City of Richmond

Agenda

Public Works and Transportation Committee

Anderson Room, City Hall
6911 No. 3 Road

Wednesday, February 21, 2018
4:00 p.m.

Pg. # ITEM

MINUTES

PWT-4 ***Motion to adopt the minutes of the meeting of the Public Works and Transportation Committee held on November 22, 2017 and January 24, 2018.***

NEXT COMMITTEE MEETING DATE

March 21, 2018, (tentative date) at 4:00 p.m. in the Anderson Room

ENGINEERING AND PUBLIC WORKS DIVISION

1. **FLOOD PROTECTION PROGRAMS UPDATE**
(File Ref. No. 10-6000-01) (REDMS No. 5722579 v.3)

PWT-18 See Page **PWT-18** for full report

Designated Speaker: Lloyd Bie

STAFF RECOMMENDATION

That the process to update the 2008 – 2031 Richmond Flood Protection Management Strategy as identified in the report titled "Flood Protection Programs Update," dated January 22, 2018, from the Director, Engineering, be endorsed.

2. **2018 ECOLOGICAL NETWORK MANAGEMENT STRATEGY UPDATE**
(File Ref. No. 10-6125-11-01) (REDMS No. 5682075 v.3)

PWT-25 See Page **PWT-25** for full report

Designated Speaker: Chad Paulin

STAFF RECOMMENDATION

That the staff report titled "2018 Ecological Network Management Strategy Update" dated January 25, 2018, from the Director, Engineering, be received for information.

3. **RICHMOND CARBON MARKET AND CARBON NEUTRALITY UPDATE**
(File Ref. No. 10-6125-05-01) (REDMS No. 5724399 v.9)

PWT-43 See Page **PWT-43** for full report

Designated Speaker: Levi Higgs

STAFF RECOMMENDATION

(1) That the staff report titled, "Richmond Carbon Market and Carbon Neutrality Update," from the Director of Engineering, dated January 26, 2018 be received for information; and

(2) That the Chief Administrative Officer and the General Manager, Engineering and Public Works be authorized to negotiate and execute agreements to purchase carbon credits to maintain the City's corporate carbon neutrality status.

PLANNING AND DEVELOPMENT DIVISION

4. **RICHMOND ACTIVE TRANSPORTATION COMMITTEE – PROPOSED 2018 INITIATIVES**
(File Ref. No. 01-0100-20-RCYC1) (REDMS No. 5673705 v.2)

PWT-51 See Page **PWT-51** for full report

Designated Speaker: Victor Wei

STAFF RECOMMENDATION

(1) That the proposed 2018 initiatives of the Richmond Active Transportation Committee, as outlined in the staff report titled "Richmond Active Transportation Committee - Proposed 2018 Initiatives" dated January 24, 2018 from the Director, Transportation, be endorsed; and

(2) That a copy of the report titled "Richmond Active Transportation Committee – Proposed 2018 Initiatives" be forwarded to the Richmond Council-School Board Liaison Committee for information.

5. **RIVER ROAD – REVIEW OF PROPOSED ALTERNATIVE ROAD SAFETY ENHANCEMENT MEASURES**
(File Ref. No. 10-6450-09-01) (REDMS No. 5746643 v.2)

PWT-62 See Page **PWT-62** for full report

Designated Speaker: Victor Wei

STAFF RECOMMENDATION

(1) That the road safety measures on River Road between No. 6 Road and Westminster Highway recommended by the independent traffic safety consultant and staff as outlined in the report dated February 9, 2018 from the Director of Transportation be brought forward for further public consultation, including with the area residents and businesses; and

(2) That staff report back with the outcome of the public consultation prior to the installation of any additional speed cushions.

6. **MANAGER'S REPORT**

ADJOURNMENT

City of Richmond

Minutes

Public Works and Transportation Committee

Date:	Wednesday, November 22, 2017
Place:	Anderson Room Richmond City Hall
Present:	Councillor Chak Au, Chair Councillor Harold Steves Councillor Carol Day Councillor Alexa Loo
Absent:	Councillor Derek Dang
Call to Order:	The Chair called the meeting to order at 4:00 p.m.

MINUTES

It was moved and seconded
That the minutes of the meeting of the Public Works and Transportation Committee held on October 18, 2017, be adopted as circulated.

CARRIED

NEXT COMMITTEE MEETING DATE

December 20, 2017, (tentative date) at 4:00 p.m. in the Anderson Room

PLANNING AND DEVELOPMENT DIVISION

1. **CITY OF RICHMOND-TRANSLINK TRAVELSMART PARTNERSHIP – COMPLETION OF PILOT PROGRAM**
(File Ref. No. 01-0154-04) (REDMS No. 5595141)

Victor Wei, Director, Transportation, provided the following information on the City's partnership with TravelSmart:

- the pilot program focused on three elementary schools and various businesses;
- each School Travel Plan is customized to the school and intended to be a living document that belongs to the school;
- staff provided businesses in the Riverside Business Park with a variety of alternative transportation solutions for employees;
- the private shuttle option emerged as the most feasible, however after further consideration, businesses opted out due to cost; and
- an outcome of this initiative was increased awareness of Richmond businesses' transportation challenge, therefore longer term solutions continue to be developed by the City and TransLink.

It was moved and seconded

(1) That the staff report titled "City of Richmond-TransLink TravelSmart Partnership – Completion of Pilot Program", dated October 20, 2017, from the Director, Transportation be received for information; and

(2) That a copy of the above report be forwarded to the Richmond Council-School Board Liaison Committee for information.

CARRIED

2. **TRANSLINK SOUTHWEST AREA TRANSPORT PLAN – RESULTS OF PHASE 2 CONSULTATION AND PREPARATION OF DRAFT FINAL PLAN**
(File Ref. No. 01-0154-04) (REDMS No. 5491921 v.10)

Mr. Wei introduced Matt Craig, Manager, TransLink System Plans. With the aid of a PowerPoint presentation (copy on file, City Clerk's Office) Mr. Craig provided the following information:

- the Southwest Area Transport Plan includes Richmond, South Delta (Ladner and Tsawwassen) and Tsawwassen First Nation;
- from May 23 to June 19, 2017, TransLink sought input from the public, stakeholders and municipal partners in the engagement for Phase 2: Identifying Priorities;
- feedback was gathered via an online survey on the TransLink website with paper surveys (in English and Chinese);
- feedback was responded through review of survey results and comments, modification of 17 proposals based on feedback, reviews with advisory committee and stakeholders to discuss options and revised proposals advanced to evaluation stage;

- finalized routing proposals underwent a multiple account evaluation (MAE) in consultation with staff to ensure that the proposed changes were aligned with regional and local goals and to help prioritize the investments and inform decision-making;
- key objectives for the transit service recommendations are:
  - improving Frequent Transit Network (FTN) service along key corridors;
  - providing more reliable and convenient bus service;
  - expanding bus service for growing communities and large areas of employment, including industrial areas; and
  - making NightBus more direct for service to Richmond City Centre and YVR;
- additional transit service, facilities and infrastructure initiatives within the sub-area that have been identified in the Mayors' Council 10-Year Vision include: improving access via park and ride, improving customer amenities at stations and exchanges, Canada Line upgrades, developing opportunities for application of flexible on-demand transit services, and identifying opportunities for transit priority, including approaches to the Queensborough Bridge; and
- moving forward, TransLink will incorporate feedback from the Draft Plan review, report back to Councils with a final plan in the new year, and conduct additional public engagement prior to implementation for significant changes.

In reply to queries from Committee, Mr. Craig noted that there were multiple factors that identified certain projects as top priority and the Mayors' Council 10-Year Vision for Transit and Transportation identifies priority investments for rail transit expansion, which includes extending certain SkyTrain lines.

It was moved and seconded

(1) That as described in the report titled "TransLink Southwest Area Transport Plan – Results of Phase 2 Consultation and Preparation of Draft Final Plan" dated November 1, 2017 from the Director, Transportation:

(a) The comments from the Senior Advisory Committee and staff be forwarded to TransLink staff for incorporation into the draft final Plan; and

(b) TransLink's draft recommendations for transit service and regionally significant cycling corridors for the Southwest Area Transport Plan be endorsed for the purpose of public consultation on the draft final TransLink Southwest Area Transport Plan.

(2) That staff be directed to report back with the draft final TransLink Southwest Area Transport Plan in January 2018.

CARRIED

ENGINEERING AND PUBLIC WORKS DIVISION

3. **UPDATE ON 2017/2018 SNOW AND ICE RESPONSE PREPARATIONS**
(File Ref. No.)(REDMS No. 5593501 v.3)

In reply to queries from Committee, Larry Ford, Manager, Roads and Construction Services, advised that long range forecasts for Richmond are difficult to predict. Mr. Ford advised that staff are examining the potential to engage with the University of British Columbia's Weather Forecast Research Team for aid in better predicting local weather. Also, he stated that leniency for residents that may have difficulty clearing ice from their properties should be directed to Community Bylaws.

It was moved and seconded
That the staff report titled "Update on 2017/2018 Snow and Ice Response Preparations", dated October 20, 2017, from the Director, Public Works Operations, be received for information.

CARRIED

4. **BURKEVILLE DRAINAGE**
(File Ref. No. 10-6060-04-01) (REDMS No. 5617890 v.2)

In reply to queries from Committee, Lloyd Bie, Manager, Engineering Planning, advised that staff will implement a public information program on the drainage issue including mail outs to residents and a public open house and will include a time frame as well as what residents can expect throughout the project.

Mr. Bie advised that Burkeville ditches are not deep enough to accommodate City standard piping and cannot be improved in a manner that will increase capacity to the required levels. He noted that ditch infills reduce the drainage system's capacity for percolation, thereby increasing the drainage system flows which will ultimately cause flooding in the neighbourhood. . Mr. Bie stated that the moratorium on ditch infills will be lifted on a block by block basis as the piped drainage system is installed.

In reply to queries from Committee, Mr. Bie noted that ditches in Burkeville could be widened, however that would result in less space in residents yards and would not solve the long term problem.

It was moved and seconded
That a moratorium on ditch infills in the Burkeville neighbourhood, until a piped drainage network is implemented as outlined in the report titled "Burkeville Drainage" dated October 27, 2017, from the Director, Engineering, be endorsed.

CARRIED

5. **2017 UNION OF BC MUNICIPALITIES COMMUNITY EMERGENCY PREPAREDNESS FUND**
(File Ref. No. 10-6060-05-01) (REDMS No. 5649642 v.3)

It was moved and seconded
(1) That the Dike Master Plan Phase 5 submission to the 2017 Union of BC Municipalities (UBCM) Community Emergency Preparedness Fund be endorsed; and

(2) That should the Dike Master Plan Phase 5 submission be successful, the Chief Administrative Officer and General Manager, Engineering and Public Works be authorized to negotiate and execute the funding agreements with UBCM.

CARRIED

6. **ELECTRIC VEHICLE CHARGING INFRASTRUCTURE - REQUIREMENTS FOR NEW DEVELOPMENTS**
(File Ref. No. 10-6125-07-02) (REDMS No. 5496295 v.10)

In reply to queries from Committee, Brendan McEwen, Sustainability Manager, advised that the "Right to Charge" legislation would require that Electric Vehicle (EV) drivers be able to charge their vehicles with appropriate means of reconciling building owners or strata council common expenses. He noted that there a few models in terms of paying for electricity for the EV and the cost would be significantly less than that of gasoline.

John Roston, Coordinator, Plug-In Richmond, spoke in support of EV's in the City and urged Committee to adopt the bylaw. He noted that driving an EV has made a difference in his life. Mr. Roston remarked that he was pleased with the response he has received from staff on the matter and stated that Richmond has the opportunity to be a leader in Canada for cost effective solutions.

It was moved and seconded
(1) That Richmond Zoning Bylaw 8500, Amendment Bylaw No. 9756, which adds Section 7.15 Electric Vehicle Charging Infrastructure, identified in the report titled "Electric Vehicle Charging Infrastructure – Requirements for New Developments" dated October 15, 2017, from the Director, Engineering, be introduced and given first reading;

(2) That Richmond Official Community Plan Bylaw 9000, Amendment Bylaw No. 9520, which amends Section 8.5 Transportation Capacity and Demand Management and Section 14.2.7.E Electric Vehicle Charging both regarding electric vehicles, identified in the report titled "Electric Vehicle Charging Infrastructure – Requirements for New Developments" dated October 15, 2017, from the Director, Engineering, be introduced and given first reading;

(3) That Richmond Official Community Plan Bylaw 9000, Amendment Bylaw No. 9520, having been considered in conjunction with:

(a) The City's Financial Plan and Capital Program; and

(b) The Greater Vancouver Regional District Solid Waste and Liquid Waste Management Plans;

is hereby found to be consistent with said programs and plans, in accordance with Section 477(3)(a) of the Local Government Act; and

(4) That Richmond Official Community Plan Bylaw 9000, Amendment Bylaw No. 9520, having been considered in accordance with Official Community Plan Bylaw Preparation Consultation Policy 5043, is hereby found not to require further consultation.

CARRIED

7. **OVAL VILLAGE DISTRICT ENERGY UTILITY BYLAW NO. 9134, AMENDMENT BYLAW NO. 9778**
(File Ref. No. 10-6600-10-02) (REDMS No. 5563539 v.7)

It was moved and seconded

(1) That the staff recommendation to amend the Oval Village District Energy Utility rate for services as presented in Option 2 of the report titled "Oval Village District Energy Utility Bylaw No. 9134, Amendment Bylaw No. 9778" be endorsed; and

(2) That the Oval Village District Energy Utility Bylaw No. 9134, Amendment Bylaw No. 9778 be introduced and given first, second and third readings.

CARRIED

8. **ALEXANDRA DISTRICT ENERGY UTILITY BYLAW NO. 8641, AMENDMENT BYLAW NO. 9777**
(File Ref. No. 10-6600-10-02) (REDMS No. 5563441 v.9)

It was moved and seconded

(1) That the staff recommendation to amend the Alexandra District Energy Utility rate for services as presented in Option 2 of the report titled "Alexandra District Energy Utility Bylaw No. 8641, Amendment Bylaw No. 9777" be endorsed; and

(2) That the Alexandra District Energy Utility Bylaw No. 8641, Amendment Bylaw No. 9777 be introduced and given first, second and third readings.

CARRIED

9. **MANAGER'S REPORT**

None.

ADJOURNMENT

It was moved and seconded
That the meeting adjourn (4:47 p.m.).

CARRIED

Certified a true and correct copy of the Minutes of the meeting of the Public Works and Transportation Committee of the Council of the City of Richmond held on Wednesday, November 22, 2017.

Councillor Chak Au
Chair

Sarah Kurian
Legislative Services Coordinator

City of Richmond

Minutes

Public Works and Transportation Committee

Date:	Wednesday, January 24, 2018
Place:	Anderson Room Richmond City Hall
Present:	Councillor Harold Steves, Vice-Chair Councillor Derek Dang Councillor Carol Day Councillor Alexa Loo
Absent:	Councillor Chak Au
Call to Order:	The Vice-Chair called the meeting to order at 4:00 p.m.

NEXT COMMITTEE MEETING DATE

February 21, 2018, (tentative date) at 4:00 p.m. in the Anderson Room

PLANNING AND DEVELOPMENT DIVISION

1. **ROAD SAFETY ALONG S-CURVE SECTION OF HIGHWAY 91**
(File Ref. No. 01-0150-20-THIG1) (REDMS No. 5647980 v.3)

In reply to queries from Committee, Fred Lin, Senior Transportation Engineer, advised that rear-end collisions are the predominate type of reported collisions along this route and the suggested safety measures are to mitigate the majority of collisions which occur in the westbound direction. He noted that the proposed safety mitigations that have been identified will be forwarded to Ministry of Transportation staff for their consideration. Mr. Lin then stated that statistics on collisions were received from the RCMP as well as ICBC claims data.

Victor Wei, Director, Transportation, noted that staff will liaise with Richmond Fire-Rescue prior to supporting any installation of safety measures to ensure there are no restrictions for emergency services access. He then advised that the safety measures will only affect the S-curve portion of the highway and should not impede any emergency services from attending to incidents along the highway.

Mr. Lin noted that contributing factors for collisions along this portion of the highway are largely due to drivers not paying attention to the road.

Mr. Wei noted that frequency of accidents along this section of the highway is low when compared to the high volume of traffic that utilizes this highway on a daily basis.

It was moved and seconded
That the City send a letter to the Ministry of Transportation and Infrastructure requesting consideration of the potential road safety measures to mitigate crashes and improve public safety along the S-Curve section of Highway 91 as described in the report titled "Road Safety along S-Curve Section of Highway 91" dated December 15, 2017 from the Director, Transportation.

CARRIED

2. **PROVINCIAL 2018/2019 BIKEBC PROGRAM SUBMISSION**
(File Ref. No. 01-0150-20-THIG1) (REDMS No. 5702465)

In reply to queries from Committee, Mr. Wei advised that the purpose of this report is to seek Council endorsement to send the submission to the Province for additional funds and noted that the pathway along Alderbridge Way would be a multi-use pathway for pedestrians and cyclists.

It was moved and seconded

(1) That the submission for cost-sharing to the Province's 2018/2019 BikeBC Program for the Alderbridge Way multi-use pathway, as described in the report, titled "Provincial 2018/2019 BikeBC Program Submission" dated January 2, 2018, from the Director, Transportation, be endorsed;

(2) That, should the above application be successful, the Chief Administrative Officer and the General Manager, Planning and Development, be authorized to execute the funding agreement; and

(3) That the 2018 Capital Plan and the 5-Year Financial Plan (2018-2022) be updated accordingly.

