



City of Richmond

Report to Committee

To: General Purposes Committee **Date:** May 10, 2023
From: Lloyd Bie, P.Eng. **File:** 10-6460-01/2023-Vol
 Director, Transportation 01
 Milton Chan, P.Eng.
 Director, Engineering

Re: **Steveston Highway Multi-Use Pathway Project Phases 1 and 2 – Update**

Staff Recommendation

- 1) That Option 1 as described in the staff report titled “Steveston Highway Multi-Use Pathway Project Phases 1 and 2 – Update”, dated May 10, 2023, from the Director, Transportation and the Director, Engineering be approved; and
- 2) That the Consolidated 5 Year Financial Plan (2023-2027) be amended accordingly.

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

Milton Chan, P.Eng.
 Director, Engineering
 (604-276-4377)

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

Staff Report

Origin

Council approved the Steveston Highway Multi-Use Pathway Project Phases 1 and 2 (the Project) as part of the 2019 and 2020 Capital Budgets, respectively. The project will implement a shared cycling and pedestrian facility on the south side of Steveston Highway from Shell Road to No. 2 Road that is physically separated and protected from traffic with provision of a concrete barrier and buffer zone.

Phases 1 and 2 are currently in the procurement phase. Phase 3 of the project (No. 2 Road to Railway Avenue) was approved by Council as part of the 2023 Capital Budget and is not the subject of this staff report.

At the March 6, 2023 meeting of the General Purposes Committee, the following referral motion was introduced:

That the staff report titled “Steveston Highway Multi-Use Pathway – Update” be referred back to staff to:

- a) Compare the implications of Steveston Highway and Williams Road as multi-use pathways;*
- b) Examine the feasibility of a Class A bike lane on Williams Road; and*
- c) Investigate funding implications.*

This report responds to the referral and seeks Council direction regarding the Steveston Highway MUP Phases 1 and 2 implementation and associated approval for budget increase. This report supports Council’s Strategic Plan 2022-2026 Focus Area #2 Strategic and Sustainable Community Growth:

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

This report supports Council’s Strategic Plan 2022-2026 Focus Area #6 A Vibrant, Resilient and Active Community:

6.1 Advance a variety of program, services, and community amenities to support diverse needs and interests and activate the community.

Analysis

Background

A major street cycling facility on Steveston Highway has been considered and approved by Council through the development and implementation of multiple City plans. It has been identified in the Council approved Official Community Plan (OCP) since 2012 which included study, analysis, public consultation and a Public Hearing as part of the OCP approval process. Phases 1 and 2 of the project were approved by Council as part of the 2019 and 2020 Capital Budget plans, respectively. An in-person Capital Projects Open House and associated online engagement in 2019 sought public feedback for Phase 1. The Steveston Highway MUP Phase 2 capital project included online public consultation in 2020. In July 2022, Council approved the Cycling Network Plan Update to guide and prioritize investment in new cycling facilities and safety improvements throughout Richmond. The Cycling Network Plan Update, included multiple rounds of public and stakeholder engagement to develop the priorities for investments in new and upgraded cycling facilities. The Council approved Cycling Network Plan Update included the Steveston Highway MUP project as a short-term priority project. Upgrade of the bike lanes on Williams Road were not identified through the consultation and Council approval process as a priority over the next 15 years.

The Steveston Highway MUP supports the Council approved OCP vision to reduce vehicle trips by 34 percent between 2008 and 2041 in order to achieve local mobility, air quality and liveability goals. The OCP targets increasing the percentage of all trips by bicycle from one percent in 2008 to 10 percent in 2041 and walking trips from eight to 18 percent over the same period. The Council approved, Community Energy & Emissions Plan 2050 (CEEP 2050) identifies accelerating achievement of the 10 percent target for cycling mode share and 18 percent target for walking mode share to 2030. A key action of the OCP is to build cycling and pedestrian infrastructure along major streets that is safe, convenient and connected to important local and regional areas as well as to the existing cycling and pedestrian networks. Steveston Highway and Williams Road are both integral to the Council approved cycling network plan to encourage increased cycling trips (Attachment 1). These streets are part of the City's cycling strategy to implement bike routes spaced at least every 800 metres that connect to major destinations within Richmond and to the rest of the region.

A MUP on Steveston Highway will ultimately provide an active transportation connection between the major activity centres of Steveston Village and the Ironwood neighborhood. Alternate cycling routes between these two destinations are circuitous. A detour via Williams Road adds approximately two kilometres to this trip, which is considered to be inconvenient, even by vehicle standards. If residents have to cycle substantially out of their way to connect to the cycling network, they are less likely to choose cycling over driving. Similar to the City's road network that supports mobility for cars through a comprehensive and cohesive major street grid, the Council approved cycling plan envisions corridors, such as, Steveston Highway to develop the same level of utility and convenience for cyclists. Ultimately, the Steveston Highway MUP project will create a "complete street" design; one that supports a transportation system that is safe, sustainable, promotes physical activity and is equitable to all road users – not just motorists.

Implications of Steveston Highway and Williams Road Cycling Upgrades to an All Ages and Abilities Standard

The Steveston Highway MUP Project Phases 1 and 2 is designed as an All Ages and Abilities cycling facility. An All Ages and Abilities route has infrastructure that includes physical barriers and separation of cyclists from traffic. A cycling facility designated as All Ages and Abilities makes cycling safe, convenient and comfortable for all ages and abilities including families with children, seniors, and new riders. A connected network of low stress All Ages and Abilities standard routes provides a wide spectrum of the population the option to cycle.

