



Parks, Recreation and Cultural Services Committee

**Anderson Room, City Hall
6911 No. 3 Road**

**Tuesday, November 26, 2019
4:00 p.m.**

Pg. # ITEM

MINUTES

PRCS-4 *Motion to adopt the **minutes** of the meeting of the Parks, Recreation and Cultural Services Committee held on October 29, 2019.*



NEXT COMMITTEE MEETING DATE

December 18, 2019, (tentative date) at 4:00 p.m. in the Anderson Room

DELEGATION

PRCS-24 1. Jim McGrath, to present the **petition** requesting improved hours of access at Steveston Pool.

COMMUNITY SERVICES DIVISION

2. **STEVESTON HARBOUR AUTHORITY ARCHWAY SIGN - REQUEST FOR FUNDING**
(File Ref. No. 11-7000-01) (REDMS No. 6336689)

PRCS-41

See Page **PRCS-41** for full report

Designated Speaker: Marie Fenwick

STAFF RECOMMENDATION

That funding of \$50,000 from the Council Community Initiative Account to the Steveston Harbour Authority to support the Steveston Harbour Authority Archway Sign, and that the expenditure be included in the Consolidated 5 Year Financial Plan (2020-2024), as outlined in the staff report “Steveston Harbour Authority Archway Sign – Request for Funding” dated November 1, 2019 from the Director, Arts, Culture and Heritage Services.



3. **THE PUBLIC TREE MANAGEMENT STRATEGY 2045: A PLAN FOR MANAGING RICHMOND’S PUBLIC URBAN FOREST**
(File Ref. No. 10-6550-07) (REDMS No. 6266663)

PRCS-48

See Page **PRCS-48** for full report

Designated Speakers: Jamie Esko and Alex Kurnicki

STAFF RECOMMENDATION

- (1) *That the Public Tree Management Strategy 2045, as detailed in the staff report titled “The Public Tree Management Strategy 2045: A Plan for Managing Richmond’s Public Urban Forest,” dated October 31, 2019 from the Director, Parks Services, be endorsed; and*
- (2) *That the Council Policy for the Public Urban Forest, as detailed in the staff report titled “The Public Tree Management Strategy 2045: A Plan for Managing Richmond’s Public Urban Forest,” dated October 31, 2019 from the Director, Parks Services, be endorsed.*



Pg. # ITEM

4. **GARDEN CITY LANDS UPDATE AND SITE ACTIVATION PLAN**

(File Ref. No. 06-2345-20-GCIT1) (REDMS No. 6329663)

PRCS-126

See Page PRCS-126 for full report

Designated Speakers: Jamie Esko and Alex Kurnicki

STAFF RECOMMENDATION

That the staff report titled “Garden City Lands Update and Site Activation Plan,” dated October 31, 2019, from the Director, Parks Services, be received for information.

☐

5. **MANAGER’S REPORT**

ADJOURNMENT

☐



Parks, Recreation and Cultural Services Committee

Date: Tuesday, October 29, 2019

Place: Anderson Room
Richmond City Hall

Present: Councillor Harold Steves, Chair
Councillor Chak Au
Councillor Bill McNulty
Councillor Linda McPhail
Councillor Michael Wolfe

Also Present: Councillor Carol Day

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 Parks, Recreation and Cultural Services Committee held on September 24, 2019, be adopted as circulated.

CARRIED

NEXT COMMITTEE MEETING DATE

November 26, 2019, (tentative date) at 4:00 p.m. in the Anderson Room

Parks, Recreation & Cultural Services Committee
Tuesday, October 29, 2019

DELEGATIONS

1. With the aid of a PowerPoint presentation (copy on-file, City Clerk's Office) Lyda Salatian, Founder and Executive Director, Green Teams of Canada, presented a proposal for a fee-for-service partnership between the City of Richmond and Green Teams of Canada, noting that (i) Green Teams organize environmentally related events such as park clean up and invasive species removal in various communities in the Lower Mainland, (ii) a summary report of each event is typically provided, (iii) the proposed partnership would be for a two-year term and cost approximately \$20,000, (iv) other communities in the Lower Mainland have partnered with Green Teams, and (v) Federal funding grants for Green Teams could only be secured during the group's initial phases.

Discussion ensued with regard to (i) participation by Richmond residents, (ii) the Green Team's organizational and funding structure, (iii) identifying potential projects in Richmond, and (iv) collaborating with existing community environmental programs.

As a result of the discussion, the following **referral motion** was introduced:

It was moved and seconded

- (1) *That the partnership proposal from the Green Teams of Canada be referred to staff; and*
 - (2) *That staff examine potential environmental-related projects in Richmond;*
- and report back.*

CARRIED

AGENDA ADDITIONS

The Chair advised that The Dugout Club will be considered as Item No. 2A, Richmond 140th Anniversary Gala and Awards Ceremony as Item No. 2B, Update of Tree Protection Bylaw No. 8057 as Item No. 2C, Steveston Harbour Authority Archway Along Sixth Avenue as Item No. 2D, "Parks Afloat" Moorage at Imperial Landing as Item No. 2E, and "Parks Afloat" Garry Point Legacy Pier, Moorage at Garry Point Park as Item No. 2F.

COMMUNITY SERVICES DIVISION

2. **STEVESTON HERITAGE SITES UPDATE**

(File Ref. No. 11-7000-01) (REDMS No. 6319822 v. 3)

Discussion ensued with regard to (i) incorporating representatives from Richmond heritage organizations in the Richmond Museum Society Board, (ii) strengthening existing heritage sites, (iii) incorporating native plants in the historical sites, and (iv) the financial impact of development and preserving heritage sites.

In reply to queries from Committee, staff noted that there will be collaboration opportunities with community groups such as the Steveston Historical Society and the Richmond Museum Society on future development of heritage sites, and there is program capacity in the sites to accommodate an increase in interest from school groups.

Cllr. Day left the meeting (4:37 p.m.) and returned (4:39 p.m.).

It was moved and seconded

That staff develop a Steveston Heritage Sites Interpretive Plan to guide the future conservation, interpretation, exhibit and program development of City-owned heritage sites in Steveston, as described in the staff report titled "Steveston Heritage Sites Update," dated October 4, 2019, from the Director, Arts, Culture and Heritage Services.