CARRIED

ENGINEERING AND PUBLIC WORKS DIVISION

3. **TERMINATION AND RENEWAL OF OUTDATED TELECOMM MUNICIPAL ACCESS AGREEMENTS**
(File Ref. No. 10-6000-01) (REDMS No. 5690501)

It was moved and seconded
That the Chief Administrative Officer and the General Manager, Engineering & Public Works be authorized to terminate and execute Municipal Access Agreements between the City and Allstream Corp and between the City and Bell Canada on behalf of the City, containing the material terms and conditions set out in the staff report titled, "Termination and Renewal of Outdated Telecomm Municipal Access Agreements", dated December 13, 2017 from the Director, Engineering.

CARRIED

4. **EMILY CARR UNIVERSITY AGREEMENT – TERRA NOVA POLLINATOR MEADOW**
(File Ref. No. 10-6125-11-03) (REDMS No. 5670527)

In reply to queries from Committee, Chad Paulin, Manager, Environment, advised that there is a combination of species in the area and that some of the blackberry plants will be ratified. He noted that there will be a public education component to the project and that staff will be working with Emily Carr to update some of the programming and consulting with the public for input into various educational initiatives.

It was moved and seconded
That the Chief Administrative Officer and the General Manager, Engineering & Public Works be authorized to enter into an agreement with Emily Carr University of Art + Design to complete the Terra Nova Pollinator Meadow project.

CARRIED

5. **LULU ISLAND ENERGY COMPANY – 2017 DISTRICT ENERGY OPERATIONAL UPDATE**
(File Ref. No. 10-6600-10-02) (REDMS No. 5693017)

In reply to queries from Committee, Kevin Roberts, Acting Senior Project Manager, Lulu Island Energy Company, and Alen Postolka, Manager, District Energy, advised that (i) rates for residential and commercial customers are different; however both sources of energy come from the Alexandra District Energy, (ii) district energy financials are based on a cost-recovery model; therefore any profits are allocated towards future implementation plans, and (iii) the City's district energy utilities function on an N+1 redundancy, which is a form of resilience that ensures the systems are available in the event of component failure.

Discussion took place on hydroelectricity and in response to queries from Committee, John Irving, Director, Engineering, commented on the cost of hydroelectricity infrastructure, including maintenance costs and the installation of new infrastructure and provided a brief financial comparison between hydroelectricity costs and that of district energy utilities.

The Vice-Chair directed staff to review and update information on the City's website regarding district energy utilities.

It was moved and seconded
That the Lulu Island Energy Company report titled "Lulu Island Energy Company – 2017 District Energy Operational Update" dated December 15, 2017 from the Director, Engineering be received for information.

CARRIED

6. AMENDMENT TO BOULEVARD AND ROADWAY PROTECTION AND REGULATION BYLAW NO. 6366

(File Ref. No. 10-6000-01) (REDMS No. 5694413)

Discussion took place and it was suggested that the City's Damage Deposit / Security Program Application (attached to and forming part of these minutes as Schedule 1) be revised to reflect the proposed changes to Boulevard and Roadway Protection and Regulation Bylaw No. 6366.

In response, staff advised that the introduction of an annual Administrative Fee on securities collected for single and two-family demotions and construction activities that remain unclaimed for extended lengths of time is the only manner in which the City can retain said monies.

It was moved and seconded
That Boulevard and Roadway Protection and Regulation Bylaw No. 6366, Amendment Bylaw No. 9817 be introduced and given first, second and third readings.

CARRIED

7. MANAGER'S REPORT

2018 Capital Construction Projects

Mr. Irving advised that the 2018 Capital Construction Projects Open House will take place in April.

ADJOURNMENT

It was moved and seconded
That the meeting adjourn (4:35 p.m.).

CARRIED

Certified a true and correct copy of the Minutes of the meeting of the Public Works and Transportation Committee of the Council of the City of Richmond held on Wednesday, January 24, 2018.

Councillor Harold Steves
Vice-Chair

Sarah Kurian
Legislative Services Coordinator

Schedule 1 to the Minutes of the Public Works & Transportation Committee meeting of Richmond City Council held on Wednesday, January 24, 2018.

Damage Deposit/ Security Program Application

Engineering & Public Works Division
6911 No. 3 Road, Richmond, BC V6Y 2C1

www.richmond.ca

Site Contact Person: _____ **Tel. No.:** _____

Email: _____ **Cell No.:** _____

Property Address: _____

✓	Type of Construction Activity	Refundable Deposit Amount	Non-Refundable Inspection Fee	Total Payable
☐	Additions and Accessory Buildings over 10 sq. m.	$500	$179	$679
☐	In-ground Swimming Pools	$500	$179	$679
☐	Demolitions	$500	$179	$679
☐	Move-Off	$1,500	$179	$1,679
☐	Single or Two Family Dwelling Construction	$1,500	$179	$1,679
☐	Combined Demolition and Single or Two Family Dwelling Construction	$2,000	$179	$2,179
☐	Commercial; Industrial; Multi-Family; Institutional; or Government Construction	$5,000	$237	$5,237
☐	Combined Demolition and Commercial; Industrial, Multi-Family; Institutional or Government Construction	$5,500	$237	$5,737
☐	Site Preparation Preload	$5,000	n/a	$5,000
☐	Soil Materials Infill or Removal from a Single Parcel	$5,000	n/a	$5,000
☐	Commercial/Industrial Landscaping	$2,500	n/a	$2,500
	TOTALS	$	$	$
	Enter Hansen Proj ID (WO#) noted below:	RC._____	4330	Total

I, _____ hereby make application and agree to abide by the guidelines
(Print name)
and specifications issued by the City Public Works Department.

Signed: _____ Date: _____

Name of Person to Receive Damage Deposit Refund: _____

Refund Mailing Address: _____ Phone: _____

_____
City Postal Code

For Damage Deposit Refund Purposes – Please call 604-244-1263

Only the damage deposit applicant may request or inquire about a refund.

Damage Deposit refunded on REQUEST only please provide accurate contact information

For Office Use	
Receipt No.:	Hansen SR #:
Hansen Project ID (W.O. #):	Permit #:

Change Suggested by Carol Day

City of Richmond

Damage Deposit/ Security Program Application

Engineering & Public Works Division
6911 No. 3 Road, Richmond, BC V6Y 2C1

www.richmond.ca

Site Contact Person: _____ **Tel. No.:** _____

Email: _____ **Cell No.:** _____

Property Address: _____

✓	Type of Construction Activity	Refundable Deposit Amount	Non-Refundable Inspection Fee	Total Payable
☐	Additions and Accessory Buildings over 10 sq. m.	$500	$179	$679
☐	In-ground Swimming Pools	$500	$179	$679
☐	Demolitions	$500	$179	$679
☐	Move-Off	$1,500	$179	$1,679
☐	Single or Two Family Dwelling Construction	$1,500	$179	$1,679
☐	Combined Demolition and Single or Two Family Dwelling Construction	$2,000	$179	$2,179
☐	Commercial; Industrial; Multi-Family; Institutional; or Government Construction	$5,000	$237	$5,237
☐	Combined Demolition and Commercial; Industrial, Multi-Family; Institutional or Government Construction	$5,500	$237	$5,737
☐	Site Preparation Preload	$5,000	n/a	$5,000
☐	Soil Materials Infill or Removal from a Single Parcel	$5,000	n/a	$5,000
☐	Commercial/Industrial Landscaping	$2,500	n/a	$2,500
	TOTALS	**$**	**$**	**$**
	Enter Hansen Proj ID (WO#) noted below:	RC._____	4330	Total

I, _____ hereby make application and agree to abide by the guidelines
(Print name)
and specifications issued by the City Public Works Department.

Signed: _____ Date: _____

Name of Person to Receive Damage Deposit Refund: _____

Refund Mailing Address: _____ Phone: _____

_____
City Postal Code

For Damage Deposit Refund Purposes – Please call 604-244-1263
Only the damage deposit applicant may request or inquire about a refund.

For Office Use	
Receipt No.:	Hansen SR #:
Hansen Project ID (W.O. #):	Permit #:

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EPW-1 / rev. January 2, 2018

City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	January 22, 2018
From:	John Irving, P.Eng. MPA Director, Engineering	**File:**	10-6000-01/2018-Vol 01
Re:	**Flood Protection Programs Update**		

Staff Recommendation

That the process to update the 2008 – 2031 Richmond Flood Protection Management Strategy as identified in the report titled "Flood Protection Programs Update," dated January 22, 2018, from the Director, Engineering, be endorsed .

John Irving, P.Eng. MPA
Director, Engineering
(604-276-4140)

Att. 1

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Roads & Construction Sewerage & Drainage	☑ ☑	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	**INITIALS:** AJ	**APPROVED BY CAO**

Staff Report

Origin

Richmond City Council adopted the 2008 – 2031 Richmond Flood Protection Management Strategy in 2008. The 2008 – 2031 Richmond Flood Protection Management Strategy is the City's guiding framework for continual upgrades and improvement of the City's flood protection system. This report is an overview of current ongoing efforts under this strategy.

This report supports Council's 2014-2018 Term Goal #6 Quality Infrastructure Networks:

> *Continue diligence towards the development of infrastructure networks that are safe, sustainable, and address the challenges associated with aging systems, population growth, and environmental impact.*
>
> *6.1. Safe and sustainable infrastructure.*

Findings of Fact

Richmond's flat, low lying topography has inherent flood risk from inundation and rainfall. Understanding and managing this risk is critical to the City's success and a primary municipal responsibility. Richmond's diking and drainage systems provide a high level of flood protection for businesses and residents in Richmond, however, these systems require ongoing maintenance and upgrading to maintain this high level of service given ageing infrastructure challenges and forecasted climate change induced sea level rise.

The 2008 – 2031 Richmond Flood Protection Management Strategy is the overarching framework that guides Richmond's flood protection activities. Guided by this strategy and aging infrastructure planning, the City has developed dike master plans, ongoing maintenance programs and capital plans for infrastructure improvements. Funding for upgrades is largely provided through the City's Drainage and Diking Utility, which generates $11.9 million annually. Additional financial support has been provided from senior levels of government through one off funding grants. The City has also been successful in partnering with development for the provision of localized infrastructure upgrades.

The following is a status report of current drainage and diking planning and construction activities for Council's information.

Flood Protection Management Strategy Update

The City received grant funding of $500,000 through the National Disaster Mitigation Program to update the 2008 – 2031 Flood Protection Management Strategy. The 2018 – 2041 Flood Protection Management Strategy will update:

- hazard and consequence information including the latest climate change science;
- opportunities to improve flood risk management such as property acquisition requirements and Flood Construction Levels (FCLs); and
- partnership opportunities in achieving preferred options.

In developing the updated Flood Protection Management Strategy, staff will utilize expertise from:

- Technical consultants with international expertise;
- The Fraser Basin Council;
- The University of British Columbia; and
- British Columbia Ministry staff.

Staff has engaged a consultant and the consultant's draft work will be completed in the fourth quarter of 2018. The Fraser Basin Council, UBC and the Province will be invited to participate and provide comment and input. Staff will then develop a draft updated 2018 – 2041 Flood Protection Management Strategy, which will be utilized for public consultation and for Council's consideration in a subsequent report.

Recent Grants

The City has procured the following significant flood protection grants over the last two years. Richmond projects utilizing this grant funding and progress on those projects is detailed in the body of this report.

Steveston Island Flood Risk Investigation

Total Project Value: $1,620,000
Federal: $810,000; Provincial: $405,000; City of Richmond: $405,000

Flood Mitigation Strategy Update

Total Project Value: $500,000
Federal: $250,000; Provincial: $250,000

Disaster Mitigation: Rebuild Pump Stations and Dike Upgrades: $24,949,998

Provincial: $16,633,332; City of Richmond: $8,316,666

Dike Master Planning

The current phases of the Dike Master Plan are shown in Attachment 1. Phase 1 is complete and was endorsed by Council on April 22, 2013. Stakeholder consultation for the draft version of Phase 2 is complete and staff will report the results of that consultation to Council in March 2018. National Disaster Mitigation Program grant funding was secured for Phase 3 and work began in November 2017 as per the conditions of the grant. Work on Phase 4 of the dike master plan began in October 2017. Staff anticipate that both Phase 3 and Phase 4 will be completed in 2018. Staff recently secured a $150,000 grant from the Union of BC Municipalities Community Preparedness Fund for Phase 5 of the Dike Master Plan and work will begin in 2018.

Steveston Island Dike Investigation

The Dike Master Plan Phase 1 identified Steveston Island as the preferred long term dike alignment for flood protection in Steveston Harbour. Staff obtained grant funding through the National Disaster Mitigation Program for Steveston Island Flood Mitigation Planning and began geotechnical investigation to determine the feasibility of this option in November 2017. The geotechnical investigative work will be completed in the first quarter of 2018.

Dike Raising and Pump Station Upgrades

As part of the City's Flood Protection Program, the following dike upgrades and pump station re-construction projects are underway through the current approved capital program combined with $16.6 million in grant funding secured from the Province of British Columbia:

- Horseshoe Slough Pump Station – detailed design has been completed, construction will begin in the first quarter of 2018 and be completed in the first quarter of 2019;
- No. 7 Road South Pump Station – design is underway, construction will begin in the second quarter of 2018 and be completed in the first quarter of 2019;
- Shell Road North Pump Station – design is underway, construction will begin in the second quarter of 2018 and be completed in the first quarter of 2019;
- No. 2 Road South Pump Station – conceptual architectural design is pending on Council approval, construction is scheduled to begin in the third quarter of 2018 and be completed in the first quarter of 2019;
- No. 2 Road North Pump Station – construction will be completed in early 2018
- South Dike from No. 3 Road to Gilbert Road – design to be completed in the first quarter of 2018. Construction is targeted for the third quarter of 2018 but will be dependent on receiving environmental approvals from the Province;
- North Dike Raising and Improvement from No. 2 Road to Mccallan Road – design to be completed in the second quarter of 2018 and construction to be completed in the first quarter of 2019 but will be dependent on receiving environmental approvals from the Province;
- South Dike from No. 3 Road to 410 m east of the Woodwards Slough Drainage Pump Station (excluding Crown Packaging property) – design to be completed in the second quarter of 2018. Construction is targeted for the third quarter of 2018 but will be dependent on receiving environmental approvals from the Province;
- South Dike from No. 9 Road Pump Station to 680 m to the east, adjacent to Lafarge – design will begin in 2018 with completion scheduled for 2019; and
- North Dike from No. 8 Rd to approximately 500 m to the east – design will begin in 2018 with completion scheduled for 2019.

The City has existing agreements with Crown Packaging and Lafarge stating their responsibilities to raise and maintain the dike fronting their respective properties. Staff has initiated discussions with both Crown Packaging and Lafarge and are working to facilitate dike improvements at these locations.

Britannia Heritage Shipyard Flood Protection Improvements

This project will improve flood protection at the Britannia Heritage Shipyard site, which is outside the City dike. The scope includes repairing existing bulkheads, raising of concrete walls and installing new sheet pile flood barriers that will be cladded to preserve the heritage appearance. The project is scheduled to be completed in the second quarter of 2018.

Box Culvert Repair or Replacement

The City has 56 km of box culverts throughout the City that are the back bone of the City's drainage system. Some of the box culverts have deteriorated prematurely and have required remedial action or replacement. The following are box culvert capital projects competed in 2017 or scheduled for 2018.

- No. 2 Road between Westminster Highway and Granville Avenue – replaced 50 m of box culvert that had joint failure and was undermining No. 2 Road. Replacement was completed in February 2017 at a capital cost of $1.5M ;

- No. 4 Road at Tuttle Avenue – replaced 25 m of deteriorated large diameter steel culvert with a 3.3 m x 1.5 m box culvert. Completed in February 2017 at capital cost of $630k; and

- No. 2 Road south of Steveston Highway – inspection of this box culvert identified over 250 defects that require attention. The approved budget for required repair work is $3.7M and work is scheduled to begin in the first quarter of 2018.

Maintenance

In 2017, dike maintenance staff re-armoured 6,000 square meters of dike face with 5,200 tonnes of rip rap and removed 5,500 square meters of trees and vegetation from the dikes. Staff will increase dike maintenance in 2018 with the additional funding approved by Council on November 14, 2017 as part of the 2018 Utility Budget rates.

Box culvert deterioration is an emerging issue in Richmond and the City implemented a box culvert inspection program in 2017. Staff performed comprehensive inspection of 7 km of box culverts in 2017 and will inspect another 8 km of box culverts in 2018.

New Technologies

Staff identified a unique technology to improve soil strength through utilization of microbes. This technology has potential to strengthen dikes that are susceptible to liquefaction during very long return period earthquakes. Staff has engaged a Dutch company to confirm the effectiveness of the microbes in Richmond's soil stratum and will employ this innovative technology in the City should it prove to be beneficial.

Financial Impact

None.

Conclusion

Richmond's flood protection system provides a high degree of security for the residents and businesses in the City of Richmond. The 2008 – 2031 Richmond Flood Protection Management Strategy is the City's guiding framework for continual upgrades and improvement of the City's flood protection system and the Drainage and Diking Utility provides a secure source of funding for these improvements. The City's Dike Master Plan identifies a long term program for increasing the height of the City's dikes over the next 25 to 75 years to stay ahead of climate change induced sea level rise and guides the City's Dike Improvement Program. The Dike Improvement Program has a number of projects that are currently in the implementation phase and additional projects are identified in the City's Capital Plan for implementation in the near future.

The City's 56 km of box culverts are the back bone of the City's drainage network. Richmond has a rigorous box culvert inspection program that has identified deterioration in some of the box culvert inventory. A number of projects have been completed or are under way to repair identified weaknesses in the box culverts.