To upgrade the Williams Road bike lanes to an All Ages and Abilities standard, would involve realigning the existing road curbs to varying degrees in order to create space for protected cycling facilities. Staff reviewed two different types of cycling upgrades to the bike lanes on Williams Road to achieve an All Ages and Abilities designation. The first considers a multi-use pathway on the north side of the street. A second design would involve creating bi-directional protected bike lanes.

Table 1 summarizes the high-level assessment of the implications of Phases 1 and 2 of the Steveston Highway MUP project and upgraded bike lanes on Williams Road between Shell Road and No. 2 Road.

Table 1: Implications of Steveston Highway and Williams Road Cycling Upgrades to All Ages and Abilities Standard (Shell Road to No. 2 Road)

Project Implications	Steveston Highway MUP Phases 1 & 2	Williams Road MUP	Williams Road Protected Bi-Directional Bike Lanes
Cost Estimate	\$11.5M	\$12.7M	\$16.9M
External Grants	Almost 50% secured	-	-
Air Quality	Good	Good	Good
Aligned with Council Approved City Plans	OCP, Cycling Network Plan Update & Approved Capital Budgets	OCP	OCP
Project Schedule (pending Council approval)	Spring/Summer 2023 commence construction	2026 Commence construction (post detailed design and funding)	2026 Commence construction (post detailed design and funding)
No. of Driveway Conflicts	50	100	190
No. of Trees impacted	25	120	235
Bus Shelter Removal	1	2	3

Further detail of the implications identified in Table 1 are described in the following sections.

Air Quality Review

At the General Purposes meeting of March 6, 2023 there was discussion regarding the air quality impacts to cyclists on Steveston Highway. Staff have discussed this matter with Metro Vancouver who are responsible for monitoring the air quality in the region. Metro Vancouver staff has advised that air quality in Richmond is good. A contributing factor for the decline in air quality near major streets is not the amount of traffic volume; however, it is related to a high percentage of large diesel truck traffic. A letter providing Metro Vancouver’s assessment on air quality in Richmond is provided in Attachment 3.

There are some roads, like Clark Drive in Vancouver, that have over 2100 large semi-trailer trucks a day. It is at this threshold, when the near road air quality reduces. In contrast, Steveston Highway and Williams Road have large semi-trailer truck volumes of approximately 50 and 4 per day, respectively (Figure 1). To assess this metric at a local scale, staff provided Metro Vancouver with traffic data on Steveston Highway and Williams Road. Metro Vancouver’s assessment of air quality along both these roads include the following:

- It is expected that air quality would not be appreciably different on Williams Road and Steveston Highway.
- Recent data indicates that air quality is good at the Richmond monitoring station and air contaminants are typically not elevated (only exceeded due to wildfire smoke in summer).
- One of the near-road study’s main findings was that large diesel trucks (i.e. semi-trailer trucks) were the main contributor to near-road air pollution. Both Steveston Highway and Williams Road are not busy truck routes and serve a low volume of large trucks.
- Air quality objectives are not expected to be exceeded along either Steveston Highway or Williams Road.
- Although residents and commuters may have air quality concerns about arterial roads in Richmond now, traffic-related air pollution is expected to continue decreasing in the future as the shift is made to encourage active transportation.

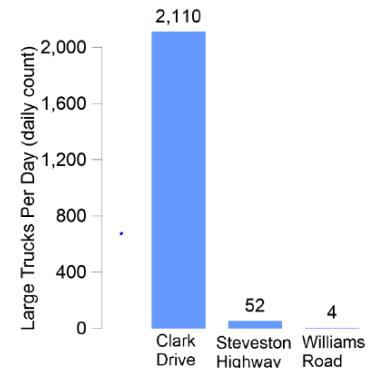


Figure 1: Large trucks per day

The assessment by Metro Vancouver staff indicates that air quality conditions along Steveston Highway should not impede the installation of a multi-use pathway; based on the air quality measurements at the Richmond-South air monitoring station, the low volume of large trucks on Steveston Highway, and Metro Vancouver’s understanding of air quality in the area. Metro Vancouver supports the expansion of active transportation networks, such as multi-use pathways, to meet regional greenhouse gas reduction targets, and to improve air quality and health.

Existing Arterial Road Cycling Facilities

There is precedence for constructing successful cycling facilities along Arterial roads in the City. Council has approved major street cycling projects including those constructed along the Arterial roads provided in Table 2. The corresponding traffic volumes illustrate a MUP on Steveston Highway that is consistent with other such major street cycling facilities in the City.

**Table 2: Arterial Road Cycling Facilities and Associated Street Average Daily Traffic Volume
(in 4 directions)**

MUP Facility	Intersection	Average Daily Traffic (vehicles/day)
Steveston Highway Phase 1 and Phase 2 MUP	Steveston Highway at Gilbert Road	43,400
Alderbridge Way MUP	Alderbridge Way at No. 4 Road	47,400
No. 6 Road MUP (Cambie Road to Bridgeport Road)	No. 6 Road at Cambie Road	37,300
Westminster Highway MUP (No. 6 Road to Nelson Road)	Westminster Highway at No. 6 Road	27,000
No. 3 Road Bike Lane	No. 3 Road at Westminster Highway	46,700

Estimated Project Costs

The procurement process for Steveston Highway Phases 1 and 2 resulted in an updated project cost of \$11.5M. Almost 50 per cent (\$5.5M) has been secured in external funding. This project cost for Steveston Highway is approximately \$1.2M less than the cost estimate for a MUP on Williams Road and about \$5.4M less than the cost estimate for protected bike lanes on Williams Road.

External Grant Implications

A total of \$5.5M has been secured in external grants for Phases 1 and 2 of the Steveston Highway MUP project. Conditions of the external grant funding include deadlines for delivery of the project and a determination of the project next steps is time sensitive.