The question on the motion was not called as discussion ensued with regard to improving signage of the heritage sites and it was suggested that heritage signage be standardized throughout the city.

As a result of discussion staff were directed to examine changing the terminology of "Steveston Heritage sites" to "Steveston Heritage belt."

The question on the motion was then called and it was **CARRIED**.

The Chair referenced a referral motion introduced at the May 7, 2018 General Purposes Committee to examine the possibility of creating a new museum group with representatives from all individual heritage sites and suggested that another referral on the matter be introduced.

As a result of the discussion, the following **referral motion** was introduced:

It was moved and seconded

That staff look at possibility of restoring the original Richmond Museum Board to include representatives of other heritage sites.

The question on the motion was not called as staff noted that the various Richmond Heritage groups have advised their preference to participate the Richmond Museum Board's Annual General Meeting.

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The question on the referral motion was then called and it was **CARRIED**.

2A. THE DUGOUT CLUB

(File Ref. No.)

A letter from the Dugout Club, dated October 28, 2019, requesting the City's support for the Dugout Club's proposed grant application to the Vancouver Canadians Baseball Foundation was distributed (attached to and forming part of these minutes as Schedule 1). It was noted that should the application proceed, the grant would provide \$50,000 and would help fund baseball playing field improvements in the East Richmond community.

Discussion ensued with regard to potential materials such as artificial turf that can be used for the playing field improvements and the timeline for the application submission.

As a result of the discussion, the following **referral motion** was introduced:

It was moved and seconded

That the request for City support from the Dugout Club be referred to staff and that staff work with the Dugout Club on the documentation required, including a letter of support, for their grant application to the Vancouver Canadians Baseball Foundation.

The question on the referral motion was not called as discussion ensued with regard to safety concerns related to artificial turf.

In reply to queries from Committee, Serj Sangara, Director, The Dugout Club, noted that there are concerns with field maintenance and natural field conditions during inclement weather. He added that alternatives to artificial turf can be examined or the funds could be used for more general improvements.

The question on the referral motion was then called and it was **CARRIED**.

2B. RICHMOND 140TH ANNIVERSARY GALA AND AWARDS CEREMONY

(File Ref. No.)

Information on the proposal from the North American Artists Association to organize a Richmond 140th Anniversary Gala and Awards Ceremony was distributed (attached to and forming part of these minutes as Schedule 2).

It was noted that the proposed event, scheduled for December 15, 2019 at the River Rock Casino would celebrate Richmond's 140th anniversary and would recognize individuals who have made contributions to the city.

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Representatives from the North American Artists Association, spoke on the event, noting that (i) the organizing group is seeking input from the City on aspects of the city's history and assistance to promote the event, (ii) the event is funded privately, and (iii) performances would include singing and dancing and would showcase all of Richmond's cultures.

As a result of the discussion, the following **referral motion** was introduced:

It was moved and seconded

That proposal from the North American Artists Association to organize a Richmond 140th Anniversary Gala and Awards Ceremony be referred to staff to consider the City providing expertise in the planning of the proposed event program.

The question on the motion was not called as discussion ensued with regard to (i) incorporating cultural groups and the First Nation in the event, (ii) the limited timeline to organize the event and (iii) the proposed award nomination process.

The question on the referral motion was then called and it was **CARRIED**.

2C. UPDATE OF TREE PROTECTION BYLAW NO. 8057

(File Ref. No.)

Information related to the proposed resolution on the updating the *Tree Protection Bylaw No. 8057* was distributed (attached to and forming part of these minutes as Schedule 3).

Discussion ensued with regard to updating the *Tree Protection Bylaw No. 8057* to focus on tree retention and maintaining the city's tree canopy

As a result of the discussion, the following **resolution** was introduced:

It was moved and seconded

WHEREAS, Richmond has policies to protect trees, yet the trend is that our tree canopy is declining rapidly on residential, industrial, commercial, and agricultural lands, in addition to losses in the remaining natural spaces known as Environmentally Sensitive Areas (ESAs);

WHEREAS, the priority has been on tree replacement, not tree retention, as the new trees are often limited in their root expansion potential due to hard packed fill. The infraction rates are also too low to deter landscaping techniques that cause tree mortality. There are exemptions that result in tree injury and a lack of habitat enhancement regulations, such as preserving low vegetation species and carbon-sequestering covers that offer high permeability;

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THEREFORE, BE IT RESOLVED that the City Council of the City of Richmond hereby supports the advice from the Advisory Committee on the Environment, to update the Tree Protection Bylaw No. 8057, for evaluation and public consultation to modernize it and bring it into line with community expectations and the better practices to retain and grow our urban forest.

The question on the resolution was not called as discussion ensued with regard to referral of the resolution to the Parks, Recreation and Cultural Services Committee and Planning Committee or the General Purposes Committee.

In reply to queries from Committee, staff noted that a report on the Public Tree Management Strategy is forthcoming in November 2019.

As a result of the discussion, the following **referral motion** was introduced:

It was moved and seconded

That the aspects of the following resolution related to Parks, Recreation and Cultural Services

WHEREAS, Richmond has policies to protect trees, yet the trend is that our tree canopy is declining rapidly on residential, industrial, commercial, and agricultural lands, in addition to losses in the remaining natural spaces known as Environmentally Sensitive Areas (ESAs);

WHEREAS, the priority has been on tree replacement, not tree retention, as the new trees are often limited in their root expansion potential due to hard packed fill. The infraction rates are also too low to deter landscaping techniques that cause tree mortality. There are exemptions that result in tree injury and a lack of habitat enhancement regulations, such as preserving low vegetation species and carbon-sequestering covers that offer high permeability;

THEREFORE, BE IT RESOLVED that the City Council of the City of Richmond hereby supports the advice from the Advisory Committee on the Environment, to update the Tree Protection Bylaw No. 8057, for evaluation and public consultation to modernize it and bring it into line with community expectations and the better practices to retain and grow our urban forest.

be referred to Parks, Recreation and Cultural Services staff for consideration.

CARRIED

Parks, Recreation & Cultural Services Committee
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2D. STEVESTON HARBOUR AUTHORITY ARCHWAY ALONG SIXTH AVENUE

(File Ref. No.)

