental changes in transit fleet emissions with full deployment of any proposed expansion, modernized, or refurbished vehicles.* Like-for-like replacement, however it supports IAQGGMP strategies 1.1 "Reduce emissions of and public exposure to diesel particulate matter". This is a like-for-like replacement and the baseline vehicles are gasoline as this is the technology that is currently available to TransLink. The new HandyDART vehicles will have an upgraded chassis and new engine that will result in approximately 20% lower fuel consumption and GHG emissions when compared to the vehicles being replaced.	
Economic Development		
Supports regional prosperity	*Contributes to a regional transportation system that moves people and goods and aligns with regional prosperity.* Replacement of HandyDART vehicles will provide improved reliability to the regional transportation system, resulting in improved service reliability to people with disabilities. Passengers will have better access to conventional bus routes and hubs, train stations, healthcare providers, and social functions. Passengers will enjoy a better quality of life and benefit from greater independence.	

APPLICATION FOR FUNDING FROM THE GREATER VANCOUVER REGIONAL FUND FOR FEDERAL GAS TAX FUNDS

Project 5 Next Generation SeaBus Design
(Ref# 212024)

A. 10-YEAR INVESTMENT PLAN

Please describe how the project fits within, and provides support to, the 10-Year Investment Plan.

This is a state of good repair project identified for Greater Vancouver Regional Fund (GVRF) funding in the draft 2022 Investment Plan

B. PROJECT DESCRIPTION

Please complete the following for each project proposed for expenditure from the GVRF.

1. **Executive Summary (not to exceed two pages)**

Project Overview

SeaBus vessel M/V Burrard Beaver entered service in 1977 at the start of SeaBus service. Beaver has been in service for 45 years and is now operating beyond its expected design life of 40 years. The Burrard Beaver is currently used as a spare vessel to maintain service reliability. It requires replacement to maintain an overall state-of-good repair of the SeaBus fleet.

Criteria for identifying vehicles due for retirement are based on a number of factors including:

- Age (life expectancy of 40 years for diesel operated SeaBus);
- Mileage (SeaBus replaces main engines on a 30,000 hr schedule);
- State of repair/condition
- Severity of service duty cycle; and
- Greenhouse gas and air emission reductions

These vehicles must be replaced when they reach end of service life, because of higher maintenance costs and because service reliability could be compromised at times when the main vessels are out of service, affecting passenger service reliability and quality.

Beaver's operation is subject to Lloyds Register and Transport Canada regulations. Beaver is a grandfathered vessel and its ability to continue to meet regulations past 2025 is not guaranteed. SeaBus is currently renewing the exemptions in place for hull.

The Next Generation SeaBus has been identified as being suitable for battery electric propulsion. A zero emission battery-electric Next Generation SeaBus will eliminate significant GHG and criteria air contaminant emissions in support of TransLink's 2050 emissions reduction targets as well as Metro Vancouver's Climate 2050 Regional targets. The scope of this project will complete the design process, review design proposals and select the preferred proponent to complete the final design-build.

Tangible Benefits and Outcomes

The choice of zero emission battery-electric Next Generation SeaBus supports the Metro Vancouver's *Integrated Air Quality and Greenhouse Gas Management Plan (IAQGGMP), Metro*

2040, Climate 2050 and TransLink's efforts to reduce emissions under the Low Carbon Fleet Strategy.

This project is a critical requirement for ultimate procurement of the replacement vessel. When procured, the new vessel will allow CMBC to maintain existing service, reduce downtime, and avoid incremental operating and maintenance costs.

Project Budget, Expenses, and GVRF Funding Request

The project budget is $2,652,670 with a GVRF funding request of $2,509,700. Expenses covered by this budget primarily include design-build procurement process and detailed design of the vessel, and other miscellaneous project costs. The funding requested in this application will be applied towards expenses considered eligible per the terms of the Administrative Agreement.

Steps taken by TransLink to identify, evaluate, and prioritize the proposed project for inclusion in the application.

This project was identified for GVRF funding during the development of TransLink's upcoming 2022 Investment Plan. This project is considered a state of good repair project as it will ultimately lead to the replacement of the end of life Beaver Seabus. TransLink's Board of Directors has endorsed the inclusion of this priority project in the 2022 GVRF Application.

2. Project Name

Next Generation SeaBus Design (Ref# 212024)

3. Project Need and Location

The objectives are to maintain service reliability for the fleet as a spare vessel while minimizing maintenance and operating costs through continued provision of reliable, fully-accessible transit vehicles.

The criteria for achieving these objectives are avoidance of incremental maintenance and operating costs, reduced vehicle breakdowns and vehicle downtime and improved accessibility.

Currently, TransLink has two significant environmental targets: an 80 per cent reduction of 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. A zero emission battery-electric Next Generation SeaBus will contribute to improved air quality and enable TransLink's to meet its GHG emission reduction targets. This project will benefit the North Shore and Vancouver -UEL urban centres.

4. Project Eligibility (check one):

☐ **Local Roads and Bridges, including active transportation**

☒ **Public Transit**

5. Project Purpose (check one):

☐ **Expansion:** Expands the carrying capacity of people and/or goods movement.
☒ **State of Good Repair:** Replaces or modernizes assets to keep the regional transportation system in a state of good repair.
☐ **Operational Efficiency/Effectiveness:** Improves the efficiency or effectiveness of the regional transportation system.
☐ **Refurbishment:** Extend the useful life of assets to maximize the utility of the regional investment in the transportation system.
☐ **Other (please specify :_____)**

6. Project Type (check one):

☐ **Growth**
☒ **Upgrade**
☐ **Risk (Resilience)**
☒ **Maintenance**
☐ **Opportunity**

7. Project Staging:

Year(s) of Acquisition or Start of Construction	Year of Completion of Construction	Year of Service Initialization	Year(s) of Renewal	Year(s) of End of Service
2022	**2023**	**N/A**	**N/A**	**N/A**

8. Has the project previously received funding through GVRF? Please explain.

No. This is the first application for GVRF funding for this project.

9. Was GVRF funding previously declined for the project? Please explain.

No. This is the first application for GVRF funding for this project.

10. Is the project anticipated to require additional future GVRF funding? If so, please explain.

Yes. TransLink will seek GVRF funding for the construction phase, if no alternative funding programs are available.

11. Project Cost + Funding

11.a Budget & Expenditures

Budget	Expenditures to Date	Forecast to Complete	Final Forecasted Cost	Variance (budget – final forecasted cost)
$2,652,670	$0	$2,652,670	$2,652,670	$0

11.b Project Funding

Prior Approved GVRF Funding	Current Year GVRF Funding Request	Other Funding – Specify source and whether confirmed/pending
$0	$2,509,700	N/A

11.c Project Budget Schedule

Item	2022	2023	2024	2025	2026	2027
GVRF-funded Project Budget	$635,000	$1,874,700				
Total Project Budget	$677,840	$1,974,830				

12. Project Budget Rationale

Describe the types of proposed project expenses to be funded by the Greater Vancouver Regional Fund

a. Explain how the project reflects the intent of the GVRF

This project ensures TransLink's assets are maintained in a state of good repair, allowing TransLink to efficiently and effectively provide transit service to the general public. Replacing diesel vessel with battery-electric will contribute to lowering the fleet's GHG emissions, NOx and diesel particulate matter which aligns with Metro Vancouver's IAQGGMP, Metro 2040 and Climate 2050 goals.

b. In the absence of GVRF funding, can the project proceed with other funding sources? What risks do the other funding sources present to the project?

No. TransLink relies on GVRF funding for replacement of its revenue vehicle fleets and plans its annual budgets accordingly. The other sources of funding available to TransLink is the Investing in Canada Infrastructure Program (ICIP). The ICIP funding program is focused on infrastructure improvement relating to capacity, quality and safety or, access to public transit systems. The

projects chosen by TransLink for GVRF funding are better suited to GVRF funding compared to the other sources of funding.

c. Identify potential risks – corporate and regional – of this project that could result in this project not being completed or being unsuccessful. Describe possible mitigation strategies to address these risks.

If funding is not received in time, TransLink will have to rely on deferred retirement vehicles to serve as a spare vessel. Continued use of deferred retirement vehicles poses a risk to reliability, as well as incremental maintenance costs to keep them in service. Lack of a reliable spare vessel may result in lost opportunities to realize goals of reduced congestion, improved peak hour service and frequency by comprising overall service reliability of the SeaBus fleet.

Further, converting the diesel vessel is to a battery-electric vessel, will help accelerate TransLink's ability to meet internal GHG targets, along with actions supporting Metro Vancouver GHG and air quality efforts.

d. How may the project cost vary as a result of changing external factors, such as interest rates and currency exchange rates?

Project costs may vary due to foreign exchange rates fluctuations and vendor pricing. These uncertainties are mitigated with a sufficient contingency allowance to absorb price and foreign exchange fluctuations.

e. How may foreseeable changes in investment, regulation, or policies from other orders of government affect the project?

Beaver's operation is subject to Lloyds Register and Transport Canada regulations. Beaver is a grandfathered vessel and its ability to continue to meet regulations past 2025 is not guaranteed. SeaBus is currently renewing the exemptions in place for its hull. Accordingly, if the design of the next vessel is not completed per current schedule, for ultimate completion of the vessel, it may have impacts on our ability to maintain service reliability.

f. How may foreseeable changes in technology affect the project?

This application is based on the new vessel being zero emission battery-electric powered. TransLink has taken into account the upgrades necessary to its existing infrastructure, as well as the opportunity to transition to zero emissions vessel, in arriving at a decision on zero emission battery-electric technology.

Changes in battery-electric vehicles and charging technology are expected and will continually improve. Innovation in battery and charging technology is beneficial.

g. What other corporate or external factors could alter the project need, scope, budget, or timeline for project delivery?

Project timeline may be affected by vendors' capacity and schedules. The global COVID-19 pandemic may also affect availability of consultants needed to complete this project if shutdowns occur.

h. Describe how the project lowers the emissions profile of the transit fleet, for both greenhouse gas and common air contaminant emissions and advances the fleet towards the region's greenhouse gas emissions reduction targets.

TransLink undertook a propulsion study in 2020 to determine the preferred propulsion type for the Next Generation SeaBus vessel with the study recommending a battery electric propulsion system as a viable alternative to the current diesel direct drive model used on first and second generation vessels. A zero emission battery electric SeaBus would save approximately 430,000l of diesel fuel per year, eliminate the emission of 1130 tonnes CO2/yr and associate NOx and PM emissions. Infrastructure feasibility study is currently underway to determine the associated impacts, costs, and viability to implement a battery electric vessel for SeaBus service. Infrastructure feasibility study is currently underway to determine the associated impacts, costs, scope, and high-level design to implement electric vessel charging at both north and south terminals respectively. Study findings will be used to flesh out vessel performance requirements and future construction and implementation schedule.

C. EVALUATION CRITERIA

Please describe how project achieves or works towards each criterion by identifying and reporting on relevant performance measures. Where appropriate, present quantitative information. Please do not exceed 10 pages per project.

Two types of evaluation criteria are identified: Screening Criteria, which represent requirements that are mandatory for any project for which GVRF funding is requested; and Integrated Criteria, which allow for a qualitative assessment of proposed projects based on high priority objectives that reflect the intent of the Federal Gas Tax Fund, of Metro Vancouver goals, and of the Mayors' Council Vision.

Criterion	Description	Assessment (To be completed by MV)
SCREENING CRITERIA		
Eligible Project Category	☐ Local roads and bridges, including active transportation ☒ Public transit	
Eligible Expenses	As set out in the 2014 Administrative Agreement (Schedule C) Eligible Item — Expenditure[1] Next Generation SeaBus Design — $2,509,700 Total — $2,509,700 [1] *Per Schedule C, Section 1.1, Part a)*	
Plan Consistency	*Projects must be consistent with TransLink's Capital Plan, 10-Year Investment Plan, Regional Growth Strategy and the Regional Transportation Strategy.* ☒ 10-Year Investment Plan (Will be included in the 2022 Investment Plan) ☒ Mayors' Council Transportation and Transit Plan ☒ Metro 2040: Shaping our Future ☒ Regional Transportation Strategy	
Corporate Policies	*Projects must be consistent with applicable TransLink policies such as sustainability, environmental responsibility, emissions and infrastructure.* ☒ Sustainability policy ☒ Environmental policy ☒ Emissions policy ☐ Infrastructure policy – n/a	
INTEGRATED CRITERIA		
Regional Growth Strategy		
Supports the Regional Growth Strategy	*The degree to which the project assists in achieving the goals in the Regional Growth Strategy and directions set out in the Metro Vancouver Board Strategic Plan.* ☐ Create a Compact Urban Area ☐ Support a Sustainable Economy ☒ Protect Environment and Respond to Climate Change Impacts ☒ Develop Complete Communities ☒ Support Sustainable Transportation Choices	

Criterion	Description	Assessment (To be completed by MV)
Urban Centres and Frequent Transit Development Areas	*Where applicable, the project is located in, or demonstrates tangible benefits to the overall performance of Urban Centres and Frequent Transit Development Areas.* SeaBus provides services to Metro Vancouver communities within TransLink's transportation service region and offer an environmentally responsible and sustainable transportation alternative to single occupant vehicle travel. They link communities with business, institutional and social hubs and destinations, and facilitate the creation and expansion of Transit Oriented Developments (TODs). They also connect with services such as bus and rail transit.	
Headline Targets	*Demonstrates tangible beneficial effects on vehicle kilometres travelled and/or walk/cycle/transit/multiple occupancy vehicle mode share.* This is a one for one SeaBus replacement project with no change in service provided (i.e. incremental vehicle kilometers travelled or shift to walk/cycle/transit mode share).	
Other Transportation Outcomes	*Demonstrates tangible beneficial effects on vehicle congestion, transit passenger congestion, transit ridership, transportation safety, and/or goods movement for the duration of the project.* This is a one for one SeaBus replacement project with no change in service provided. As such, there are no incremental benefits to vehicle congestion, transit passenger congestion, transit ridership and/or transportation safety.	
Project Type	*Demonstrated value of the project type (refer to section 6).* By maintaining this spare vessel in good repair, our ability to maintain service reliability when the main vessels are out-of service for repairs, will not be compromised.	
	Regional Environmental Objectives	
Supports the Climate 2050	*Contributes to the achievement of regional climate action and air quality goals, including directions set out*	

Criterion	Description	Assessment (To be completed by MV)
Strategic Framework and Integrated Air Quality and Greenhouse Gas Management Plan	*in the Metro Vancouver Board Strategic Plan, the Regional Growth Strategy, Climate 2050, and the Integrated Air Quality and Greenhouse Gas Management Plan.* Operation of a zero-emission battery electric propulsion SeaBus vessel would eliminate GHG, NOx and PM emissions associated with the current diesel direct drive model used on first and second generation SeaBus vessels.	

Quantifiable Emissions Impacts	*Achieves quantifiable beneficial impacts on greenhouse gas and common air contaminant emissions relative to baseline transit vehicles and lowers the emissions profile of the transit fleet. The information requirement for this criterion is fulfilled as follows:* *1. For each transit vehicle project, provide a comparison of the emissions of the project versus the baseline vehicle.* *2. For the application in aggregate, provide the:* • *Annualized transit fleet emissions in the current year;* • *Plus, incremental changes in transit fleet emissions with full deployment of any proposed expansion, modernized, or refurbished vehicles.* If a battery-electric Seabus is procured, it is estimated to reduce CO2 emissions from SeaBus operations by 1,130 MT / year. By replacing the diesel direct drive M/V Burrard Beaver SeaBus for Next Generation battery electric propulsion SeaBus vessel, the diesel fuel usage will be reduced by 430,000 liters per year.	
Economic Development		
Supports regional prosperity	*Contributes to a regional transportation system that moves people and goods and aligns with regional prosperity.* Replacement of this spare SeaBus vessel will allow us to maintain service reliability of the fleet to the regional transportation system.	

To: Finance and Intergovernment Committee

From: Water Committee

Date: September 22, 2021 Meeting Date: November 10, 2021

Subject: **Award of Contract Resulting from Request for Proposal (RFP) No. 20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services**

At its October 14, 2021 meeting, the Water Committee considered the attached report dated September 22, 2021, titled "Award of Contract Resulting from Request for Proposal (RFP) No. 20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services" and endorsed the following recommendations:

a) approve the award of a contract for Phase A work in an amount of up to $7,018,783 (exclusive of taxes) to Hatch Limited resulting from Request for Proposal (RFP) No. 20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services, subject to final review by the Commissioner; and
b) authorize the Commissioner and the Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

Water Committee commented that approval of the Phase A work effectively results in the approval of all three phases of the contract with no recourse. The approval is for Phase A work only; however, the total anticipated contract value is presented for information. Award of subsequent phases of the contract will be brought back to the GVWD Board for approval.

At its October 29, 2021 meeting, the GVWD Board considered and approved the same recommendations.

This report is now before the Finance and Intergovernment Committee for information.

Attachment
Award of Contract Resulting from Request for Proposal (RFP) No. 20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services, dated September 22, 2021 *(Doc# 47745292)*

To: Water Committee
Finance and Intergovernment Committee

From: Roy Moulder, Director, Purchasing and Risk Management, Financial Services
Bob Cheng, Project Manager, Coquitlam Water Supply, Project Delivery

Date: September 22, 2021 Meeting Dates: October 14, 2021 and November 10, 2021

Subject: **Award of Contract Resulting from Request for Proposal (RFP) No. 20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services**

RECOMMENDATION

That the GVWD Board:

a) approve the award of a contract for Phase A work in an amount of up to $7,018,783 (exclusive of taxes) to Hatch Limited resulting from Request for Proposal (RFP) No. 20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services, subject to final review by the Commissioner; and

b) authorize the Commissioner and the Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

EXECUTIVE SUMMARY

The new Coquitlam Main No. 4 will address a capacity shortfall in the existing Coquitlam conveyance system, and also provide additional capacity for the future Coquitlam Lake Water Supply Project. The 12 km long Coquitlam Main No. 4 consists of four sections, including the Central, South, Tunnel and Cape Horn Sections. The 2.3 km long section located in the City of Coquitlam's Town Centre area will be tunneled to reduce construction impacts.

A Request for Proposal No. 20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services was issued on June 10, 2021, and proposals were received from the four proponents short-listed from the Request for Qualifications process (RFQ No. 20-100). Award of a contract for Phase A Preliminary Design in an amount of up to $7,018,783 (exclusive of taxes) to the highest ranked proponent, Hatch Limited, is recommended.