TransLink has confirmed that funding allocated for the Steveston Highway MUP project can not be reassigned to Williams Road. A project on Williams Road will have to be submitted once City funding is secured to TransLink's Municipal grant application process and will be assessed based on its own merits and in consideration of other submissions for any competitive grant funding being sought by the City. As Williams Road is not identified as part of the Regional Bikeway Network, the opportunities for competitive grant funding are anticipated to be limited.

Project Schedule Implications

Phases 1 and 2 of the Steveston Highway Multi-Use Pathway project were approved by Council for detailed design and construction in 2019 and 2020, respectively and staff proceeded to complete the detailed design and enter into the procurement of construction based on this direction. Phases 1 and 2 of the project are at the construction procurement stage. Should Council approve the recommended budget increase, the procurement process would continue with the aim of commencing construction in late spring/early summer.

Several months have passed since the close of the procurement and the original project start date and contract award timeline have elapsed.

Staff have remained in contact with the lead proponent and to-date they have indicated they are prepared to hold their proposal price and accept a delayed start date for the work.

However, this should not be considered as a contractual guarantee as the price was procured by way of a Request for Proposals, and until a contract is executed, the bidder remains free to revoke their proposal entirely and without penalty. Hence, there are still risks and unknown cost impacts as a result of the delay in awarding the contract.

Consideration of cycling infrastructure upgrades on Williams Road will require detailed design work and internal and external funding to be secured through future capital budgets and grant applications for construction costs.

To conduct the detailed design and accrue the necessary funding, upgrade to the Williams Road bike lanes is not anticipated to commence construction until 2026 at the earliest.

Steveston Highway Multi-Use Pathway Implications

Corridor Analysis

Along Steveston Highway there are several activity centres that can be accessed by cycling, including the Ironwood residential, commercial and industrial areas, multi-family development along the north side of Steveston Highway and to Steveston Village and Community Centre via the approved Phase 3 section of the project that will connect to the Railway Greenway. Ultimately, the Steveston Highway MUP will connect these destinations regionally via the current George Massey Tunnel. The project will connect to approximately 13,000 residents and 3,500 jobs along Steveston Highway (Attachment 4). From a cycling perspective, this area is currently under served, as there is no bike route within 800 metres as envisioned in the Council approved OCP. The alternate routes along Williams Road or the perimeter dike trail require lengthy detours that are an additional barrier for many cyclists.

Multi-Use Pathway Design

As has been identified by the public, traffic issues on Steveston Highway discourage cycling on this route, with traffic volume and speed being identified as significant barriers to cycling. The provision of a separated cycling facility to protect cyclists from traffic provides travel choices on this significant local and regional route.

Figures 2 and 3 illustrate how the Steveston Highway MUP project will facilitate a cycling facility that is comfortable for all ages and abilities. Cyclists and pedestrians will be protected and separated from vehicle traffic on Steveston Highway with a new concrete barrier curb on the south side of Steveston Highway and buffer zone between the street and the pathway. The design of the Steveston Highway MUP complies with industry safety and geometric design guidelines.



Figure 2: Steveston Highway MUP Illustration (Perspective from Street)



Figure 3: Steveston Highway MUP Illustration (Perspective from MUP)

Consultation

There have been several points of engagement in the development of the Steveston Highway MUP project to seek feedback and input from the public and stakeholders. Consultation has included opportunities for comment on the expansion of the cycling network along the Steveston Highway corridor as well as on the specific design details of the Phase 1 and Phase 2 MUP capital projects as follows:

- *Steveston Highway Major Street Cycling Facility*: Development of the 2041 OCP (adopted by Council in 2012).
- *Steveston Highway MUP Phase 1*: In-person Capital Projects Open House in April 2019 and associated Let's Talk Richmond engagement in June 2019.
- *Steveston Highway MUP Phase 2*: Online Capital Projects Open House engagement from August to September, 2020.
- *TransLink Regional Bikeway*: As part of Transport 2050 consultation in October 2021.
- *Richmond Cycling Network Plan Update*: Multiple rounds of public engagement from June 1 to June 30, 2021 and November 1 to 30, 2021. The Steveston Highway MUP project identified as a short term priority project.

In addition to formal engagement, there have been several other opportunities for comments to be submitted by the public regarding the Steveston Highway MUP project. Council has considered eight other staff reports related to the City's cycling network, capital project submissions and cost-share grant applications that identified the project.

Williams Road Bike Lane Upgrade to an All Ages and Abilities Standard

Corridor Analysis

The existing cycling facility on Williams Road between No. 2 Road to Shell Road consists of an in-street painted bike lane in each direction of traffic. Although an upgrade of this facility will offer more protection for cyclists, it does not expand the length of the City's cycling network.

Bike Lane Upgrade Review

In response to Council's referral to review the implications of upgrading the painted bike lanes on Williams Road between Shell Road to No. 2 Road to All Ages and Abilities standard, staff developed two conceptual designs discussed below. The eastern and western extents of staff's review are consistent with Phase 1 and Phase 2 of the Steveston Highway MUP project: Shell Road to No. 2 Road.

Although delineators or concrete barrier curb could be added to the bike lanes at a lower cost, these measures result in large gaps along the bike lane to accommodate the numerous driveways fronting this street and at bus stops where there would be no physical protection for cyclists from traffic. Buses would also block the bike lane during loading/unloading of passengers. Therefore, this type of discontinuous treatment would not achieve the standard for a cycling facility as directed by Council.

Williams Road Multi-Use Path (MUP)

Staff assessed a MUP on the north side of Williams Road (Figure 4). This would require reconstructing the existing north curb to create a protected and separated cycling facility. This concept includes a 3.0 metre MUP with a boulevard between the traffic lane and pathway. However, the dedicated sidewalk on the north side of the street would be widened to share with cyclists. To accommodate the MUP within the road right-of-way, the existing bi-directional bike lanes will need to be removed.