A letter from the Steveston Harbour Authority regarding a funding request for \$50,000 towards a proposed archway along Sixth Avenue, dated October 28, 2019 was distributed (attached to and forming part of these minutes as Schedule 4).

The Chair spoke to the funding request from the Steveston Harbour Authority (SHA) and referenced a referral previously introduced at the September 25, 2018 Parks, Recreation and Cultural Services Committee meeting related to staff consideration of a new archway on City property at Sixth Avenue, including options to showcase the heritage value of the proposed archway location. He suggested that staff consider the funding request from SHA in conjunction with the previous referral on the matter.

Discussion ensued with regard to potential funding opportunities for the proposed archway.

As a result of the discussion, the following **referral motion** was introduced:

It was moved and seconded

That the letter from the Steveston Harbour Authority, dated October 28, 2019, on the proposed Archway along Sixth Avenue, be referred to staff to consider potential funding opportunities, and report back.

CARRIED

2E. “PARKS AFLOAT” MOORAGE AT IMPERIAL LANDING

(File Ref. No.)

The Chair distributed information related to a potential moorage at Imperial Landing (attached and forming part of these minutes as Schedule 5) and referenced a report to the February 27, 2018 Parks, Recreation and Cultural Services Committee meeting on the matter.

Discussion ensued with regard to previous referrals to staff to examine dredging the area between the Imperial Landing float and the shore to accommodate small water craft and moorage options for boats.

As a result the following **referral motion** was introduced:

It was moved and seconded

(1) That staff investigate the actual depth between the east wing of the Imperial landing float and the dyke to determine if it is deep enough for small boats;

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- (2) *That staff determine how deep the area can be dredged without requiring sheet piling;*
- (3) *That staff investigate the possibility of using used floats and estimate the costs for constructing floats for small craft;*
- (4) *That staff prepare an accurate estimate for the cost of sheet piling if required; and*
- (5) *That staff consider the optimal model for mooring boats on a City waterfront.*

CARRIED

2F. **“PARKS AFLOAT” GARRY POINT LEGACY PIER, MOORAGE AT GARRY POINT PARK**

(File Ref. No.)

The Chair distributed information related to a Garry Point Legacy Pier, Moorage At Garry Point Park (attached and forming part of these minutes as Schedule 6) and referenced a referral on matter made to staff in 2014.

Discussion ensued with regard to (i) options to develop a permanent float on the City owned water-lot in Garry Point, (ii) potential uses of the float, and (iii) cost estimates of float development.

As a result of the discussion, the following **referral motion** was introduced:

It was moved and seconded

- (1) *That staff prepare a revised plan for the Garry Point Legacy Pier containing it entirely on City owned land and water-lot; and*
- (2) *That staff prepare cost estimates for a float containing both two and three sections of the four section float originally proposed.*

The question on the motion was not called as discussion ensued with regard to cost mitigation and recovery options.

In reply to queries from Committee, staff noted that a previous report on options for a permanent float was presented to Council but was not recommended by staff due to estimated project costs. It was suggested that the feasibility of the project could be improved through design adjustments to the proposal that could reduce costs.

The question on the referral motion was then called and it was **CARRIED**.

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3. **MANAGER'S REPORT**

(i) Manager of Museum and Heritage Services

Rebecca Clarke was introduced as the new Manager, Museum and Heritage Services.

(ii) Halloween Events

Staff noted that various Halloween events will be taking place at the City's recreation facilities and that public community firework displays are scheduled for Halloween night. Staff added that City staff, including Richmond Fire-Rescue, Bylaws staff, alongside the Richmond RCMP will be active to ensure a safe Halloween night for residents. It was further noted that residents can call the Richmond RCMP's non-emergency line to report illegal fireworks.

(iii) New Recreation Program and Facility Booking Registration System

Staff noted that the new Recreation Program Registration System will be operational on November 6, 2019. Staff added that in the two days leading to the system's launch, the current system will be unavailable. It was noted that participants will still be able to attend programs during the shutdown, however will not be able to register in new programs and that additional staff will be available to assist registrants on launch day.

(iv) Garden City Lands

Staff noted that a report on the Garden City Lands is forthcoming in November 2019.

Cllr. Day left the meeting (5:45 p.m.).

ADJOURNMENT

It was moved and seconded

That the meeting adjourn (5:46 p.m.).

CARRIED

Parks, Recreation & Cultural Services Committee
Tuesday, October 29, 2019

Certified a true and correct copy of the Minutes of the meeting of the Parks, Recreation and Cultural Services Committee of the Council of the City of Richmond held on Tuesday, October 29, 2019.

Councillor Harold Steves
Chair

Evangel Biason
Legislative Services Coordinator

OCT. 28th / 2019

PARKS AND REC COMMITTEE

CC: Richmond Sports Council

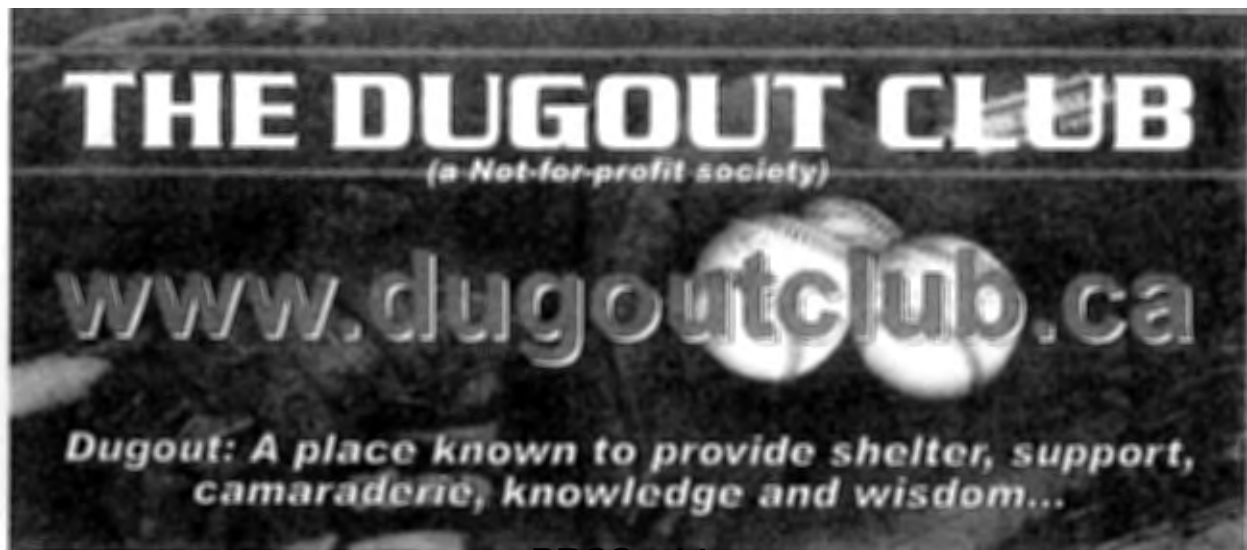
The Dugout Club - a Rmd based Non-For-Profit Registered Society - is contemplating making application for a \$50,000 grant being provided by the **Vancouver Canadians Baseball Foundation** in order to help bring one of our community projects to fruition.