PURPOSE

This report is to advise the GVWD Board of the results of the Request for Proposal (RFP) No. 20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services, and to recommend award of the contract for Phase A work in the amount of up to $7,018,783 (exclusive of taxes) to Hatch Limited.

BACKGROUND

Pursuant to the GVWD *Officers and Delegation Bylaw No. 247, 2014 (Bylaw)* and the *Procurement and Real Property Contracting Authority Policy (Policy)*, procurement contracts that exceed a value of $5 million require the approval of the GVWD Board of Directors.

This report is being brought forward to the Water Committee and the Finance and Intergovernment Committee to consider a recommendation to the GVWD Board to authorize award of a contract for Phase A Preliminary Design Consulting Engineering Services for the Coquitlam Main No. 4 Tunnel.

PROJECT DESCRIPTION

To meet the region's water supply needs and keep pace with regional population growth, an upgrade to the Coquitlam transmission mains is required. The new Coquitlam Main No. 4, consisting of 12 km of water main ranging in diameter from 2.2 m to 3.5 m, will address a capacity shortfall in the existing Coquitlam conveyance system, and also provide additional capacity for the future Coquitlam Lake Water Supply Project. Coquitlam Main No. 4, consisting of the Central, South, Tunnel and Cape Horn Sections, needs to be constructed and commissioned by 2029 to avoid impacting the delivery of water to the southern and eastern areas of the region.

The preliminary design of Coquitlam Main No. 4 was completed in early 2018. In the fall of 2018, City of Coquitlam and Metro Vancouver staff determined that the preliminary alignment through the South Section would pose significant impacts to the community, existing utilities and proposed residential developments, which were not present during the initial alignment assessment. In order to reduce long-term impacts to the City's utilities and developments as well as construction impacts, a tunnel option (see Attachment) was developed by the City of Coquitlam, City of Port Coquitlam and Metro Vancouver staff and approved by the City of Coquitlam Council on February 24, 2020.

The new Coquitlam Main No. 4 Tunnel will be approximately 5 m in diameter and 2.3 km long, and will be excavated deep in the ground using a Tunnel Boring Machine (TBM). The project also includes the construction of two deep vertical entry and exit shafts, 3.5 m diameter welded steel water main inside the shafts and tunnel, and an underground valve chamber adjacent to each shaft to facilitate connection of the new water main to the existing water transmission system.

As a result of the Request for Qualifications (RFQ) No. 20-100 that was publicly advertised on Metro Vancouver's and BC Bid websites, four (4) experienced consultants were shortlisted:

1. Hatch Limited (Hatch);
2. McMillen Jacobs Associates (MMJ);
3. Mott MacDonald Canada Limited (MM); and
4. Stantec Consulting Limited (Stantec).

The shortlisted consultants were invited to respond to the Request For Proposal (RFP) No. 20-287 issued on June 10, 2021. The RFP closed on July 22, 2021 and four (4) consultants submitted proposals, as shown in the following Table:

Table 1: RFP No. 20-287 Proposal Submissions (cost exclusive of taxes)

Proponent	Phase A Preliminary Design	Phase B Detailed Design	Phase C Construction Engineering	Total Cost
Hatch	$7,018,783	$13,061,574	$13,417,376	$33,497,733
MM	$7,846,702	$13,206,432*	$14,963,917*	$36,017,052*
MMJ	$4,641,853	$12,207,136	$12,567,748	$29,416,737
Stantec	$3,066,452	$12,205,864	$12,706,354	$27,978,670

*Total cost adjusted using level of effort prescribed in the RFP for Phases B and C

Proposals were evaluated based on 65% technical and 35% financial. The technical component of the proposals was evaluated by staff from the Project Delivery Department. The financial component was evaluated by staff from the Purchasing and Risk Management Division.

The proposal submitted by Hatch was identified as the highest ranked proposal (highest technical and the third lowest total cost). The proposed staff are highly experienced and have successfully delivered previous tunnelling projects for Metro Vancouver, including the Port Mann Water Supply Tunnel and particularly Annacis Water Supply Tunnel, which has a very similar project risk profile and challenges as the Coquitlam Main No. 4 Tunnel (i.e. similar diameter and length, soft ground tunnelling in urban area in a seismic hazard zone). Their performance on these projects has met expectations. The Project Manager has extensive experience in project management, design and construction of large water tunnels and shafts. The proposal demonstrated a thorough understanding of the scope of work for each phase, including identifying and understanding the key issues, and providing a well thought-out methodology and detailed work plan along with appropriate staff capacity, experience and availability.

For Phase A, the RFP required the proponent to propose the hours. While Hatch's proposal is not the lowest price, their proposal provides a more accurate estimate of the effort required for Phase A and consequently much better value.

Following identification of the highest ranked proposal, negotiations ensued as allowed for in the RFP to seek clarifications regarding the shaft site options assessment study, noise and vibration assessment team lead and potential adjustment of risk analysis lead. Negotiations were completed on September 21, 2021 and Hatch has satisfactorily addressed all of Metro Vancouver's questions. Hatch also confirmed that the budget for Phase A consulting services remains unchanged.

It is recommended to award RFP No. 20-287 Phase A to Hatch Limited in the amount of up to $7,018,783 (exclusive of taxes). Prior to completion of Phase A, and subject to funding approval and satisfactory performance of Phase A, the Corporation and Hatch will enter into discussions to recomfirm the fees associated with Phase B and Phase C services.

ALTERNATIVES

1. That the GVWD Board:
   a) approve the award of a contract for Phase A work in an amount of up to $7,018,783 (exclusive of taxes) to Hatch Limited resulting from Request for Proposal (RFP) No. 20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services, subject to final review by the Commissioner; and
   b) authorize the Commissioner and the Corporate Officer to execute the required documentation once the Commissioner is satisfied the award should proceed.

2. That the GVWD Board terminate RFP No. 20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services, and direct staff to report back to the GVWD Board with options for an alternate course of action.

FINANCIAL IMPLICATIONS

If the GVWD Board approve Alternative 1, a contract will be awarded to Hatch Limited in the amount of up to $7,018,783 (exclusive of taxes) for Phase A work. The approved GVWD budget for design can accommodate the proposed price.

The GVWD Board has the choice to not proceed with Alternative 1, but staff will need further direction on how to proceed with the project. It will result in a delay to the project schedule and is anticipated to add additional costs to the overall project.

CONCLUSION

A Request for Proposal (RFP) No. 20-287 Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services was issued to four shortlisted firms under RFQ 20-100, and Hatch Limited was identified as the highest ranked proponent overall, although not the lowest fee.

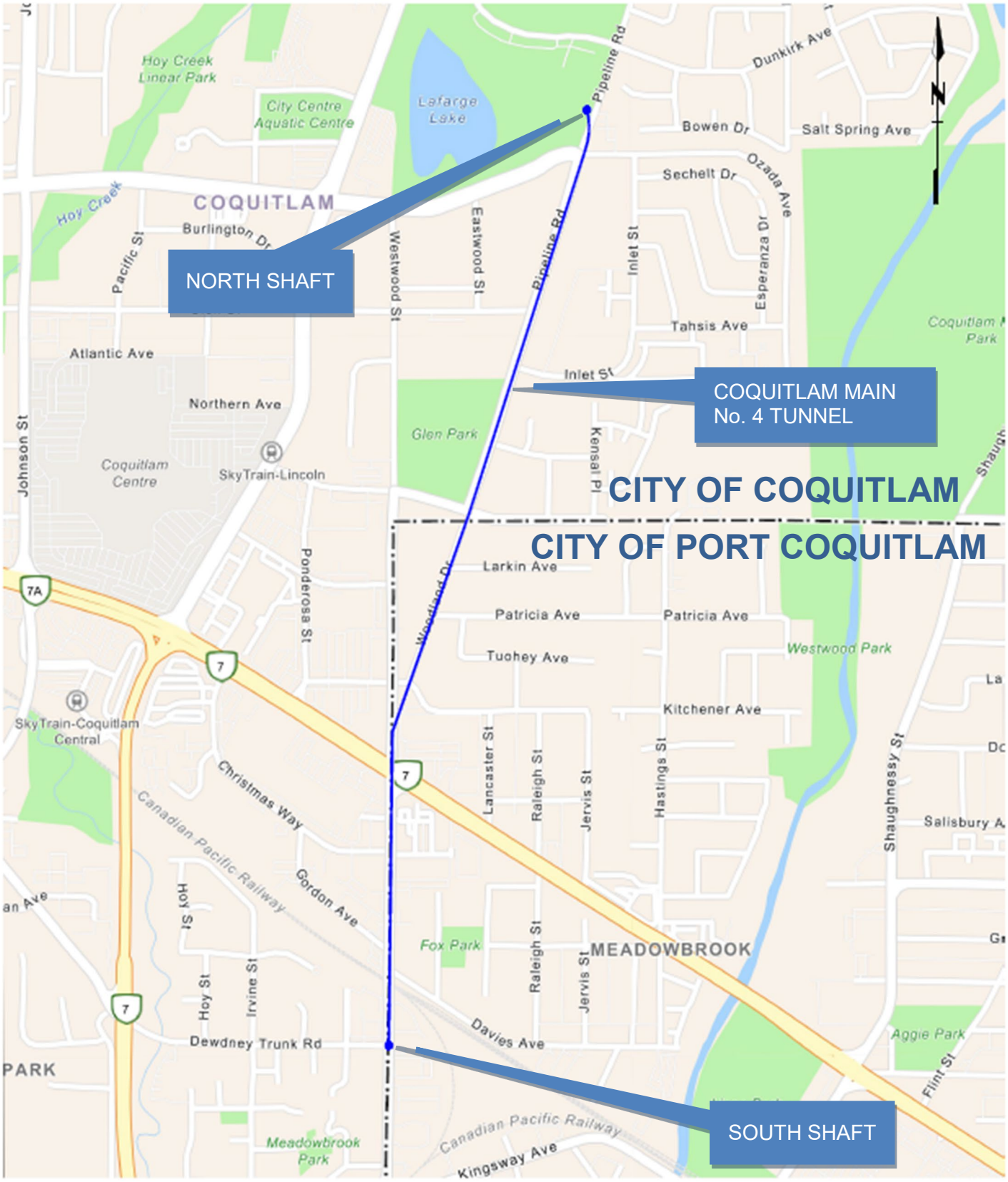
Based on the evaluation of the proposals in response to RFP No. 20-287: Coquitlam Main No. 4 Tunnel – Preliminary Design, Detailed Design and Construction Consulting Engineering Services, it is recommended that the Board authorize the Commissioner and the Corporate Officer to award and execute a contract to Hatch Limited in the amount of up to $7,018,783 (exclusive of taxes) for Phase A work.

Attachment

Coquitlam Main No. 4 Tunnel Alignment

47745292

COQUITLAM MAIN No. 4 TUNNEL ALIGNMENT



47745292

metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Liquid Waste Committee
Finance and Intergovernment Committee

From: Brett Young, Director, Major Projects, Project Delivery

Date: October 29, 2021 Meeting Dates: November 4, 2021 and November 10, 2021

Subject: **Iona Island Wastewater Treatment Plant Projects – Revised Design Concept**

RECOMMENDATION

That the GVS&DD Board endorse the revised design concept for the Iona Island Wastewater Treatment Plant projects, as presented in the report dated October 29, 2021 titled "Iona Island Wastewater Treatment Plant Projects – Revised Design Concept"; and direct staff to finalize the project definition report for Board approval in March 2022.

EXECUTIVE SUMMARY

Staff recommend a revised design concept for the Iona Island Wastewater Treatment Plant (IIWWTP) projects that includes the flexibility of implementing one of two proven secondary treatment process technologies, Membrane Bioreactor or Aerobic Granular Sludge. These secondary treatment technologies have a more compact footprint and provide a potential capital cost savings of ~10% relative to the earlier design concept. The revised design concept also addresses solids handling concerns while improving on constructability challenges and offering the potential for a reduced construction duration. There are no material changes to the ecological restoration projects, resource recovery opportunities or intended Iona Beach Regional Park uses.

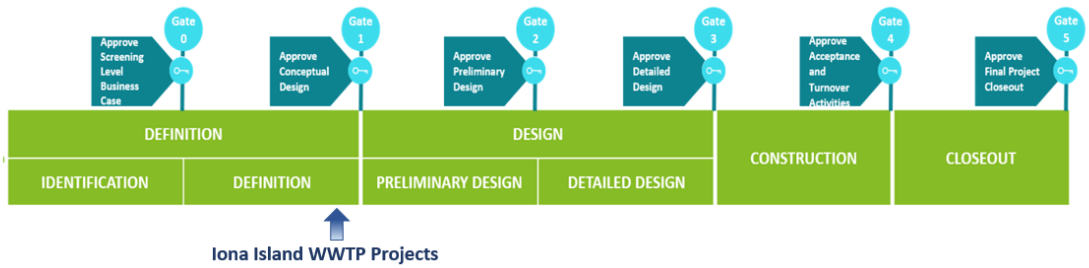
This recommendation was informed by input from an external expert panel and engagement with member jurisdictions, key stakeholders, the public and First Nations. Member jurisdiction staff remain interested in and concerned about household rate impacts from this major capital project.

Further evaluation will be done to refine the design, and validate expected performance and costs for the IIWWTP upgrade, and additional information will be presented with the final conceptual design and project definition report to committees and Board in March 2022.

PURPOSE

To present the revised design concept for the Iona Island Wastewater Treatment Plant projects for Board endorsement, so that staff can finalize the project definition report for Board approval in March 2022. This represents Gate 1 in Metro Vancouver's *Stage Gate Approval Process* (Figure 1).

Figure 1: Iona Island Wastewater Treatment Plant projects reaching stage gate 1.



BACKGROUND

At its July 30, 2021 meeting, an information report (Reference 1) was presented to the GVS&DD Board that identified a number of challenges to the earlier design concept. These challenges all contributed to higher estimated capital costs than originally anticipated and impacts to the schedule forecasting that the secondary treatment upgrade would be completed in approximately 2034, which is four years later than the regulatory deadline.

The information report presented preliminary cost and schedule information and identified steps underway to address the challenges. These steps included engaging an external expert panel, additional value engineering, and evaluation of options recommended to reduce costs or increase value. Staff also noted Metro Vancouver would engage member jurisdictions, key stakeholders, the public and First Nations on any revised aspects of the projects.

The July 2021 report also noted that staff would report back to the Board in November 2021 with recommended changes to the earlier design concept to address the challenges and seek Board endorsement of a revised design concept to enable staff to finalize the project definition.

ADDRESSING THE CHALLENGES

Challenge Review by External Expert Panel

An external panel of global experts undertook a value engineering exercise in June and July 2021 to challenge the earlier design concept and identify potential cost-saving and value-added opportunities. This process was led by technical specialists who have not been involved in the process to date with expertise in:

- wastewater treatment process design;
- operations and maintenance of large-scale municipal wastewater plants;
- geotechnical engineering, ground improvements and seismic design;
- landscape architecture and ecological restoration projects; and,
- constructability and the successful delivery of large infrastructure projects.

The external expert panel was given a broad mandate to review not only the challenges identified by the project team, but to also identify any other potential concerns with the earlier design concept, and to recommend opportunities to improve the value of the projects in terms of improved operations, reduced cost of construction, and lower total costs of ownership.

Expert Panel Recommendations

As part of the Challenge Review process, the expert panel made a total of 35 recommendations in the following three focus areas:

- wastewater treatment plant process design;
- ecological, community/park integration, and resource recovery; and
- construction considerations.

Many of the recommendations were consistent with value-engineering opportunities identified by the project and consultant teams.

A number of the recommendations, in particular those related to construction considerations and ecological, community and park integration, are applicable to later stages of the projects beyond the current project definition phase and will be further assessed at that time.

To address the cost and other challenges identified in the July 2021 Board report, the expert panel made specific recommendations related to:

1. wastewater treatment process design options, including technologies with more compact footprints to offset the high costs of ground improvements; and,
2. further characterization of site geology and additional seismic design modelling to refine ground improvement cost estimates.

Additional seismic modelling is being done as part of the next steps to finalize the project definition report.

Recommendations related to wastewater treatment process options were further evaluated. As part of a structured decision making process, and in consultation with the expert panel, a short-list of three technology options was developed for further detailed evaluation against the earlier design concept.

Review and Evaluation of Options

The short-listed technology options selected for detailed evaluation were:

- Option 1: Base Case (July 2020 Board-endorsed design concept, Reference 2)
- Option 1A: Modified Base Case
- Option 2: Membrane Bioreactor
- Option 3: Aerobic Granular Sludge

All of these are proven technologies for secondary level treatment of municipal wastewater and were considered earlier in the project definition.

Preliminary layouts to address the challenges were developed for each option with a focus on maintaining traditional views for the Musqueam Indian Band and the goal of providing a net gain in quality land for Iona Island Beach Regional Park. Park land gain would be achieved through conversion of existing lagoons to wetland habitat and other proposed ecological restoration projects. Important elements of the projects related to resource recovery opportunities, the ecological restoration projects and intended park uses are not materially different for any of the options.