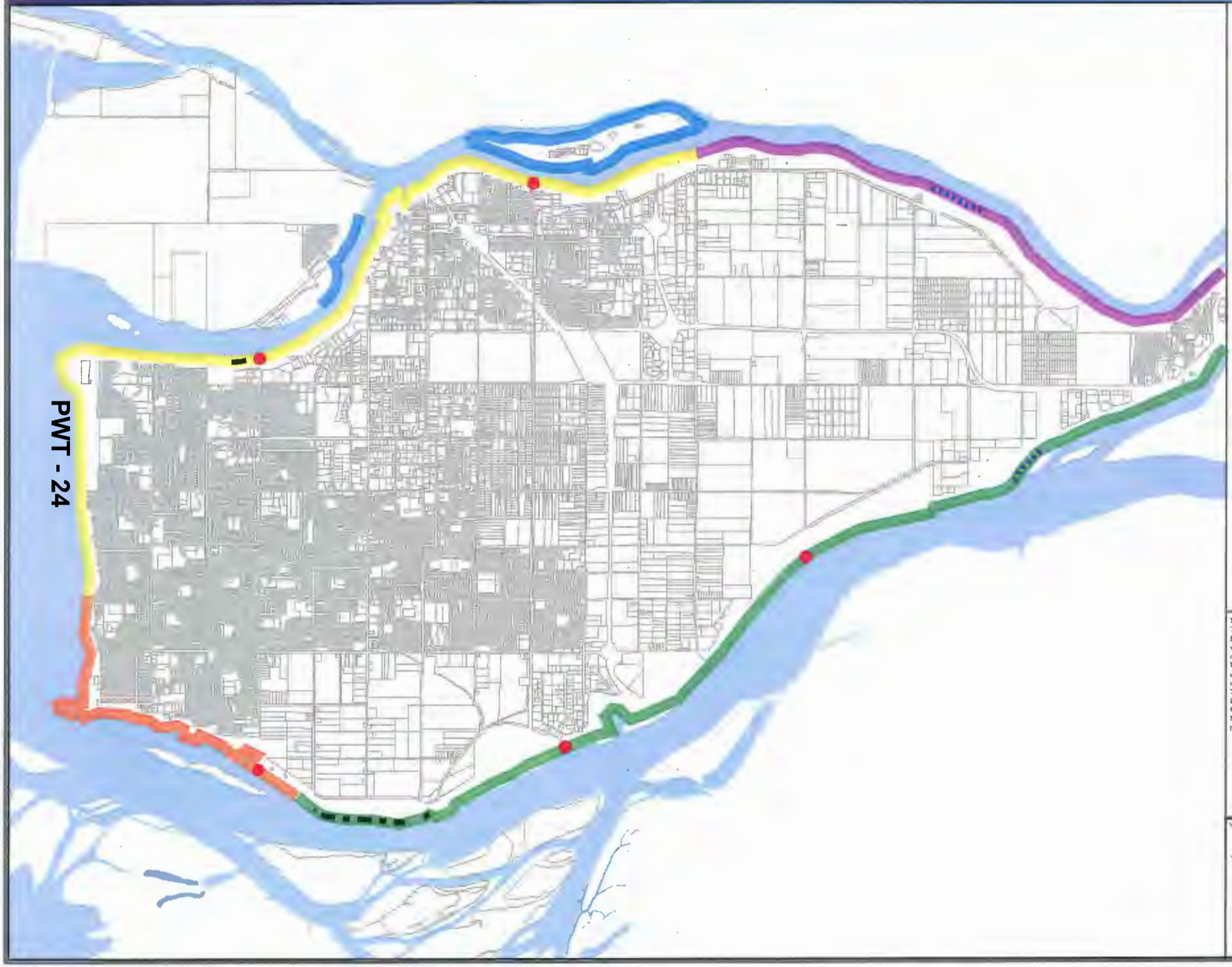
Staff is continually identifying new technologies that may have application in Richmond and is working with a Dutch company to determine if a microbe based soil stabilization process will work in Richmond. This process has significant potential to improve the City's liquefiable soils and provide improved protection during seismic events.

Lloyd Bie, P.Eng.
Manager, Engineering Planning
(604-276-4075)

LB:lb

Att. 1: Dike Master Plan Phasing Map

Dike Master Plan Phases Map



PWT - 24

R:\Engineering Planning\Shared\Projects\Dykes\pdf\Dike_Project_History.pdf

R:\Engineering Planning\Shared\Projects\Dykes\mxd\Dike_Project_History.mxd

Attachment 1

City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	January 25, 2018
From:	John Irving, P.Eng. MPA Director, Engineering	**File:**	10-6125-11-01/2017-Vol 01
Re:	**2018 Ecological Network Management Strategy Update**		

Staff Recommendation

That the staff report titled "2018 Ecological Network Management Strategy Update" dated January 25, 2018, from the Director, Engineering, be received for information.

John Irving, P.Eng. MPA
Director, Engineering
(604-276-4140)

Att. 1

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Arts, Culture & Heritage	☑	
Parks Services	☑	
Development Applications	☑	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	**INITIALS:** CJ	**APPROVED BY CAO**

Staff Report

Origin

Richmond City Council adopted the Ecological Network Management Strategy in September 2015 with a specific vision:

"The Ecological Network is the long-term ecological blueprint for the collaborative management and enhancement of the natural and built environments throughout the city, within neighbourhoods, and across land-uses and development types in order to achieve ecologically connected, livable and healthy places in which residents thrive."

This report supports Council's 2014-2018 Term Goal #4 Leadership in Sustainability:

> *Continue advancement of the City's sustainability framework and initiatives to improve the short and long term livability of our City, and that maintain Richmond's position as a leader in sustainable programs, practices and innovations.*
>
> *4.1. Continued implementation of the sustainability framework.*
>
> *4.2. Innovative projects and initiatives to advance sustainability.*

This report showcases Richmond's commitment to protecting natural areas and expanding the existing network by summarizing key achievements since 2015 and outlining future initiatives (Attachment 1). Attachment 1 will be posted online and publicized through the City's social media channels and highlighted at community events.

Background

The Ecological Network Management Strategy (the Strategy) provides a comprehensive framework to manage and guide decisions regarding natural areas in Richmond and the ecosystem services they provide on City, public and private lands. The Strategy outlines an extensive approach to complement, align, and inform the City's planning, regulatory and operational context to strengthen and enhance Richmond's natural spaces.

The Ecological Network (EN) is comprised of Richmond's natural and semi-natural areas, (terrestrial, riparian and aquatic) including Richmond Nature Park, Sturgeon Bank, the South Arm Islands, Northeast Bog as well as smaller-scale natural areas such as backyards, parks, school yards and old fields. These areas support critical ecosystem functions that support wildlife habitat, erosion protection, pollination and food production, water filtration, drainage, flood mitigation, recreation and aesthetics, and improve the quality of life for residents and businesses in Richmond.

Analysis

The implementation of the Strategy is set by a series of recommended actions and initiatives. Actions seek to establish an implementation approach that integrates and aligns the EN into

processes occurring throughout the different City departments and builds on existing City processes, policies, and plans. Actions are grouped into four activity focus areas:

1. Green Infrastructure and Development
2. Vegetation, Habitat and Wildlife
3. Parks and Public Spaces
4. Stewardship and Collaboration

Since implementation in 2015, there have been numerous projects and initiatives among City Departments. Showcase projects that have been executed by the City (within this timeframe) pursuant to the Strategy are highlighted below.

Green Infrastructure & Development

Green infrastructure uses methods that mimic natural systems to provide services and achieve multiple benefits. From rainwater management systems to district energy utilities, 'green' design initiatives have become integral to the EN's success. The following projects showcase green infrastructure solutions in Richmond:

- **Sidaway Drainage Improvement Project**: Infrastructure improvements and ecological enhancements (new culverts and native plantings) to approximately 1800 metres (m) of channelized watercourse along Sidaway Road and Steveston Highway.

- **Metro Vancouver's Lulu Island Waste Treatment Plant Expansion**: Through the ESA DP, the compensation plan involved the removal of invasive species, ecological habitat replacements at a 3:1 compensation ratio, with over 4000 new plantings on Iona Island.

- **Stormwater Management:** Throughout the city, several green infrastructure solutions using stormwater have been provided through development including:

    - Hollybridge Canal rain garden;
    - Oval Village rain gardens (Intracorp and Cressey developments);
    - Stormwater detention for the Gardens Development and adjacent Gardens Agricultural Park; and
    - Translink (Boundary Rd.) rain garden.

- **Alexandra District Energy Utility**: Established a green roof approximately 240 m^2 that includes native grasses and sedums to control storm water runoff.

- **Railway & West Cambie Greenways**: Required significant tree retention, new plantings, and a rain water management system to extend the ecological function of the corridors.

- **Cornerstone Evangelical Baptist Church and Christian Academy**: Remediated a portion of the ESA that was previous disturbed by unauthorized changes and replanted with native trees and shrubs.

Vegetation, Habitat & Wildlife

Richmond is home to a unique mix of diverse ecological places, many of which are managed through a range of municipal, provincial and federal jurisdictions. The EN seeks to protect these areas and are actively monitored and enhanced over time so they continue to provide the ecological services vital to community health.

The following projects have enabled the City to strengthen the EN by protecting and enhancing the City's vegetation, habitat and wildlife:

- **Riparian Response Strategy**: Enhanced approximately 2.1 hectares (21,000 m^2) of disturbed riparian habitat with native plantings through residential, commercial and industrial developments approvals.

- **Knotweed Treatment**: Identified in the ISAP, the City treated 260 knotweed infestations throughout the EN, equal to approximately 2.5 hectares of habitat.

- **Bridgeport Industrial Park Pollinator Pasture & Terra Nova Pollinator Meadow**: Converted approximately 3,000 m^2 of underutilized land at Bridgeport to a wildflower pasture to benefit native pollinators and a plan to increase this area by 2,500 m^2 in 2018 at Terra Nova.

- **David Suzuki Foundation's Butterfly Rangers:** Worked with the Richmond Butterflyway Rangers who are responsible for planting pollinator patches in 21 locations throughout Richmond, including City Hall.

- **Barn Owl Nest Box Program:** Four barn owl boxes were installed at Terra Nova Rural Park and West Cambie Park to promote nesting and two fixed with monitoring cameras were installed at the Alexandra District Energy Utility Building.

- **Snow Goose Cover Crop Program:** Provided 100 acres of wildlife habitat within the Agricultural Land Reserve for migrating snow geese to utilize each season.

- **Bath Slough Revitalization**: in addition to a pollinator pasture, revitalization efforts included 250 native shrubs and trees planted along the slough.

- **Northeast Bog Conservation Area**: On-going study to assess the bog's carbon storage and sequestration capacity to offset the City's greenhouse gas emissions and preserve the unique ecosystem.

- **Trellis Seniors' Care Facility**: ESA restoration in Hamilton that will enhance and combined area of 1,099 m^2 with native plantings and trees.

- **Jayden Mews Development**: Townhouse development north of Garden City Lands that included 374 m^2 of enhanced area and visible artwork that functions as barn owl habitat.

Parks and Public Spaces

Projects can complement the management and enhancement of our ecological assets such as Parks and public spaces. The City has successfully integrated a multitude of projects that have strengthened the EN including:

- **Garden City Lands**: A unique and made-in-Richmond project that combines initiatives to promote agriculture and ecology stewardship within the community. This project will contribute over 1,250 native trees, 15,000 native shrubs while maintaining a portion of the bog's ecological function within the EN.

- **Terra Nova Resource Management Strategy**: Once finalized, this strategy will allow the City to better coordinate the multiple functions and programs occurring at the park and provide for new community initiatives that will support the EN.

- **Minoru Park Vision Plan**: This plan incorporates sustainability measures into the park including utilizing stormwater from surrounding developments and adding ecosystem services throughout the park.

- **South Dike Upgrade**: Once completed, this project will enhance approximately 750 m of the south dike and adjacent park area.

Stewardship & Collaboration

Central to the continued success of the EN is the active involvement of community members at different scales and levels of participation. The EN seeks to ignite collaboration and stewardship through community involvement and engagement at all levels of EN delivery. Staff have successfully built and strengthened community relationships within the City through project initiatives.

The following projects have strengthened the EN through key stewardship and collaboration efforts:

- **Tree Canada Plantings**: Included 90 volunteers from Siemens Canada, IKEA Canada, Shiseido and Ion Trading to plant 730 trees along the Railway Greenway and at Garden City Lands.

- **TD Tree Days Plantings**: Included planting over 1400 native trees and shrubs by 130 volunteers and members from TD Bank.

- **Partners for Beautification Program**: Allows community members to adopt streets, gardens, parks, trails, and open spaces to proactively remove litter and invasive plants from these areas.

- **Our Home and Native Bloom**: Successful community project on display at City Hall to promote Richmond's unique island ecology through educational talks and stewardship events.

- **Project WET:** In partnership with Richmond elementary school teachers and the Public Works Department, this project is an interactive elementary school science program aimed at educating students about the importance of potable water in Richmond.

- **Public Works Open House**: This interactive event offers a hands-on experience for residents including plenty of activities for all ages, including awareness about Richmond's unique environment.

- **Sustainability in Action Videos**: Several short videos produced by the City to highlight the actions that Richmond is taking to achieve a more sustainable community.

- **Bridgeport Pollinator Pasture**: A partnership initiative with Border Free Bees and other community partners to raise awareness in the community about the plight of wild pollinators and enjoy the tranquility of the site.

- **Richmond Earth Day Youth (REaDY) Summit**: Through the unique partnership of the City of Richmond, the Richmond School District, and the David Suzuki Foundation, REaDY helps build capacity for environmental education amongst Richmond high school and elementary students and has attracted over 1,500 participants to date.

Financial Impact

None. Funding received through annual capital and operating budgets augment the capacity for staff to manage and deliver the projects highlighted in this report.

Conclusion

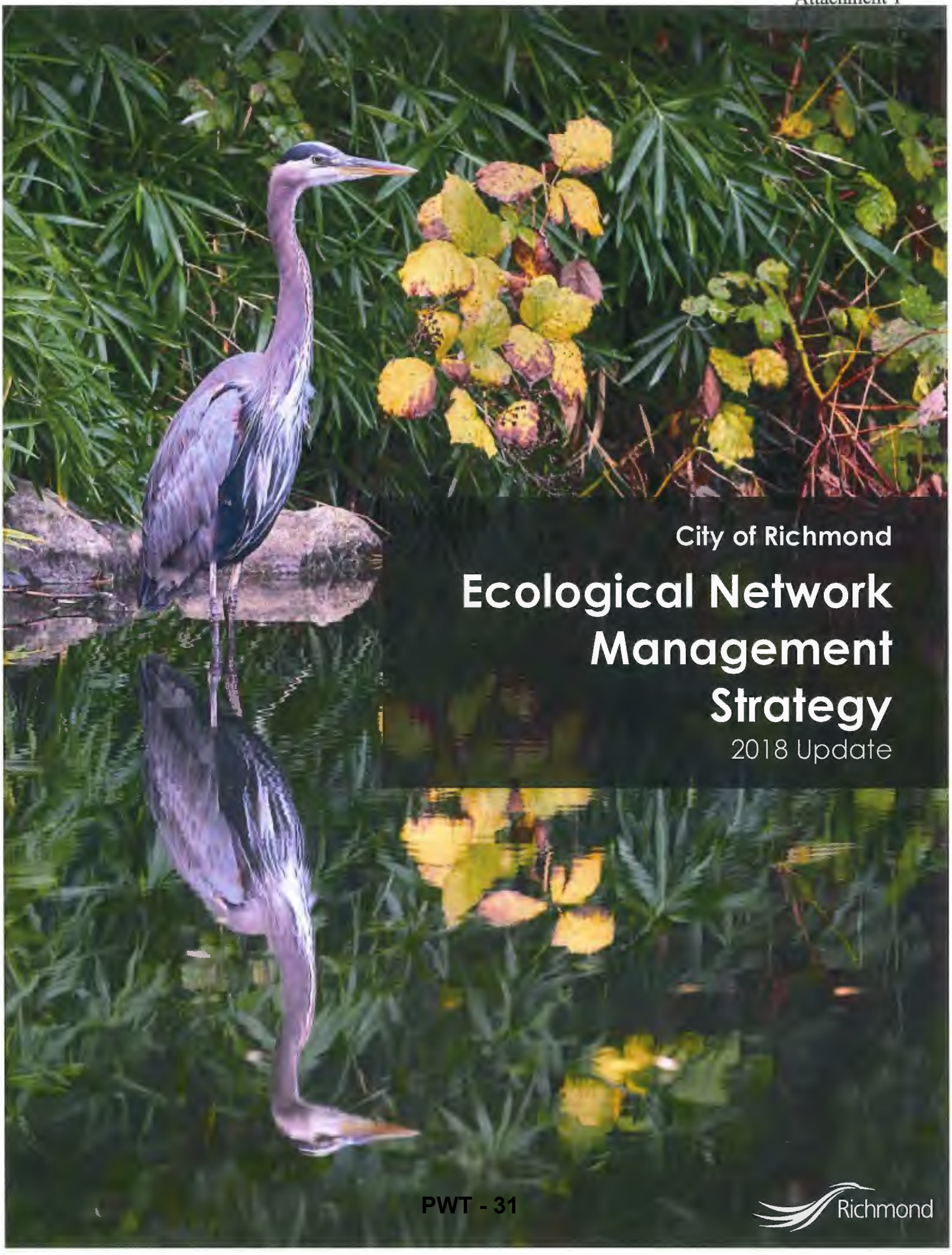
Richmond's Ecological Network Management Strategy set a new direction to strengthen habitat connections throughout Richmond and is an effective tool to communicate to residents what the City has been doing to support a healthy local ecosystem.

Future initiatives will focus on promoting new collaborative opportunities and establishing stronger processes for monitoring the Strategy's successes.