Figure 4: Williams Road MUP Concept: Typical Cross Section

The site considerations of a MUP on Williams Road include conflicts with approximately 100 driveways compared to 50 driveways for the Steveston Highway MUP project. The north side of Williams Road also has approximately 120 trees that will conflict with the MUP compared to the Steveston Highway MUP project that is anticipated to impact 25 trees. The limited road right-of-way of Williams Road also precludes bus stops from having adequate space for transit shelters. Two existing stops that currently have shelters will be impacted as a result.

Due to the adjacency of several developed properties, it is anticipated there will be sections of the road where certain elements may need to be reduced, such as the boulevard width or the centre two-way left-turn lane in order to accommodate the existing built environment (fences, edges, retaining walls, etc.) along Williams Road.

The cost estimate for design and construction of this option is \$12.7M.

Williams Road Protected Bi-Directional Bike Lanes

To maintain the existing function of the bi-directional bike lanes on Williams Road, the implications of protected bike lanes were explored. This concept retains the existing sidewalks on both sides of the street, however, removal of the centre two-way left-turn lane is required to reallocate the road space to protect and separate off-street bike lanes. The loss of the centre lane will result in a single lane of traffic in each direction (Figure 5).

The reduction in road capacity will create traffic delays as through traffic will need to wait behind turning traffic at the numerous driveways along this corridor, especially at high trip generators including accesses to the Broadmoor Mall Shopping Centre, McRoberts High School and South Arm Park and Community Centre. The reduction from three to two travel lanes will also require traffic behind a stopped bus to wait during loading and unloading of passengers. Further delays will be experienced by vehicles as the left-turn lanes at the major signalized intersections will also have to be removed which reduces road capacity and safety on the corridor.



Figure 5: Williams Road Protected Bike Lanes Concept: Typical Cross Section

The upgraded bike lanes will have conflicts for cyclists with approximately 190 driveways and will impact a total of approximately 235 trees and three existing bus shelters.

The cost estimate for design and construction of this option is \$16.9M.

Steveston Highway MUP Phases 1 and 2 Budget Update

The procurement process for Phases 1 and 2 was conducted using a public, competitive request for proposal process. Staff have received and reviewed the proposals and pricing for this work. The pricing received, in combination with contingency and ancillary items required to complete these phases of the project, exceeds the approved budget amount.

Table 3 outlines the budget shortfall based on tendered prices and cost estimates completed by staff and consultants.

Table 3: Budget Update

Budget Breakdown	Project Budget and Costs
City Funding	\$3.50M
External Funding	\$5.51M
Total Approved Budget	\$9.01M
Estimated Total Cost**	\$11.50M
Budget Variance	(\$2.49M)

*City funding sources are 94.05% from Roads Development Cost Charges and 5.95% from Capital Reserve

**Estimated costs to complete the project includes 10% contingency, allowance for private property impacts, third party utility impacts and other ancillary items.

Options to Proceed

Due to the results of the construction tender process, staff reviewed options to address the potential project budget impacts. Staff have prepared the following options for Council consideration as outlined below.

Option 1 – Proceed with Project and Increase Budget (Recommended)

Option 1 is to amend the budget for the Steveston Multi Use Pathway, Phases 1 and 2 capital projects to address the budget shortfall of \$2.49 million. The budget increase encompasses all tendered and estimated costs provided through a competitive procurement process. Staff have engaged with TransLink to seek additional funding for this project, however, TransLink has advised additional cost sharing for this project is not available. Award of construction contract for Phase 1 and Phase 2 of this project would proceed immediately following Council approval of the budget increase. Ongoing consultation will occur during the construction phase of the project through notification to all impacted stakeholders and abutting property owners prior to commencement of construction activity and ongoing communication to address any comments or questions raised regarding the construction process. The additional funding required to cover the anticipated costs for the project are available in the Roads DCC (\$2,341,845) uncommitted balance and Capital Reserve-Revolving Fund (\$149,400). Should Council endorse this option, the Consolidated 5 Year Financial Plan (2023-2027) will be amended accordingly.

Option 2 – Implement Phase 2 Only

This option reduces the scope of the project by deferring Phase 1 to a future date to accrue additional funds through the capital planning process. External funding (\$1.4M) for this phase will be lost and the project would remain incomplete until an indeterminate date in the future. Implementing Phase 2 will realize the higher external grant contributions received amounting to (\$4.1M) and implement the longer section (2.5 km) of the MUP between No. 2 Road and Mortfield Gate. Reducing or modifying the project scope, could have financial implications.

As the current construction procurement was for both Phase 1 and Phase 2, reducing the scope to Phase 2 only would require a new procurement process which could result in bids being received higher than the approved budget. This option would also delay the project and therefore, impact to the deadline for the external grant funding of March 31, 2025 is a consideration.

Option 3 – Cancel the Project

Based on the tender results received, with Council direction, staff can proceed to terminate the project and leave the roadway in its current form and continue with normal maintenance.

Both the Translink funding secured for this project (\$5,010,000) and the BC Active Transportation Infrastructure Grant (\$500,000) will be lost as a result of this option. Approved Capital funding for Phase 1 and 2 of this project would be returned to its funding source.

Financial Impact

Option 1 is recommended by staff and would require the Consolidated 5 Year Financial Plan (2023-2027) to be amended, and an increase to the project's capital budget by \$2,490,000 with \$2,341,845 funding from the Roads DCC and \$148,155 funding from Capital Reserve – Revolving Fund. A temporary funding source will be utilized until the Consolidated 5 Year Financial Plan (2023-2027) can be amended. Implementing the project now, as envisioned, will allow the City to utilize the secured Trans Link and Provincial funding to the fullest amount totalling approximately 48 per cent of the project value. This option reduces any risk with respect to escalating construction costs going forward.