Table 1: Summary of key advantages, disadvantages, and trade-offs for IIWWTP project options

Option	Advantages	Disadvantages
1 – July 2020 Design Concept	• Layout of WWTP facilities all within GVS&DD owned lands • Familiar to MV operations with migration path to advanced technologies in future	• Interim trucking of sludge to other WWTPs for ~7-year period • Challenges related to constructability and contract packaging flexibility
1A – Modified Base Case	• Eliminates need for interim sludge handling by constructing new digestion capacity concurrent with liquid treatment upgrades	• Footprint encroaches significantly onto park land; ecologically fragmenting parkland

Option	Advantages	Disadvantages
	• Reduces challenges with constructability and contract packaging flexibility	• Largest footprint with increased ground improvement costs
2 – Membrane Bioreactor	• Most compact secondary treatment footprint option with limited impact on MV park land • Addresses solids handling and constructability challenges	• Option with highest energy demand and higher O&M costs • Regular replacement of membranes required every 10 to 12 years
3 – Aerobic Granular Sludge	• Leading technology with lower O&M costs gaining traction and adoption globally • Addresses solids handling and constructability challenges	• Limited number of working installations at similar scale and complexity • Proprietary technology with only single supplier in the market

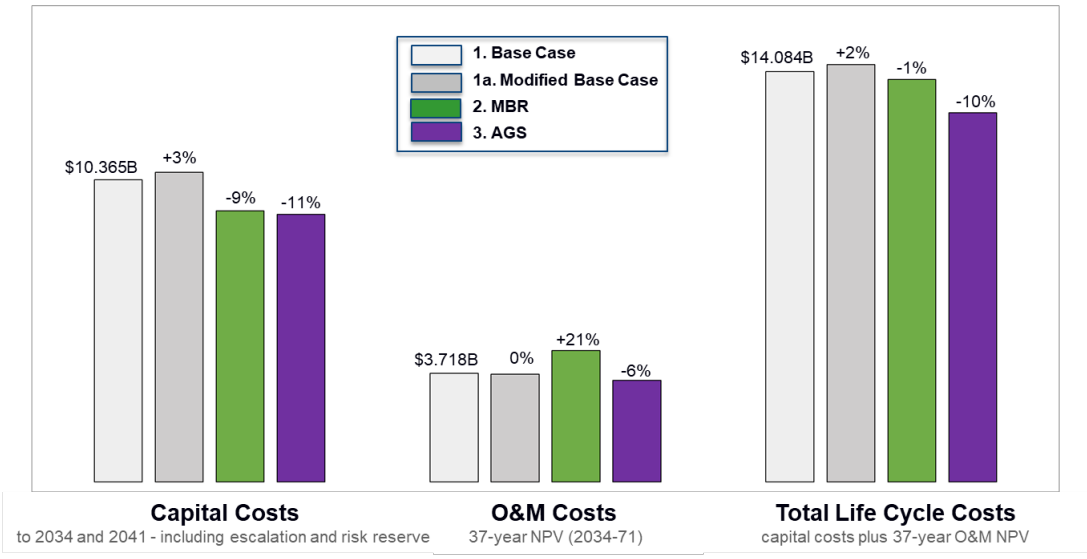
More detailed results from the evaluation of the options is provided in the following section.

RESULTS OF OPTIONS EVALUATION

Preliminary Cost Comparison

Capital and O&M cost estimates (Class 4) were developed, using Metro Vancouver's *Best Practice Project Estimating Framework*, for the three options and compared to Class 3 cost estimates for the base case (July 2020 design concept) as shown in the following figure. This figure is for the initial projects only and does not include costs of future upgrades or expansions.

Figure 2: Preliminary cost comparisons of options being evaluated



Key points from the above figure are:

- Both options involving more compact footprint secondary treatment technologies provide a potential reduction in capital costs of approximately 9% to 11%, due primarily to lower ground improvement costs.
- The higher O&M costs for the Membrane Bioreactor option offset some of the capital cost savings resulting in only a relatively marginal potential reduction (estimated at 1%) in total life-cycle costs.
- Both capital and O&M costs are lower for the Aerobic Granular Sludge option compared to the Base Case with a potential savings of about 10% in life-cycle costs.

Table 2 below summarizes how the options address each of the challenges identified and other key criteria. This is different from the summary table presented earlier at the time of the Board endorsement of the July 2020 design concept and includes the following changes:

- The first part of the table shows how each option compares in addressing the challenges identified with the earlier design concept (base case).
- The second part of the table shows other key issues where (i) certain criteria from the earlier table have been omitted where these are similar for the options considered, and (ii) new criteria specific to these options have been added where outcomes vary and illustrate some of the trade-offs in the decision process.

Table 2: Addressing the challenges and other key criteria

Summary Evaluation Criteria	Option 1 Base Case	Option 1A Modified Base Case	Option 2 MBR	Option 3 AGS
Addressing the Challenges				
Capital costs	Higher	Higher	Medium	Medium
Operations & maintenance costs	Medium	Medium	Higher	Lower
Total project life cycle costs (2034-71)	Medium	Medium	Medium	Medium
Potential to mitigate regulatory compliance delay	Lower	Lower	Medium	Medium
Avoidance of costs/risks re interim solids handling	Lower	Higher	Higher	Higher
Improve constructability and contract flexibility	Lower	Medium	Medium	Medium
Other Criteria and Trade-Offs				
GHG emissions from operations	Medium	Medium	Higher	Lower
Net gain in regional park land area	Higher	Medium	Higher	Higher
Layout extends to undisturbed east park lands	Lower	Higher	Medium	Medium
Risk of delay related to land tenure issues	Lower	Medium	Medium	Medium
Transition to year-round Nitrogen (nutrient) removal	Medium	Medium	Higher	Medium
Proven at similar scale; multiple technology vendors	Higher	Higher	Medium	Lower

REVISED DESIGN CONCEPT

To address the challenges identified, a revised design concept is recommended for the upgrading of the IIWWTP that involves:

- A modified layout of the treatment plant allowing for concurrent construction of the additional digester capacity, which avoids the need for trucking sludge solids to other regional treatment facilities and also mitigates some of the constructability challenges.
- The flexibility of implementing either the Membrane Bioreactor or the Aerobic Granular Sludge secondary treatment technologies. These more compact technology footprints offer the potential for significant capital cost savings of approximately 10% relative to the earlier design concept while also offsetting the impacts of the above footprint changes.

The revised design concept will meet all goals and objectives set at the start of the project definition, including tertiary level treatment and upgraded odour control systems. The opportunities for resource recovery remain and the ecological restoration projects are unchanged from the earlier design concept.

The project definition report will be completed with the flexibility of selecting either the Membrane Bioreactor or Aerobic Granular Sludge secondary treatment technologies subject to further evaluation during the preliminary design phase.

The upgrade of the IIWWTP will be the largest capital project ever undertaken by Metro Vancouver and additional due diligence is warranted to ensure the most cost-effective project is implemented. These due diligence steps will include:

- undertaking pilot testing of both the Membrane Bioreactor and Aerobic Granular Sludge technologies, as was planned for the earlier design concept; and
- further advancing technical and commercial discussions with potential vendors.

These steps will help to further refine the design, as well as the expected performance and costs of the wastewater treatment process at the scale of the IIWWTP upgrade. Pilot testing is frequently undertaken for large and complex wastewater treatment projects and was also done for Metro Vancouver's Seymour-Capilano Filtration Plant in the 2000s. This will not impact overall project schedule provided that priority delivery tasks (including initiating pilot testing) continue as planned.

IMPACTS TO REGIONAL PARK AND LAND TENURE CHANGES

To address the challenges identified, including providing space on site for the concurrent construction of the additional solids handling facilities, the proposed footprint of the plant includes a limited extension (approximately 3 hectares) into Metro Vancouver Regional District (MVRD) park land. Necessary land tenure changes will be facilitated through a land transfer between MVRD and GVS&DD, which will be subject to decisions by both Boards in 2022. Staff are working closely to develop an agreement that ensures a net gain in quality park land on the island. The land tenure transfer also requires provincial approval, which will include Indigenous Nation and public engagement. More information on the process will be brought forward in reports to MVRD and GVS&DD in 2022.

The limited use of park land to facilitate the layout changes will be more than offset by land tenure changes that would result in a much larger area being transferred to the regional park, including

approximately 18 hectares from GVS&DD, through conversion of existing lagoons to wetland habitat and other proposed ecological restoration projects.

There is a risk of delay to the project should land tenure not be resolved in a timely manner. In this case, layout of the upgraded treatment plant would need to be modified to construct part of the facilities on lands to the west of the existing treatment plant, potentially impacting Musqueam's desired view corridors.

PUBLIC AND FIRST NATIONS ENGAGEMENT

Engagement Activity

Further to extensive project definition engagement activities between June 2018 and February 2021, Metro Vancouver conducted engagement with member jurisdictions, the public, key stakeholders, and First Nations from July 30 to October 22, 2021. Staff provided updates and sought feedback on aspects of the projects that could, based on the work undertaken to address the challenges, result in revisions to the design concept that was presented during previous project engagement.
Engagement topics included:

- project cost and schedule estimates for the earlier design concept; and
- treatment technology and plant footprint for the earlier Board-endorsed design concept and three other short-listed technology options.

Table 3: Engagement activities by audience

Audience	Engagement Activity	Date(s)
Member jurisdiction staff	Update presentations at Vancouver Sewerage Area meetings	September 14, 2021 October 12, 2021
	Presentation to City of Vancouver Corporate Leadership Team	October 7, 2021
	Presentations to Regional Engineers Advisory Committee (REAC), Regional Finance Advisory Committee (RFAC), and Regional Administrators Advisory Committee (RAAC)	September 16, 2021 (REAC and RAAC only) October 18, 2021
First Nations	Project update letter including offer to meet	August 24, 2021
	Engagement letter with discussion guide and offer to meet	September 27, 2021
Musqueam Indian Band	Staff to staff meeting	July 30, 2021 September 14, 2021
	Project update letter	August 24, 2021
	Engagement letter with discussion guide with offer to meet	September 27, 2021
Public engagement	Online public comment period (39 participants)	September 27 to October 22, 2021
	Online community meetings (55 participants)	October 12 and 14, 2021
Key stakeholders	Meeting with Vancouver Airport Authority (YVR)	September 22, 2021
	Meeting with Deering Island Homeowners Society	September 24, 2021
	Meeting with Georgia Strait Alliance	September 29, 2021
	Meeting with Vancouver Fraser Port Authority	October 4, 2021
	Meeting with birders and naturalists	October 18, 2021

Meetings with the other groups and agencies also took place during this period to discuss regulatory issues and potential funding opportunities: Environment and Climate Change Canada; Infrastructure Canada; Canadian Infrastructure Bank; federal members of parliament; BC Ministry of Environment and Climate Change Strategy; BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development; BC Ministry of Transportation and Infrastructure; and BC Ministry of Municipal Affairs.

The methods used to promote public engagement and further details on activities are provided in an engagement summary (Attachment 1).

Engagement Feedback

Feedback was provided to Metro Vancouver during meetings, via the online public comment period, and in 13 separate submissions. All feedback received during the engagement period is provided in the engagement summary.

Table 4: Key issues raised during fall 2021 engagement, with Metro Vancouver staff responses

Audience	Key comments/questions/issues	Metro Vancouver (MV) response
Member jurisdiction staff and public audiences	Concern expressed with potential impacts to household rates; interest in receiving further information on these impacts when available.	At the July 30, 2021 Board meeting, staff presented preliminary household rate impacts for the July 2020 design concept. Estimated rate impacts for the revised design concept cannot be updated until cost estimates, schedule, and cash flows are further refined – this information will be presented to committees and Board in March 2022 with the final conceptual design and project definition report. Based on the evaluation to date, the revised design concept provides a potential capital cost savings of ~10% relative to the earlier design concept.
Musqueam Indian Band staff	Concern that Metro Vancouver's (MV's) Iona Island Wastewater Treatment Plant history video doesn't speak to the negative impacts the treatment plant has had on the Musqueam community. Also noted an opportunity to highlight how Musqueam and MV have moved from a place of no consultation, to the immersive and collaborative work being done today.	Comments noted. MV removed the video from the project website and provided the script to Musqueam staff to obtain feedback and integrate revised collaborative content into a revised video.
	Interest in MV sharing a preliminary permit review with Musqueam to help them identify and analyze permits of interest.	MV will share a preliminary permit framework for Musqueam's review.
Public and community members	Desire for higher level of treatment.	The revised design concept includes tertiary level wastewater treatment, exceeding regulatory requirements and providing adaptability to incorporate future advancements in treatment technology.

Audience	Key comments/questions/issues	Metro Vancouver (MV) response
	Preference indicated for Membrane Bioreactor secondary treatment technology in several submissions following public meetings.	This is one of two treatment technologies that will be studied further.
	Desire for increased communications regarding the projects and for MV to share updates regarding cost estimates and schedule.	In September 2021, MV commenced a quarterly email newsletter to provide regular project updates. Refined cost estimates and schedules will be presented to committees and Board in March 2022 as part of the conceptual design and project definition report. The revised design provides a potential capital cost savings of ~10% relative to the earlier design concept and the potential for a reduced construction duration.
	Desire to protect and enhance Iona Island's ecology and habitat for birds and fish.	This is a primary goal of the ecological restoration projects.
Deering Island Homeowners Society	Concern with the proposed location of the materials transport barge berth related to noise and visual impacts.	Concern noted. MV has explored other locations and has determined them infeasible from a property, permitting, and scheduling perspective. Barge berth operations will be restricted to 12 hours a day. MV will continue to provide updates to Deering Island residents including information on permitting requirements.
Georgia Strait Alliance / Obabika	Interest in learning more about the two alternate technologies evaluated as options to the July 2020 design concept.	MV provided responses to technical questions from Georgia Strait Alliance regarding the two alternate technologies in the September 29, 2021 meeting and provided further information in a follow up email.
	Concern with missing 2030 regulatory deadline for secondary treatment, and that secondary and tertiary treatment will not be in effect until 2034.	Concern noted. The revised design concept provides the potential for a reduced construction duration and MV is proceeding with priority delivery tasks immediately to mitigate further schedule impacts.
Birders and naturalists	Desire to limit plant footprint encroachment into MV Parks land.	MV is committed to a net gain in MV Parks land.
	Desire to ensure protection of birds and bird habitat throughout construction and operation of the IIWWTP.	Protection of bird habitat is one of the key objectives of the ecological restoration projects, and the impact of construction activities on wildlife and habitat will be mitigated where possible.
	Concern with dewatering of the sewage lagoons and potential for altering island ecological function; desire for detailed assessment of bird diversity / abundance within and around lagoons before commencing dewatering; desire for monitoring programs for lagoons	Lagoon dewatering is needed as a priority to maintain construction schedule. MV will work with birder groups during preliminary design to limit and mitigate the impacts to birds and their habitat, wherever possible. MV is committed to a net gain in MV Parks land, including the creation of

Audience	Key comments/questions/issues	Metro Vancouver (MV) response
	and adjacent habitat before, during, and after construction.	freshwater habitat as part of the ecological restoration projects.
Vancouver Airport Authority (YVR)	Appreciation for MV's acknowledgement of YVR's concerns surrounding bird habitat and aviation safety. Desire to continue working together to ensure that YVR's concerns are addressed.	Comment noted. MV will contact YVR regarding ongoing engagement through participation in the Technical Advisory Panel for the ecological restoration projects.
	Interest in understanding MV's project schedule and priority delivery activities to assist with YVR's planning and delivery of its planned projects in the coming years.	MV will continue to meet with YVR on a regular basis to share information as the projects progress.
Vancouver Fraser Port Authority (VFPA)	Interest in understanding if Iona Island was the only site considered for this development, given the identified complexities and associated estimated costs.	Other locations for the upgrade were studied in 2008/09 but deemed unfavourable for cost, property, permitting and environmental reasons. This was further validated when project definition resumed in 2018 and as part of recent challenge review and value engineering exercises.
	Interest expressed in being involved in the Technical Advisory Panel for the ecological restoration projects.	MV will contact YVR regarding participation in the Technical Advisory Panel for the ecological restoration projects.

An engagement report documenting feedback received since the start of project definition engagement in June 2018 will be provided with the project definition report in March 2022. The report will include how Metro Vancouver is integrating and/or taking action on feedback received to inform the design of the plant and ecological projects.

Further engagement is planned for the preliminary design phase that will follow project definition. Additional engagement activities will be undertaken, as required, to support ongoing priority delivery tasks and related permitting requirements.

NEXT STEPS

Following Board endorsement of the revised design concept, staff will refine the conceptual design, including budget and expected rate impacts, and finalize the project definition report for presentation to committees and Board in March 2022.

ALTERNATIVES

1. That the GVS&DD Board endorse the revised design concept for the Iona Island Wastewater Treatment Plant projects, as presented in the report dated October 29, 2021 titled "Iona Island Wastewater Treatment Plant Projects – Revised Design Concept"; and direct staff to finalize the project definition report for Board approval.

2. That the Board receive for information the report dated October 29, 2021 titled "Iona Island Wastewater Treatment Plant Projects – Revised Design Concept" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

The revised design concept does not impact the Phase 1 budget (2022 to 2026) and provides a potential capital cost savings of approximately 10% for the overall project.

At the July 30, 2021 Board meeting, staff presented preliminary household rate impacts for the July 2020 design concept. Rate impacts for the revised design concept will be updated once cost estimates, schedule, and cash flows are further refined. This information will be presented to committees and Board in March 2022 with the final conceptual design and project definition report.

OTHER IMPLICATIONS

The preliminary schedule for the July 2020 design concept shows secondary treatment operational in 2034, four years past the regulatory deadline for compliance. The revised design concept has the potential to accelerate the construction schedule by one to two years, to be confirmed in the final project definition report.

CONCLUSION

Staff recommend a revised design concept for the Iona Island Wastewater Treatment Plant projects incorporating a different secondary treatment technology that requires less land and provides a potential capital cost savings of approximately 10% relative to the earlier design concept. The revised concept includes the flexibility of selecting one of two proven secondary treatment process technologies, Membrane Bioreactor or Aerobic Granular Sludge during the preliminary design phase, when further evaluation will be done to refine the design and validate the expected performance and costs of the IIWWTP upgrade.

The revised design concept addresses solids handling concerns while improving on the constructability challenges. It also offers the potential for a reduced construction duration due to the smaller size of the treatment facilities. There are no material changes to the ecological restoration projects or resource recovery opportunities.

During engagement on the options being evaluated, member jurisdiction staff reiterated their interest in, and concern with, expected household rate impacts from this major capital project. This information will be presented with the final conceptual design and project definition report to committees and Board in March 2022. Staff recommend Alternative 1.

Attachment

Engagement Summary: Iona Island Wastewater Treatment Plant Projects – July 30 to October 22, 2021

References

1. "Iona Island Wastewater Treatment Plant Projects – Project Definition Update", report dated June 23, 2021
2. "Iona Island Wastewater Treatment Plant Project Design Concept", report dated June 23, 2020

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Iona Island Wastewater Treatment Plant Projects

Engagement Summary

July 30 to October 22, 2021

October 25, 2021

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Table of Contents

List of Appendices

1. Purpose

This report provides a summary of engagement activities and feedback received for the Iona Island Wastewater Treatment Plant (IIWWTP) projects from July 30 to October 22, 2021.

2. Summer/Fall 2021 Engagement Period

To address the identified challenges with the July 2020 design concept that were presented in the July 30, 2021 project definition update to the GVS&DD Board, the project team has been working to refine the design and develop a revised design concept.