Chad Paulin
Manager, Environment
604-247-4627

Peter Russell
Sr. Manager, Sustainability & District Energy
604-276-4166

Att. 1: Ecological Network Management Strategy: 2018 Update Summary Document



City of Richmond

Ecological Network Management Strategy

2018 Update

Richmond

ECOLOGICAL NETWORK MANAGEMENT STRATEGY

Richmond City Council adopted the Ecological Network Management Strategy in September 2015 with a specific vision:

"The Ecological Network (EN) is the long-term ecological blueprint for the collaborative management and enhancement of the natural and built environments throughout the city, within neighbourhoods, and across land-uses and development types in order to achieve ecologically connected, livable and healthy places in which residents thrive."

In support of that vision, the Ecological Network Management Strategy (the Strategy) outlines detailed actions and initiatives developed under four focus areas:

1. **Green Infrastructure and Development**
2. **Vegetation, Habitat and Wildlife**
3. **Parks and Public Spaces**
4. **Stewardship and Collaboration**

This document and the statistics provided herein, serves to provide an update on actions taken in support of initiatives identified in the Strategy since its 2015 adoption and highlight future actions.

The Strategy received the Silver Award for Excellence in Policy Planning from the Planning Institute of BC

GREEN INFRASTRUCTURE AND DEVELOPMENT

OVERARCHING OBJECTIVES

1. **Protection of riparian areas**
2. **Connecting & enhancing wildlife corridors**
3. **Increasing ecological services**

Green infrastructure uses methods that mimic natural systems to provide services and achieve multiple benefits. From rainwater management systems to district energy utilities, 'green' design initiatives have become integral to the EN's success.

8,015 m^2
compensated with

1,188
native trees &

6,475
native shrubs

KEY ACHIEVEMENTS

Development Application Compensation: Through its Environmentally Sensitive Area (ESA) Development Applications from September 2015 to the present, an area of approximately 8,015 m^2 has been compensated for by adding over 7,000 native trees and shrubs to Richmond.

Sidaway Drainage Improvement Project: Civil improvements (culverts) and ecological enhancements (native plantings) to approximately 1,800 m of channelized watercourse along Sidaway Road and Steveston Highway.

Metro Vancouver's Lulu Island Waste Treatment Plant Expansion: Through the ESA DP, the compensation involved the removal of invasive species, ecological habitat replacements at a 3:1 compensation ratio, with over 4,000 new plantings on Iona Island.

Stormwater Management: Throughout the City, several green infrastructure solutions using stormwater have been provided through development including:

- Hollybridge Canal rain garden;
- Oval Village rain gardens (Intracorp and Cressey developments);
- Stormwater detention for the Gardens Development and adjacent Gardens Agricultural Park; and
- Translink (Boundary Rd.) rain garden.

Alexandra District Energy Utility (ADEU): Established a green roof approximately 240 m^2 that includes native grasses and sedums to control storm water runoff.

Railway & West Cambie Greenways: Required significant tree retention, new plantings, and a rain water management system to extend the ecological function of the corridor.

Richmond Middle Arm Waterfront Park Brownfield Action Plan: Initiative to restoration and develop a waterfront park that has been subject to impacts from soil and groundwater contamination due to historical uses.

ADEU building green roof planting palette.

FUTURE ACTIONS

Pump Station Actuator Upgrades (Bridgeport, Horseshoe Slough & Future Sites): Upgrades will allow for the controlled exchange of water between the Fraser River and Bath Slough to improve water quality and restore the slough's natural water cycle.

Integrated Rainwater Resource Management Strategy: Continue the strategic implementation of water detention measures, such as storage ponds that have additional benefits for the City such as water reuse and ecological and aesthetic value.

VEGETATION, HABITAT, AND WILDLIFE

OVERARCHING OBJECTIVES

1. **Identify areas of opportunity**
2. **Retain and enhance existing vegetation**
3. **Strengthen connectivity**

Richmond is home to a unique mix of diverse ecological places; many of which are managed through a range of municipal, provincial and federal jurisdictions. The EN seeks to protect these areas and actively monitored and enhanced over time so they continue to provide the ecological services vital to community health.

2.1ha
of riparian enhancements through development projects

2.5ha
of knotweed treated

KEY ACHIEVEMENTS

Riparian Response Strategy: Enhanced approximately 2.1 ha (21,000 m^2) of disturbed riparian habitat with native plantings through residential, commercial and industrial developments approvals.

Knotweed Treatment: Identified in the ISAP, the City treated 260 knotweed infestations throughout the EN, equal to approximately 2.5 ha of habitat.

Cornerstone Evangelical Baptist Church and Christian Academy:
Remediated a portion of the ESA that was previous disturbed with unauthorized changes and replanted with native trees and shrubs.

Bridgeport Industrial Park Pollinator Pasture: Converted approximately 3,000 m^2 of underutilized land at Bridgeport to a wildflower pasture to benefit native pollinators.

David Suzuki Foundation's Butterfly Rangers: Worked with the Richmond Butterflyway Rangers who are responsible for planting pollinator patches in 21 locations throughout Richmond, including City Hall.

Barn Owl Nest Box Program: Four barn owl boxes installed at Terra Nova Rural Park and West Cambie Park to promote nesting and two fixed with monitoring cameras were installed at the Alexandra District Energy Utility Building.

Jayden Mews Development: Townhouse development north of Garden City Lands that included 374 m^2 of enhanced area and visible artwork that functions as barn owl habitat.

Snow Goose Cover Crop Program: Provided 100 acres of wildlife habitat within the Agricultural Land Reserve for migrating snow geese to utilize each season.

Bath Slough Revitalization: In addition to a pollinator pasture, revitalization efforts included 250 native shrubs and trees planted along the slough.

Northeast Bog Conservation Area: On-going study to assess the bog's carbon storage and sequestration capacity to offset the City's greenhouse gas emissions and preserve the unique ecosystem.

Trellis Seniors' Care Facility: ESA restoration in Hamilton that will enhance and combined area of 1,099 m^2 with native plantings and trees.

Dr. Cameron Cartier of Border Free Bees accepts the Mayor's Artistic Innovation Award, 2017

One of six Barn owl boxes installed at Terra Nova and ADEU

FUTURE ACTIONS

Bath Slough Restoration: Restoration will include the removal of various invasive species and replacing this area with native trees and shrubs and ongoing success monitoring

Riparian Response Strategy Update: Will formalize and streamline the RMA application process to improve customer service and allow for success monitoring.

PARKS AND PUBLIC SPACES

OVERARCHING OBJECTIVES

1. **Complement the management & enhancement of ecological assets**
2. **Identify unprotected ecological assets**
3. **Create new protected spaces**

Projects can complement the management and enhancement of our ecological assets such as Parks and public spaces. The City has successfully integrated a multitude of projects that have strengthened that Ecological Network, which have been highlighted below as key achievements.

4,469

trees planted in parks and on streets between 2013 & 2017

KEY ACHIEVEMENTS

Garden City Lands: A truly unique and made-in-Richmond project that combines initiatives to promote agriculture and ecology stewardship with community wellness and cultural expression. This project will contribute over 1,250 native trees and 15,000 native shrubs while maintaining a portion of the bog's ecological function within the EN.

Railway Greenway: Greenways are fundamental ecological corridors within urban landscapes providing food and habitat for wildlife and opts for active transportation for residents. A significant amount of native tree and shrub planting was completed along the entire greenway in 2017.

Aberdeen Park: The design of this park incorporates multiple objectives, bringing nature into an urban, recreational context with the integration of a rain garden feature.

London Landing Park: Completion of park landscaping includes ESA restoration/riparian plantings along foreshore according to an agreement with FREMP.

FUTURE ACTIONS

Minoru Park Vision Plan: This plan incorporates sustainability measures into the park including utilizing stormwater from surrounding developments and adding ecosystem services throughout the park.

Urban Forestry Management Strategy: When implemented, this strategy will see to the sustainable management of publicly-owned trees throughout the city.

Terra Nova Resource Management Strategy: Once finalized, this strategy will allow the City to better coordinate the multiple functions and programs occurring at the park and provide for new community initiatives that will support the EN.

STEWARDSHIP AND COLLABORATION

OVERARCHING OBJECTIVES

1. **Ignite collaboration & stewardship through community involvement**
2. **Build and strengthen community relationships within the City through various project initiatives**

Central to the continued success of the EN is the active involvement of community members at different scales and levels of participation. The EN seeks to ignite collaboration and stewardship through community involvement and engagement at all levels of EN delivery.

KEY ACHIEVEMENTS

Tree Canada Plantings: Included 90 volunteers from Siemens Canada, IKEA Canada, Shiseido and Ion Trading to plant 730 trees along the Railway Greenway and at Garden City Lands.

TD Tree Days Plantings: Included planting over 1,400 native trees and shrubs by 130 volunteers and members from TD Bank.

Partners for Beautification Program: Allows community members to adopt streets, gardens, parks, trails, and open spaces to proactively remove litter and invasive plants from these areas.

Enhanced Pesticide Management Program: Reduces exposure of unnecessary pesticide use for residents and empowers community members to make the switch to pesticide free practices.

Environmental Workshops & Events: Delivered 49 free workshops that have attracted over 700 residents since 2016 and included topics such as Natural Lawn Care and Organic Gardening, to Bee Identification and Fruit Tree Management.

465
volunteers participated in planting over

3,200
native trees & shrubs

1,500
REaDY Summit participants to date

Our Home and Native Bloom: Successful community project on display at City Hall to promote Richmond's unique island ecology through educational talks and stewardship events.

Our Home and Native Bloom at City Hall Plaza, 2017

Project Wet: In partnership with Richmond elementary school teachers and City of Richmond Public Works, this project is an interactive elementary school science program aimed at educating students about the importance of potable water in Richmond.

Public Work Open House: This interactive event offers a hands-on experience for residents including plenty of activities for all ages, including awareness about Richmond's unique environment.

Sustainability in Action Videos: Several short videos produced by the City to highlight the actions that Richmond is taking to achieve a more sustainable community.

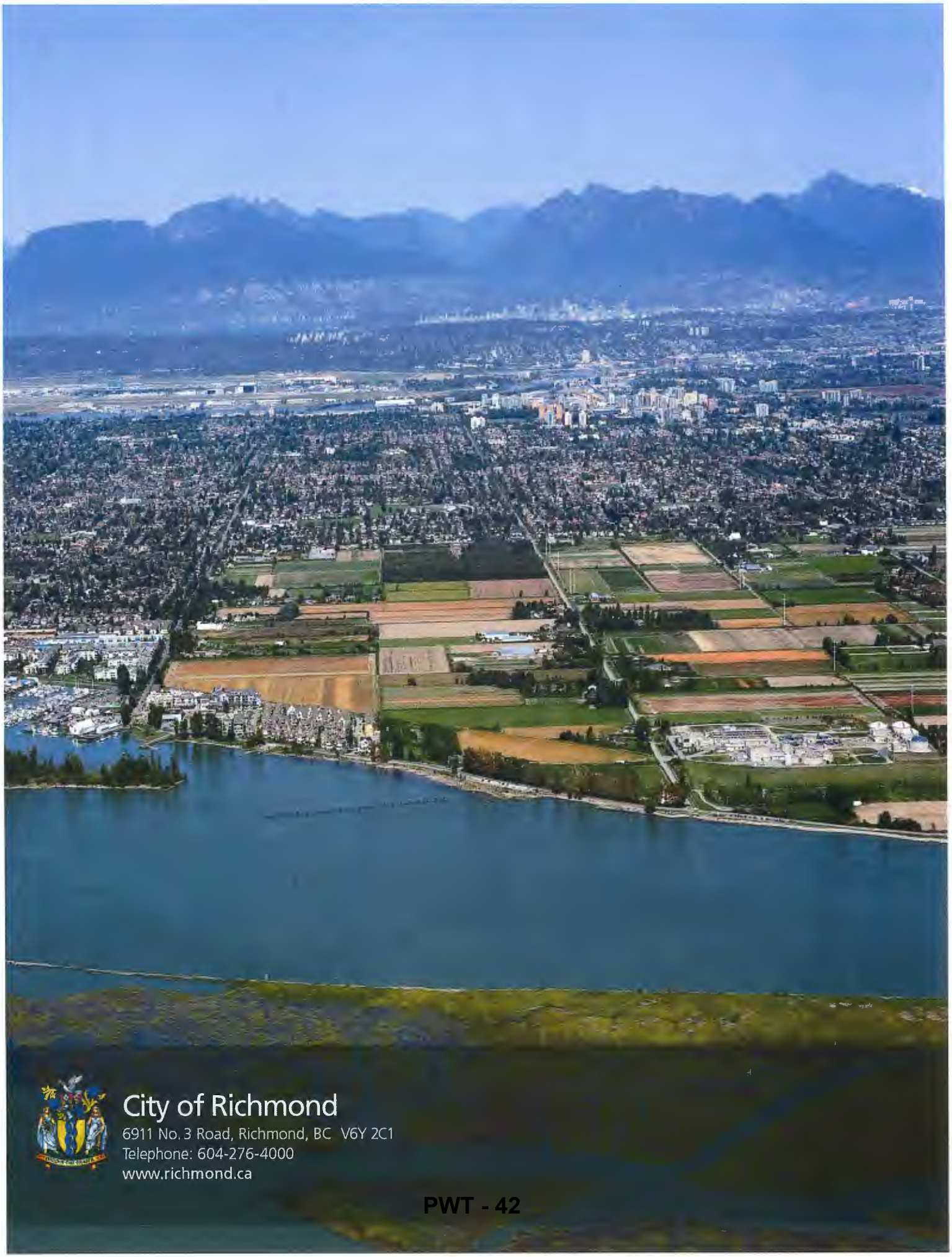
Richmond Earth Day Youth (REaDY) Summit: Through the unique partnership of the City of Richmond, the Richmond School District, and the David Suzuki Foundation, REaDY helps build capacity for environmental education amongst Richmond high school and elementary students and has attracted over 1,500 participants to date.

Public Works Open House 2017

FUTURE ACTIONS

Terra Nova Pollinator Pasture: Continue the successful partnership with Emily Carr University to establish a new 2,500 m^2 pollinator meadow at Terra Nova in 2018.

Interactive Chafer Beetle Videos: A new series of videos prepared to educate, inform and assist residents in dealing with chafer beetle infestations.



City of Richmond
6911 No. 3 Road, Richmond, BC V6Y 2C1
Telephone: 604-276-4000
www.richmond.ca

City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	January 26, 2018
From:	John Irving, P. Eng MPA Director, Engineering	**File:**	10-6125-05-01/2018-Vol 01
Re:	**Richmond Carbon Market and Carbon Neutrality Update**		

Staff Recommendation

1. That the staff report titled, "Richmond Carbon Market and Carbon Neutrality Update," from the Director of Engineering, dated January 26, 2018 be received for information.

2. That the Chief Administrative Officer and the General Manager, Engineering and Public Works be authorized to negotiate and execute agreements to purchase carbon credits to maintain the City's corporate carbon neutrality status.

John Irving, P. Eng MPA
Director Engineering
(604-276-4140)

Att. 1

REPORT CONCURRENCE	
CONCURRENCE OF GENERAL MANAGER	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	INITIALS: CJ
APPROVED BY CAO	

Origin

The City of Richmond committed to maintaining carbon neutral corporate operations when it signed the BC Climate Action Charter. The City has maintained this commitment since 2013. The purpose of this report is to seek approval to develop and execute partnership agreements with two additional Richmond-based organizations (Lafarge Canada and Panevo Services) and to renew a partnership agreement with Pacific Gateway Hotel through the Richmond Carbon Market (RCM) program and to present a corporate carbon neutrality update.

These planned actions support the following Council 2014-2018 Term Goals:

#4 Leadership in Sustainability:

4.1. Continued implementation of the Sustainability Framework.

4.2. Innovative projects and initiatives to advance sustainability.

#5 Partnerships and Collaboration:

5.1. Advancement of City priorities through strong intergovernmental relationships.

5.2. Strengthened strategic partnerships that help advance City priorities

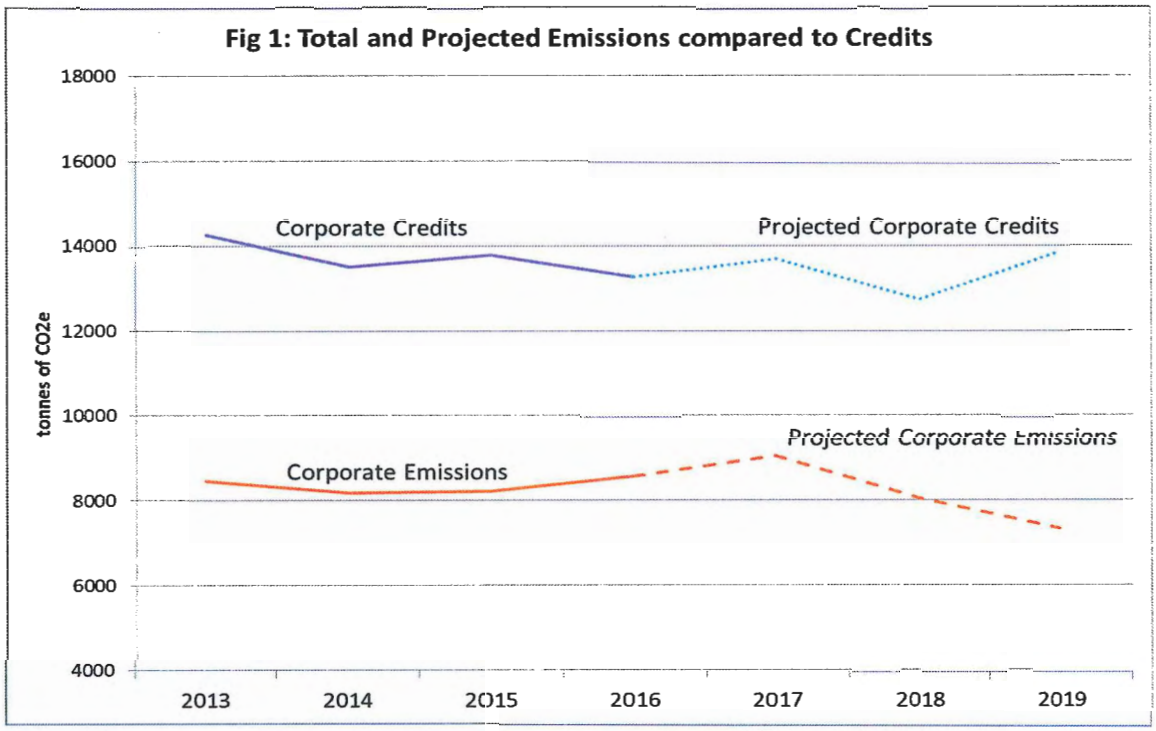
Background

In September 2008, Council signed the BC Climate Action Charter, voluntarily committing the City to annual corporate GHG emissions reporting and to achieving carbon neutral operations. In 2013, Richmond City Council adopted the *Towards Carbon Neutrality: Implementation Strategy,* which put in place an effective framework defined by four key steps for meeting carbon neutrality commitments: measure, reduce, compensate (or offset) and report.