Conclusion

The Steveston MUP Project has been an integral part of the Council approved cycling network plan as identified in the Council approved 2041 Official Community Plan, as well as a planned major street cycling route identified as part of TransLink's Regional Cycling Network. This infrastructure will connect several activity centres in the City for pedestrians and cyclists and is aligned with the research on how to increase the number of cycling trips in a community through expanded and accessible cycling facilities.

Since the completion of the Council approved OCP, Richmond has seen continued population growth and a consistent high level of development activity.

At the same time, there has been an evolution in the design of cycling facilities with greater emphasis on bikeways that are comfortable for all cyclists. The Steveston Highway MUP Project will ensure that the Council approved cycling network plan and policies are reflective of the community's needs, continue to support the City's long-term mobility objectives and reflect best practices with respect to cycling facility planning and design.

If Option 1 is approved, ongoing consultation will occur during the construction phase of the project through notification to all impacted stakeholders and abutting property owners prior to commencement of construction activity and ongoing communication to address any comments or questions raised regarding the construction process.

Staff recommend that Option 1 be approved to continue with the project as planned with approved Capital Budget and TransLink funding, to increase the project budgets by \$2.49M, and amend the Consolidated 5 Year Financial Plan (2023-2027) accordingly.



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

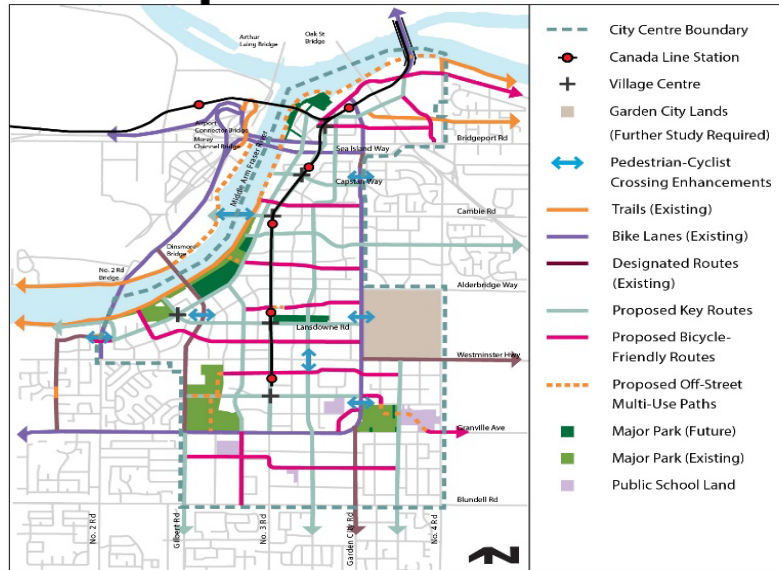
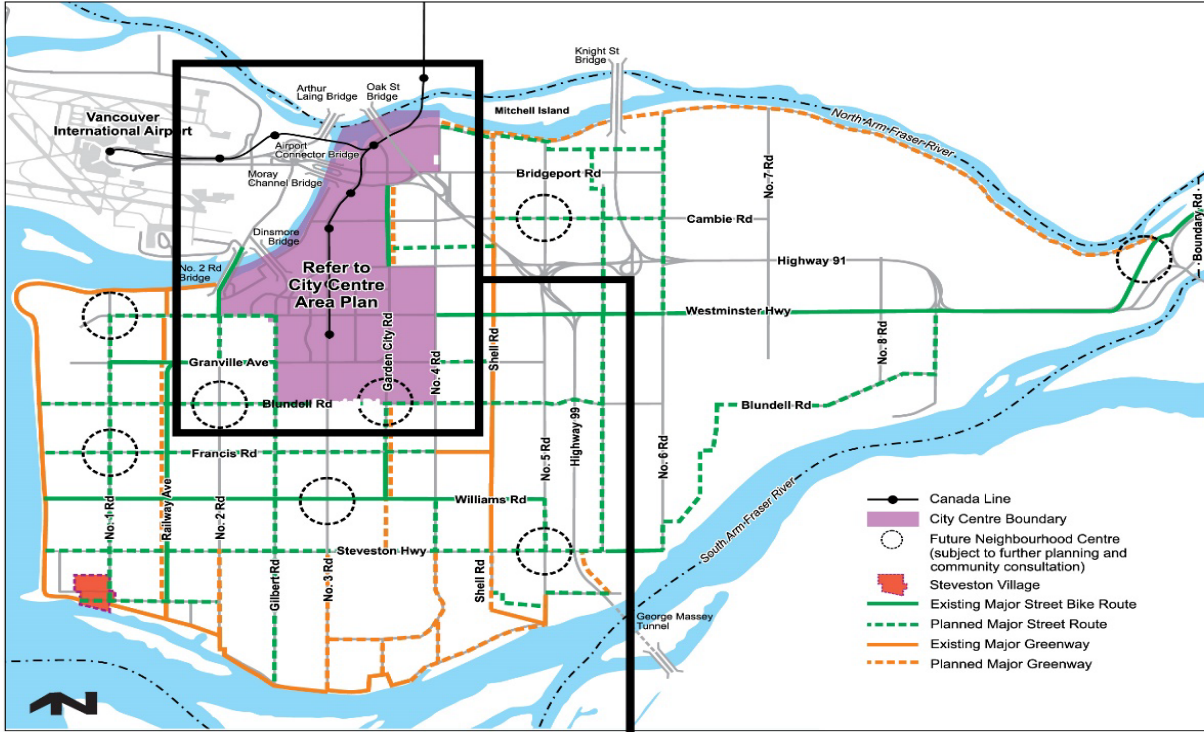