To inform this work, Metro Vancouver conducted engagement with member jurisdictions, key stakeholders, the public, and First Nations in late summer and early fall 2021. Staff provided updates and sought feedback on aspects of the projects that could, based on the work to refine the design, result in revisions to the design concept that was presented during previous project engagement.

Engagement topics included:

- project cost and schedule estimates for the July 2020 design concept; and
- treatment technology and plant footprint for the July 2020 design concept and three alternate short listed technology options.

Engagement activities conducted and key feedback received are outlined in the subsequent sections by audience.

3. Previous Project Definition Engagement

The summer/fall 2021 engagement period followed extensive IIWWTP project definition engagement activities between June 2018 and February 2021.

In early 2022, a full report of stakeholder, public, and First Nation feedback received since summer 2018 will be provided to committees and the GVS&DD Board for consideration along with the final Project Definition Report. For reference, a summary of IIWWTP Projects engagement between 2018 and early 2021 is provided in the graphic below.

Figure 1: Summary of IIWWTP Projects engagement activities, from 2018 to early 2021.

4. Summary of Audiences and Activities

The following engagement activities, by audience, took place between July 30 to October 22, 2021:

Vancouver Sewerage Area (VSA) Member Jurisdictions

Members:

- City of Vancouver
- City of Richmond
- City of Burnaby
- University Endowment Lands (UEL)
- University of British Columbia (UBC)

Activities:

- Update presentations at VSA meetings: September 14 and October 12, 2021
- Presentation to City of Vancouver Corporate Leadership Team: October 7, 2021
- Presentations to:
    - Regional Administrators Advisory Council (RAAC) and Regional Engineers Advisory Council (REAC): September 16, 2021
    - RAAC, REAC, and Regional Finance Advisory Council (RFAC): October 18, 2021

Key Stakeholders

Organizations and Groups:

- Birders and naturalists
- Deering Island Homeowners Society
- Georgia Strait Alliance / Obabika
- Vancouver Airport Authority (YVR)
- Vancouver Fraser Port Authority (VFPA)

Activities:

- Virtual meeting with YVR: September 22, 2021
- Virtual meeting with Deering Island Homeowners Society: September 24, 2021
- Virtual meeting with Georgia Strait Alliance and Obabika: September 29, 2021
- Virtual meeting with VFPA: October 4, 2021
- Online webinar with birders and naturalists: October 18, 2021 (17 attendees)

Community Engagement

Groups:

- Residents and businesses in proximity to Iona Island (approx. 4,350 addresses)
- Subscribers to project email list (approx. 1,600 contacts)
- Iona Beach Regional Park visitors
- Community members and general public

Activities:

- Online community meeting (webinar format): October 12, 2021 (34 attendees)
- Online community meeting (webinar format): October 14, 2021 (21 attendees)
- Online public comment period: September 27 to October 22, 2021 (39 participants)
- Correspondence received to project inbox: July 30 to October 22, 2021 (13 letters and messages)

Additional details on each of these audiences, associated engagement activities, and input received can be found in Section 5: Stakeholder and Community Feedback.

First Nations

First Nations and Tribal Councils:

- Musqueam Indian Band
- Tsleil-Waututh Nation
- Cowichan Tribes
- Halalt First Nation
- Lake Cowichan First Nation
- Lyackson First Nation
- Penelakut Tribe
- Seabird Island Band
- Shxw'ow'hamel First Nation
- Skawahlook First Nation
- Soowahlie First Nation
- Sto:lo Nation
- Sto:lo Tribal Council
- Stz'uminus First Nation

Activities:

- Staff to staff virtual meeting with Musqueam Indian Band: July 30, 2021
- Project update letter to each First Nation and Tribal Council including offer to meet: August 24, 2021
- Staff to staff virtual meeting with Musqueam Indian Band: September 14, 2021
- Engagement letter and discussion guide to each First Nation and Tribal Council including offer to meet: September 27, 2021

Additional details on First Nation engagement, associated engagement activities, and input received can be found in Section 6: First Nation Feedback.

Meetings with Senior Government Agencies

Meetings with the following also took place during the summer/fall 2021 engagement period to discuss regulatory issues and potential funding opportunities: Environment and Climate Change Canada; Infrastructure Canada; Canadian Infrastructure Bank; federal members of parliament; BC Ministry of Environment and Climate Change Strategy; BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development; BC Ministry of Transportation and Infrastructure; and, BC Ministry of Municipal Affairs.

Communications and Promotions

The following communication tools were used to provide an update about the project and invite participation in the summer/fall 2021 engagement period:

- Reached out via email, mail and phone to key stakeholder groups to organize meetings to discuss project.
- Emails to Musqueam Indian Band to provide updates and organize meetings to discuss project.
- 28 letters sent to 14 First Nations, including offers to meet to discuss the project.
- Rack cards delivered via Canada Post and by hand to over 4,350 residents and businesses located near the project, inviting participation in:
    - the online public comment period (September 27 to October 22, 2021); and
    - the online community meetings (October 12 and 14, 2021).

  Rack cards were also provided to the UEL Administration Office.

- Three bulk emails sent to subscribers to project email list (over 1,600 subscribers as of October 2021):
    - September 10, 2021 – Community newsletter including notice of upcoming engagement
    - September 27, 2021 – Invitation to participate in September and October 2021 public engagement opportunities, including meetings and public comment period
    - October 8, 2021 – Reminder of upcoming online community meetings and invitation to participate in both meetings and public comment period
- Six newspaper advertisements placed in Burnaby Now, Richmond News, and Vancouver is Awesome to promote the public comment period and online community meetings.
- Web advertising on the webpages of The Ubyssey (UBC Student Newspaper), Burnaby Now, Richmond News, and Vancouver is Awesome, to promote the public comment period and online community meetings.
- Six social media posts, with over 45,000 impressions
- Sign posted at Iona Beach Regional Park to promote the public comment period and online community meetings.
- Updates posted to the Iona Island Wastewater Treatment Plant Project webpage (3,374 page views between July 30 and October 22, 2021)

5. Stakeholder and Community Feedback

Engagement activities and key feedback received are reported below for each audience. Feedback was collected through meeting notes, virtual meeting transcripts, online questionnaires, and correspondence. A record of all feedback received is provided in the attached appendices:

- Appendix A: Stakeholder and Community Feedback (Meetings and Correspondence)
- Appendix B: Online Public Comment Period Feedback

Staff responses to feedback provided in the period covered by this summary, as well as all feedback that has been received since the start of engagement activities in 2018 will be provided as part of the final engagement summary report that will presented to committees and the GVS&DD Board for consideration along with the Project Definition Report in early 2022.

Member Jurisdictions

City of Richmond, City of Vancouver, City of Burnaby, UEL, UBC

Engagement Activities:

September 14, 2021	Update presentation at VSA meeting
September 16, 2021	Update presentations to: • RAAC • REAC
October 7, 2021	Presentation to City of Vancouver Corporate Leadership Team
October 12, 2021	Update presentation at VSA meeting

October 18, 2021	Update presentations to: • RAAC • REAC • RFAC

Key feedback received:

- Concerns expressed regarding potential impacts to household rates.
- Interest in receiving further information on these impacts when available.

Key Stakeholder Groups

Metro Vancouver met virtually with five key stakeholder groups:

Vancouver Airport Authority (YVR)

Engagement Activity:

September 22, 2021	Virtual engagement meeting with representatives from YVR

Key feedback received:

- Appreciation for Metro Vancouver's acknowledgement of YVR's concerns surrounding bird habitat and aviation safety. Desire to continue working together to ensure that YVR's concerns are addressed because increased bird abundance and specifically snow geese, pose one of the highest risks to aviation safety.
- Interest in understanding Metro Vancouver's project schedule and priority delivery activities to assist with YVR's planning and delivery of its planned projects in the coming years.
- Interest in potential opportunities for Musqueam, Metro Vancouver and YVR to work together and share information as the project moves forward.
- Interest in participating in the Technical Advisory Panel for the ecological restoration projects.
- Interest in how the different technology options could change the work already underway with YVR as it relates to the utilities underneath Ferguson Road, traffic, and staging impacts.
- Interest in what work Metro Vancouver has done to learn how the causeway breach could impact flows in the middle arm and through the blind channel. Desire to understand how the causeway breach could impact flows of water further upstream.
- Interest in whether storm surges are being considered in Metro Vancouver's foreshore modelling.
- Interest in the scope of the effluent heat recovery feasibility study.

Deering Island Homeowners Society

Engagement Activity:

September 24, 2021	Virtual engagement meeting with Deering Island Homeowners Society representative

Key feedback received:

- Concern that the proposed location of the materials transport barge berth will cause visual impacts and a significant amount of industrial noise near Deering Island's residential area.
- Interest in whether the project team looked at other potential barge berth location sites.
- Comment that Metro Vancouver should consider placing the barge berth further west.
- Comment that the Fraser River area near Deering Island is typically noisy due to airplane and marine traffic, and becomes noisier at nighttime due to the frequency of barges. A barge berth could bring more industrial noise to the area.
- Interest in understanding what happens if the Iona Wastewater Treatment Plant project becomes too expensive for the ratepayers to fund.
- Commenter expressed surprise at the length of the project schedule and concern with potential cost escalation due to the 20-year project timeline.
- Interest in understanding whether all of the proposed treatment options are meant to accommodate the solids handling.
- Comment that Deering Island Homeowners Society supports this important environmental project overall.

Georgia Strait Alliance (GSA) and Obabika

Engagement Activity:

September 29, 2021	Virtual engagement meeting with representatives from Georgia Strait Alliance and Obabika

Key feedback received:

- Interest in learning more about the two alternate technologies being evaluated as options to the July 2020 design concept.
- Concern expressed regarding missing the 2030 regulatory deadline for secondary treatment and that secondary and tertiary treatment will not be in effect until 2034.
- Interest in understanding what occurred following the approval of the Liquid Waste Management Plan in 2011 and Metro Vancouver's commitment to focus efforts on the Lions Gate and Iona Island treatment plants, and how this relates to the current situation where the IIWWTP upgrade is going to take more time than is legally required.
- Interest in whether Metro Vancouver has received approval from the federal government to go past the 2030 regulatory deadline and why there were 18 months of delays for the indicative design to brought to the Board.
- Interest in understanding whether ratepayers will be solely responsible for covering the total 6.7-billion-dollar cost or if there are other anticipated funding streams.
- Interest in whether the proposed treatment options remove toxins such as pharmaceuticals.
- Interest in understanding how Indigenous knowledge has been integrated into the ecological restoration project planning so far.

- Comment that a lot of GSA's concerns over the last 18 months have been addressed in this project definition update. Appreciation expressed for the time Metro Vancouver has taken to provide the project definition update, the opportunity to have a direct conversation, and for Metro Vancouver's openness and honesty about various aspects of this project. Comment that it is clear now that GSA is a little more aligned that previously thought.
- Comment that GSA believes that we all want the IIWWTP to be as good as it can possibly be to reduce pollution in the Salish Sea.
- Offer extended by GSA to help Metro Vancouver in any way they can with regards to discussions with senior government agencies regarding funding for the IIWWTP projects.

Vancouver Fraser Port Authority (VFPA)

Engagement activity:

October 4, 2021	Virtual engagement meeting with representatives from VFPA

Key feedback received:

- Interest in understanding if Iona Island was the only site considered for this development, given the identified complexities and associated estimated costs.
- Interest in being involved in the Technical Advisory Panel for the ecological restoration projects.
- Interest in understanding when households across the region can expect to see impacts to rates.

Birders and Naturalists

Given the ecological significance of Iona Island and the Fraser River estuary, Metro Vancouver is engaging with interested birders and naturalists representing many different groups including:

- Birds Canada
- City of Vancouver
- Delta Naturalists
- Ducks Unlimited
- Environment and Climate Change Canada
- Nature Canada
- Nature Trust of BC
- Nature Vancouver
- Stewardship Centre for BC
- WildResearch
- Wild Trust of BC
- Vancouver Whale Watch

Engagement Activities:

October 18, 2021	Virtual engagement meeting with birders and naturalists
October 22, 2021	Submission of letter with additional comments from 13 representatives of local bird conservation and research groups

Key feedback received:

- Desire to limit plant footprint encroachment into Metro Vancouver park land.
- Desire to ensure protection of birds and bird habitat throughout construction and operation of the IIWWTP into the future.

- Concern expressed regarding the dewatering of the sewage lagoons and potential for altering the island's ecological function. Desire for detailed assessment of bird diversity and abundance within and around the lagoons before commencing dewatering.
- Desire for Metro Vancouver to develop well designed monitoring programs for the sewage lagoons and adjacent habitats before any activities occur that could potentially alter the ecological function of the island, including monitoring activities before, during, and after construction. Desire for Metro Vancouver to engage with the local wildlife community to help co-develop and implement monitoring and research.
- Comment that the sewage lagoons play a vital in supporting avian diversity on Iona Island—which is home to 285 observed species, the highest recorded diversity of birds in all of British Columbia.
- Comment that the island is an important natural asset that warrants the utmost attention during the development of the project.
- Desire for bird-friendly building design standards to be incorporated into facility and building design, including glass and lighting standards. Interest in learning more about the ecological restoration projects, the technical requirements being incorporated into their design, and what their effects will be on the future ecology of the area.

Public

Community Engagement

Engagement Activities:

July 30 to October 22, 2021	Correspondence received to project inbox (13 letters and messages), including submissions from: • Fraser Riverkeeper • West Southlands Residents Association
September 27 to October 22, 2021	Online public comment period (39 participants)
October 12 and 14, 2021	Online community meetings (55 participants)

Key feedback received:

- Desire for higher level of wastewater treatment expressed.
- Preference indicated for Membrane Bioreactor (MBR) secondary treatment technology in several submissions following public meetings.
- Desire for increased communications regarding the projects and for Metro Vancouver to share updates regarding cost estimates and schedule.
- Desire to protect and enhance Iona Island's ecology and habitat for birds and fish. General support expressed for ecological restoration projects.
- Concern expressed regarding missing the 2030 regulatory deadline for secondary treatment, and secondary and tertiary treatment coming into effect in 2034.
- Concern regarding the continued discharge of primary treated effluent into the Salish Sea. Desire for tertiary treatment to be implemented as soon as possible—and no later than 2034—for the health of the surrounding environment.
- Concern expressed about the high cost estimate for the project and that the challenges associated with the increased costs were not addressed earlier.
- Concern expressed regarding impacts to ratepayers. Desire for project to produce the best result while considering impact to households.
- Desire for First Nation engagement and action towards reconciliation. Interest in learning First Nations' perspectives on the project.
- Desire for the true value of the natural environment and the existing debt to nature to be considered when considering project costs and benefits.
- Comment that it is challenging for an individual without technical training or knowledge in the field to make informed comments about wastewater treatment process technologies.
- Interest in understanding if Metro Vancouver has looked into relocating the treatment plant to a different location, especially given current cost estimate.
- Concern expressed regarding the impact of microplastic and microfiber pollution. Desire for the treatment technology selected to address this issue.
- Concern expressed regarding impacts of construction activities, the loss of the existing sludge lagoons, and increased park user access to currently restricted areas of the park on bird populations at Iona Island.
- Interest in the scope of the modelling, studies and investigations being done to inform the projects, and whether lands on the north shore of the North Arm of the Fraser will be included.
- Interest whether Metro Vancouver is considering the energy efficiency and carbon costs of the different technology options.
- Concern expressed regarding the impacts of climate change and sea level rise on Iona Island and the IIWWTP and interest in understanding how Metro Vancouver is addressing this issue.
- Desire for Metro Vancouver to demonstrate leadership in the areas of wastewater treatment and environmental action.

See Appendix A: Stakeholder and Community Feedback (Meetings and Correspondence) and Appendix B: Online Public Comment Period Feedback for a list of all feedback received from the audiences listed above.

6. First Nation Feedback

First Nations engagement activities and key feedback received are reported below. Feedback was collected through meeting notes, virtual meeting transcripts, correspondence. A record of all feedback received is provided in the attached Appendix C: First Nation Feedback.

In line with Metro Vancouver's Information Sharing Process, Metro Vancouver has reached out to 14 First Nations and Tribal Councils on the IIWWTP Projects:

- Musqueam Indian Band
- Tsleil-Waututh Nation
- Cowichan Tribes
- Halalt First Nation
- Lake Cowichan First Nation
- Lyackson First Nation
- Penelakut Tribe
- Seabird Island Band
- Shxw'ow'hamel First Nation
- Skawahlook First Nation
- Soowahlie First Nation
- Sto:lo Nation
- Sto:lo Tribal Council
- Stz'uminus First Nation

Building on previous correspondence about the projects extending back to November 2018, the following letters were sent to each First Nation or Tribal Council during the late summer to early fall 2021 engagement period:

August 24, 2021	Project update letter *Purpose:* • Notify of the July 30, 2021 Project Definition Update to the GVS&DD Board, identified challenges, and next steps • Provide updates on the priority delivery activities and the status of project permit applications • Offer to meet regarding the projects and provide a point of contact for further discussion
September 27, 2021	Engagement letter *Purpose:* • Invite First Nations and Tribal Councils to share their feedback • Provide a discussion guide with information about the engagement topics included in the current engagement period • Offer to meet regarding the projects and provide a point of contact for further discussion

Metro Vancouver did not receive responses to the correspondence listed above from First Nations or Tribal Councils within the allocated time period, and only Musqueam Indian Band was available to actively engage (see details of engagement activities below). As noted earlier, a full report of First Nation feedback received since the start of IIWWTP engagement will be provided to the GVS&DD committees and Board for consideration along with the final Project Definition Report.

Musqueam Indian Band

As part of ongoing collaboration and engagement with Musqueam Indian Band, feedback was provided through staff to staff virtual meetings with the project team.

Engagement Activities:

June 30, 2021	Staff to staff virtual meeting – Provided an update regarding ongoing priority activities, permits and approvals, the identified challenges with the July 2020 design concept and subsequent work to refine the design, and upcoming engagement.
September 14, 2021	Staff to staff virtual meeting – Provided a project update and sought feedback on the July 2020 design concept, subsequent challenges identified, proposed treatment options being evaluated, and priority delivery activities.