That being to bring an actual BASEBALL diamond to the East Richmond Community that we believe will not only enhance the opportunity for small children to begin to play the game right there in their own neighbourhood, but if done right by **installing an AT infield as being done in many other municipalities**, will provide an opportunity to multiple users from all over Richmond to be benefitted by this addition. Those being baseball associations of all brands, Slo-Pitch, Softball users and perhaps if needed at the time, even for the 2020 Senior Games as "Slo-Pitch" is tentatively scheduled for that location.

While the need for such a facility is already on the recently discussed "**Richmond Sports Council's Facility Needs Assessment**", the actual application requires a semblance of support from the City if not the actual permits, pricing, etc. Our hope is to relay at least that much in our application along with a "ballpark figure" if at all possible.

Thank you in advance for the opportunity to speak on this matter on behalf of not only TDC, but for those in the community that would benefit from this addition to our playing fields.

Serj Sangara
TDC DIRECTOR



Richmond 140th Anniversary Gala and Awards Ceremony

The North American Artist Association is hosting an event for the celebration of the 140th Anniversary of Richmond on December 15, 2019 at River Rock Theatre.

Established in September 2016, one of the objectives of the Association is to provide a platform for cultural exchanges among the artists from difference streams of arts and backgrounds. In the past years, the Association has successfully organized the following activities:

1. August 6, 2017, the "Celebration of the 150th Anniversary of Canada."
2. January 13, 2018, the "First Spring Festival Evening in Burnaby."
3. August 18, 2018, a 10-day "First Canadian Chinese Painting and Calligraphy Art Exhibition" and an auction event in Richmond.
4. January 12, 2019, the "Second Spring Festival Evening in Burnaby."
5. September 15th to 24th, 2019, the 2nd Canadian International Painting and Calligraphy Art Exhibition at the Vancouver Chinese Cultural Center.

In the spirit of celebrating Richmond's cultural diversity and paying tribute to the many organizations and individuals who have made great contributions to the growth of the city, the event on December 15 will have two components. There will be a multicultural performance on the history of the city as how it has developed from a fishing and farming community into a modern city and the contributions made by different ethnic groups such as the First Nations, Europeans, Japanese, Chinese, Indo-Canadians and other immigrants. Secondly, awards will be given to groups and individuals for their contributions to the development of the city. There will be an open nomination process and award recipients are recommended by an independent panel according to the set criteria for different categories.

The Alliance has been in contact with different Richmond ethnic groups, staff of Richmond's Cultural Services and met with Mayor Brodie and Councillor Au for their inputs and support. The Alliance welcomes any assistance from the City in organizing and promoting this meaningful event.

The North American Artists Association
Contact Person Brian Zhang 604-339-6088

October 29th 2019

Councillor Wolfe

Resolution for Richmond City Council's Parks, Recreation and Culture Committee

RE: Update of the Tree Protection Bylaw

WHEREAS, Richmond has policies to protect trees, yet the trend is that our tree canopy is declining rapidly on residential, industrial, commercial, and agricultural lands, in addition to losses in the remaining natural spaces known as Environmentally Sensitive Areas (ESAs).

WHEREAS, the priority has been on tree replacement, not tree retention, as the new trees are often limited in their root expansion potential due to hard packed fill. The infraction rates are also too low to deter landscaping techniques that cause tree mortality. There are exemptions that result in tree injury and a lack of habitat enhancement regulations, such as preserving low vegetation species and carbon-sequestering covers that offer high permeability.

THEREFORE, BE IT RESOLVED that the City Council of the City of Richmond hereby supports the advise from the Advisory Committee on the Environment, to update the Tree Protection Bylaw No.8057, for evaluation and public consultation to modernize it and bring it into line with community expectations and the better practices to retain and grow our urban forest.

Supplementary Memo:

To: Barry Konkin, Manager of Policy Planning

Date: October 30, 2018

From: Tadd Berger, Richmond Advisory Committee on the Environment

Subject: Richmond Tree Protection Bylaw No. 8057 – recommendations for updating

1. Establish a tree working group to make recommendations regarding updating the Tree Protection Bylaw. This group could include a council member, city staff and members of the Advisory Committee on the Environment and others.

This working group's terms of reference can include:

- a. Switching the priority to tree retention instead of tree replacement in the existing tree bylaw to respect the character of existing neighbourhoods.
- b. Amending the Zoning Bylaw so that houses don't cover such a large percentage of a property and instead retain space for trees.
- c. Stop watering down the existing tree bylaw with interpretations that favour cutting trees. Until the bylaw is updated, uniformly apply the rules we have.
- d. Increasing fees for tree cutting permits.
- e. Dealing with property owners who violate the tree bylaw, for example, removing trees prior to construction which can include increasing penalties for violations up to and including revocation of a building permit.
- f. Increasing funding for urban forest planning and maintenance and overseeing the development of an urban forest strategy that includes planting more trees on public land.
- g. Liaising with staff who are completing a tree canopy inventory.
- h. Recommending ways to optimize www.richmond.ca, for example, creating a trees area to include data on the tree canopy, data on cutting permits, information on caring for trees and related.
- i. Making recommendations on developing an education campaign focused on the benefits of retaining trees compared to replacing trees.
- j. Making recommendations on whether the City should sell propagated trees to residents at reduced prices (similar to the City of Vancouver).
- k. Making recommendations to create one department to manage trees. Currently trees on city land are administered by the Parks department, trees on private land are managed by Tree Enforcement. Set backs and other by-laws affecting trees on private land are dealt with by the Planning and building Departments.