Kevin Roberts, P.Eng.
Acting Manager
Engineering Design and Construction
(604-204-8512)

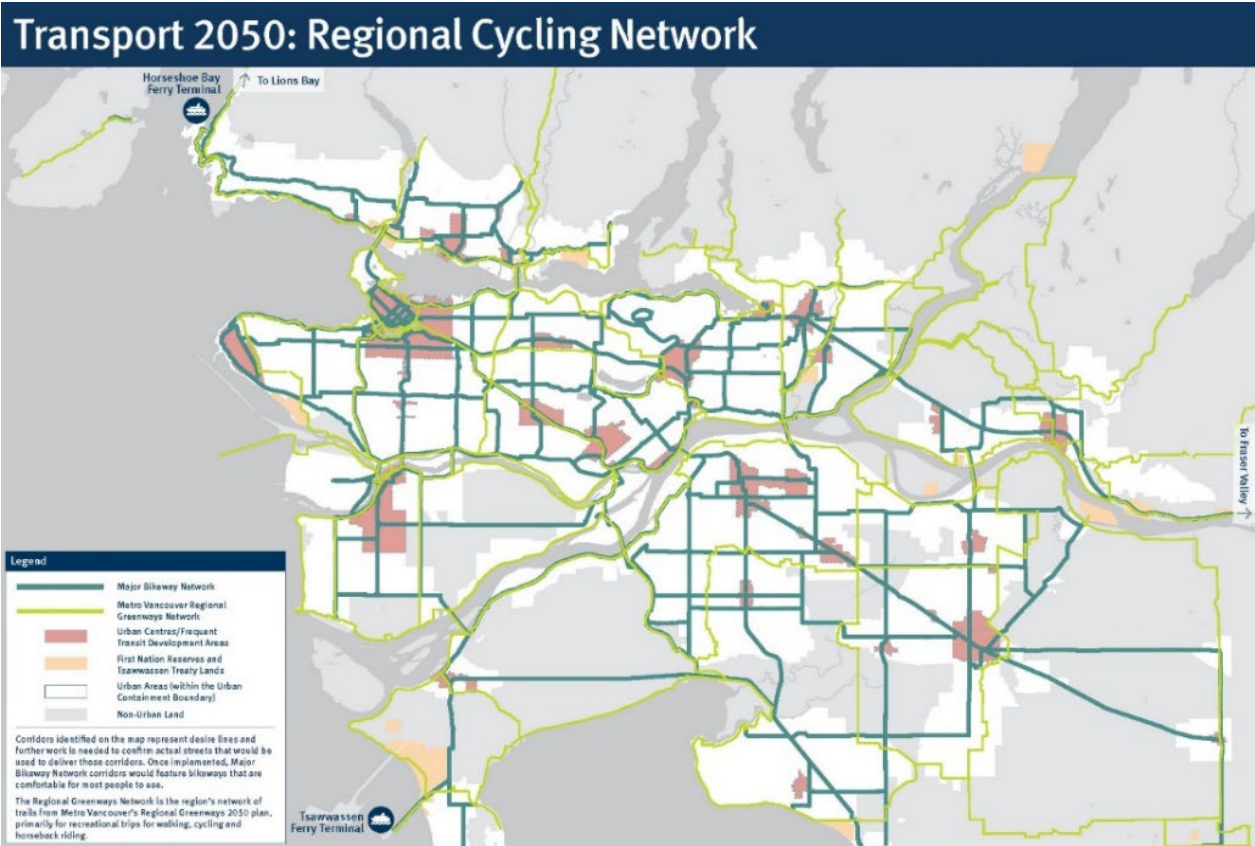
SH:ck

- Attachments:
1. 2041 OCP Cycling Network Plan and City Centre Cycling Plan
 2. TransLink Regional Bikeway Network
 3. Information on Air Quality in Richmond, and Commuters' Exposure to Air Pollution
 4. Population and Jobs served by Steveston Highway MUP

2041 OCP Cycling Network Plan and City Centre Cycling Plan



TransLink Regional Bikeway Network



Information on Air Quality in Richmond, and Commuters' Exposure to Air Pollution



Parks and Environment Department
Tel. 604-456-8811 or via Email
Conor.Reynolds@metrovancover.org

April 14, 2023

File: AQ-07-03-070

Lloyd Bie, Director
Transportation
City of Richmond
6911 No. 3 Road
Richmond, BC V6Y 2C1
VIA EMAIL: LBie@richmond.ca

Dear Lloyd Bie:

Information on Air Quality in Richmond, and Commuters' Exposure to Air Pollution

Metro Vancouver is responding to a request from staff at the City of Richmond to provide information on air quality along Steveston Highway and Williams Road, and commuters' exposure to air pollution.

This letter will address the following points:

- Air quality data from Metro Vancouver's monitoring network shows that air quality near Steveston Highway and Williams Road is good, with the exception of wildfire smoke in summer.
- Based on Metro Vancouver's near-road air monitoring study and traffic data, air quality along Steveston Highway and Williams Road is expected to meet (i.e., be better than) air quality objectives.
- Improving active transportation networks helps to reduce transportation emissions including greenhouse gas emissions and supports a more climate resilient transportation network.
- Encouraging active transportation can lead to both air quality and health benefits.