Key feedback received:

- Concern expressed that Metro Vancouver's IIWWTP history video doesn't speak to the negative impacts the treatment plant has had on the Musqueam community. Also noted an opportunity to highlight how Musqueam and Metro Vancouver have moved from a place of no consultation, to the immersive and collaborative work being done today.
- Interest in Metro Vancouver sharing a preliminary permit review with Musqueam to help them identify and analyze permits of interest.
- Interest in how changes to the design concept will impact Musqueam views.
- Interest in understanding what the driver of the increased footprint option is versus the other treatment options.

7. Next Steps

An engagement summary documenting feedback received since the start of engagement in June 2018, as well as staff responses, will be provided to committees and the GVS&DD Board with the Project Definition Report in early 2022.

Further engagement is planned for the design phase that will follow project definition. Additional engagement activities will be undertaken, as required, to support ongoing priority delivery tasks and related permitting requirements.

Appendix A - Stakeholder and Community Feedback (Meetings and Correspondence)

The following table details all feedback received from stakeholders and members of the public though engagement meetings and correspondence during the July 30 to October 22, 2021 engagement period.

#	Date	Source	Question/Comment/Issue
1	30-Jul-21	Email	Will there be any work done on the section that dissects McCleery golf?
2	22-Sep-21	Meeting with Vancouver Airport Authority (YVR)	Are any of the proposed treatment options favoured at this point?
3	22-Sep-21	Meeting with Vancouver Airport Authority (YVR)	As MV works through these different considerations to the shift in technology, what upstream impacts do you see shifting that could change the work already underway with YVR as it relates to the utilities underneath Ferguson, traffic and most of the staging impacts? Will those ongoing conversations have to be adjusted or accommodated based on what moves forward?
4	22-Sep-21	Meeting with Vancouver Airport Authority (YVR)	Noting the IIWWTP projects schedule constraints between now and 2023, how can YVR get ahead of the work YVR needs to undertake to streamline upcoming project activities planned by both YVR and MV?
5	22-Sep-21	Meeting with Vancouver Airport Authority (YVR)	YVR appreciates Metro Vancouver's acknowledgement of YVR's concerns surrounding bird habitat and aviation risk. YVR and Metro Vancouver need to continue working together to ensure that YVR's habitat enhancement concerns are addressed because increased bird abundance and specifically snow geese, pose one of the highest risks to aviation safety.
6	22-Sep-21	Meeting with Vancouver Airport Authority (YVR)	YVR expressed interest in learning more about the Technical Advisory Panel as information becomes available.
7	22-Sep-21	Meeting with Vancouver Airport Authority (YVR)	Has MV done any work to understand how the causeway breach could impact flows in the middle arm, and flows through the blind channel? YVR wants to understand how the causeway breach could impact flows of water further upstream.
8	22-Sep-21	Meeting with Vancouver Airport Authority (YVR)	YVR is interested to know if storm surges are being considered in MV's foreshore modelling?
9	22-Sep-21	Meeting with Vancouver Airport Authority (YVR)	YVR expressed interest in potential opportunities for Musqueam, Metro Vancouver and YVR to work together and share information as the project moves forward.
10	22-Sep-21	Meeting with Vancouver Airport Authority (YVR)	Does MV anticipate that the procured engineering support services, brought on to confirm routing, could encounter changes to the Ferguson road project currently in design?
11	22-Sep-21	Meeting with Vancouver Airport Authority (YVR)	What is the scope of the effluent heat recovery feasibility study?
12	22-Sep-21	Meeting with Vancouver Airport Authority (YVR)	Which First Nations are you looking to engage with on the IIWWTP project definition update?
13	22-Sep-21	Meeting with Vancouver Airport Authority (YVR)	YVR appreciates the opportunity to review the Project Definition update and continue this work together. YVR will connect with staff internally and provide feedback and input on the Project Definition update.

#	Date	Source	Question/Comment/Issue
14	24-Sep-21	Meeting with Deering Island Homeowners Society	Having worked on a number of treatment plant projects, I've never seen a schedule this long.
15	24-Sep-21	Meeting with Deering Island Homeowners Society	Wasn't the schedule of the Annacis Island Wastewater Treatment Plant much shorter?
16	24-Sep-21	Meeting with Deering Island Homeowners Society	Normally if a project happens over a 20-year time, the present day project cost estimate is going to escalate.
17	24-Sep-21	Meeting with Deering Island Homeowners Society	What if the Iona Wastewater Treatment Plant project becomes too expensive for the ratepayers to fund?
18	24-Sep-21	Meeting with Deering Island Homeowners Society	Are all of these proposed treatment options meant to accommodate the solids handling?
19	24-Sep-21	Meeting with Deering Island Homeowners Society	Has the project team looked at other potential barge berth location sites?
20	24-Sep-21	Meeting with Deering Island Homeowners Society	The proposed barge berth location is located directly across from Deering Island and will cause a significant amount of industrial noise near Deering Island's residential area. MV should consider placing the barge berth further west, for example in front of Wreck Beach.
21	24-Sep-21	Meeting with Deering Island Homeowners Society	Noted that the Fraser River area near Deering Island is typically noisy due to airplane and marine traffic. At nighttime this area becomes even more noisy due to the frequency of barges. Believes the addition of a barge berth will bring more industrial noise to the area.
22	24-Sep-21	Meeting with Deering Island Homeowners Society	Deering Island Homeowners Society appreciates MV for taking the time to meet and review the Project Definition Update. Deering Island supports this important environmental project overall. Deering Island Homeowners Society advised MV that the Deering Island Homeowners Society would hold an annual general meeting in October.
23	28-Sep-21	Comment on MV Facebook Post	Let's hope they do a better job than the contractors building the new treatment plant in North Van. Two years behind and millions over budget.
24	28-Sep-21	Comment on MV Facebook Post	Looking so much better.
25	28-Sep-21	Comment on MV Facebook Post	Did a school tour of that facility back in the 1960s, it was world class back then. Any upgrades to control effluent discharges to the environment is money well spent.
26	28-Sep-21	Comment on MV Facebook Post	It's about time; it's a disgrace of what Vancouver and BC in general, do when it comes to water treatment yet always act environmentally friendly and green…

#	Date	Source	Question/Comment/Issue
27	28-Sep-21	Comment on MV Facebook Post	Nice beaches out there [at Iona] and a good hike along the spit. Lots of birds.
28	28-Sep-21	Comment on MV Regional Parks Facebook Post	I hope the upgrade wll improve the water quality of Fraser river and Vancouver shoreline!
29	28-Sep-21	Comment on MV Regional Parks Facebook Post	Methan capture, refinement and resale. Dry sludge treated and used for nutrients for non-food trees and plants. Ammonia extracted & refined for use in window cleaner. Urea extratracted and used for D.E.F. or diesel exhaust fluid.
30	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	GSA is seeking clarity on how the 4% resource recovery costs will be allocated (included in the cost estimate pie chart on slide 8 of the IIWWTP – Project Definition Update presentation)?
31	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	What is the dollar amount associated with tertiary upgrades as opposed to secondary upgrades?
32	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Are the ratepayers solely responsible for covering the total 6.7 billion dollar cost or are there other anticipated funding streams?
33	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Request for further elaboration on the combined sewer premium cost. Will this extend the timing of plant construction?
34	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Will tertiary treatment be operational at the same time as secondary treatment in 2034?
35	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	The 2034 date is deeply concerning to GSA and caught GSA by surprise because no indication of this risk was communicated prior to the July 2021 board report.
36	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	GSA is interested in understanding what occurred following the approval of the Liquid Waste Management Plan in 2011 and MV's commitment to focus efforts on the Lions Gate and Iona Island Treatment plants. What happened in those preliminary years and why are we suddenly looking at a plant that's going to be taking more time than is legally required?
37	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Could the Iona Island Wastewater Treatment Plant project have been started earlier?
38	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Has MV received approval from the federal government to go past the 2030 regulatory deadline?

#	Date	Source	Question/Comment/Issue
39	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Will the digesters be built in 2041, as was indicated in the IIWWTP July 2021 board report?
40	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	How would all of these treatment plant technologies be used at a changing scale during a high rainfall event? Would there be certain efficacies associated with different technologies during a higher rainfall?
41	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Understands that the fundamental difference between 'tertiary 1' versus 'tertiary 2' would be the sludge activated BNR with the nutrient removal scenario. This type of treatment, used in Kelowna, allows for substantial removal of toxins of high concern. Is that accounted for in this process and is there a different technology that can achieve the same result?
42	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Do the proposed treatment options remove toxins such as pharmaceuticals?
43	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Note that the technologies could change, based on what is needed to address the compound of concern at the time. For example, antidepressants are a big concern in Europe. Could specific technologies target toxins of that nature?
44	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Which wastewater treatment technology doesn't require primary treatment as a separate stage?
45	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	If the AGS option does seem reasonable for our region, would that mean the primary treatment upgrade would not have to happen?
46	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	GSA recognizes that construction projects always take longer than planned, but sees opportunities to explore time savings. Does MV think there may be opportunities to save some time?
47	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Interest in how Indigenous knowledge has been integrated into the ecological restoration project planning so far.
48	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	GSA interested in understanding why there were 18 months of delays for the indicative design to brought to the Board.
49	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Had MV brought a recommended July 2020 concept to the Board in early 2021, would that have included the new proposed technologies or are these technologies a new addition? Were these PDR delays to the Board associated with ground truthing the various phases and construction realities?

#	Date	Source	Question/Comment/Issue
50	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Noted that a lot of GSAs concerns over the last 18 months have been addressed in this project definition update. Appreciates the time MV has taken to provide the project definition update and appreciates the opportunity to have a direct conversation. It's clear now that GSA is a little more aligned that previously thought. Appreciates MVs openness and honesty about various aspects of this project. GSA was alarmed by the Board report released in July 2021 and felt as though it came out of nowhere, given the fact that GSA wasn't notified about the challenges MV was facing.
51	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	Feel like this meeting has been in the spirit of what GSA hopes MV can go forward with because GSA believes that we all want the IIWWTP to be as good as it can possibly be to reduce pollution in the Salish Sea. GSA expressed thanks for MVs contributions at today's meeting and looks forward to working with MV.
52	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	When does the public comment period questionnaire start and end? Does the questionnaire include specific questions or does it provide opportunity for comments?
53	29-Sep-21	Meeting with Georgia Strait Alliance and Obabika	GSA indicated that they would offer to help MV in any way they could. GSA knows that there have been ongoing discussions with government agencies around IIWWTP funding. GSA explained that every time GSA has had opportunities to meet with different levels of government around funding, GSA raises the issue of funding the IIWWTP and presses them to come to the table. GSA will continue to request the federal and provincial government to help fund the IIWWTP projects and alleviate the Board's funding concerns.
54	30-Sep-21	Email	Re: "Treatment plant technology": As the upgrade project proceeds, please foreground the need to filter/capture microplastics/microfibres. We also hope that there would be public education and outreach on this crucial issue. See the link to a recent New York Times article we found relevant. (Also happens to reference Vancouver). https://www.nytimes.com/2021/09/28/science/microfiber-pollution-svalbard.html?action=click&module=Well&pgtype=Homepage&section=Science

#	Date	Source	Question/Comment/Issue
55	4-Oct-21	Meeting with Vancouver Fraser Port Authority	In regards to the household costs, when will ratepayers across the region expect to see the additional costs? Is it once the IIWWTP construction project is complete or is it prior to the construction of the IIWWTP?
56	4-Oct-21	Meeting with Vancouver Fraser Port Authority	Given the costly price tag, was this the only site considered for this development with this number of complexities?
57	4-Oct-21	Meeting with Vancouver Fraser Port Authority	VFPA is interested in being involved in the Technical Advisory Panel and learning more about the ecological restoration projects. VFPA is particularly interested in topics around sediment reuse and sand ecosystem restoration work.
58	4-Oct-21	Meeting with Vancouver Fraser Port Authority	Will MV present all of the proposed treatment plant concepts to the public at the upcoming community meetings?
59	8-Oct-21	Comment on MV Facebook Post	To what extent are these lagoons protected from higher tides expected due to climate change?
60	8-Oct-21	Comment on MV Facebook Post	The entire facility is being built basically at sea level facing rising tides, storm surge and increasing flood risk from the Fraser, it would be nice to hear how Metro Vancouver is addressing that.
61	8-Oct-21	Comment on MV Facebook Post	About time. Quick to tax and slow to fix.
62	12-Oct-21	Online Community Meeting	Given the huge extra cost, has there been any thoughts to relocate the project?
63	12-Oct-21	Online Community Meeting	There was discussion of the cost of seismic upgrades. Has there been specific consideration of the costs of sea level rise and climate change?
64	12-Oct-21	Online Community Meeting	Thank you for the presentation. Can you please talk about the impacts of the 4 year delay from the regulatory deadline?
65	12-Oct-21	Online Community Meeting	Will the plant be out of compliance of the regulatory deadline of secondary treatment for 4 years according to this timeline? What will be the impacts of being non-compliant?
66	12-Oct-21	Online Community Meeting	Has an independent estimate and risk quantification review been done outside the project team?
67	12-Oct-21	Online Community Meeting	How much confidence is there on the current 10.4 billion estimate?
68	12-Oct-21	Online Community Meeting	What is the additional cost of choosing the world class tertiary treatment process I pointed out is being used at the Orange Country California treatment plant, compared to the lower quality tertiary treament process now used at the Brightwater treament plant that Metro Van has indicated they are considering?
69	12-Oct-21	Online Community Meeting	If there is only one supplier with AGS, how do you negotiate with the supplier if you already have decided to use that technology?

#	Date	Source	Question/Comment/Issue
70	12-Oct-21	Online Community Meeting	Is there e.coli and bacteria sampling in the salish sea (beyond Iona beach) as part of baseline sampling?
71	12-Oct-21	Online Community Meeting	The images we're seeing show paths between all of the pond areas. We know that birds currently use the inner ponds where access is restricted much more than the outer ponds, particularly at high tide. Would you consider eliminating some of the paths to provide birds with more refuge areas away from people and (especially) dogs?
72	12-Oct-21	Online Community Meeting	I applaud Metro Vancouver for being so concious of the envirmonment and its importance.
73	12-Oct-21	Online Community Meeting	Is the impact on the shoreline on other side of theNorth arm of the Fraser being considered/investigated?
74	12-Oct-21	Online Community Meeting	Unfortunately, too many dog owners do not respect posted signs
75	12-Oct-21	Online Community Meeting	What kind of baseline bird surveys is Metro Vancouver collecting right now? Season(s), group of species, survey type, etc.
76	12-Oct-21	Online Community Meeting	Is there going to be any funding available to allow studies by NGOs and student groups of wildlife at the plant in the future?
77	12-Oct-21	Online Community Meeting	Thank you. I did not hear any surveys done for landbirds. Will MV consider surveys for landbirds too given Iona is an important stopover site for a great diversity of migratory landbirds?
78	12-Oct-21	Online Community Meeting	I understand there was plans to place a bridge on the causeway. What is the timing on that structure?
79	12-Oct-21	Online Community Meeting	Does the treatment technology need to be decided before the final project definition can be done?
80	12-Oct-21	Online Community Meeting	Has there been planning consideration to ensure there is sufficient habitat for migratory birds during construction?
81	12-Oct-21	Online Community Meeting	One of your ecological priorities is to "Improve Water Quaitly" in the Salish Sea and the Federal Government has jurisdiction over marine waters, including protecting the threatened Orca populations. Therefore could you appeal to their desire to enhance public perception of their Orca-protection efforts? That might convince them to contribute the additional cost of implementing world-class tertiary treament, in order to ensure the highest ecological purity of the outfall being discharged into the Orca's habitat.
82	12-Oct-21	Online Community Meeting	A great presentation. All topics well defined and look forward to future discussions
83	12-Oct-21	Online Community Meeting	Thank you for the presentation. Much appreciated.
84	14-Oct-21	Online Community Meeting	Why is dewatering taking so long?

#	Date	Source	Question/Comment/Issue
85	14-Oct-21	Online Community Meeting	Has a construction firm been selected for any of these phases yet? Do have to worry about what happened on the Lionsgate stop?
86	14-Oct-21	Online Community Meeting	What is the final effluent quality for the proposed disc filter system in terms of TSS, BOD and COD?
87	14-Oct-21	Online Community Meeting	Who is currently the general contractor on the project?
88	14-Oct-21	Online Community Meeting	What is the population estimate for 2100 being used for the design?
89	14-Oct-21	Online Community Meeting	Can you explain the process you will use to determine which design option will ultimately be selected? (What criteria are used)?
90	14-Oct-21	Online Community Meeting	What's the capital, O & M and lifecycle cost differences among these four options?
91	14-Oct-21	Online Community Meeting	Do you include a cost of carbon in the review of options?
92	14-Oct-21	Online Community Meeting	Which technology is considered financially feasible?
93	14-Oct-21	Online Community Meeting	I work in ecological restoration and marsh conservation. I have worked in the marsh alongside the Iona Island causeway and Sea Island so this issue is close to my heart. Is there any chance that Metro Van will backtrack on the commitment to upgrade to tertiary treatment?
94	14-Oct-21	Online Community Meeting	Is the aerobic granular technology confined to one supplier because of a patent? And, if so when does that expire?
95	14-Oct-21	Online Community Meeting	Will contractors be able to propose alternative consolidation methods to speed up the ground improvement works?
96	14-Oct-21	Online Community Meeting	Given what has recently occured with the North Shore wastewater treatment plant, how will this shape how you will procure services to deliver the Iona wastewater treatment program?
97	14-Oct-21	Online Community Meeting	Do the people on the panel risk having a conflict of interest if their company ends up on the short list for some of the contracts?
98	14-Oct-21	Online Community Meeting	A graph earlier showed the ecological projects starting in 2023. Are jetty breaches and invasive species removal not already ongoing, or are these not MV related?
99	14-Oct-21	Online Community Meeting	I take my 9ft boat all the way around Sea Island monthly at over 50km a round trip. Does Metro Van have any water lots that can have log storage removed to restore habitats?
100	14-Oct-21	Online Community Meeting	What happens to the log booms currently in some of the retoration areas?
101	14-Oct-21	Online Community Meeting	Will the breach under the outfall pipe be accessible at high tide or at some other tide stage?