Achieving carbon neutrality for corporate operations entails that the City reduces corporate emissions where possible and offsets corporate emissions as necessary. Guided by the City's 2013 Green Fleet Action Plan and Energy Management Program for buildings and infrastructure, the City is constantly working on reducing its corporate GHG emissions footprint and energy use. To meet the City's community commitment of 33% reduction from 2007 levels by 2020, Council has endorsed a 20% GHG emissions reduction target for Fleet by 2020 from 2011 levels and a 65% reduction for corporate buildings by 2020 from 2007 levels.

Key mechanisms identified in the 2013 strategy to address the need for compensation included assessing and quantifying beyond "business as usual" corporate activities that reduce GHG emissions and the implementation of the RCM pilot program to invest in Richmond-based projects.

The City has achieved carbon neutral operations for the past four reporting years, and is anticipating achieving carbon neutrality in 2017 as well. Due to the City's completion of several emissions reduction projects since 2013, including the investment in the development of RCM projects, the City is carrying forward a surplus of credits. Any surplus credits are able to be carried forward to following years to achieve carbon neutrality. Based on the ongoing work to reduce corporate emissions and the ongoing accumulation of verified emission credits, the City is projecting that carbon neutrality will be maintained through past the 2020 reporting year, as shown below in Figure 1.



Richmond Carbon Market Program

The RCM pilot program was initiated in 2015, and it was envisioned that it would act as a tool that the City could use to build community resilience by investing in Richmond-based projects that would generate carbon credits that then belong to Richmond. When the pilot was introduced, Council endorsed a strategy to invest funds the City receives annually through the Province's Climate Action Revenue Incentive Program. In 2015 five project submissions were received as part of the first round of projects. The five projects and their current status are shown in the following table.

Table 1: First Round Project Submissions for RCM program

Proponent	Project Description	Project Status	GHG emission credits (tCO_2e)
1. Pacific Gateway Hotels	Building energy efficiency retrofits	Retrofit work was completed prior to 2015, and the purchase agreement for the associated 2015 credits was finalized in 2016	106
2. EcoWaste Industries	Enhanced landfill re-vegetation and carbon sequestration	Project is on –hold, full re-design is required and it may not qualify for the program once implemented	-
3. TnT Supermarkets	Organic waste diversion and bio-digester, to achieve a zero waste grocery operation	Equipment associated with project was moved to another location outside of Richmond	-
4. RDH Building Engineering	Building energy renewal and retrofits in Richmond	The proponent did not complete the required reporting – project was not advanced	-
5. Harvest Power	Packaged organics separation and recycling	The proponent did not complete the required reporting – project was not advanced	-

While there was community interest in the call for projects, agreements with four of the five original proponents were not completed. The RCM program is on-going, and for this reason two new proponents and one original proponent have come forward in the City's second call for projects.

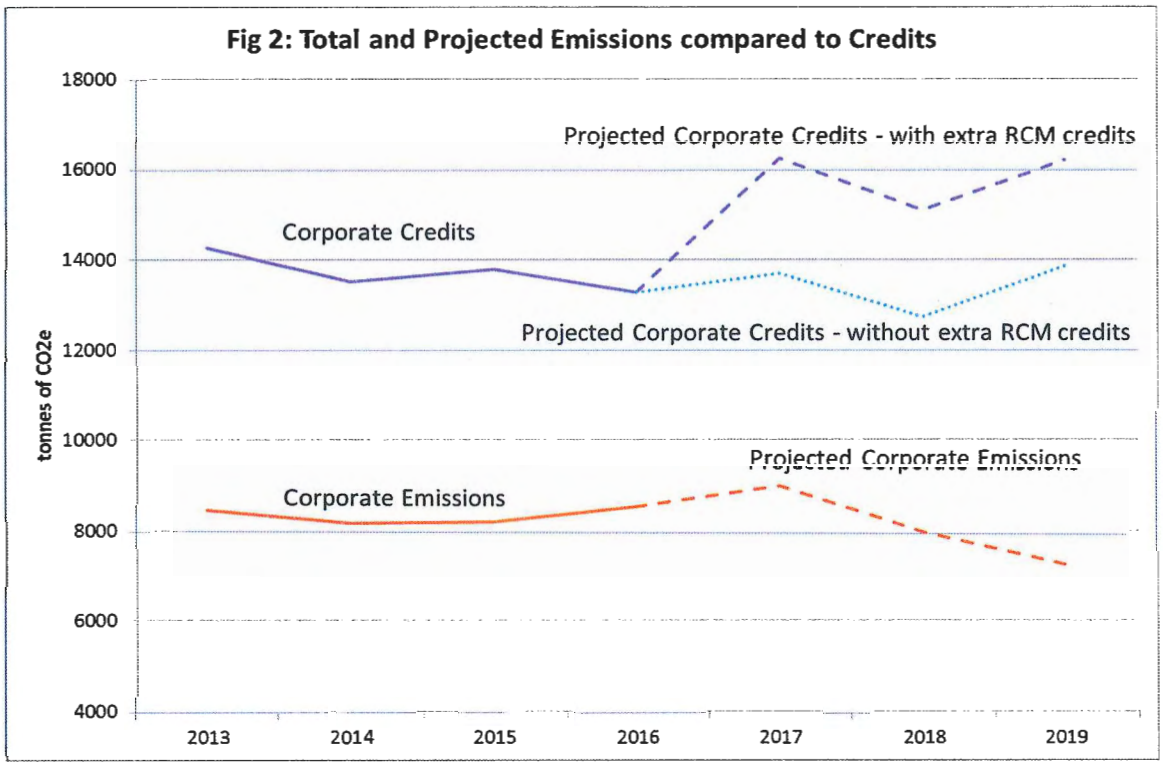
Analysis

The second call for projects through the RCM involved re-posting a Notice of Opportunity on BC Bid, providing direct information to Richmond businesses through the City's Economic Development Office monthly newsletter and social media page, and by soliciting directly some of the participants that were involved in the City's original pilot program consultations. As a result of these actions two additional participants were identified, with Pacific Gateway Hotel re-submitting a follow up proposal. Information on the three submissions that were received as part of the second round call for projects is listed in the table below for Council consideration. For further description and information on each potential participant and their submissions, please see Attachment 1.

Table 2: Community Project Submissions to the Richmond Carbon Market

Proponent	Project Description	Project Status	Est. GHG emission reductions available (tCO_2e)	Max. Investment ($25/tCO2e)
1. Pacific Gateway Hotels	Building energy efficiency retrofits – Calendar years 2016 and 2017	Completed, quantification to be finalized in early 2018	200	$5,000
2. Lafarge Canada	Asphalt recycling and displacement of virgin aggregate material	Completed, quantification to be finalized in early 2018	2,400	$60,000
3. Panevo Services Ltd	Industrial and commercial energy efficiency improvement and equipment renewal consultants	Not yet implemented	500-2,000	$50,000
		Total	**3,100-4,600**	**$115,000**

If approved, the execution of agreements with both Pacific Gateway and Lafarge can likely be completed before the City's 2017 carbon neutral reporting deadline in June 2018, which will allow further surplus to be accumulated this reporting year. Once Panevo Services Ltd finalizes its project submission and the required quantification and verification documents, the specific project information will be reviewed by the City. It is not expected that the execution of a purchase agreement with Panevo will occur prior to June 2018, but could be completed before the 2018 reporting deadline in June 2019 if approved. The City will be well positioned to maintain corporate carbon neutrality indefinitely if these proponents are selected to be included in the Richmond Carbon Market Program and corporate emissions targets are reached, as shown in Figure 2.



In addition to external RCM program projects, there are internal corporate projects that the City has quantified or is in the process of quantifying to further reduce the City's carbon footprint. The expected credits associated with the projects are reflected in Figures 1 and 2. Further information on the corporate projects and their status are listed in the following table.

Table 3: Anticipated Corporate Carbon Credits

Project Description	Tonnes CO2e	Project Status
Household Organic Waste Composting – Municipally Collected	7,000	Quantification completed by Metro Vancouver on an annual basis.
Corporate concrete and asphalt recycling – Sidaway Yard	500	Quantification and reporting methodology completed in 2017, further credits received on an annual on-going basis as concrete batches are recycled.
Alexandra District Energy Utility (2014-2016)	550	Quantification and verification completed in 2017. Credits will be a one-time allocation as the ADEU is now part of the separate corporation, Lulu Island Energy Company.
Northeast Bog (2018)	Over 1,000*	Initial carbon assessment has been completed. Further ecological and environmental assessments to be completed in mid-2018.
Total projected credits from corporate projects	**9,050**[a]	

*) current estimates, projects still to be quantified

[a]) currently approximately 7,500 tonnes of the projected credits from corporate activities would be available on an on-going basis

Financial Impact

None, funding for this program was previously approved by Council.

Conclusion

Through the continued strategic implementation of the *Towards Carbon Neutrality – Implementation Strategy,* the City is a leader amongst BC municipalities in working towards reductions in community and corporate GHG emissions. With the continued development and deployment of the Richmond Carbon Market program, the development and quantification of corporate projects, and the strive to achieve corporate building and fleet GHG emission reduction targets, the City is well positioned to maximize corporate and community benefits of transitioning towards a low carbon community while also maintaining carbon neutral operations indefinitely.

Levi Higgs, CEM, PMP
Corporate Energy Manager
(604-244-1239)

Peter Russell
Senior Manager, Sustainability
and District Energy
(604-276-4130)

Att. 1: Richmond Carbon Market Program - Submission Summary 2018

City of Richmond

Richmond Carbon Market Program – Submission Summary

Proponent Submissions Summary

A second request for community greenhouse gas (GHG) emission reduction project plans was issued publicly in November 2017, as part of the Richmond Carbon Market program. This request was designed to further assess the opportunity for the City to invest in community based projects that result in quantifiable GHG emissions reductions, which then could be used to offset the City's corporate GHG footprint.

Three submissions were received as part of this request, and detailed project summaries and organization information is indicated below.

1. Pacific Gateway Hotel

- **Business type:** Pacific Gateway Hotel is a 374 room hotel, resort, and marina operation on Sea Island in Richmond. The hotel is affiliated with Preferred Hotels and Resort International, which represents a global collection of 650 independent hotels in 85 countries.
- **Location:** 3500 Cessna Drive, Richmond
- **Type of Project:** Building energy efficiency retrofits – Option 1
- **Project Description:** The facility completed energy efficiency upgrades to the building structure and systems to reduce energy use and GHG emissions, including;
    - Building automation system upgrades
    - Boiler plant replacement with domestic hot water pre-heat
    - Upgrade and replacement of make-up air units and exhaust fans
    - Lighting re-lamp and retrofit
    - Resealing the building envelope to decrease conditioned air leaks.

  The project quantification will assess the difference in GHG emissions between business as usual energy use of the building as compared to the post energy efficiency retrofit operation.
- **Pre-feasibility Estimated GHG Emissions Reduction:** 200 tCO2e per year
- **Project Timeline:** Project was completed in 2014, and a three year baseline was established. The project timeline for this submission will include emission reductions in the 2016 and 2017 calendar years as compared to the baseline conditions.
- **Additional Community Benefits:** Economic investments in energy efficiency upgrades at the hotel help support local jobs and economy.

2. Lafarge Canada

- **Business type:** Lafarge North America has numerous operations throughout North America, producing construction and infrastructure related material including cement, ready-mix concrete, aggregates, asphalt, and other products. Lafarge operates a large cement manufacturing and processing plant in East Richmond as well as a smaller asphalt batch plant on Mitchell Island.
- **Location:** Mitchell Island, Richmond
- **Type of Project:** Emissions reductions through displacement of virgin material – Option 2
- **Project Description:** Lafarge operates a plant on Mitchell Island that produces an asphalt product used for paving roads of various types. The asphalt they manufacture is a mix of asphalt cement combined with aggregate and sand. Asphalt cement is the black, tarry liquid (nearly solid at ambient temperatures) residue from the oil refining industry. The plant has been modified so that they can accept recycled asphalt material into their mix displacing the amount of virgin asphalt cement material they use, and reducing the transportation required for that material. The greater amounts of recycled material the plant uses, the greater the energy and emissions savings they can achieve.
- **Pre-feasibility Estimated GHG Emissions Reduction:** 2,400 tCO2e per year
- **Project Timeline:** This project is an on-going activity at the asphalt batch plant on Mitchell Island, with various amounts of recycled material used on an annual basis. Estimated credits are derived from the plant's asphalt production and recycled content mix in 2016.
- **Additional Community Benefits:** Reduced truck traffic in the City, which results in reduced pollution.

3. Panevo Services Ltd

- **Business type:** Panevo Services Ltd is an engineering consultant company that delivers energy efficiency studies, Energy Management Information System projects, and minor capital projects for industrial clients across Canada that help to reduce energy use and GHG emissions.
- **Location:** Various clients in Richmond, BC
- **Type of Project:** Building and Industrial energy efficiency – Option 1/2
- **Project Description:** Panevo is consistently helping various clients achieve energy and GHG reductions, as well as cost savings, through various efficiency and equipment renewal projects, such as; boiler upgrades, waste heat recovery system installations, and envelope improvements. Currently they are working with multiple Richmond based clients, and are expecting to be able to bring a project plan forward in the next six months for RCM consideration.
- **Pre-feasibility Estimated GHG Emissions Reduction:** 500-2,000 tCO2e per year
- **Project Timeline:** Before the end of 2018
- **Additional Community Benefits:** Increased cost savings for Richmond businesses, increased economic activity, and reduced emissions related pollution.

City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	January 24, 2018
From:	Victor Wei, P. Eng. Director, Transportation	**File:**	01-0100-20- RCYC1/2018-Vol 01
Re:	**Richmond Active Transportation Committee – Proposed 2018 Initiatives**		

Staff Recommendation

1. That the proposed 2018 initiatives of the Richmond Active Transportation Committee, as outlined in the staff report titled "Richmond Active Transportation Committee - Proposed 2018 Initiatives" dated January 24, 2018 from the Director, Transportation, be endorsed.

2. That a copy of the report titled "Richmond Active Transportation Committee – Proposed 2018 Initiatives" be forwarded to the Richmond Council-School Board Liaison Committee for information.

Victor Wei, P. Eng.
Director, Transportation
(604-276-4131)

Att. 3

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

Staff Report

Origin

The Richmond Community Cycling Committee was formed in 1993 to allow City staff to work in partnership with the community to promote commuter and recreational cycling in Richmond. In 2013, Council approved the evolution of the Committee into the Richmond Active Transportation Committee (RATC) to reflect a broader mandate that includes skateboarding, in-line skating and low-speed scooters. The Committee provides input and feedback to the City on infrastructure projects designed for these modes and undertakes various activities in co-operation with the City that encourage, educate and raise awareness of active transportation.

This report reviews the 2017 activities of the RATC and identifies a number of initiatives for 2018 that would support its mandate to provide input and advice to the City on issues in the planning, development, improvement, and promotion of an active transportation network that supports a greater number of trips by cycling, walking and rolling. The Committee's activities contribute towards the City's sustainability goals articulated in Richmond's *Official Community Plan* and *Community Energy and Emissions Plan* to reduce greenhouse gas emissions by 33% by 2020 and 80% by 2050 based on 2007 levels by prioritizing and funding walking, rolling and cycling infrastructure and, in turn, support Richmond's long-term health, liveability and vibrancy.

This report supports Council's 2014-2018 Term Goal #2 A Vibrant, Active and Connected City:

> *2.3. Outstanding places, programs and services that support active living, wellness and a sense of belonging.*

This report supports Council's 2014-2018 Term Goal #3 A Well-Planned Community:

> *3.3. Effective transportation and mobility networks.*

Analysis

The RATC undertook and participated in a number of activities in 2017 that contributed to enhanced cycling and rolling opportunities, and increased education and awareness of active transportation in Richmond.

Planning, Expansion and Improvement of Active Transportation Network in 2017

The City continued to improve Richmond's active transportation network in 2017, which comprises nearly 71 km of on- and off-street bike and rolling routes. The Committee provided feedback on the planning, design, construction, and/or improvement of the following facilities.

- *Crosstown Neighbourhood Link*: Currently under development, the east-west Crosstown Neighbourhood Link is aligned between Blundell Road and Francis Road and will link the Railway Greenway to the Parkside Neighbourhood Link on Ash Street (see Attachment 1 for alignment map and phases). Phases 1 and 2 were completed between Railway Avenue and Gilbert Road. Phase 3 will commence in 2018 with upgrades to the Lucas Road-No. 3 Road-

Bowcock Road intersections to facilitate the east-west movement of cyclists. The bike route is anticipated to be completed with Phase 4 in 2019.