An assessment by Metro Vancouver staff indicates that air quality conditions along Steveston Highway and Williams Road should not impede the installation of a multi-use pathway on either road, based on the air quality measurements at the Richmond-South air monitoring station, the low volume of large trucks on both Steveston Highway and Williams Road, and Metro Vancouver's understanding of air quality in the area. Metro Vancouver supports the expansion of active transportation networks, such as multi-use pathways, to meet regional greenhouse gas reduction targets, and to improve air quality and health.

59147707

Metro Vancouver residents are concerned about climate change and solutions include reducing emissions to create cleaner air and a healthier future. In 2021, the Metro Vancouver Board of Directors adopted regional targets to reduce greenhouse gas emissions from personal vehicles by 65% by 2030 (relative to 2010 levels), and to reduce all transportation emissions by 25% for diesel particulate matter and 40% for nitrogen oxides, relative to 2020 levels. Actions are needed now to support those targets. All governments need to make it easier and more convenient for people and families at all income levels to make low emission transportation choices. Improving active transportation networks helps to reduce greenhouse gas emissions and supports a more climate resilient transportation network.

A response to the request from City of Richmond staff is provided in the attachment. This letter presents the views of Metro Vancouver staff and has not been reviewed or endorsed by the Metro Vancouver Board of Directors.

If you have any questions, please contact Amy Thai, Senior Policy Analyst, Air Quality and Climate Change, by phone at 604-306-5679 or by email at amy.thai@metrovancover.org.

Sincerely,



Conor Reynolds, P.Eng., Ph.D.
Director, Air Quality and Climate Change

CR/KR/at

cc: Peter Russell, Director, Sustainability & District Energy, City of Richmond
Sonali Hingorani, Manager, Transportation Planning and New Mobility, City of Richmond

Attachment:

Metro Vancouver Staff Response to Provide Information on Air Quality in Richmond, and Commuters' Exposure to Air Pollution.

Metro Vancouver Staff Response to Provide Information on Air Quality in
Richmond, and Commuters' Exposure to Air Pollution.

Metro Vancouver's air quality monitoring network

Metro Vancouver operates an extensive air quality monitoring network throughout the region, with two stations in Richmond (Richmond-South and Richmond-Airport). Air quality along Steveston Highway and Williams Road is best characterized by data from the Richmond-South monitoring station, located at Aragon Road and Williams Road. Because this station is less than one kilometer from both Williams Road and Steveston Highway, it is representative of air quality in the area of both roads. There are no large industrial emission sources in the immediate area, so local emissions are largely the result of the activities of residents. Air quality improvements have been made over the last two decades for most air contaminants, including nitrogen dioxide (NO₂), sulphur dioxide (SO₂) and carbon monoxide (CO), with the exception of fine particulate matter (PM_{2.5}) which has been influenced in recent years by wildfire smoke.

Recent data indicate that air quality is good at this monitoring station and air contaminants such as fine particulate matter (PM_{2.5}), ground-level ozone, and nitrogen oxides are typically not elevated. In the last three years all air quality objectives and standards, which are health-based targets that define the acceptable outdoor concentration of air contaminants, were met except for Metro Vancouver's 24-hour average PM_{2.5} objective, which was exceeded due to wildfire smoke in summer. It is expected that air quality would not be appreciably different on Williams Road and Steveston Highway.

Traffic-related air pollution

To better understand the impacts of traffic-related air pollution near major roads, Metro Vancouver collaborated with Environment and Climate Change Canada, the Ontario Ministry of the Environment, Conservation and Parks, and the University of Toronto on a two-year (2015 to 2017) monitoring study.¹ This national study included a new monitoring station located on Clark Drive, a busy truck route in Vancouver. The station measured near-road traffic-related air pollutants that impact health.

Many air contaminants are linked to particular health impacts. Metro Vancouver monitors a range of health- and traffic-related air pollution at numerous air quality monitoring stations throughout the region, including the two stations in Richmond.

Diesel vehicles are considered the most critical source of traffic-related air pollution. Diesel-exhaust particles are one of the most harmful vehicle-related air contaminants and a known carcinogen. Although diesel engines are more fuel-efficient than gasoline engines, they emit considerably more particulate matter. As described in more detail below, both Steveston Highway and Williams Road have relatively low volumes of diesel truck traffic, so air quality objectives are not expected to be

¹ [Metro Vancouver Near-Road Air Quality Monitoring Study](#)

exceeded along either route.

Large trucks are a main contributor to near-road air pollution

One of the near-road study's main findings was that large trucks were the main contributor to near-road air pollution. Emissions from different types of vehicles vary significantly. While most passenger vehicles on the road are fuelled by gasoline, the majority of large trucks (i.e., semi-trailer trucks) still consume diesel.

Large trucks made up only 6% of the total traffic measured at the Clark Drive monitoring station, but they contribute a disproportionate amount of vehicle-related emissions. The elevated air contaminant concentrations at the Clark Drive near-road station, including nitrogen oxides, black carbon and ultrafine particles, are due to the large trucks travelling this road, rather than total traffic volumes.

The study results showed that vehicle type, large trucks in particular, rather than traffic volume, was the main contributor to the amount and type of air contaminants associated with major roadways, and the results showed a correlation between elevated air contaminant levels and the hours and days when large trucks are typically on the roads.