#	Date	Source	Question/Comment/Issue
102	14-Oct-21	Online Community Meeting	Has an evaluation been conducted on how ecological changes will affect the size and species? For example Brant Geese versus Sandpiper, and their literal impact with aircraft at YVR?
103	14-Oct-21	Online Community Meeting	I'm really excited about the proposals to connect all the channels that used to be there!
104	14-Oct-21	Online Community Meeting	What is the sea level rise assunmption for 2100?
105	14-Oct-21	Email from West Southlands Residents Association	I am sending this email on behalf of the West Southlands Residents Association, a neighbourhood across the Fraser from the Iona Island water treatment plant. Although not bordering the Fraser, residents are often on the walkways adjacent to the river. I would like to find out where the barge berth for transportation of construction materials is to be built and whether it is expected to have an impact on the north shore of the Fraser. I have been unable to find anything on the website to clarify the plans. Also, have any studies related to the ecological work include consideration of the impact on the north shore of the Fraser?
106	15-Oct-21	Email from West Southlands Residents Association	West Southlands Residents Association has a long-standing interest in Fraser River -related issues including the shoreline. Many homes are in the flood plain and in recent years have seen the impact of water level rise on their properties, especially during King tides in December and January.
107	17-Oct-21	Email in advance of October 18 Birders and Naturalists Meeting	I'm not able to attend the October 18th Birders and Naturalists meeting, so I've completed the online questionnaire and put my thoughts in writing, in hopes that writing my thoughts will help to emphasize my concerns and will be a help in your zoom discussion.
108	17-Oct-21	Email in advance of October 18 Birders and Naturalists Meeting	Panels state that cost estimates have been developed and updated to take into consideration the challenges mentioned in the previous two panels. I am saddened that the expert engineers who worked on this project design over the past three years, did not already take these factors into account. I am saddened that "constructability" (access challenges and construction in a limited workspace) and "ground improvements" were not fully recognized earlier on in the design phase.

#	Date	Source	Question/Comment/Issue
109	17-Oct-21	Email in advance of October 18 Birders and Naturalists Meeting	Under Project Overview, one of the bullets about the design states: "Withstand an earthquake and sea level rise". Early during the initial public meeting phase, the question was raised as to whether it makes economic sense to locate the plant on Iona Island, given that location's elevation is so very close to current sea level, as well as earthquake stability issues. I recall the response was that other sites had been considered, but none would work. How thorough was this consideration of other possible locations? What portion of the current cost estimate is to cover earthquake stability and sea level rise, given this location on a floodplain island of the Fraser River estuary?
110	17-Oct-21	Email in advance of October 18 Birders and Naturalists Meeting	On the panel titled "What success looks like", the list is excellent, but one important point is missing. The point that is missing is the aim to: Enhance and sustain the varied natural habitats of Iona Beach Regional Park. These natural habitats include its upland sand dune, shrub and deciduous trees, its intertidal wetlands, and its freshwater ponds and marshes. Yes, there is a bullet which states, to enhance the visitor experience, but what is missing is a statement about the natural habitat. Yes, there is mention of other important nature considerations, such as water quality, salmon, killer whales and marine environment, but there should be a specific statement about the natural habitats of Iona Island Regional Park.
111	17-Oct-21	Email in advance of October 18 Birders and Naturalists Meeting	The terrestrial ecosystems and bird habitat are mentioned in the next panel, that is, the panel titled: "About the July 2020 Board-Endorsed Design Concept – Ecological Restoration Projects". However, enhancement and sustaining the varied natural habitats of the park should be mentioned in the proceeding panel ("What Success looks like"). As a side note on the topic of natural habitats of the park and consideration of visitor experience and overall environmental well being, it is worth noting that this constitutes only a very small portion of the overall cost of the project – the budget estimate is only 3% for "Ecological Restoration & Community Amenities".

#	Date	Source	Question/Comment/Issue
112	17-Oct-21	Email in advance of October 18 Birders and Naturalists Meeting	The last statement of the panel on "Ecological Restoral Projects" is misleading. That statement reads: "No modifications to the ecological restoration projects are being considered or evaluated as part of a revised design concept." Surely this statement is misleading when Design Concept 1a (Modified Base Case) states that more parkland will be used for construction of the facility. If parkland is reduced in size, then this surely will impact the park visitor experience and/or the ability to sustain and enhance the natural habitats of the park.
113	17-Oct-21	Email in advance of October 18 Birders and Naturalists Meeting	Regarding the statement about schedule constraints and that the project would not be completed until about four years after the federal government's regulatory deadline – should this not be immediately discussed with the responsible federal government staff? There is not much that the public can comment on this scheduling issue and how to resolve.
114	17-Oct-21	Email in advance of October 18 Birders and Naturalists Meeting	The total estimated project costs in 2021 dollars of $6.7 million and what this amounts to for the Vancouver Sewerage Area households does appear high compared to other Metro Vancouver sewerage areas. How much of the additional cost is due to necessary earthquake proofing and building to withstand sea level rise? Have other locations for the treatment plant been considered?
115	17-Oct-21	Email in advance of October 18 Birders and Naturalists Meeting	In considering overall costs, it should be appreciated that when we discharge our human waste into the ocean, it must be done to full tertiary treatment standard. In accounting dollars, we should calculate the debt owing to nature over the many previous decades of discharging sewerage that had received only basic treatment into the Salish Sea. Has anyone calculated that long term debt to nature?
116	17-Oct-21	Email in advance of October 18 Birders and Naturalists Meeting	Regarding the external panel of subject matter experts who have reviewed the three revised design options presented in subsequent panels – what is the basis for choosing a redesign? Will it be the cheapest cost, measured only in immediate construction costs and not including debt to nature and/or loss of long-term park benefits to nature, including humans? Will the recommendation/decision be made only on which option can be completed by 2030? Those factors are not always included in the Pros and Cons. That is for the panel on Option 1: Base Case, it does not mention under Cons, the high cost and expected completion date of 2034.

#	Date	Source	Question/Comment/Issue
117	17-Oct-21	Email in advance of October 18 Birders and Naturalists Meeting	Regarding Design Option 1a: Modified Base Case (July 2020 Board-endorsed design concept with use of additional land), it states, "Footprint encroaches onto Metro Vancouver Parks Land". This does not fit with the statement in an earlier panel that the design options under consideration have "no change to ecological enhancement plan". If more parkland will be used, this surely will impact the park visitor experience and/or the ability to sustain and enhance the natural habitats of the park.
118	17-Oct-21	Email in advance of October 18 Birders and Naturalists Meeting	Regarding Option 2 (Membrane Biological Reactor) and Option 3 (Aerobic Granular Sludge), I do not have the required knowledge in sewerage treatment to provide to comment. I assume this is why Metro Vancouver enlisted the help of the external panel. Will the details of their report be public, together with the names of the panel members?
119	18-Oct-21	Meeting with Birders and Naturalists	Are there plans to use eco-friendly alternative concrete that uses less energy to produce and produces less CO2?
120	18-Oct-21	Meeting with Birders and Naturalists	How much of the $400-500 household costs goes to capital costs and how much is operational?
121	18-Oct-21	Meeting with Birders and Naturalists	What happens to the methane gas?
122	18-Oct-21	Meeting with Birders and Naturalists	Does the water, that is currently ejected into the Salish Sea, still make its way there with all of the options you have mentioned? if not, is the pipe decommissioned?
123	18-Oct-21	Meeting with Birders and Naturalists	Can MV please provide the consequence table developed as part of the structured decisions making process?
124	18-Oct-21	Meeting with Birders and Naturalists	As we see the cost go up at this site, do other alternative sites become feasible or is Iona Island the only option on the table?
125	18-Oct-21	Meeting with Birders and Naturalists	What mitigation is proposed for encroachment in the park lands?
126	18-Oct-21	Meeting with Birders and Naturalists	Since the proposed treatment plant footprint encroachment could result in the loss of parkland, and understanding any loss of parkland would be traded for parkland somewhere else, shouldn't any mitigation for lost land, due to encroachment, be added to the budget?
127	18-Oct-21	Meeting with Birders and Naturalists	Based on the budget and the pie chart, there is $312,000,000 for community amenities and ecological restoration. Is this all planned for this site (or around it)?
128	18-Oct-21	Meeting with Birders and Naturalists	How are offsets being calculated and where will those offsets be invested? And is there a no net loss approach being utilized in this project?
129	18-Oct-21	Meeting with Birders and Naturalists	Will the ponds be independent of the sewage operation?

#	Date	Source	Question/Comment/Issue
130	18-Oct-21	Meeting with Birders and Naturalists	With regards to the foreshore work, has MV included a requirement to explore shorebird use and biofilm productivity on the foreshore mudflats?
131	18-Oct-21	Meeting with Birders and Naturalists	With dewatering of the lagoon being imminent, is there a baseline report being prepared on bird use of the lagoons that will be available for review and comment prior to dewatering?
132	18-Oct-21	Meeting with Birders and Naturalists	Will there be fenced off areas for semi public access and more importantly quiet areas for birds?
133	18-Oct-21	Meeting with Birders and Naturalists	Has any consideration been given to incorporating Bird Friendly Building Design as outlined in the Standards Council of Canada?
134	18-Oct-21	Meeting with Birders and Naturalists	Given the areas rich avian diversity, MV should consider bird friendly glass and lighting can be incorporated into future building designs. There is some recent research out of UBC across the river on rather significant numbers of birth deaths resulting from window/building collisions.
135	18-Oct-21	Meeting with Birders and Naturalists	What has the response from YVR been regarding creating bird habitat near the airport? How will their concerns affect the restoration plans?
136	18-Oct-21	Meeting with Birders and Naturalists	With different ecological values of those losses versus proposed swaps for parkland to have this net gain and no net-loss approach (appreciating that is one of MV's guiding principles), can MV indicate where that land swap might occur to understand the differences between those kinds of ecological integrities? Intent is to understand the net gain.
137	18-Oct-21	Meeting with Birders and Naturalists	Comment acknowledging that the IIWWTP projects is a great project and the related restoration projects will be wonderful.
138	18-Oct-21	Meeting with Birders and Naturalists	When MV opens up the causeway it will change the flow of the water in the North Arm. Have you looked at the upstream effects?
139	18-Oct-21	Meeting with Birders and Naturalists	Considering that sea level rise in the next century, could rise as much as one metre, how does that affect all the ecological restoration? Since the Iona Island vegetation is very sensitive to tidal flows, how does MV keep ahead of all that work within the plans?
140	18-Oct-21	Meeting with Birders and Naturalists	Could MV look at the ponds and the upland areas in the long-term, thinking about allowing the salt marsh to move up into those areas?
141	18-Oct-21	Meeting with Birders and Naturalists	What surveys have been done so far and which ones are you're planning on doing in the near future?

#	Date	Source	Question/Comment/Issue
142	18-Oct-21	Meeting with Birders and Naturalists	Will MV be looking at other metrics beyond exploring the number of birds and species? Noted that current research using 10-year banding data sets have been showing interesting results. The patterns of fat gain for migratory birds is an important source for migratory birds to migrate long distances. Research shows that Iona Island is acting as a very important stopover site for these migratory birds. Expressed interest in understanding future metrics related to whether the restoration projects maintain its importance in terms of fueling migratory birds.
143	18-Oct-21	Meeting with Birders and Naturalists	Is it possible to get a map showing the areas that will be lost in the proposed areas for land swaps, to increase the net gain of parkland at some point?
144	18-Oct-21	Meeting with Birders and Naturalists	Is there any discussion of looking at increasing park size elsewhere, as opposed to Iona Island itself? Expressed concern about MV increasing park size and incorporating more mundane land that's perhaps more covered in invasive compared with quality habitat that could perhaps be acquired elsewhere.
145	18-Oct-21	Meeting with Birders and Naturalists	Has any consideration been given to the living dykes project at Boundary Bay and possibly incorporating some of those methods into this project?
146	18-Oct-21	Meeting with Birders and Naturalists	Inquired about Board approval and additional engagement opportunities.
147	18-Oct-21	Meeting with Birders and Naturalists	These proposed design concepts will undoubtedly have some pretty substantial ramifications for Wild Research's programs. At what point in time will there be opportunities for more discussion?
148	18-Oct-21	Email	Will there be another Birders and Naturalists meeting during the engagement period or if there would be a chance to review what was said?
149	20-Oct-21	Telephone inquiry to Metro Vancouver Information Centre	Request to view videos or listen to recordings regarding the Iona Island Wastewater Treatment Plant projects.
150	22-Oct-21	Email from West Southlands Residents Association	Is a timetable available for construction of the barge berth ?
151	22-Oct-21	Letter submission from Fraser Riverkeeper	Fraser Riverkeeper has been working to compel Metro Vancouver to upgrade the Iona Island Wastewater Treatment Plant since 2007. The plant upgrade is a once-in-a-lifetime opportunity to invest in the health of the Salish Sea and adjacent communities.

#	Date	Source	Question/Comment/Issue
152	22-Oct-21	Letter submission from Fraser Riverkeeper	We were encouraged by Metro Vancouver's announcement last year that the Iona Island Wastewater Treatment Plant, after 57 years of functioning as a rudimentary primary treatment facility, would be upgraded to a tertiary plant. Now is the time to ensure federal regulatory standards are adhered to and timelines are met, as the Wastewater Systems Effluent Regulations require a minimum of secondary treatment of municipal wastewater treatment plants by 2030.
153	22-Oct-21	Letter submission from Fraser Riverkeeper	Fraser Riverkeeper has been pushing for a true tertiary treatment system, complete with the most protective technologies to best protect our communities, since learning of those plans. Fraser Riverkeeper submitted comments in October 2020 in support of a true tertiary plant upgrade with the potential to be truly protective of water quality and fish habitat.
154	22-Oct-21	Letter submission from Fraser Riverkeeper	Metro Vancouver is missing the 2030 regulatory deadline by four years and must avoid any further delay: Metro Vancouver has announced that its committed timeline is four years after the 2030 regulatory deadline for secondary treatment. The federal government requires secondary treatment at all wastewater treatment plants by 2030, but this won't happen at Iona until 2034. The project is also not expected to be fully complete until 2042. While it is encouraging that Metro Vancouver is committing to what it states is tertiary treatment, the delay in adhering to the federal deadline by four years is disappointing. Further delays must be avoided as discharges of deleterious substances into fish-bearing habitat further damages the health of the Salish Sea with each passing day. The primary treated sewage released into the Georgia Strait impacts water quality in vital salmon and orca habitat. Metro Vancouver must commit to implement true tertiary treatment with the best available technology as soon as possible, ensuring that the adjacent habitat built with the plant will benefit the wildlife whose habitat is impacted by longer delays in tertiary.

#	Date	Source	Question/Comment/Issue
155	22-Oct-21	Letter submission from Fraser Riverkeeper	Membrane Biological Reactor, Technology Option 2, the standard tertiary system technology utilized around the globe, should be incorporated into the design: Metro Vancouver should ensure the most protective and effective of tertiary treatment methods are adopted to protect the Salish Sea and its inhabitants. The decision should be made to prevent the largest quantity of harmful toxins like nitrogen, ammonia, metals, and microplastics from polluting the Salish Sea. Technology Option 2, the Membrane Biological Reactor, represents the most protective option and would boost the Iona Island Treatment Plant to one that is true tertiary, using technology that filters out as many toxins as possible, ensuring that the receiving environment is not endangered.
156	22-Oct-21	Letter submission from Fraser Riverkeeper	In the Spirit of Transparency, Metro Vancouver should maintain and honour the Public's Right to Know around Budget Modifications: Costs for the planned rebuild of Iona's aging wastewater treatment plant have ballooned more than five times since 2019. The new facility was still on target for its $1.9 billion as recently as 2019. However, a July 2020 report noted that estimate did "not reflect the preliminary design activity since 2018. The list of issues causing delays were not fully taken into consideration when the design concept for the new facility was presented to – and endorsed by – the Metro Vancouver board in July 2020. While it is understandable that unforeseen circumstances arise in the most challenging of projects, the new estimate of $10.4 billion is a monumental increase. Moving forward, Metro Vancouver must work to ensure transparency regarding the challenges that lead to any future cost overruns as soon as they encounter them.

#	Date	Source	Question/Comment/Issue
157	22-Oct-21	Letter submission from Fraser Riverkeeper	Metro Vancouver is Leading the Way: While this issue is directly impacting Vancouver, cities across the country look to Vancouver as a leader in environmental action. Its decisions will influence other municipalities facing these or similar choices. Metro Vancouver has the opportunity to be a leader in sewage treatment, and inspire municipalities with smaller populations, budgets, and publicity to take progressive steps to ensure the cleanest water possible. Moving forward with a true tertiary system that is the most protective of marine habitat will set the standard by which other Canadian municipalities can emulate and strive for.
158	22-Oct-21	Letter submission from Fraser Riverkeeper	Our team recognizes the great measures and effort the Metro Vancouver team has undertaken to proceed with this work against the backdrop of the serious challenges presented by the global COVID-19 pandemic. We sincerely thank you for your time and hard work on this Project and for continuing to hear from a broad range of interest groups in your public consultation process.
159	22-Oct-21	Letter submission from Birder and Naturalist Community	Since the start of community consultations in January 2019, the birding community has participated and consistently indicated to MetroVancouver Liquid Waste Services staff the importance of the sewage lagoons and adjacent habitats at Iona Island to avian biodiversity. The birding community has highlighted, on multiple occasions, to MetroVancouver staff that with 285 observed species Iona Island has the highest recorded diversity of birds in all of British Columbia. It is an important natural asset that warrants the utmost attention during the development of this project.
160	22-Oct-21	Letter submission from Birder and Naturalist Community	During the engagement process, MV staff have been informed the sewage lagoons play a vital role in supporting avian diversity and that monitoring of bird populations at Iona Island should occur prior to any major project activities getting underway.

#	Date	Source	Question/Comment/Issue
161	22-Oct-21	Letter submission from Birder and Naturalist Community	Despite our efforts to explain the ecological significance of the island, we have learned from MetroVancouver Liquid Waste Services staff and supporting consultants that one of the first steps in the Iona Island Wastewater Treatment Plant upgrade, the de-watering of the sewage lagoons, appears to already be underway. It is our understanding that these activities are occurring without a detailed assessment of bird diversity and abundance within and around the lagoons. The process of de-watering and eventual infilling of the sewage lagoons will drastically alter food availabilities and foraging options to the avifauna utilizing the island. It also remains unclear how these landscape level changes are going to be mitigated during the development process given the lifespan of this project.
162	22-Oct-21	Letter submission from Birder and Naturalist Community	Without pre-disturbance monitoring and data collection, it will be impossible for MetroVancouver to determine what impacts and changes in bird diversity, abundance and condition have occurred, and whether restoration efforts have been successful. We would like to see MetroVancouver develop and implement a set of studies focusing on the pre-, during and post-treatment monitoring.
163	22-Oct-21	Letter submission from Birder and Naturalist Community	MetroVancouver has indicated during the engagement process that it is committed to a “not net loss” approach and we commend this vision; however we believe it is important for MV to begin the process of impact assessment as early as possible to ensure it has sufficient pre-development data in hand, to allow staff to reasonably determine both positive and negative outcomes of these activities. To date, the birding community has not been made aware of any plans for such a study.
164	22-Oct-21	Letter submission from Birder and Naturalist Community	During the engagement process, park staff informed the birding community that it was undertaking BC Coastal Waterbird Surveys as a means of allowing staff to gain greater insights into the temporal shifts in waterbird presence on lagoons and ponds. While this may indeed be of some value, there appears to be a lack of discussion relating to quantifying the impacts of this project on migratory and non-migratory landbirds which have been shown to rely on Iona for the important development of fat reserves during migration.