Contact: Tadd Berger, ACE chair. tberger@pinchin.com



Schedule 4 to the Minutes of the
Parks, Recreation & Cultural
Services Committee meeting of
Richmond City Council held on
Tuesday, October 29, 2019.

October 28, 2019

STEVESTON HARBOUR AUTHORITY

12740 Trites Road, Richmond, B.C. V7E 3R8 604-272-5539 Fax 604-271-6142

Harold Steves, Chair
Parks, Recreation and Cultural Services Committee
City of Richmond
Via Email: hsteves@richmond.ca

Dear Councillor Steves,

RE: SHA ARCHWAY- 6TH AVENUE – REQUEST FOR \$50,000 FROM CITY OF RICHMOND

As discussed at our presentation to the Parks, Recreation & Cultural Services Committee in late 2018, I am happy to advise that Steveston Harbour Authority (SHA) has finally received a quotation for \$150,000 for the design, construction and installation of the archway at the entrance to the Gulf Site at Sixth Avenue and Chatham Street. As discussed with your Committee, the City of Richmond, and the Council of the Musqueam Indian Band, the cost of the archway will be split three ways on an equal-share basis. We also expect that the Department of Fisheries and Oceans will be providing in-kind support, in the form of pile driving and other logistical support.

I have attached a copy of the design which outlines the dimensions for your information. Please note that this design has been revised numerous times as a result of extensive comments from BC Hydro over the past several months. Further, please be reminded that the overall style of the archway is similar to the archway that was erected at our fish sales float in July 2017.

We expect that fabrication of the archway will commence in early December. We are extremely excited about the archway as it will achieve the following objectives:

- promote the fishing industry;
- "stamp" the site for fishing-related development, as required by Steveston Harbour Authority's mandate;
- produce a collaborative, positive project that reflects the interlocking relationships between governments industry, the public and First Nations in Steveston; and act as a catalyst for the additional fishing-based capital projects on the Gulf Site.

Please make arrangements to have the City of Richmond contribute \$50,000 to the cost of building the archway, representing 33.3% of the maximum cost for the project. We request that these funds be provided directly to the SHA in order that we can disperse the funds to the engineers and other contractors.

Please contact Jaime Gusto, General Manager of the SHA, in the event that you require any further information or documentation in order to process our request.

Yours truly,



Robert Kiesman, Board Chairman
Steveston Harbour Authority

CC: SHA Board of Directors
Jaime Gusto, General Manager
Marie Fenwick, Director of Art, Culture & Heritage Services

Enclosures (2)

MEASUREMENTS AS PER
ENGINEERED DRAWINGS
See "S100.pdf" & "S101.pdf"

REVISED HEIGHT OF
BE HYDRO & TELUS UNITS
AS PER ENGINEERED DRAWINGS
AS PER STEVESTON HARBOUR AUTHORITY
SITE SURVEY
REVISED AUGUST 2, 2019

PLAN - CENTER TRUSS UPPER CHORD
SCALE: 1/8" = 1'-0"

PLAN - CENTER TRUSS UPPER CHORD
SCALE: 1/8" = 1'-0"

TELEPHONE POLE

CONSIDER THE LOCATION OF THE UNITS
AND THE HEIGHT OF THE UNITS

HYDRO & TELUS UNITS
SEE DETAIL

WATER DRAINAGE

CHANGED TRUSS
SEE DETAIL

REPAIR ALUMINUM PLATE
ON EACH SIDE OF CHANGED TRUSSES

TWO-BAY ROAD CONNECTION

3200 HIGH
PROPERTY FENCE

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To: Parks, Recreation and Cultural Services Committee

Date: October 29, 2019

From: Harold Steves, City Councillor

RE: "Parks Afloat" Moorage at Imperial Landing

Richmond is a group of islands surrounded by vast areas of water, much of it free of water traffic. This has led to the concept of utilizing surrounding waters as part of our park system. Approximately 25 years ago the concept was initiated at the Britannia Shipyard with a water-based programme with canoes and kayaks at the Britannia. It was discontinued when management changed.

On Feb.6, 2018 committee received a report in answer to a referral on Nov. 28, 2017. It was received for information. While there are a number of issues in the report a first step would be further investigation of moorage potential at Imperial Landing. The area between the Imperial Landing float and the dyke was once the deepest moorage in the harbour, primarily for seine boats

Referred that:

- 1) Staff investigate the actual depth between the east wing of the Imperial landing float and the dyke to determine if it is deep enough for small boats.
- 2) Staff determine how deep the area can be dredged without requiring sheet piling
- 3) Staff investigate the possibility of using used floats and estimate the costs for constructing floats for small craft
- 4) Staff prepare an accurate estimate for the cost of sheet piling if required.

TO: Parks, Recreation and Cultural Services Committee

Date: October 29, 2019-10-29

From: Harold Steves, City Councillor

RE: "Parks Afloat" Garry Point Legacy Pier, Moorage at Garry Point Park

In October 2015 Option 3 – "New Steel and Timber Float" was adopted as the desired option for a new permanent float at Garry Point Park. In 2016 committee was informed that the westerly end of the proposed float was on crown provincial water-lot and requires approval from the province for anything other than special event temporary use.

Subsequently staff was asked to modify the plans to install a permanent float on the City owned water-lot east of the crown water-lot. As only two, or three, sections of the four sections of the proposed float would have to be constructed it would reduce the cost by 25% to 50% (see attached diagram

The report never came back.