Both Steveston Highway and Williams Road are not busy truck routes and serve a low volume of large trucks. Recent traffic counts for these two roads by City of Richmond staff showed that they experience orders of magnitude less volume of large trucks on average compared with Clark Drive: traffic data showed that over 2,000 large trucks per day used Clark Drive while Steveston Highway and Williams Road experienced considerably fewer large trucks on average per day at 52 and 4, respectively (Figure 1). Given this, Steveston Highway or Williams Road would not experience the same elevated levels of traffic-related air pollution as Clark Drive. **Air quality objectives are not expected to be exceeded along either Steveston Highway or Williams Road.**

591477072

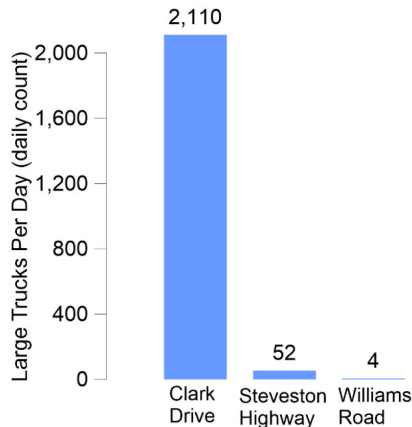


Figure 1: Average count of large trucks per day at Clark Drive (2015-2017), Steveston Highway (2023) and Williams Road (2023).

Reducing transportation emissions by expanding active transportation networks

Transportation is the largest source of greenhouse gas emissions in Metro Vancouver, accounting for approximately 45% of regional greenhouse gas emissions. Strategies and actions to reduce transportation emissions are identified in Metro Vancouver's *Clean Air Plan*, the regional plan for managing air quality and greenhouse gases over the next 10 years, and the *Climate 2050 Transportation Roadmap*², a strategy to transition the region to a low carbon and climate resilient region over the next 30 years. Both plans include a strategy to reduce driving through increased active transportation and public transit use. A key action of this strategy is to expand active transportation networks, such as walking and cycling paths. Adding new active transportation facilities, especially in under-served areas, will allow more residents to have access to safe and convenient infrastructure so they can travel comfortably to nearby destinations without travelling by a vehicle. Metro Vancouver is committed to becoming a carbon neutral region by 2050, and strong climate action is needed now to achieve this goal.

The following strategy and actions associated with active transportation are identified in the *Clean Air Plan* and *Climate 2050 Transportation Roadmap*:

- **Strategy:** Reduce Driving through Active Transportation and Public Transit
- **Actions:**
 - Expand Active Transportation Networks
 - More Stable Infrastructure Funding for Regional Active Transportation Networks
 - Support Residents and Businesses in Active Transportation
 - Communicate the Benefits of Walking, Cycling and Public Transit

² [Metro Vancouver Transportation Roadmap](#)

591477073

Furthermore, a carbon neutral modelling study³ commissioned by Metro Vancouver demonstrated the effectiveness of shifting to active transportation to reduce transportation emissions. The study modelled the potential greenhouse gas reductions of various policies and found that a shift to active transportation is an effective approach in reducing on-road transportation emissions. By increasing the percentage of trips by active modes to 20% (up from the current value of approximately 15%), the study found that it could lead to the second largest reduction of greenhouse gas emissions from personal transportation in the near term (by 2030), only behind the regulated sales targets for new zero emission vehicles.

Air quality and health benefits of active transportation

Expanding active transportation networks can accelerate the shift to active travel options and improve air quality for all users of a travel corridor. The protected bike lane on Hornby Street in Vancouver is an example of the effect active transportation infrastructure can have on air quality. Metro Vancouver operates an air quality monitoring station adjacent to Hornby Street and found an improvement in air quality after the installation of a two-way cycling lane in 2010. Air quality measurements taken before the bike lane installation consistently exceeded the annual NO₂ objective before the bike lane was installed. Once the cycling lane was installed, annual NO₂ concentrations were lower and the annual NO₂ objective was met. Metro Vancouver staff expect that the cycling lane contributed to the lower concentrations by reducing traffic volumes and acting as a buffer between traffic emissions and the monitoring station. Installation of separated active transportation infrastructure, whether it is a cycling lane or multi-use pathway, can reduce exposure of traffic-related air pollution for residents of that road and for people walking and cycling along the corridor.

While there may be a perception that pedestrians and cyclists are exposed to higher levels of air pollution along a busy road, studies have instead shown that car and bus commuters are exposed to higher levels of air pollution than cyclists and pedestrians.⁴ This is mainly because cyclists and pedestrians tend to travel along the side of the road, further away from the centre of the road where traffic-related air pollution concentrations are higher. In addition, the cabin of a motor vehicle can trap air pollutants inside, increasing occupants' exposure, while cyclists and pedestrians are outside, where air pollutants can disperse more freely. Even when cyclists' increased breathing rate is considered, cyclists still have less exposure to air pollution than drivers.⁵ It is in the best interest of all users of a busy travel corridor, whether they use motorized or active transportation, to improve air quality along that route by encouraging active transportation.

Active transportation, even along busy roads, can have health benefits. Studies showed that health benefits of physical activity from active transportation outweigh the risk of exposure to air

³ [Carbon Neutral 2050 Policy & Modelling Report \(metrovancouver.org\)](https://www.metrovancouver.org/resources/reports/carbon-neutral-2050-policy-and-modelling-report)

⁴ [Levels of ambient air pollution according to mode of transport: a systematic review - The Lancet Public Health](https://www.thelancet.com/public-health)

⁵ [Differences in cyclists and car drivers exposure to air pollution from traffic in the city of Copenhagen - ScienceDirect](https://www.sciencedirect.com/science/article/pii/S0924646014000704)
591477074

pollution.⁶ So in addition to the general air quality improvements that can result from shifting to active transportation, active transportation itself can provide health benefits for individuals.

The increasing adoption of low and zero emission vehicles will also improve air quality along roads. Although residents and commuters may have air quality concerns about arterial roads in Richmond now, traffic-related air pollution is expected to continue decreasing in the future.

⁶ [Levels of ambient air pollution according to mode of transport: a systematic review - The Lancet Public Health](#)
591477075

Population and Jobs served by Steveston Highway MUP



GP - 25
(Special)