#	Date	Source	Question/Comment/Issue
165	22-Oct-21	Letter submission from Birder and Naturalist Community	In order to meet the standards of acceptable research design, it is essential that MetroVancouver develop well designed monitoring programs of the sewage lagoons and adjacent habitats before any activities occur that could potentially alter the ecological function of the island. A failure to implement pre-treatment surveys undermines the ability to reach accurate conclusions about potential impacts on avian biodiversity that may be required during latter permitting stages of the project.
166	22-Oct-21	Letter submission from Birder and Naturalist Community	Given the proposed duration of this project, it is entirely possible that the regulatory process might change over the next decade. Greater demonstrations of ethical and responsible development will likely increase through time and we propose that the implementation of a strong monitoring program will only help to further public trust in our regional government.
167	22-Oct-21	Letter submission from Birder and Naturalist Community	Recognizing the significance of the area to wildlife in this province within the local birding community there exists a wealth of expertise and knowledge that we are willing to contribute to a program from MetroVancouver to monitor and analyse data on the avian community at Iona Island. As a community, we respectfully request MetroVancouver re engage with the local wildlife community to help codevelop and implement a research and monitoring program that will provide MetroVancouver with the data required to assess the impact their projects on the bird life at Iona Island. We the co-signed are available to meet with MetroVancouver and discuss a detailed research and monitoring strategy.
168	22-Oct-21	Email accompanying letter submission from Birder and Naturalist Community	Thank you for organizing the October 18th update on the proposed Iona Island Wastewater Treatment Plant. It was helpful to learn how the proposed project is progressing. Just as helpful was learning where things have not progressed, including the level of avian baseline monitoring. Since the October 18th meeting a number of leaders in the bird conservation community have connected with one another and shared concerns around the level of baseline information being used to inform the Iona Island Wastewater Treatment Plant project activities.
169	22-Oct-21	Email accompanying letter submission from Birder and Naturalist Community	Collectively those that have added their names to the attached letter believe more baseline data needs to be collected and analysed before any further activities associated with the upgrade are undertaken. Please find attached a shared letter expressing our concerns and an offer to engage in further dialogue about how to implement required research and monitoring.

Appendix B - Online Public Comment Period Feedback

The following table details all feedback received through the online public comment period questionnaire between September 27 and October 22, 2021.

July 2020 Board-endorsed design concept

QUESTION 1
Do you have any comments about the project cost estimate and schedule as presented in the panels?

#	Date	Response
1	22-Oct-21	no
2	22-Oct-21	IF there's a cost to delay --apart from ecological/water quality costs--is it factored in here? ie if option x can come online faster, will it avoid costly govt penalties, thus offsetting higher operating costs? WOuld like to see that in the 'alternatives' info. Are there 'just around the corner' technologies that were not examined, that might be now considered given things are already delayed? I realize that costs in design & extends timeline, unless faster to build...
3	21-Oct-21	I have concerns about the water sewage costs being ramped up to a 5 year budget instead of spread over 10 years to a more modest yearly increase. 66 percent increase is too much to ask of Metro Vancouver residents !
4	20-Oct-21	no
5	20-Oct-21	This is definitely a case where it does not do to be "penny-wise and pound-foolish." I know making the proper investments now will be most beneficial in the long run.
6	20-Oct-21	Can under estimating population growth vs over estimating affect future development opportunities.
7	18-Oct-21	Nothing specific
8	17-Oct-21	I am saddened that the expert engineers who worked on this project design over the past three years, did not already take these factors into account. I am saddened that “constructability” (access challenges and construction in a limited workspace) and “ground improvements” were not fully recognized earlier on in the design phase. Under Project Overview, one of the bullets about the design states: "Withstand an earthquake and sea level rise". Early during the initial public meeting phase, the question was raised as to whether it makes economic sense to locate the plant on Iona Island, given that location's elevation is so very close to current sea level, as well as earthquake stability issues. I recall the response was that other sites had been considered, but none would work. How thorough was this consideration of other possible locations? What portion of the current cost estimate is to cover earthquake stability and sea level rise, given this location on a floodplain island of the Fraser River estuary? The total estimated project costs in 2021 dollars of $6.7 million and what this amounts to for the Vancouver Sewerage Area households does appear high compared to other Metro Vancouver sewerage areas. How much of the additional cost is due to necessary earthquake proofing and building to withstand sea level rise? Have other locations for the treatment plant been considered? In considering overall costs, it should be appreciated that when we discharge our human waste into the ocean, it must be done to full tertiary treatment standard. In accounting dollars, we should calculate the debt owing to nature over the many previous decades of discharging sewerage that had received only basic treatment into the Salish Sea. Has anyone calculated that long term debt to nature? Regarding the statement about schedule constraints and that the project would not be completed until about four years after the federal government's regulatory deadline – should this not be immediately discussed with the responsible federal government staff? There is not much that the public can comment on this scheduling issue and how to resolve.

9	15-Oct-21	Missing the federal deadline by four years is disappointing, it could have been avoided and the delay further damages the health of the Salish Sea. However, the region can still make things right by implementing tertiary treatment by 2034, or sooner, as they are promising.
10	13-Oct-21	It's very disappointing that you missed the federal deadline by 4 years, causing further damages to the health of the Salish Sea. I hope that you can complete the tertiary treatment ahead of 2034.
11	13-Oct-21	One comment is that a "design build" concept should not be used. This type of contract increases the risk of project delays and cost over runs. Even if it delays the start of construction, the project should have the design completed before construction contracts are awarded.
12	13-Oct-21	Who has been selected as the General Contractor? or who are on the short list?
13	12-Oct-21	It is not clear why initial estimate was so much lower than current estimate of costs. Where the challenges unanticipated in the initial estim? did materials or labour costs rise more than anticipated? Did all these "challenges" catch the estimators by surprise?
14	12-Oct-21	No
15	10-Oct-21	I understand that the cost of this project is great, but would like to argue that nature is not infinite. In other words, climate change is in full effect and we must protect wild environments with urgency rather than shuffling around dates, money and time. The delays on this project are indicative of a lack of concern and a lack of upholding the human and non-human right to a healthy environment. Iona Island Wastewater Treatment Plant should be upgraded to tertiary treatment by 2030 to 1) reduce senseless human pollution in the Salish Sea, 2) protect migrating salmon of the Fraser River and 3) set an example for municipal projects that are morally good and effective for pristine ecological habitat.
16	10-Oct-21	Missing the federal deadline by four years is disappointing, it could have been avoided and the delay further damages the health of the Salish Sea. However, the region can still make things right by implementing tertiary treatment by 2034, or sooner, as promised.
17	9-Oct-21	It is shocking and disappointing to learn that the federal deadline for this project has been missed by 4 years. The cost has increased exponentially in that time. However, better late than never. We MUST do this project because we need to restore the Fraser Estuary as much as possible - it is one of the most important biodiversity areas in all of Canada - salmon, birds, orca and more depend on this area. Many people depend on this area for their livelihood too. Marshes also store carbon so we must ensure this continues to fight the climate emergency. Cost must be of secondary importance! We must spend the money on projects like these now or nothing else will matter in the future - it will be too late!
18	9-Oct-21	Missing the federal deadline by four years is disappointing, it could have been avoided and the delay further damages the health of the Salish Sea. However, the region can still make things right by implementing tertiary treatment by 2034, or sooner.
19	9-Oct-21	Imagine this project will take several stages. I am not familiar with the costs, but it is necessary step to protect and presrve the Georgia Straight habitat and all its surroundings.
20	9-Oct-21	I am very disappointed that the project schedule will miss the federally mandated 2030 deadline. The cost estimate will, of course reflect the civil construction industry increases due to the excessive delay in starting this project.

21	9-Oct-21	The most important consideration is the prevention of non-tertiary treated sewage being flowed into the Salish SeaNo
22	9-Oct-21	most people can understand the costs can vary in a project of this complexity and I think it would've been more helpful if the reasons and background to why some of the costs increased so much and been explained in an ongoing and timely manner.
23	9-Oct-21	Yes, implementing tertiary treatment by 2034 or sooner is imperative for the health of the Salish Sea and the entire ecoystem in this region, an incredibly important habitat for salmon, orcas, birds, and other wildlife. Do not delay any longer.
24	9-Oct-21	Unfortunate we will miss 2030 deadline
25	9-Oct-21	Disappointed that the federal deadline is being missed. That is 4 extra years of unnecessary pollution going into the Salish Sea.
26	5-Oct-21	It has to be done. We don't need a cadillac but we need the best result without millions on minor improvements
27	4-Oct-21	What are the reprecussions for not completing the upgrades by the 2030 deadline?
28	2-Oct-21	In all these issuses, there shpuld be a clear outline by the First Nations with their prespective, given the City will have included them as they are directly impacted, as they were impacted in the first Iona Plant project. before any comment by me as a lay person, and not living adjacent to it< i would expect the First Nations stated views to be included first, and then shared in this city overview etc. so we are fully imformed, as part of the approppriate way to move forward!!!!
29	1-Oct-21	No. Seems like a long time to get this built, but I lack knowedge/expertise in this area.

July 2020 Board-endorsed design concept

QUESTION 2
Do you have any comments about the ecological restoration projects? (No modifications to the ecological restoration projects are being considered or evaluated as part of any revised design concept.)

#	Date	Response
30	22-Oct-21	no
31	22-Oct-21	What is the situation with trucking sludge to other locations? it must cost? is it just moving a problem material to future/elsewhere? Is, or might there be in future, recovery potential in it?
32	22-Oct-21	Concider the birds and their habitat when you are making decisions
33	21-Oct-21	no
34	20-Oct-21	I have not been able to access the materials, e.g. a map o that indicates the changes to the area. Would you send them to me? My concerns are that this is an Important Birding Area and a critical habitat for birds. What is being done to protect this natural area?
35	20-Oct-21	no
36	20-Oct-21	I would like you to please prioritize being as energy-efficient as possible, and - where compatible with the above - keep the enroachment on parks as small as possible. Energy efficiency, however, must be priority number one.
37	20-Oct-21	Seems the quality of the outflow could be enhanced to the point of restoring the ability for human consumption of the areas shellfish as well as recreational water safety.
38	18-Oct-21	My main concern is that bird habitat is maintained. It can be a difficult thing to create. I'm pleased to see tidal function being restored in areas by breaching causeways, etc. I suggest a viewing "tower" is not a great idea. Birds do not respond well to having high structures above habitats and people up there. All birds can be viewed well from ground level. Please review consideration of this addition to the grounds.
39	17-Oct-21	The terrestrial ecosystems and bird habitat are mentioned in the panel titled: “About the July 2020 Board-Endorsed Design Concept – Ecological Restoration Projects”. However, enhancement and sustaining the varied natural habitats of the park should be mentioned in the proceeding panel (“What Success looks like”). As a side note on the topic of natural habitats of the park and consideration of visitor experience and overall environmental well being, it is worth noting that this constitutes only a very small portion of the overall cost of the project – the budget estimate is only 3% for “Ecological Restoration & Community Amenities”. The last statement of the panel on "Ecological Restoral Projects" is misleading. That statement reads: *"No modifications to the ecological restoration projects are being considered or evaluated as part of a revised design concept."* Surely this statement is misleading when Design Concept 1a (Modified Base Case) states that more parkland will be used for construction of the facility. If parkland is reduced in size, then this surely will impact the park visitor experience and/or the ability to sustain and enhance the natural habitats of the park.
40	13-Oct-21	MORE IS BETTER, we have a lot of past sins to make up for.
41	13-Oct-21	What part does the First Nations have in this Project?
42	12-Oct-21	It is not clear from information that I have found whether the impact on the opposite shoreline, along the north arm of the Fraser, has been included in evaluations and monitoring.
43	12-Oct-21	No
44	10-Oct-21	I respect that Iona Beach and Regional Park have been redesigned in the past 20 years to benefit hundreds migratory birds. However, the jetty disturbs marine mammal and fish movement; it also represents a graveyard for what was once an abundant crustacean habitat.

45	10-Oct-21	Is there going to actually be an improvement in the new ecology by destroying the existing one other than what's needed for plant expansion.?
46	9-Oct-21	Sorry, I am not familiar with the plan. I will try and find out the details on line (I Imagine..) I live on Vancouver Island, so I am nor sure if I could be a "valuable custommer" . I will inform myself so that I can give you bettter answers, Thank you
47	9-Oct-21	All reasonable steps should be taken to restore the natural ecosystems.
48	9-Oct-21	i'm just glad ecological restoration projects were included
49	9-Oct-21	why wasn't this planned to be completed earlier than later, why isn't this upgrade to the plant a high high priority?
50	6-Oct-21	sounds like a good plan
51	5-Oct-21	The point here is sewage treatment not environmental enhancements
52	4-Oct-21	While any improvement to the ecological value of the treatment site can be considered positive, was such an extensive proposal required? The environmental gain will be seen in the receiving environment and the water quality discharge.
53	2-Oct-21	See above: *"In all these issuses, there shpuld be a clear outline by the First Nations with their prespective, given the City will have included them as they are directly impacted, as they were impacted in the first Iona Plant project. before any comment by me as a lay person, and not living adjacent to it< i would expect the First Nations stated views to be included first, and then shared in this city overview etc. so we are fully imformed, as part of the approppriate way to move forward!!!!"*
54	1-Oct-21	Agree with need for ecological restoration in lower Fraser River.

Treatment plant technology options and layouts being evaluated

QUESTION 3
Do you have any comments about Technology Option 1 (Base Case - July 2020 design concept)?

#	Date	Response
55	22-Oct-21	no
56	21-Oct-21	no
57	20-Oct-21	no
58	20-Oct-21	This seems the best best.
59	20-Oct-21	Better than previous plans. Does this adequately satisfy the regions desire, hopes and expectations towards a non-septic non-toxic discharge into our waterways?
60	17-Oct-21	The estimated cost does seem high, but in considering overall costs, it should be appreciated that when we discharge our human waste into the ocean, it must be done to full tertiary treatment standard. In accounting dollars, we should calculate the debt owing to nature over the many previous decades of discharging sewerage that had received only basic treatment into the Salish Sea. Has anyone calculated that long term debt to nature?
61	13-Oct-21	We need a true tertiary system. Some of the choices presented do not qualify. Please consider the Membrance Biologial Reactor or option 2.
62	13-Oct-21	Not enough knowledge to comment on technology but trucking seems like a reasonable option to have a simple process all on Metro lands. Also, resource recovery and provisions to deal with chemicals of emerging concern would be nice. However, once tertiary is in place these can be added later if the plant is "future proofed" for these. They will be needed in the future.
63	13-Oct-21	Which is the most cost effective technology
64	12-Oct-21	This seems reasonable
65	10-Oct-21	We want a true tertiary system. Some of the choices being presented, however, are not truly tertiary. The Standard tertiary system technology around the globe, and the one that is the best option, is Membrane Biological Reactor or Technology option 2.
66	9-Oct-21	Please avoid this one.
67	9-Oct-21	Ditto: "Sorry, I am not familiar with the plan. I will try and find out the details on line (I Imagine..) I live on Vancouver Island, so I am nor sure if I could be a "valuable custommer" . I will inform myself so that I can give you bettter answers, Thank you "
68	9-Oct-21	Regardless of the technology chosen, the critical issue is to achieve true tertiary treatment as soon as possible, and in any case, no later than 2034.
69	9-Oct-21	No go
70	9-Oct-21	truly tertiary?
71	4-Oct-21	Where is the information on the net effectiveness/ improvement on water quality for each of the treatment options?
72	2-Oct-21	See above: *"In all these issuses, there shpuld be a clear outline by the First Nations with their prespective, given the City will have included them as they are directly impacted, as they were impacted in the first Iona Plant project. before any comment by me as a lay person, and not living adjacent to it< i would expect the First Nations stated views to be included first, and then shared in this city overview etc. so we are fully imformed, as part of the approppriate way to move forward!!!!"*

Treatment plant technology options and layouts being evaluated

QUESTION 4
Do you have any comments about Technology Option 1a (Modified Base Case)?

#	Date	Response
73	22-Oct-21	no
74	21-Oct-21	no, Best use to meet the requirements
75	20-Oct-21	no
76	20-Oct-21	Moving towards a higher quality teriary processing ASAP is the objective, without overloading the system with under estimates of popuation growth impacts.
77	17-Oct-21	Regarding Design Option 1a: Modified Base Case (July 2020 Board-endorsed design concept with use of additional land), it states, "Footprint encroaches onto Metro Vancouver Parks Land". This does not fit with the statement in an earlier panel that the design options under consideration have "no change to ecological enhancement plan". If more parkland will be used, this surely will impact the park visitor experience and/or the ability to sustain and enhance the natural habitats of the park. The plant redesign and development should not encroach further on parkland.
78	13-Oct-21	Not enough knowledge to comment.
79	12-Oct-21	This seems unreasonable to permanently expand the plant size and encroach on Park Land to alleviate 6-years of temporary trucking.
80	9-Oct-21	Please avoid this one.
81	9-Oct-21	Ditto: "Sorry, I am not familiar with the plan. I will try and find out the details on line (I Imagine..) I live on Vancouver Island, so I am nor sure if I could be a "valuable custommer" . I will inform myself so that I can give you bettter answers, Thank you "
82	9-Oct-21	Regardless of the technology chosen, the critical issue is to achieve true tertiary treatment as soon as possible, and in any case, no later than 2034.
83	9-Oct-21	Good option
84	9-Oct-21	truly tertiary?
85	2-Oct-21	See above: *"In all these issuses, there shpuld be a clear outline by the First Nations with their prespective, given the City will have included them as they are directly impacted, as they were impacted in the first Iona Plant project. before any comment by me as a lay person, and not living adjacent to it< i would expect the First Nations stated views to be included first, and then shared in this city overview etc. so we are fully imformed, as part of the approppriate way to move forward!!!!"*

Treatment plant technology options and layouts being evaluated

QUESTION 5
Do you have any comments about Technology Option 2 (Membrane Biological Reactor)?