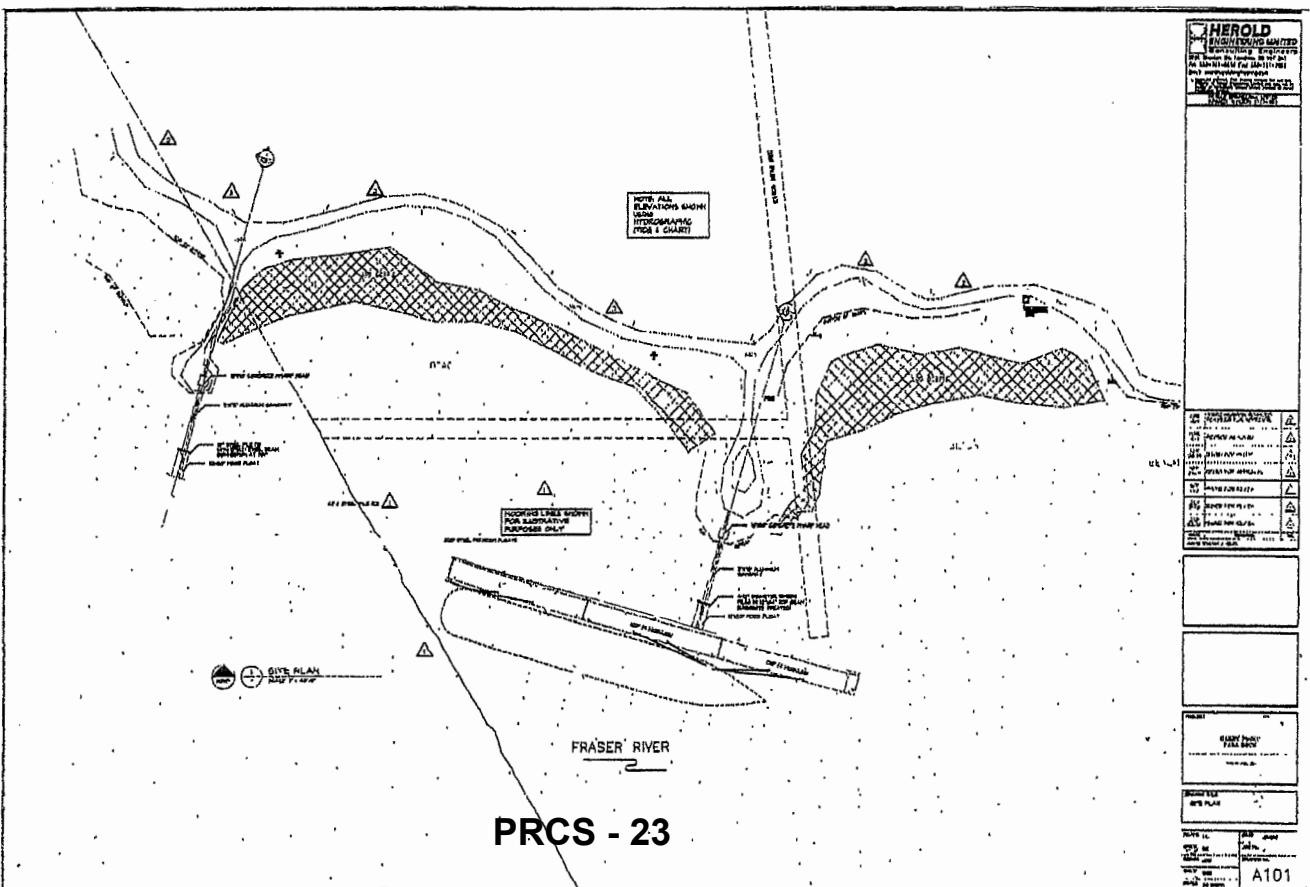
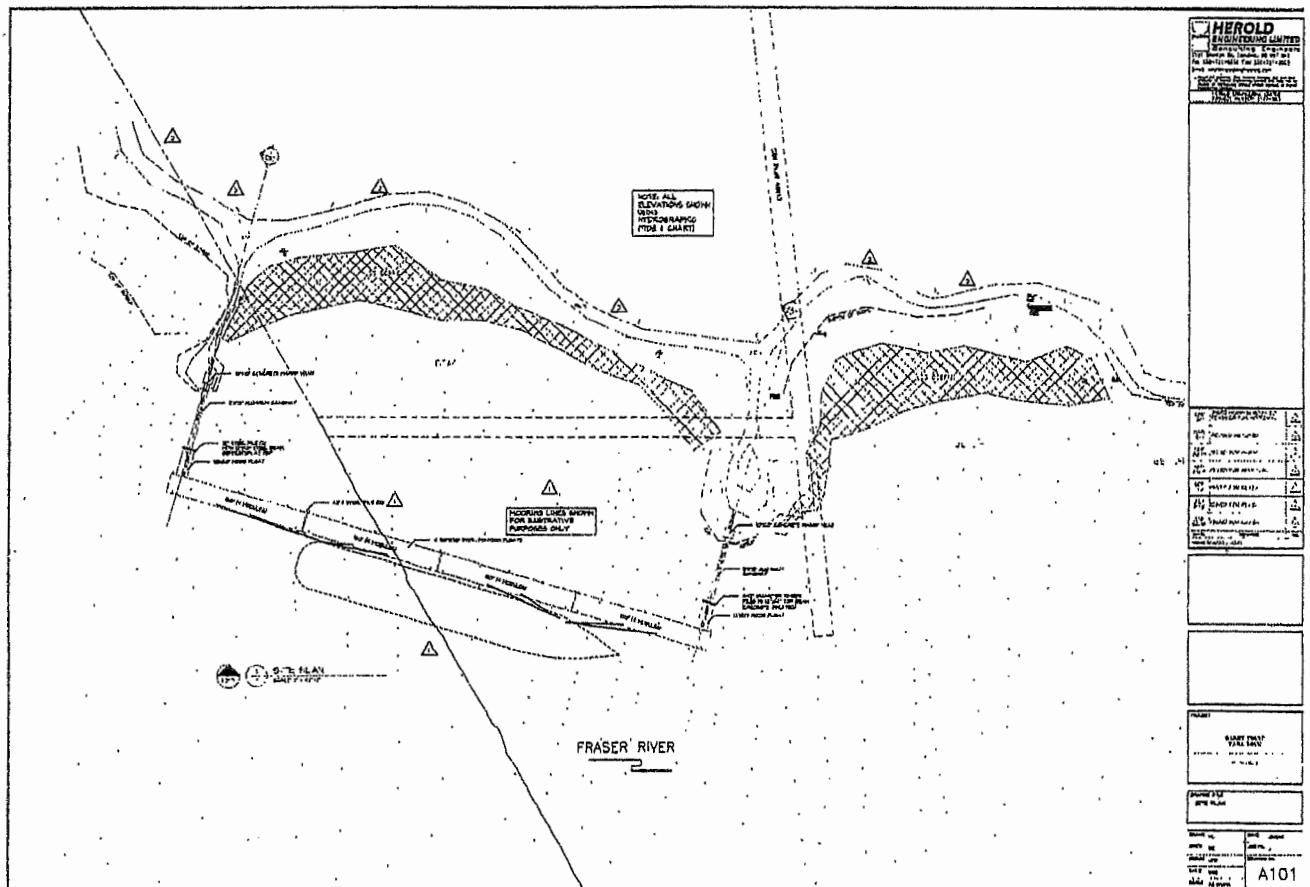
The Kaiwo Maru visited in 2017 using the Imperial Landing float which was towed out to Garry Point. It is time to invite a major tall Ship again and the Imperial Landing float will be needed where it is.