- *Garden City Road Bike Route*: To address conflicts between northbound cyclists using the on-street bike lane on Great Canadian Way north of Bridgeport Road and right-turning motorists at the Costco driveway, the existing pathway and sidewalk on the west side of Great Canadian Way between Bridgeport Road and Charles Street was upgraded to a 3.0 m wide multi-use pathway (MUP) with pedestrian lighting. At its northern end, the new MUP connects to the existing MUP on Van Horne Way that in turn links to the Canada Line Bridge. At its southern end, the new MUP will connect to a MUP being constructed as part of the frontage requirements of developments on the west side of Garden City Road between Sea Island Way and Capstan Way. Collectively, these improvements are part of the City's continued efforts to upgrade existing and establish new cycling facilities that are physically separated from adjacent vehicle traffic, particularly in the City Centre.

- *On-Street Bike Corral*: Richmond's first on-street bike corral was installed in Steveston on No. 1 Road immediately south of Moncton Street (Figure 1). This form of bike parking not only enables the provision of bike racks at a site where there is insufficient boulevard width to accommodate a rack but also does not impact on-street vehicle parking as the bike corral is located within the intersection clearance zone.

Figure 1: Bike Corral on No. 1 Road

- *Green Surface Treatment*: Addition of green-coloured anti-skid surface within bike lanes or at crosswalks at strategic locations where there is a higher potential for conflicts between cyclists travelling straight through and motorists needing to cross the bike lane in order to merge or make a turn. The vibrant colour is the approved national standard that is intended to highlight and raise awareness to both cyclists and motorists to watch out for each other and use caution when in the area. The green treatment was added within the crosswalks for the Shell Road Trail and the MUP on Westminster Highway east of No. 6 Road (Figure 2).

Figure 2a: Westminster Hwy MUP at No. 7 Road

Figure 2b: Shell Road Trail at Granville Ave

- *Detailed Design for Active Transportation Projects*: The Committee provided feedback on the progress of detailed design for the following planned active transportation improvement projects that each include the provision of a two-way paved multi-use pathway: Sexsmith Road (Beckwith Road-Charles St) and River Drive (Van Horne Way-No. 4 Road).

- *River Road*: The Committee continued to provide feedback on road safety improvement options for implementation on River Road between No. 6 Road and Westminster Highway.

- *Cycling Wayfinding*: Additional cycling wayfinding signage and pavement markings were installed southbound on the Garden City Road bike route south of Cook Road to indicate the alternative use of Citation Drive as a quiet bypass route for southbound cyclists destined for westbound Granville Avenue (Figure 3). In addition, street name signs based on Parks' Wayfinding Strategy will be installed at the cross streets along the Shell Road and Bridgeport Trails to orient cyclists who may be unfamiliar with the routes.

Fig 3: Wayfinding Sign for Citation Dr

- *TransLink Initiatives*: The Committee provided input into the following regional initiatives being led by TransLink:

    - Southwest Area Transport Plan: TransLink staff attended the June 14, 2017 meeting of the Committee as part of the Phase 2 public consultation activities seeking feedback on proposed transit service changes and regionally significant cycling corridors;
    - Bike Parkade: Design work for the planned construction of a secure bike parkade at the Bridgeport Canada Line Station, anticipated in 2019; and
    - Bicycle Monitoring: The installation of bicycle counters on select bike routes in Richmond, anticipated in 2018, as part of a systematic, regional program to count bicycle trips and monitor bicycle use throughout the region with the data also being used to support the planning and assessment of cycling infrastructure and program investments. At least three counters will be installed in Richmond. While the locations have yet to be finalized, candidates include Great Canadian Way south of Van Horne Way, No. 3 Road south of Saba Road, Railway Avenue north of Williams Road, Westminster Highway east of No. 6 Road, Granville Avenue west of Minoru Blvd, and the No. 2 Road Bridge.

Promotion of Active Transportation Network in 2017

The Committee participated in the following activities in 2017 to promote cycling and other active transportation modes in Richmond.

- *Bike to Work Week (May and October 2017)*: The Committee worked with the organizer (HUB Cycling) of this region-wide annual initiative to continue to successfully stage these events in Richmond. Region-wide, the number of registered participants was relatively consistent to 2016 (1% decline). A total of 519 riders who reside in Richmond registered on-line for both events (up from 500 in 2016) including 109 new bike commuters, and collectively logged 2,330 trips for a total distance of 30,583 kilometres thereby avoiding the emission of 6.6 tonnes of greenhouse gases (see Figure 4). Within this group were four

teams from the City of Richmond. Together, the City teams logged 211 trips for a total distance of 2,035 kilometres, thus avoiding the emission of 441 kilograms of greenhouse gases.

A total of five celebration stations for cyclists were held in Richmond including two sponsored by the City at the Canada Line Bridge for both the Spring and Fall events. Collectively, these celebration stations logged 466 cyclists, which is comparable to past years.

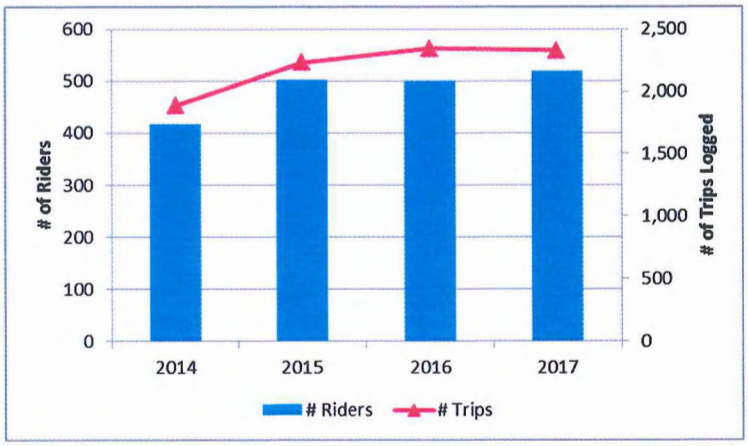


Figure 4: Participation of Cyclists who reside in Richmond in Bike to Work Week

- *17th Annual "Island City, by Bike" Tour (June 11, 2017)*: Each year in June, as part of regional Bike Month activities and the City's Environment Week events, the Committee and the City jointly stage guided tours for the community of some of the city's cycling routes. The 17th annual "Island City, by Bike" tour was based at West Richmond Community Centre and offered short (9-km) and long (18-km) rides with escorts provided by volunteer members of the Richmond RCMP bike squad. The loops featured the Railway Greenway and the Crabapple Ridge Neighbourhood Bike Route. Activities included a bike and helmet safety check prior to the ride plus a barbecue lunch and raffle prize draw at the finish. Richmond RCMP also provided registration services for an anti-theft bike initiative. The event attracted 75 cyclists of all ages and ability, which is comparable to attendance at past recent events.

- *Update of Cycling & Recreational Trails Map*: The new map, produced in a more portable format (i.e., folds down to slightly larger than a credit card), was distributed in early 2017 to community centres, libraries and other civic facilities as well as handed out at various City events (Figure 4).

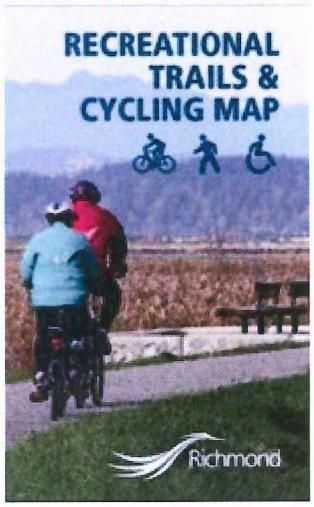


Figure 4: Map Cover

- *Participation in City Events*: Committee members provided information on how to get around Richmond in fun, safe and environmentally friendly ways at the following City events: Ships to Shore (May 5-6, 2017) at Garry Point Park and All Aboard! (August 19, 2017) at the Steveston Interurban Tram Building.

- *HUB Cycling Bike to Shop Day (July 23, 2017)*: HUB Cycling staged the second annual Bike to Shop Days event to promote cycling as attractive and sustainable form of transportation. For the first time, a celebration station was located in Richmond at Steveston (No. 1 Road-Bayview Street) that provided local and regional cycling information, snacks, free bike tune-ups, and chances to win prizes. Local merchants offered discounts to participants.

Active Transportation Education in 2017

The City provided funding to HUB Cycling to operate cycling education courses for local residents with input from the Committee. The City's support for cycling education generates multiple benefits including increased safety, encouragement of a life-long healthy activity and sustainable mode of travel, and potential to reduce traffic congestion around schools as more students choose to ride a bike, all of which align with the City's Official Community Plan goals.

- *Bike to School Education for Students*: A total of over 330 students from Grades 6 and 7 at Talmey (three classes) and Ferris (five classes) Elementary Schools and Grades 4 through 7 at Mitchell Elementary Schools (four classes) participated in five-day bike education courses, held in co-operation with Richmond School District. The courses include in-class lessons, on-bike playground cycling safety training for younger students and neighbourhood road ride education for older youth. The courses were well received and enjoyed the enthusiastic participation of all students. Following the course, students reported a 58 per cent increase in cycling and a higher number of days per week that they biked to school. Attachment 2 provides a summary of the outcomes and feedback.

- *StreetWise Education for Adults*: One beginner's course targeted to recent immigrants was held in co-operation with Immigrant Services Society of BC. A total of 11 new riders (the number of participants is limited to maintain the teacher-student ratio) of varied immigrant backgrounds, who live in Richmond, took to the classroom, an empty parking lot, and eventually to the road to learn to ride safely and confidently on Richmond streets. Attachment 3 provides a summary of the course outcomes.

Proposed Active Transportation Network Initiatives in 2018

The Committee will provide input at the earliest conceptual stage on the prioritization, planning, design, and implementation of the following projects that expand and/or improve the network of infrastructure that can be used by active transportation modes.

- *Planned Active Transportation Network Expansion*: City capital projects include further progress on the Crosstown and Parkside Neighbourhood Links, and improvements to Westminster Highway (rebuild and widening where feasible of the existing two-way multi-use path between No. 6 Road and No. 7 Road), Odlin Road (new east-west route connecting to the Aberdeen Canada Line Station) and River Drive (construction of new two-way multi-use path between Van Horne Way and No. 4 Road). Conceptual design will also be initiated for the northern extension of the Shell Road Trail (Highway 99 Overpass to River Road) in anticipation of the project being proposed for inclusion in the 2019 Capital Budget.

- *City Centre Cycling Network Update*: Per the Council-approved 2018 Capital Budget, the cycling network plan identified in the City Centre Area Plan (last updated in 2007) will be updated to ensure it is reflective of current needs and industry design standards. The work will include an implementation strategy to advance expansion of the cycling network.

- *Active Transportation Network Spot Improvements*: Potential projects include localized improvements to existing on-street cycling facilities such as improved pavement markings (e.g., green painted bike lanes at potential conflict areas), additional signage, new ramps to

facilitate access to off-street pathways, installation of delineators to prevent motorists from encroaching into bike lanes, and the expansion of bicycle parking including additional on-street bike corrals.

- *Planned Park, Road and Development Projects*: The Committee will review additional City and external agency projects that impact existing or would incorporate new active transportation infrastructure as part of the overall project such as the George Massey Tunnel Crossing Improvement, No. 2 Road upgrade (Steveston Highway-Dyke Road), and TransLink's bike parkade at the Bridgeport Canada Line Station.

Project costs associated with the expansion and improvement of the active transportation network for 2018 are accommodated in the City's annual capital budget and considered as part of the annual budget review process. Some of these projects are eligible for financial contribution from external agencies (e.g., ICBC and TransLink). If successful, staff will report back on the amount of financial contribution obtained from these external agencies through the annual staff reports on ICBC and TransLink cost-sharing programs respectively.

Proposed Education and Promotion of Active Transportation in 2018

The Committee will encourage and promote active transportation as sustainable travel modes that also have significant health benefits via the following activities.

- *Dockless Bike Share*: As the City has been approached by company representatives interested in launching the operation of dockless bike share systems (i.e., bicycles that are accessed via a mobile app and equipped with GPS and digital locks so that they can be parked anywhere) in Richmond, the Committee will provide input on the factors that should be considered with respect to its potential implementation.

- *18th Annual "Island City, by Bike" Tour*: Assist in the planning, promotion and staging of the seventeenth annual bike tour of Richmond during Bike Month in June 2018, which is set for Sunday, June 10th at Thompson Community Centre. Both the long and short routes will seek to feature recent improvements to the active transportation network to raise community awareness of the neighbourhood facilities that support walking, cycling and rolling activities.

- *Bike to Work & School*: Assist in the planning, promotion and staging of this region-wide event during May and October 2018, which includes the provision of celebration stations in Richmond for cyclists.

- *Bicycle Education for Students and Adults*: In co-operation with HUB, the Richmond School District and a variety of community agencies to expand the delivery of safe cycling education courses to additional elementary schools and, new for 2018, a course targeted to seniors.

- *Promotion of Active Transportation Network*: Continue to participate in City events related to health and transportation to raise the awareness of new active transportation facilities both locally and regionally. Continue to update, revise and enhance related information on the City's website and Facebook site.

Financial Impact

None.

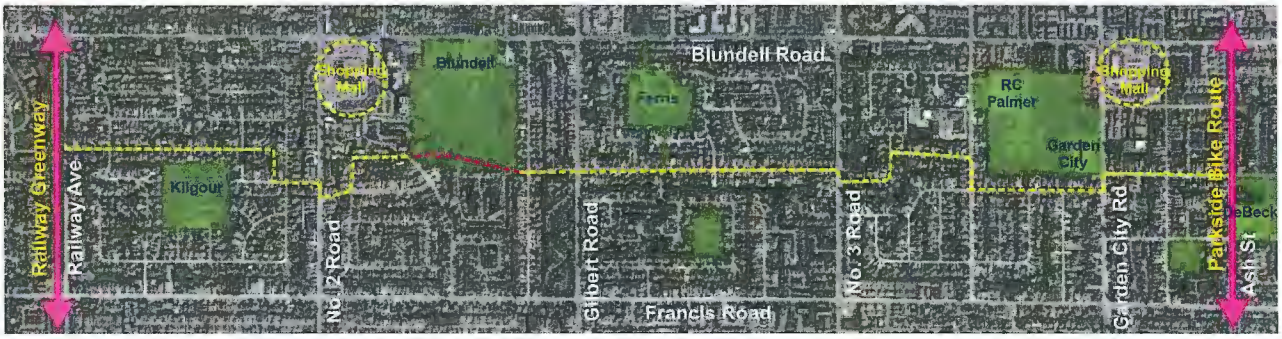
Conclusion

The Richmond Active Transportation Committee continues to build its diversity of users' experience to support its broader mandate that includes other rolling transportation modes. The Committee's proposed 2018 initiatives would continue efforts to further encourage greater and safer use of active transportation modes in Richmond, which in turn will support progress towards meeting the City's target for the reduction of greenhouse gas emissions as well as the travel mode share targets of the City's Official Community Plan.

Joan Caravan
Transportation Planner
(Staff Liaison to Richmond Active Transportation Committee)
(604-276-4035)

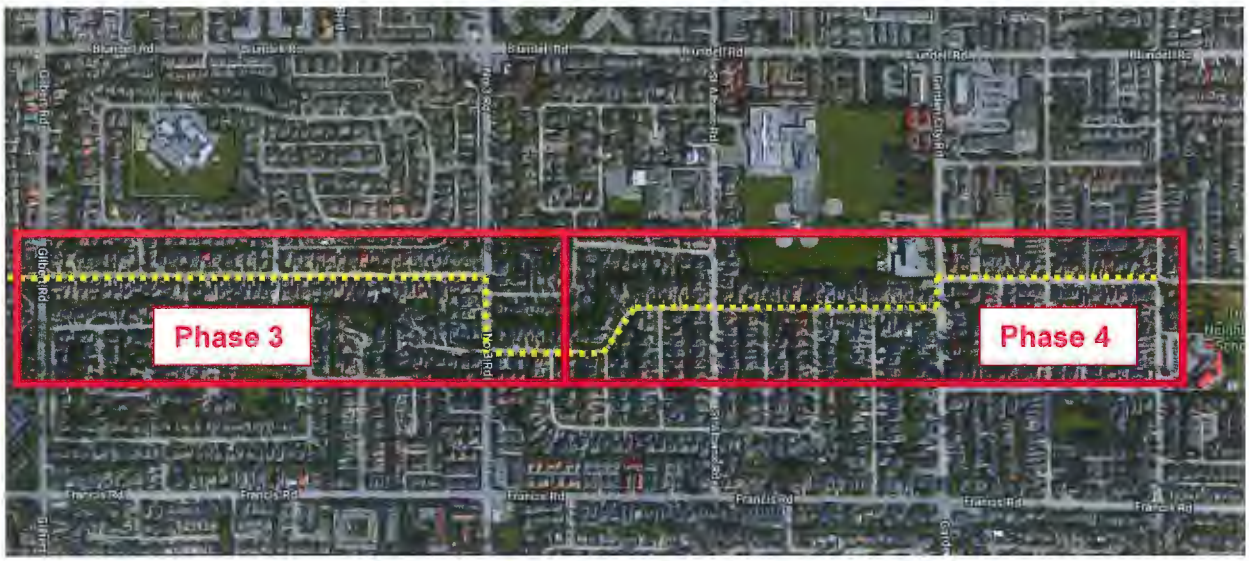
Att. 1: Crosstown Neighbourhood Bike Route: Alignment and Phases
Att. 2: Summary of 2017 Bike to School Program Results
Att. 3: Summary of 2017 StreetWise Immigrant Newcomer Program Results

Crosstown Neighbourhood Bike Route: Alignment and Phases



Route Alignment

Phases 1 and 2: Complete



Phase 3 (Planned 2018) and Phase 4 (Planned 2019)

2017 Bike to School Education in the City of Richmond.

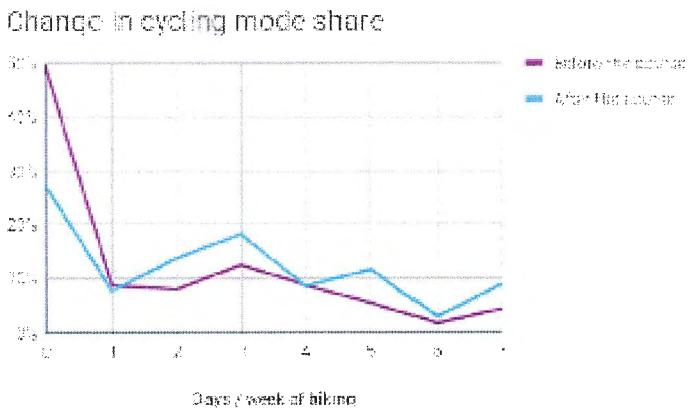
In 2017 the City of Richmond Transportation Planning funding allowed HUB Cycling to deliver a total of three *Ride the Road* courses providing positive impact for approximately 336 youth in the City of Richmond. In addition, TransLink funded three *Learn2Ride* courses. *NOTE: The outcomes for TransLink funded courses are included in a separate 2017 TransLink Bike Education final report from HUB Cycling, which will also be distributed to the City of Richmond.*

Ride the Road Courses:

- Talmey Elementary: delivered to three classes of grade 6 and 7 students. May 10-16.
- Ferris Elementary: delivered to five classes of grade 6 and 7 students. June 1, 2, 5, 6, and 8.
- Mitchell Elementary: delivered to four classes of grade 4 to 7 students. May 31, June 1, 2, 5, and 6.