#	Date	Response
86	22-Oct-21	no
87	21-Oct-21	no
88	20-Oct-21	Suggest applying the Xogen technology, viewed at https://www.youtube.com/watch?v=2vJZn3Avf70 for additional features engaging this technology.
89	20-Oct-21	I like this one the least.
90	20-Oct-21	Besides being very expensive, locked into supply materials, high maintenance and power requirements, its purposes are apparent. Other techniques may also assist greater clarification and reduction of SS and BOD in a shorter time frame. The Xogen system (xogen.ca) and its branching technologies may reduce the time and degree of solids collection within a compact land space. Though I have neither lock nor stock in the company, engaging its unique technology would be a boon to BC's longevity and well-being, while also visualizing our energy transformation future, preserving petroleum resources for purposes other than combustion.(tinyurl.com/khjk67wz) If some requests to them for piloting such a system, our budgets etc, savings may be found with reduced retention times required, if this process contributes its share of clarification and 'biological reform' eliminating toxic product discharges.
91	17-Oct-21	Regarding Option 2 (Membrane Biological Reactor) and Option 3 (Aerobic Granular Sludge), I do not have the required knowledge in sewerage treatment to provide to comment. I assume this is why Metro Vancouver enlisted the help of the external panel. Will the details of their report be public, together with the names of the panel members?
92	15-Oct-21	I want a true tertiary system. Some of the choices being presented, however, are not truly tertiary. The Standard tertiary system technology around the globe, and the one I think is the best option, isMembrane Biological Reactor or Technology option 2.
93	13-Oct-21	This is the best.
94	13-Oct-21	Not enough knowledge to comment.
95	12-Oct-21	MBR technology is fairly established but I know there are lots of replacements more frequent that 10-years.
96	10-Oct-21	Membrane Biological Reactor or Technology option 2 should be implemented by 2030.
97	9-Oct-21	Technology option 2 is the best option. I realize that this technological piece is very complicated AND that a true tertiary system is critical for the project to be effective to preventing undertreated sewage from entering the waters and further polluting the surrounding ecosystems. We want to be able to swim in our oceans while we stay healthy as do marine creatures.
98	9-Oct-21	It is better to have a true tertiary system, but otherwise this is the best option out of all the options.
99	9-Oct-21	Where do I find the details about the Member Biological Reactor??
100	9-Oct-21	Regardless of the technology chosen, the critical issue is to achieve true tertiary treatment as soon as possible, and in any case, no later than 2034.
101	9-Oct-21	No go

102	9-Oct-21	Tertiary treatment is ultimately so important and I think Technology Options 2 or 3 would be the best way to go.
103	9-Oct-21	TheStandardtertiary system technology around the globe, and the one I think is the best option, is Membrane Biological Reactor or Technology option 2.
104	9-Oct-21	I believe this is the best option
105	9-Oct-21	reactor? Not earth friendly
106	2-Oct-21	See above: *"In all these issuses, there shpuld be a clear outline by the First Nations with their prespective, given the City will have included them as they are directly impacted, as they were impacted in the first Iona Plant project. before any comment by me as a lay person, and not living adjacent to it< i would expect the First Nations stated views to be included first, and then shared in this city overview etc. so we are fully imformed, as part of the appropppriate way to move forward!!!!"*

Treatment plant technology options and layouts being evaluated

QUESTION 6
Do you have any comments about Technology Option 3 (Aerobic Granular Sludge)?

#	Date	Response
107	22-Oct-21	no
108	21-Oct-21	no
109	20-Oct-21	seems okay
110	20-Oct-21	Seems appropriate and well developed.
111	17-Oct-21	Regarding Option 2 (Membrane Biological Reactor) and Option 3 (Aerobic Granular Sludge), I do not have the required knowledge in sewerage treatment to provide to comment. I assume this is why Metro Vancouver enlisted the help of the external panel. Will the details of their report be public, together with the names of the panel members?
112	13-Oct-21	Not enough knowledge to comment.
113	12-Oct-21	I understand this is an emerging technology but has had lots of research done in BC.
114	9-Oct-21	Please avoid this one.
115	9-Oct-21	I will have to look up the details, before being able to answer this question.
116	9-Oct-21	Regardless of the technology chosen, the critical issue is to achieve true tertiary treatment as soon as possible, and in any case, no later than 2034.
117	9-Oct-21	Best option
118	2-Oct-21	See above: *"In all these issuses, there shpuld be a clear outline by the First Nations with their prespective, given the City will have included them as they are directly impacted, as they were impacted in the first Iona Plant project. before any comment by me as a lay person, and not living adjacent to it< i would expect the First Nations stated views to be included first, and then shared in this city overview etc. so we are fully imformed, as part of the approppriate way to move forward!!!!"*

General

QUESTION 7
Do you have any other comments about the Iona Island Wastewater Treatment Plant Projects?

#	Date	Response
119	22-Oct-21	What is done with the sludge and dry waste solids. Could they be transported by empty coal trains to interior locations for soil blending, use for forests and agriland development.
120	22-Oct-21	I assume whichever design is selected WILL be capable of removing very small-scale plastic particles? Wish there was included a bit of info on capabilities of options altho I realize it's likely very technical. Is there any attempt to coordinate chosen technologies across the whole lower mainland, or even great area [pacific NW, or western Canada]--maybe can't, because of differing challenges. Seems if there's parallel systems, might be easier to get or train qualified people? or fix problems? I don't have any expertise to comment on the various options, but wow it seems there's quite a variety. Isn't there some way to rank them, apart from specific (& necessary) local considerations, in sense of world-wide current or best or emerging practices?
121	21-Oct-21	keep the improvement costs down by spreading it over 10 years ,not 5 years .
122	20-Oct-21	As mentioned suggest finding a place to engage Xogen to verify its benefits.
123	20-Oct-21	Thank you for all your work on this project.
124	20-Oct-21	Dilution is still not a solution to pollution. The technologies we decide to apply in small or great proportion, have the intrinsic abilities to transform both the energy and viable recirculation of the planets resources. The air quality the facilities produce and the treated sewage outflow characteristics determine the health of the sea and shores, healthy people, better land use value and civilization coexisting with close access to vibrant nature, often the reasons for populaton growth.
125	18-Oct-21	I am keen to see the best possible treatment of wastewater for the area on environmental and human health grounds. I do not have opinions on the technology.
126	17-Oct-21	Regarding the external panel of subject matter experts who have reviewed the three revised design options presented in subsequent panels – what is the basis for choosing a redesign? Will it be the cheapest cost, measured only in immediate construction costs and not including debt to nature and/or loss of long-term park benefits to nature, including humans? Will the recommendation/decision be made only on which option can be completed by 2030? Those factors are not always included in the Pros and Cons. That is for the panel on Option 1: Base Case, it does not mention under Cons, the high cost and expected completion date of 2034.
127	15-Oct-21	It is essential that we have true tertiary treatment ASAP to protect the Salish Sea that so many species as risk depend on, including endangered Southern Resident Killer Whales. The lack of communication and honesty from Metro Vancouver to the community has created distrust around the project. The region should communicate any changes to budgeting and timelines any other complications with stakeholders and the public as soon as they encounter them. The community is an important part of creating a strong plan for the region, and that begins by open communication from Metro Vancouver.

128	13-Oct-21	Communication to the community should be improved, particularly to changes in budgeting and timelines. The health of the Salish Sea is important to me and many other residents of BC. We can not be a climate leader, or a green community while raw sewage is being pumped into our sea. Please ensure that this project is completed well (with a true tertiary system) and as soon as possible.
129	13-Oct-21	Thanks for making the effort to include tertiary and this consultation process. We look forward to the day when Metro Vancouver is NOT the waste water villan of developed world.
130	12-Oct-21	No
131	10-Oct-21	While I am not an expert regarding any of the issues presented here, I live on this planet and am very concerned with preserving its habitability for all living things. (I also believe that we humans have not come close to understanding our connectedness with all living things. Who would ever have thought that trees communicate with each other???) Just as we have seen that the caribou can not survive when their habitat is degraded and the salmon populations are diminished when their complex habitat needs are destroyed, we, too, need to protect a healthy environment for humans to thrive in. So it would be my wish that finances not be a consideration in developing this facility; the recent election campaign made it clear that we have enough money to provide such 'common good' services. We simply have to make those with the resources pay whatever their 'fair share' requires; they have certainly benefitted more than most from being, in one way or another, a member of this community. This is simply a question of political will.
132	10-Oct-21	Primary treatment at IIWWTP is irresponsible in that it pollutes pristine ecological habitat of the Salish Sea. Note: I live in Vancouver, on unceded Musqueam territory.
133	10-Oct-21	The lack of communication and honesty from Metro Vancouver to the community has created distrust around the project. The region should communicate any changes to budgeting and timelines any other complications with stakeholders and the public as soon as they encounter them. The community is an important part of creating a strong plan for the region, and that begins by open communication from Metro Vancouver.
134	9-Oct-21	Communication between Metro Vancouver and its citizens is very important. Metro Vancouver needs to inform us of the reasons why this project is badly needed and be transparent about the delays, cost overages, etc. as soon as they occur. We need the public to be on-side with this project and be willing to pay for it. Your messaging must show courage and leadership - tell the public this is the only way to keep our community and ecosystems healthy. Remind them that we all rely on clean water, air and food to survive so we must take care of nature or else we will not only kill off the plants and animals but also ourselves. Remind them that you are undertaking this project for the sake of each of them and their children/youth.
135	9-Oct-21	The lack of communication and honesty to the community has created distrust around the project. The region should communicate any changes to budgeting and timelines any other complications with stakeholders, the public, and local First Nations as soon as they encounter them. The community is an important part of creating a strong plan for the region, and that begins by open communication.
136	9-Oct-21	Ditto: "*I will have to look up the details, before being able to answer this question*"

137	9-Oct-21	Project principals must do a better job of communication with the local community, the public and other stakeholders as the project evolves. The continued flow of under-treated effluent into the Salish Sea if unacceptable.
138	9-Oct-21	Should meet the Federal time line or ASAP thereafter.
139	9-Oct-21	There should be an absolute commitment to the completion of the projects by 2034. The date has already been pushed 4 years further than it should be .
140	9-Oct-21	Better communication and transparency please! The region should communicate any changes to budgeting and timelines any other complications with stakeholders and the public as soon as they encounter them. The Salish Sea is critical habitat for numberous endangered and declining species that have cultural importance to Indigenous peoples on the coast and up the Fraser riverbed - if Metro Vancouver is committed to true reconciliation, you will implement the best treatment technologies available at the quickest possible timeline.
141	9-Oct-21	please commit to open, transparent full communications on plans, budgets and schedules. I want to see a full tertiary treatment system.
142	9-Oct-21	lagged time line completion date
143	9-Oct-21	I am not sure which option is best.... not a specialist. But it is important for it to be a true tertiary wastewater treatment.
144	5-Oct-21	Produce the best result while remembering that we taxpayers see our government costs going up faster than incomes. Be resonable. We, the taxpayer, have no rational ability to comment on the best option.
145	2-Oct-21	In all these issuses, there shpuld be a clear outline by the First Nations with their prespective, given the City will have included them as they are directly impacted, as they were impacted in the first Iona Plant project. before any comment by me as a lay person, and not living adjacent to it< i would expect the First Nations stated views to be included first, and then shared in this city overview etc. so we are fully imformed, as part of the approppriate way to move forward!!!!
146	1-Oct-21	It's very hard for a non-expert member of the public (like myself) to make informed comments on wastewater technologies with which we are unfamiliar.
147	28-Sep-21	this project will be detrimental to the migratory shorebirds that use this place to roost and feed. With endless construction noise and the loss of the precious sewage lagoons turning into duck ponds we will be losing a precious treasure pls reconsider
148	28-Sep-21	When the project is running - I hope that the public can be given performance data and environmental impact assessment data

Appendix C - First Nation Feedback

The following table details all First Nation feedback received during the July 30 to October 22, 2021 engagement period.

Musqueam Indian Band			
#	**Date**	**Source**	**Question/Comment/Issue**
1	30-Jul-21	Project update meeting with Musqueam Indian Band Staff	How will the proposed design changes impact views to Musqueam?
2	30-Jul-21	Project update meeting with Musqueam Indian Band Staff	What is the driver of the increased footprint option versus the other treatment options?
3	30-Jul-21	Project update meeting with Musqueam Indian Band Staff	*In response to Metro Vancouver interest in inviting Musqueam staff to participate in the regulatory working group:* Musqueam staff will need to confirm this with their colleagues, but expect interest. This was discussed previously as a means to help resolve timing and other issues tied to permitting.
4	30-Jul-21	Project update meeting with Musqueam Indian Band Staff	*In response to Metro Vancouver invitation to Musqueam staff to meet in early September to engage on aspects of the existing IIWWTP design concept that could potentially be revised:* Agreed to meet and confirmed September 14 as the meeting date. Asked Metro Vancouver to structure the September 14 meeting format to accommodate Musqueam staff who can only attend one-half of the two-hour meeting.
5	14-Sep-21	Project Definition Update Engagement Meeting with Musqueam Indian Band (Staff to Staff)	Who is the audience for the "History of Iona Island Wastewater Treatment Plant" video?
6	14-Sep-21	Project Definition Update Engagement Meeting with Musqueam Indian Band (Staff to Staff)	The "History of Iona Island Wastewater Treatment Plant" video doesn't include any content related to the significant negative human health impacts the treatment plant had on Musqueam people. Metro Vancouver should explore opportunities to include voices from the Musqueam community directly impacted by the treatment plant's history.

Musqueam Indian Band			
#	**Date**	**Source**	**Question/Comment/Issue**
7	14-Sep-21	Project Definition Update Engagement Meeting with Musqueam Indian Band (Staff to Staff)	Agrees with concerns about the "History of Iona Island Wastewater Treatment Plant" video voiced by Musqueam staff. Appreciates the video and sees opportunity to build on the story by spotlighting how Musqueam and Metro Vancouver (Metro Vancouver) have moved from a place of no consultation, to the immersive and collaborative work being done today. Sees opportunity to emphasize how the relationship between Musqueam and Metro Vancouver has progressed.
8	14-Sep-21	Project Definition Update Engagement Meeting with Musqueam Indian Band (Staff to Staff)	When is Metro Vancouver expecting to have the Project Definition Report approved?
9	14-Sep-21	Project Definition Update Engagement Meeting with Musqueam Indian Band (Staff to Staff)	Appreciates Metro Vancouver's commitment to share permits early on in the permitting process. Supports the idea of Metro Vancouver sharing a preliminary permit review with Musqueam to help them identify and analyze permits of interest.
10	14-Sep-21	Project Definition Update Engagement Meeting with Musqueam Indian Band (Staff to Staff)	Is the acquisition of eastern Iona island for the new treatment plant options complicated?

To: Finance and Intergovernment Committee

From: Jerry Dobrovolny, Commissioner/Chief Administrative Officer

Date: October 21, 2021 Meeting Date: November 10, 2021

Subject: **Manager's Report**

RECOMMENDATION

That the Finance and Intergovernment Committee receive for information the report dated October 21, 2021, titled "Manager's Report."

Finance and Intergovernment Committee Work Plan

Attachment 1 to this report sets out the Committee's Work Plan for 2021. The status of the Committee's key priorities is shown as pending, in progress, or complete together with the quarter that each is expected to be considered by the Committee.

Attachment

1. 2021 Finance and Intergovernment Committee Work Plan *(Doc# 42574503)*

Finance and Intergovernment Committee 2021 Work Plan
Report Date: October 21, 2021

Priorities

1st Quarter	**Status**
2021 Standing Committee Events	Complete
Board Strategic Planning Session	Complete
TransLink Federal Gas Tax Application	Complete
Intergovernmental Relations Strategy	Complete
North Shore Wastewater Treatment Plant Update	Complete
Project Delivery Update	Complete
Procurement Policy Update	Pending
National Zero Waste Council Update	Complete
2020 Zero Waste Conference	Complete
Forums on Systemic Racism Report Out and Next Steps	Complete
Tier III Cost Apportionment Bylaw Amendments	Complete
Litigation Updates	Complete
Fraser Basin Council Update	Complete
Lower Mainland Flood Management Strategy Update	Complete
Poplar Landing Update	Pending
Intergovernmental Communications and Engagement Update	Complete
Metro Vancouver Comments on from External Agency Projects (As Required/Applicable)	Pending
Board Policies (As Required/Applicable)	Pending
2nd Quarter	
Vancouver Airport Authority Update and Board Appointment	Complete
Resilient Region Strategic Framework	Complete
Waste-to-Energy Facility District Energy	Complete
Burrard Inlet Environmental Action Program – Fraser River Estuary Management Program (BIEAP – FREMP) Partnership Update	Pending
2020 Statement of Financial Information	Complete
Status of Reserves	Pending
Major Project Updates	Complete
Project Delivery Update	Complete
Municipal Finance Reform Update	Pending
Intergovernmental Communications and Engagement Update	Complete
UBC Cliff Interagency Steering Committee Update	Pending
Major Projects from External Agencies (As Required/Applicable)	Pending
Board Policies (As Required/Applicable)	Complete
3rd Quarter	
Environmental, Social and Governance (ESG) and Socially Responsible Investment (SRI) Strategy Update	Pending
TransLink Federal Gas Tax Report	In Progress
Project Delivery Update	Complete

Litigation Updates	Complete
Intergovernmental Communications and Engagement Update	Pending
Major Projects from External Agencies (As Required/Applicable)	Pending
Board Policies (As Required/Applicable)	Complete
4th Quarter	
Annual Budget and Five Year Financial Plan – Regional District Service Areas and Corporate Support	Complete
School and Youth Leadership Program Update	In Progress
Major Project Updates	Complete
Project Delivery Update	Complete
Intergovernmental Communications and Engagement Update	In Progress
Major Projects from External Agencies (As Required/Applicable)	Pending
Board Policies (As Required/Applicable)	In Progress