Referred that:

- (1) Staff prepare a revised plan for the Garry Point Legacy Pier containing it entirely on City owned land and water-lot.
- (2) Staff prepare cost estimates for a float containing both two and three sections of the four section float originally proposed.

October 6, 2015

Attachment 5 – Option 3 – New Steel and Timber Float



November 12, 2019

To: Mayor and Council
City of Richmond, BC
Attention: Clerk's Office, City of Richmond

Subject: Petition Requesting Improved Hours of Access at Steveston Pool

The Steveston Pool is referred to by many as 'Richmond's Best Kept Secret'. Many people who use or would like to use this pool believe that the days and hours that the pool is actually open are too restrictive and not the best utilization of such a valuable civic resource.

The people that we contacted who swim at the Steveston Pool are in favor of extending the days and hours that the pool is open. Currently, some Steveston Pool swimmers can only swim weekends, some can only swim during the week. Others will no longer swim once the Steveston Pool is closed for the season and some will go to Ladner to swim.

Specifically, we would ask that this pool:

1. Be open to the Public from the beginning of May until the end of September, 7 days a week beginning in 2020. This should continue beyond 2020;
2. Have Length Swimming Hours protected and continued for the duration of the Pool opening; and
3. The new hours of operation should be:
 - Weekends and Statutory Holidays: Length swim from 10am to noon.
Public swim from noon to 7pm.
 - Weekdays: Length swim from noon to 2pm. Public swim from 2pm to 7pm.

This Petition has been signed by 109 individuals who swim at Steveston Pool or otherwise support the request for longer hours and more days of pool availability. Petition signatures were collected throughout the month of September, 2019 when length swimming was limited to a 2 hour daily window Monday to Friday.

The following documents are attached in support of this request to the City of Richmond:

1. The Petition request; and
2. Petition signatures (on 15 pages).

We ask that the City of Richmond acknowledge receipt of this Petition and associated documents and advise what and when action will be taken to address the concerns and requests that are outlined in the Petition.

We are scheduled to present this petition and rationale to the November 26, 2019 Parks, Recreation and Cultural Services Committee meeting and would also be available to meet other City representatives, as required.

Please contact the following in regard to this Petition:

Jim McGrath

Email: ktjmb5@hotmail.com

Mobile: 604-374-3968

Thank you for acting on the concerns documented in this Petition.

The Steveston Pool Petition Action Team

September, 2019

Petition to the City of Richmond

Requesting Increased Hours of Operation at the Steveston Pool

Many people have informally asked The City of Richmond to increase the hours and days of operation for the Steveston Pool. This pool is referred to by many people as "Richmond's best kept secret".

Many swimmers want to have increased opportunities to use the Steveston pool.

Currently, some Steveston Pool swimmers can only swim weekends, some can only swim during the week. Some will no longer swim once the Steveston Pool closes for the season and some will go to Ladner to swim.

We would like to see the Steveston Pool used to its full potential.

We, the undersigned, use the Steveston Pool or otherwise support improved hours and days of operation for this pool. Specifically, we ask that:

1. The Steveston Pool be opened at the beginning of May, 2020 and remain open 7 days a week until September 30, 2020. This should continue beyond 2020.
2. Length Swimming should continue daily for the duration of the Pool opening.
3. The new hours of operation should be:
 - Weekends and Statutory Holidays: Length swim from 10am to noon.
Public swim from noon to 7pm.
 - Weekdays: Length swim from noon to 2pm. Public swim from 2pm to 7pm.

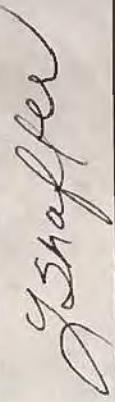







In summary, we ask that the City of Richmond **increase the hours and days of operation at the Steveston Pool.**

Please give serious consideration to the concerns of the Richmond City taxpayers and advocates for the Steveston Pool.

The full list of Petition signatures is attached.

Thank you.

Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
Louise Shaffer	4440 Cabot DR.	604 277-9274	
Eileen Donovan	25-11631 7th Ave Richmond	604- 277-7769	
Margaret Hobson	310-4280 Moncton Richmond V7E 6T4	604 274 4152	
BARBARA WONG	8800. SPIRES	604-8319972	
BETSY BAWDEL	122-12633 2RD RICHMOND	604-270- 2509	
PATRICK BOYLEND	119-5600 ADDRESS RD.	778-833 4257	
Margie Hardy	4231 Candlewood	778-231- 7313	
Diane Simonsen	12160 Ostry Drive Richmond BC	604 789 1474	

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Page 1 of 15

Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
GISELA HIRT	11671 TRUMPER DR RICHMOND BC	604- 271-6127	G. Hirt
CHRIS WELMOER	4771 Garry street Richmond, BC	604- 328-0059	Chris Welmoer
HAROLD SCHROPP	11671 TRUMPER DR	604 271 6127	[Signature]
Kim Evans	3020 Garry St Richmond	604 241 4472	[Signature]
Terry Tinkley	3320 Pleasant Rd Steady	604 340-4402	[Signature]
Paula Alvar	11360 Clipper Court, End	604- 275-9755	[Signature]
Sig Schreier	120-36th Avenue Rd	604 347-0804	[Signature]
Alex Kasso	10251 Honeybush DR	604-771 4043	[Signature]
[Signature]	9140 Macdonald V7H 4E2	778 279 99 75 F. Fowler	[Signature]