"Thank you for organizing the HUB workshops for our students. We have all enjoyed having Lorraine and her crew here and learnt lots about biking and safe riding. Thank you again for offering us this wonderful learning opportunity."

-Teacher at Mitchell Elementary



Students report a 58% increase in riding after the course as shown by this graph.

On average students biked 1.6 days/week before the course, and 2.6 days/week after the course.

69% of students said the neighbourhood road ride was their favourite part of the course. Students said:

"It was fun being leader and guiding the group." "I got to explore new quiet neighbourhoods." "It was my first time on the road." "It made me feel more confident riding on the road."

2017 StreetWise Education in the City of Richmond.

In 2017 the City of Richmond Transportation Planning Department funded HUB Cycling to deliver one *Immigrant Learn to Ride* course in partnership with the Immigrant Services Society *of* BC. In addition, TransLink funded one adult *Ride the Road* course. ***NOTE: The outcomes for TransLink funded courses are included in a separate 2017 TransLink Bike Education final report, which will also be distributed by HUB Cycling to the City of Richmond.***

StreetWise Course:

- Immigrant Learn to Ride - delivered in partnership with staff of the Immigrant Services Society *of* BC
  Location: Minoru Park Course dates: July 12 and July 19, 2017
  Number of participants reached: 11 adults

Participant Outcomes:

Newcomer participants started the course with varying skills levels, but most were beginner riders. Many participants in the course achieved the following outcomes:

- One brand new rider developed their ability to balance, pedal, steer and brake on a bicycle
- Other participants gained confidence in their basic cycling skills including straight-line riding, turning, braking, shoulder checks, and hand signals
- Learned about the Canadian road use context, and rules of the road
- All participants practiced ensuring that their bike was safe to ride
- A small group put their new urban riding skills to practice on a group road ride on quiet neighbourhood streets
- All participants found out about the most useful Metro Vancouver cycle route planning resources and how to use them

"I think it was well presented and the students enjoyed the bike riding"
- Issof BC staff

City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	February 9, 2018
From:	Victor Wei, P. Eng. Director, Transportation	**File:**	10-6450-09-01/2018-Vol 01
Re:	**River Road – Review of Proposed Alternative Road Safety Enhancement Measures**		

Staff Recommendation

1. That the road safety measures on River Road between No. 6 Road and Westminster Highway recommended by the independent traffic safety consultant and staff as outlined in the report dated February 9, 2018 from the Director of Transportation be brought forward for further public consultation, including with the area residents and businesses.

2. That staff report back with the outcome of the public consultation prior to the installation of any additional speed cushions.

Victor Wei, P. Eng.
Director, Transportation
(604-276-4131)

Att. 4

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Engineering Fire Rescue RCMP	☑ ☑ ☑	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	**INITIALS:** CJ	**APPROVED BY CAO**

Staff Report

Origin

At the December 11, 2017 Council meeting, a delegation to Council expressed concerns regarding Council approval on September 25, 2017 of the installation of 20 additional speed humps along River Road between No. 7 Road and Westminster Highway. As a result, the following referral was carried:

> *That staff review the potential solutions to traffic calming measures along River Road prior to the installation of speed humps.*

At the January 29, 2018 Council meeting, three delegations to Council expressed concerns regarding the planned speed humps as well as the behaviour of cyclists in the same section of River Road. This report responds to the referral as well as concerns noted by the delegations at the January 29, 2018 Council meeting.

This report supports Council's 2014-2018 Term Goal #1 A Safe Community:

> *Maintain emphasis on community safety to ensure Richmond continues to be a safe community.*

This report supports Council's 2014-2018 Term Goal #3 A Well-Planned Community:

> *3.3. Effective transportation and mobility networks.*

Analysis

Update on Road Safety Measures Currently being Implemented

The installation of new "Single File" signage along with complementary "sharrow" pavement markings as well as new "Caution" signs to advise motorists to expect large volumes of cyclists on the roadway during weekends (Figure 1) commenced in Fall 2017 and is on-going with completion anticipated in Spring 2018.

Figure 1: Cycling-Related Signage on River Road

Conversion of the existing solid double yellow centreline to a dashed single yellow centreline at select locations and the removal of any remaining raised pavement markers (cat's eyes) and replacement with reflective delineator posts mounted in the gravel shoulder has also been initiated (e.g., ordering of materials, further analysis of locations where centreline can be modified) with completion date of this work anticipated to be early Summer 2018.

Condition of Existing Speed Humps

With respect to comments from a delegation to the January 29, 2018 Council meeting regarding the condition of the existing six speed humps in the 18,000-block of River Road, an inspection has

confirmed that the humps are structurally sound. Maintenance issues regarding refreshing the paint markings and repairing a road pothole at one location have since been addressed.

Review of Potential Traffic Calming Measures- Independent Study by External Consultant

In light of the comments expressed from the delegations to recent Council meetings that alternative road safety measures were not sufficiently examined by staff and the subsequent direction from Council for staff to review potential traffic measures further, staff retained the services of an independent transportation planning and engineering consultant to provide an objective assessment of and recommendations for road safety measures along the corridor. The purpose of the assessment is therefore to provide an objective professional engineering opinion on the countermeasures recommended by the City (i.e., 20 speed cushions), ones suggested by the delegation to the December 11, 2017 Council meeting (Attachment 1), as well as any other measures identified as necessary based on the consultant's own technical traffic safety review. The agency was selected from a short list of consulting companies with expertise in road safety audits as recommended by ICBC.

The review was conducted based on industry-recognized methods and recommended by Transportation Association of Canada's *Canadian Guide to In-service Road Safety Reviews* with the general scope being to conduct a traffic safety and operation review of River Road (No. 6 Road to Westminster Highway) in response to trends derived from past accident records. The key components of the review included: site visit with drive- and ride-through, collision analysis based on ICBC data from 2012 through 2016, identification of issues, review of traffic data including vehicle speed, volume, and type, review and assessment of countermeasures, and development of an implementation strategy. The consultant's full report documents the findings and identifies recommended mitigation measures to address road safety and operational concerns along with an assessment of the safety benefit of each measure. Attachment 2 provides the Executive Summary of the consultant's report.

Summary of Technical Findings by Independent Review

The consultant's review of ICBC crash data identified the following collision configuration types out of a total annual average of 24 collisions:

- single vehicle off-road crashes (33%);
- side impact or sideswipe crashes (31%);
- crashes involving heavy vehicles (17%);
- rear-end crashes (13%);
- cyclist-involved crashes (11%);
- single vehicle crashes – damage from debris (9%); and
- head-on crashes (3%).

In addition, a review of speed data indicated that the 85th percentile of the speeds measured generally was over 70 km/h whereas the posted speed limit is 50 km/h (30 km/h for trucks). The high travel speeds along the corridor are recognized as a concern given the characteristics of the roadway and identified as a significant contributing cause of collisions (both frequency and severity).

Based on the above findings, motorists have accounted for 100% of all collisions with cyclists involved in only 11% of the crashes. Thus, focusing on cyclists as the primary cause of safety issues on River Road is not considered to be effective as this would neglect 89% of the collisions observed. Moreover, motorists also have demonstrated excessive speeding behaviour. The consultant's review therefore focused on the high vehicular travel speeds and the following four collision patterns to be addressed by safety countermeasures: single vehicle off-road crashes, single vehicle crashes – damage from debris, side impact and sideswipe crashes, and cyclist-involved crashes. Countermeasures are proposed that focus on engineering measures to mitigate these collisions and moderate drivers' behaviour with education initiatives proposed for both cyclists and motorists.

Road Safety Measures Proposed by Independent Review

The Executive Summary (Attachment 2) of the consultant's report outlines the road safety measures proposed to address the above collision issues, with consideration given to the measures suggested by the delegate to Council on this topic. Solutions are proposed to better align the operating speeds with the road conditions in order to reduce the frequency and severity of all of the four identified collision issues. As summarized in Table 1 below, the measures would either (1) improve existing road conditions to accommodate actual motorist operating speeds; or (2) reduce motorist operating speeds to a level appropriate to the road conditions. Attachment 3 displays a map of the proposed locations of the measures.

Table 1: Measures Proposed by Independent Review

Time Frame	Proposed Measure	Rationale	Estimated Cost	Staff Comments
Phase 1: Short Term (within 1 year)	Sign and pavement marking updates: • conversion of up to 7 km of centreline • addition of sharrow stencils at 75 m spacing (1)	Encourage vehicle-cycle sharing and create consistent messaging along the corridor	$67,000-$180,000	Currently being implemented
Phase 1: Short Term (within 1 year)	Movable speed reader boards (total of 4 boards)	Provide direct feedback to motorists vis-à-vis posted speeds	$50,000-$60,000	Beyond staff's original recommendations and recommended for further public consultation
Phase 1: Short Term (within 1 year)	Signage treatments at 90° curves including chevron warning signs (potential LED lit) (2)	Enhanced warning and guidance through sharp curves	$15,000-$50,000	
Phase 1: Short Term (within 1 year)	Anti-skid pavement treatments at 90° curves to increase friction (assume 200 m length per lane)(2)	Provide increased driver control through sharp curves	$425,000-$500,000	
Phase 1: Short Term (within 1 year)	Education for cyclists and motorists regarding rules of the road	May increase desirable driver and cyclist behaviour	Negligible	
Phase 1: Short Term (within 1 year)	Increase road maintenance: more frequent cleaning and refreshing of pavement markings	Reduce potential for collisions involving debris or in areas where markings may faded or obscured	Additional $15,000 per year	

Time Frame	Proposed Measure	Rationale	Estimated Cost	Staff Comments
Phase 1: Short Term (within 1 year)	Reduce posted speed limit to 30 km/h for all vehicles with traffic calming comprising 43 speed cushions: • 13 sets of 3 speed cushions spaced at 100 m between the curves with a minimum of 400 m between each set, • 1 set of 3 speed cushions on No. 6 Road approaching River Road, and • 1 speed cushion on River Road approaching Westminster Highway	Observed motorist speeds are too fast for safe operation based on road conditions Minimize excessive speeds and keep motorists within an appropriate speed	Phase 1: $325,000-$350,000 for initial installation of 43 speed cushions	Beyond staff's original recommendations and recommended for further public consultation
Phase 2: Medium Term (2 to 5 years)	If the Phase 1 speed cushions do not achieve 40 km/h operating speeds, then 11 additional sets of 3 speed cushions (33) can be installed between the gaps for a combined total of 76 speed cushions	Observed motorist speeds are too fast for safe operation based on road conditions Minimize excessive speeds and keep motorists within an appropriate speed	Phase 2: Additional $250,000-$275,000 for installation of 33 speed cushions (if required)	
Phase 3: Long Term (> 10 years)	Re-build dyke and River Road	Match secondary arterial road classification and accommodate all road users	To be determined as part of Dyke Master Plan	

(1) Sharrow stencils comprise a bike stencil with two chevrons as illustrated in Attachment 3.
(2) The proposed measures would mitigate approximately 43% (annual average of 10 collisions) of the total collisions at the 90° curves at No. 6 Road and Westminster Highway.

The consultant also concludes that proposed "speed cushions" are deemed appropriate on collector and arterial roads such as River Road, particularly to accommodate emergency vehicles such as fire and ambulance. Cushions provide a softer vertical deflection compared to speed humps and are typically installed with gaps to allow wider wheelbase emergency vehicles more easy passage while still requiring passenger vehicles to ride over the hump.

Based on the consultant's focus on road safety and measures to mitigate crash severity and frequency to the fullest extent, a reduced speed limit of 30 km/h for all vehicles is proposed. As a cost-effective means to ensure adherence to this lower speed limit, the installation of 43 speed cushions as Phase 1 is recommended and, if the extent of these initial speed cushions does not achieve the desired motorist speed, then a further 33 speed cushions as Phase 2 for a total of 76 speed cushions. This higher number of speed cushions differs from the 20 speed cushions originally recommended by staff as the latter number was based on the following factors:

- absolute minimum number required based on maintaining the existing 50 km/h speed limit (30 km/h for trucks); and
- giving consideration to the potential impacts of the speed cushions to local residents and the road's classification as a minor arterial currently carrying an average daily traffic volume of 3,000 vehicles that is intended to provide network mobility in the city;
- the overall length of the roadway carrying longer-distance traffic flows between activity centres; and
- the potential visual impacts from the speed cushions and related signage.

For the long term, the consultant recommends that the road be widened to an arterial standard with separate provision for cyclists and pedestrians. These improvements would have a high cost, as widening and raising of the dike would be required and would not be practical to implement at this time. Reducing vehicle operating speeds through traffic calming, regulation and enforcement is a cost-effective option that can be implemented relatively quickly.

Public Consultation on Proposed Road Safety Measures

In light of recent concerns expressed by area residents and Council's direction to assess alternative measures prior to the installation of additional speed cushions, staff recommend that broader public consultation be undertaken to allow not only immediate area residents and businesses but also other road users the opportunity to provide their feedback on the following road safety enhancement options:

- 20 new speed cushions previously approved by Council at its September 25, 2017 meeting (with installation deferred pending staff review the potential alternative traffic calming measures along River Road as directed by Council at its December 17, 2017 meeting);
- chevron signage, special non-skid pavement treatments, revised speed limit, and 43 (Phase 1) and 33 (Phase 2, if required) additional speed cushions proposed by the independent road safety audit consultant; and
- any other alternatives and suggestions by the public.

Two open houses would be held at the Hamilton Community Centre in April 2018 with an accompanying survey. Presentation material and the survey would also be available on the City's on-line discussion platform LetsTalkRichmond.ca. Raising community awareness of the public engagement would be undertaken via media releases, the City's website, social media messaging, and local newspaper notices. Staff will then report back on the feedback from the above public consultation prior to the installation of any additional speed cushions.

In the meantime, staff would complete the implementation of the remaining pavement marking and signage improvements as approved by Council.

Increased Maintenance of River Road

The subject section of River Road is currently cleaned four times per year at cost of approximately $15,000. To address comments from the delegation to the January 29, 2018 Council meeting regarding debris along River Road as well as mitigate single vehicle crashes resulting from road debris, staff recommend that the frequency of road maintenance be doubled to eight times per year for a total annual cost of approximately $30,000. If supported by the public, staff would submit the additional maintenance cost for Council approval as part of future operating budget considerations starting in 2019.

Complementary Enforcement and Education Measures

With respect to comments from the delegations to the January 29, 2018 Council meeting regarding a desire for increased enforcement for both motorists and cyclists, Richmond RCMP will be implementing a number of enforcement and education initiatives as detailed in

Attachment 4 to increase public safety along River Road (i.e., speed enforcement, cyclist enforcement and education).

Feedback from BC Emergency Health Services (BC Ambulance)

Further to concerns noted by the delegations at the January 29, 2018 Council meeting regarding the potential impact of speed cushions on response times for emergency services, staff sought feedback on the proposed measures from BC Emergency Health Services. Paramedic staff advise that most ambulances that have patient transport capabilities have similar wheel axle widths to Richmond Fire-Rescue vehicles. Thus, while crews may have to travel at a lower rate of speed through the traffic calming sections when carrying a patient, overall there would be little or no impact to patients or response times.

Financial Impact

None. The public consultation activities can be accommodated within the approved operating budget of the Transportation Department.

Conclusion

An independent road safety and operations review of River Road has confirmed the safety benefits of installing speed cushions and further identified a number of additional interim measures that would better align the operating speeds with the road conditions in order to reduce the frequency and severity of the identified collision issues. Staff recommend that public consultation be undertaken on all of the consultant's proposed road safety measures, speed cushions recommended by staff and any other alternatives from the area residents and businesses. Staff will report back on the input received with recommendations and associated costs prior to the installation of any additional traffic calming measures.

Fred Lin, P.Eng., PTOE
Senior Transportation Engineer
(604-247-4627)

Joan Caravan
Transportation Planner
(604-276-4035)

Att. 1: Possible Road Enhancements Proposed by Delegation to December 11, 2017 Council Meeting
Att. 2: Executive Summary of Consultant Report: River Road Traffic Safety and Operational Review (February 2018)
Att. 3: Consultant Report: Map of Locations of Proposed Traffic Safety Measures
Att. 4: Memorandum from Richmond RCMP re Traffic Enforcement Initiatives for River Road

Possible Road Enhancements Proposed by Delegation to December 11, 2017 Council Meeting

1. **Install guard rails on the curve.**
Of the 16 accidents that have occurred on River Road in the area of the proposed speed humps, 6 were between 20800 and 22180.

2. **Install solarlite road markers along the sides and down the center line.**
Removing the "cat's eye" road markers is dangerous for drivers in foggy conditions. The solarlite road markers would light the way while tying into the City of Richmond's green initiative. Solarlite markers do not rely on the illumination from headlights and so would also make night time walking or cycling safer.

3. **Put reflective markers on the hydro poles, train bridge and fire hydrants.**
Due to the physical constraints of River Road these are almost touching the pavement in some areas. Fire hydrants have been struck, and at least 2 deaths have resulted in vehicles striking the pole or bridge.

4. **Increase the speed limit to 60k with the exception of the areas that are currently 30k as well as in front of Tom-Mac Shipyards**
Research has shown that increasing vehicle speed to 60k over 50k improves fuel economy and reduces emissions and greenhouse gas. The exception areas should have reduced speed and signage for safety of residents and employees.

5. **Reduce speed limit to 30k past Tom-Mac Shipyard and place flashing "caution" signs prior to the Tom-Mac shipyard area.**
Some drivers may be unaware of the forklift and other vehicle traffic at this business location and should be alerted of such activity.

6. **Install signboard that flashes speed.**
Flashing speed signs are often the only reminder that most drivers need. Ideally this would be in the 20000 block near the new picnic area that was constructed by the City of Richmond.

7. **Increased police presence.**
We need extra police presence in our area to address issues of property theft as well as patrolling the road. If speed is a major issue, hire a full time enforcement officer – the $100,000 allotted to this project would cover his/her initial salary and all of the speeding tickets issued would cover his/her wage on an ongoing basis. I stress that enforcement be toward both vehicles and cyclists.

8. **Install a "caution no shoulder" sign at the start of the road in each direction**
If drivers are not familiar with the area they may not realize that there actually is no or next to no shoulder on the road – especially when it is dark.

9. **Direct recreational cyclists to the designated cycle path until such time as a cycling lane can be installed on River Road and safely accommodate these cycling groups.**
This can be done by sending a letter to the cycling clubs welcoming them to cycle in Richmond, however, as River Road is under study clubs are asked to use the designated cycling lane – they of course know where this is as they must leave the cycling lane to enter River Road. Any cycling activity that continues on River Road should be single file to the right as the law states.

10. **Install "Local Traffic Only" signs at each end and direct the non-resident traffic to Westminster Highway or the 91 connector**
River Road was built many years ago to allow residents access to their properties, however, growth and densification in neighbouring Hamilton has resulted in many drivers choosing River Road rather than Westminster Highway or the 91 Connector as their commuter route. There are times when this traffic is backed up from the train bridge all the way to the corner at Westminster Highway. This increased traffic causes disruption to residents, as at times they cannot even exit their property. In addition, a look at the accident history shows that a full 50% of the accidents between No. 7 Road and Westminster Highway occur at the corner. I hazard to guess that the majority, if not all of the accidents that have occurred between No. 7 Road and Westminster Highway are non-residents. River Road was never intended to be the commuter route it has become. It must be upgraded to allow for this increase traffic flow or direct the non-resident traffic back to Westminster Highway or the 91 Connector until River Road can be upgraded. This can be accomplished by placing barricades with "Road Closed – Local Traffic Only" signs. I'm sure that after having to go back to the freeway or Westminster Highway a couple of time the commuters will stop using River Road.

EXECUTIVE SUMMARY

Study Purpose and Background

Watt Consulting Group was retained by the City of Richmond to undertake an independent traffic operations and safety review of the River Road corridor from No. 6 Road to Westminster Highway. The study was commissioned in response to safety concerns raised by the public, particularly related to off-road crashes and to crashes involving cyclists. The study is also supported by ICBC, who may contribute funding to the implementation of the proposed options.

Method Used

The review generally followed the method recommended in the Transportation Association of Canada's *Canadian Guide to In-service Road Safety Reviews.* This method clearly identifies a problem statement then identifies countermeasures to address the issues identified.

Site visits were conducted on January 17 and 18, 2018 – both at night and in the daytime and by bike riding the corridor and driving the corridor. Crash records from the Insurance Corporation of British Columbia were reviewed for the five years between 2012 and 2016 (inclusive). The predominant crash types were identified along with the higher-crash locations. Actual vehicle operational speed profiles were also reviewed.

This study considered a broad range of countermeasures to address the identified collision issues, including countermeasures previously proposed by City staff, ICBC staff, as well as several proposed by members of the public. Additional collision-reduction countermeasures were proposed by WATT, resulting in the evaluation of a total of 29 measures.

Findings

On average, 24 crashes were recorded annually along the corridor. The crash data indicated the highest number of crashes are at the following locations:

- No. 6 Road and River Road (22 percent of total collisions), and
- River Road and Westminster Highway curve and intersection (21 percent of total collisions).

Of known collision configuration types, 33 percent were single vehicle off-road crashes, 9 percent were single vehicle – damage by debris, 31 percent were side impact or side-swipe crashes, and eight crashes involved cyclists (11 percent). The remainder were rear-end (13 percent) or head-on (3 percent).

In terms of severity, 37 percent of the crashes were injury collisions and one percent were fatal collisions, which is typical for urban two-lane arterial roads when compared to the British Columbia average. One fatal collision occurred in 2016 involving a cyclist, and a second fatal collision occurred more recently outside the crash record period, involving a single vehicle going off-road.

The analysis indicates that most of the crashes were occurring on weekdays in the daytime, with very few collisions at night. Seasonal patterns for collisions were not evident.

The roadway design consists generally narrow lanes of variable width. There is also limited or no road-side shoulder in most areas. There is a steep drop-off to a ditch on the south side of the road in many areas which would be non-recoverable should a vehicle leave the roadway. There are utility poles, fire hydrants, trees, and fences close to the road in many areas.

Cyclist "Single File" signage was clear and implemented at a high frequency, however the additional messaging sign to drivers to change lanes to pass are difficult to read and comprehend at-speed and are contradictory to the double yellow centreline used along most of the corridor. Staff has a plan to revise the double yellow centreline to single broken lines at select locations to allow passing where safe.

Speed data was reviewed and generally the 85th percentile of the speeds measured was over 70 kilometers per hour. These travel speeds are considered high as the posted speed is 50 kilometres per hour (or 30 kilometres per hour for trucks) and the geometry of the road is not well-able to accommodate such high speeds. The rural nature of the road and area nonetheless may encourage some motorists to drive faster than is safe for conditions. A significant contributing cause of the crashes (both frequency and severity) is likely that drivers are traveling driving faster than the speed best-suited for the physical conditions. The road has an Average Annual Daily Traffic volume (AADT) of approximately 3,000 vehicles per day.

The corridor was found to be well-lit at night even in wet and rainy conditions, with most pavement markings being quite visible.

Problem Statement

The review of crash records identified four distinct collision patterns. After discussion with staff, it was confirmed that these four collision patterns are the issues that should be addressed with any safety countermeasures:

- **single vehicle crashes – off-road;**
- **single vehicle crashes – damage from debris;**
- **side impact and sideswipe crashes;**
- **cyclist-involved crashes.**

In addition, the high travel speeds along the corridor are a concern given the characteristics of the roadway.

Proposed Countermeasures

The proposed countermeasures were evaluated to assess whether they addressed the identified collision issues described above. The proposed measures are summarized in Table ES-1 and shown conceptually in the attached Figure – Proposed Countermeasures. In general, the proposed measures include:

- a package of sign and pavement marking improvements that provide consistent messages to drivers and cyclists;
- improved maintenance, particularly to remove debris;
- improvements to reduce off-road crashes such as increasing the pavement friction (to help motorists maintain control) at the two 90 degree curves;
- measures to guide drivers through the two 90-degree turns.

To reduce the frequency and severity of all of the four identified collision issues, solutions are proposed to better align the operating speeds with the road conditions. Changes would either:

- improve the road conditions to accommodate the actual vehicles operating speeds, or
- reduce operating speeds to a more appropriate level relative to the road conditions.

Improving Road Conditions

The road is classified as a secondary arterial which suggests that the road surface should be widened to standard, shoulders installed, and roadside hazards located sufficiently far from the edge of road or protected. As well, given the nature of the road adjacent the River and the recreational use it attracts, pedestrian and cycling facilities (and possibly equestrian facilities) should be considered. It is acknowledged that these improvements would come at a high cost and likely be done when the dyke is re-built and therefore an interim option should be considered.

Reducing Operating Speeds

Reducing the vehicle operating speeds through traffic calming, regulation, and enforcement can be a cost-effective option which can be implemented relatively quickly. Reducing speeds can be achieved through physical measures that require vehicles to slow down, but may also include other traffic control elements that better reflect conditions.

Speed humps are a proven effective means of maintaining a lower operational speed whilst other speed calming measures and techniques do not have reliable results. Speed humps are appropriate on local roads however the modification of speed humps to create a "speed cushion" are more appropriate on collector and arterial roads such as River Road, particularly to accommodate emergency vehicles such as fire and ambulance. Cushions provide a softer vertical deflection compared to speed humps, and are typically installed with gaps to allow wider wheelbase emergency vehicles more easy passage while still requiring passenger vehicles to ride over the hump. Cyclists are not typically bothered by speed humps or cushions and this is evident by the existing installation of speed humps on the corridor. With cyclists "taking the lane" by driving single file in the middle of the lane they will have the option of driving over the speed hump or using the gap in the cushion without adversely affecting other traffic.

Speed reader boards can also be effective in reducing speeds and alerting drivers they are going too fast for conditions. However, their effectiveness is more when first installed and gradually reduces over time, suggesting that movable devices be installed and their location be changed from time to time.

Recommendations

It is recommended that the City develop a long-term plan to widen River Road to a 50 kilometer per hour design speed and to provide for shoulders, and separate recreational users from general traffic (cyclists, pedestrians, equestrians).

In the interim, it is recommended that the City implement measures to reduce operating speeds and mitigate the occurrence of the four key collision types. Proposed measures include the installation of a series of speed cushions to minimize excessive speeds and keep motorists within an appropriate speed to share the road single file with cyclists (40 km/h or less). Speeds should be reduced further at the No. 6 Road and the Westminster Highway 90-degree curves.

The speed cushions should be accompanied with appropriate speed hump warning signs, regulatory 30 kilometer per hour signs for all (including trucks), 20 kilometer per hour advisory speeds should be posted on 90 degree curve ahead signs at the two 90 degree curves. Speed reader boards should be installed, and should be movable so that different areas along the corridor can be benefited. Additional measures listed below should also be implemented as part of the short term and/or interim approach.

ICBC is a project partner, and funding from ICBC is likely available for many of the recommended measures.

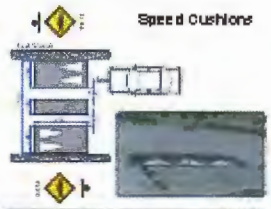
TABLE ES-1: Summary of Proposed Countermeasures

Proposed Countermeasure	Justification and Benefit	Time Frame	Estimated Cost
Sign and Pavement Marking Updates (including conversion to single broken yellow centreline, addition of sharrow stencils, and signage improvements). High end estimate assumed conversion of up to 7000m of double yellow to single broken markings, sharrows spaced at 75m for the entire corridor, and up to 40 new signs.	To clarify shared use motorist-cyclist nature of the road and to create clear and consistent messaging along the corridor. Narrow (shared) road and high motorists speeds create speed differential and safety risk. **Target:** Reduce cyclist collisions.	Short Term	$67,000 to $180,000
Speed Reader Boards (assuming four boards). Recommend that the boards be movable, to reduce driver complacency and allow for flexibility in application at areas of concern.	Speed reader boards provide direct feedback to drivers vis-à-vis posted speed limit and road conditions and can reduce speeds. Observed speeds are currently faster than are safe for road conditions. **Target:** Reduce speed-related collisions.	Short Term	$50,000 to $60,000
Curve Treatments, including chevron warning signs (possible LED enhancements). These would be installed at the 90 degree curves.	Provide enhanced warning and guidance through sharp curves where collision frequency is higher. Sharp curves may be unexpected after long, relatively straight and unimpeded approach. **Target:** Reduce off-road collisions.	Short Term	$15,000 to $50,000
Pavement Treatments – to increase friction (assumed 800 lane-metres of application; assumed 200m length per lane at each curve)	Provide increased driver control through sharp curves where collision frequency is higher. Sharp curves may be unexpected after a long, relatively straight and unimpeded approach. **Target:** Reduce off-road collisions.	Short Term	$425,000 to $500,000

Proposed Countermeasure	Justification and Benefit	Time Frame	Estimated Cost
Education (for both drivers and cyclists, regarding shared roads and single file operations. Could include informational material or presentations to cycling groups.)	May increase driver understanding and behaviour toward cyclists, and cyclists understanding towards driver behaviour, regarding desirable single file and passing behaviour. **Target:** Reduce cyclist collisions	Short Term	Not estimated
Increase Maintenance (more frequent debris clearing / street sweeping, and/or re-striping of pavement markings).	Reduce potential for collisions involving debris, or off-road collisions in areas where markings may be faded or obscured. Debris was a noted factor in some single vehicle collisions. **Target:** Reduce debris-related and off-road collisions.	Short Term	Not estimated
Traffic Calming – Speed Cushions Reduce posted speed limit to 30 km/h for all vehicles with traffic calming comprising 43 speed cushions: • 13 sets of 3 speed cushions spaced at 100 m between the curves with a minimum of 400 m between each set • 1 set of 3 speed cushions on No. 6 Road approaching River Road, and • 1 speed cushion on River Road approaching Westminster Highway. If the above speed cushions do not achieve 40 km/h operating speeds, then 11 additional sets of 3 speed cushions (33) can be installed between the gaps for a combined total of 76 speed cushions.	This design will minimize excessive speeds and keep motorists within an appropriate speed to share the road with cyclists. Speed cushions have lesser response time impacts to emergency vehicles than speed humps. Narrow (shared) road and high motorists speeds create speed differential and safety risk for cyclists. Observed motorist speeds are currently faster than are safe for road conditions. **Target:** Reduce cyclist collisions, reduce off-road collisions, and reduce sideswipe collisions.	Interim	$325,000 to $350,000 for initial installation of 43 speed cushions. $250,000 to $275,000 for Phase 2 installation of 33 speed cushions (if required).

Proposed Countermeasure	Justification and Benefit	Time Frame	Estimated Cost
Re-Build Dyke and Road	Design would match the secondary arterial roadway classification, and accommodate all road users. **Target:** Reduce all collisions.	Long Term	Not estimated
Enforcement	Enforcing vehicle speeds and other rules of the road (e.g. passing behaviour) can improve safety. The benefits, however, lessen over time unless enforcement is frequent or continual (which may be prohibitive). **Target:** Reduce all collisions.	Short and Long Term	Not estimated

River Road Traffic Operations Safety Review - City of Richmond
Proposed Countermeasures



WATT Consulting Group

City of Richmond

Memorandum

Richmond RCMP Detachment

To:	Mayor and Councillors	**Date:**	February 8, 2018
From:	Edward Warzel Manager, RCMP Administration	**File:**	09-5375-00/2018-Vol 01
Re:	**Richmond RCMP Traffic Enforcement Initiatives for River Road between No. 6 Road and Westminster Highway**		

Introduction

This memorandum provides information in response to delegations at the January 29, 2018 Council meeting regarding a desire for increased enforcement.

Background

- At the December 11, 2017 Council meeting, a delegation at Council expressed concerns regarding Council approval on September 25, 2017 about the installation of 20 additional speed humps along River Road between No. 7 and Westminster Highway. A referral was carried requesting staff review the potential solutions to traffic calming measures along River Road prior to the installation of speed humps.

- At the January 29, 2018 Council meeting, three delegations at Council expressed concerns regarding the planned speed humps as well as the behaviour of cyclists in the same section of River Road.

- Comments from the delegations from the January 29, 2018 Council meeting indicated a desire for increased RCMP enforcement in this area.

Updates

The OIC Richmond Detachment has conducted a review of the issues and as such will be strategically deploying resources to tactically address concerns brought forth by the community which are:

- Richmond RCMP Road Safety Unit will take the lead and commit to having increased presence and regular speed enforcement along River Road.

- As this problem is not a solely resident generated issue but rather a multi-jurisdictional one, the Lower Mainland District Integrated Road Safety Unit will also be deployed to conduct speed enforcement along River Road. Both units will provide statistical evidence including number of service hours delivered, outputs, initiatives, and public feedback.

- Richmond RCMP volunteers will implement the Speed Watch program to raise driver awareness of local speed limits and encourage speed reductions. This will include recording license plate numbers of speed offenders and following up with reminder letters.

- As an educational component the Richmond RCMP Road Safety Unit, Bike Unit and Media Relations Unit, in collaboration with ICBC will meet with local Bike Clubs to raise awareness of the importance of Road Safety along River Road. Cyclists will be encouraged through education to obey the law and to be respectful to drivers, pedestrians and residents.

- Richmond RCMP Media Relations Unit will increase publication of articles on safety along River Road for drivers, pedestrians and cyclists. There will be additional announcements of enforcement and safety campaigns in this area.

- There will be continued collaboration between the RCMP and the Richmond Transportation department to enhance design and safety measures along the identified area of River Road.

Please contact the writer at ewarzel@richmond.ca or (604) 207-4767 if you require further information.

Edward Warzel
Manager, RCMP Administration

EBW: ebw

P.c. SMT
Victor Wei, Director, Transportation