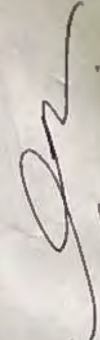

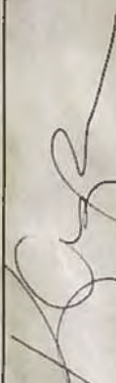
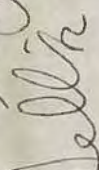
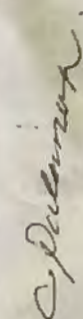
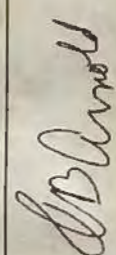

Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
JOANNE McFarland	3291 PLEASANT ST. RMD	604-271-9521	J McFarland
MIKE McFARLAND	3291 PLEASANT ST. RICHMOND, B.C.	604- 271-9521	Mike McFarland
Linda Johnston	pleasant st.	604 314-0578	L Johnston
David Johnston	3295 Pleasant St.	604 314-0578	D Johnston
Colin McCann	3286 PLEASANT ST	604 275 2955	C. McCann
Bileen Clevefart	3326 Pleasant St	604-277-0884	B Clevefart
Glenn Tinkley	3320 Pleasant	778-870-1443	G Tinkley
C-Tinkley	3320 PLEASANT	604-218-9411	C Tinkley

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Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
JANE GUN	8331 Rowland Cr. Richmond	778-321322	
JOSÉE CORMIER	10517 NO. 1 RD RICHMOND	604-868-6353	
Willy Chau	8271 Osgood Ave	604-260-9868	
Susan + Glen Nichol	9260 Maskall Dr. Richmond	604-277-4345	
Ken Asperden	11711 YOSHIDA RICH - CT	604 764-5335	
Jonathan Ellis	10135 Lawton Drive	778-237-7480	
CATHARINE PANTAS	11020 N. WILLIAMS RD	778-233-9050	
David Arnold	10188 Lawson Dr.	604-874-7167	
MARIE ARNOLD	10188 LAWSON DR.	604 274-7767	

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Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
MARGARET BROWN	#202-1140 GLANVILLE	604-308-0286	Margaret J. Brown
James Filigorela	6233 LONDON RD.	884 2775281	James Filigorela
Kathy McClement	32-9088 Jones Rd	778 882-3206	Kathy McClement
Doreen Stath	3051 Garry St Richmond	609 2722364	Doreen Stath
Ashley Newcomb	11746 Yoshida Court Richmond	604271142 49	Ashley Newcomb
Jim Thibbitt	410-4280 Newtons St	604- 274-4771	Jim Thibbitt
David Currie	5860 Kilmakade Richmond Bx	607 2956335	David Currie
DENYNE BUTLER	12294 IMPERIAL DRIVE, RICHMOND, B.C.	604-271-7217	Denys Butler
Michelle Becker	446-5600 Andrews Rd Richmond, BC V7E 6N1	604 274 9720	Michelle Becker

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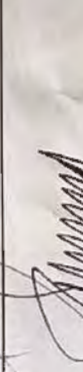

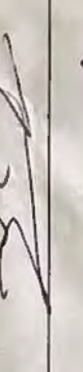



Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
Karih Casasempere	5931 Pearl Crt Rich. BC	604 275-5934	K. Casasempere
Cherie Ross	4280 Moncton St.	604/ 241/4043	Cherie Ross
Gosie Ryanel	5860 Goldersye Pike	604 726 7557	Gosie Ryanel
Suzanne Appleton	3991 Broadway	778- 578 866-	Suzanne Appleton
Kate Howie	239 5400 Andrews	604 274-1433	K. Howie
Jane Tennant	12011 Hayashi Court Richmond BC	604-271- 1906	J. Tennant
Aqua Porteous	32-5444 Andrews Rd Richmond	778 228 4721	Aqua Porteous
HAI VAN LE	12011 HAYASHI COURT RICHMOND, BC	778-997-1971	H. Van Le

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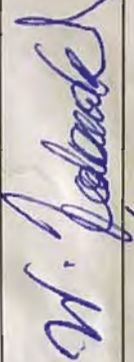

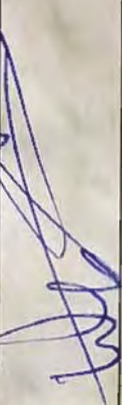


Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
Yvonne Kwaksistala	12328 buckham St. Richmond B.C.	604-992-9425	
DUNCAN SMITH	11391 LARWIN RICHMOND B.C.	604 271 2063	
Samantha FATTEN	12639 No 2 Rd. RICHMOND B.C.	604-204-2524	
Qi Chen	4660 Moncton st. Richmond, B.C.	778-316-3822	
Erster Vigh	32-8471 Ryan Rd. End B.C.	604 278 8558	
Becky Masson	9880 Seaton Ct. R.H. B.C.	604 271-0384	
Deb McGrath	10131 Lawson Drive	604-271-4671	
JIM McGRATH	10131 LAWSON DRIVE	604-271-4671	

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Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
James Muter	65 6245 Shandura Rd. Rich B.C.	778 036-1887	
Kipuk Munizinto	9471 AVANNA RICH	604 349 0399	
WALTER ZALANDEK	11180 1288 Rd. Rich.	604 272 8310	
Diana Degeering	113/6880 Buswell St., Rich	778 751-9338	
Ves Chung	324-12873 Railway Ave	778-990- 1305	
CINDY SANTHER	307 5700 Andrews	604 679 7557	
DONALD ACTON	3700 LEDWAY RD	604-277-3917	

Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
DONELLA McGRATH	207- 8535 JONES RD.	604- 273-4370	Donella McGrath
Maylin Fraser	5477 Sandford Pl.	604-760-1069	M Fraser
Kerry vital	13-8311 Sanders Rd	604-785-4671	[Signature]
Richard Vital	14 8311 Sanders Rd	604 685099	[Signature]
Judy Langston	10162 Lawson Drive	604-271-0051	Judy Langston
Rachel J. Tourbe	10199 Lawson Dr.	604-628-2231	R.J. Tourbe
<div></div>			

Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
Heather Larson	4831 Windjammer Dr	604-219-4703	[Signature]
Leslie Reilly	3500 Raymond Ave	604-241-1957	[Signature]
Michele Stark	8740 #1 Rd # 306	604-241-0240	mStark
Rob Stark	8740 #1 Rd # 306	604-244-0210	[Signature]
Manyanne Nerveter	4831 Windjammer Dr	604-612-7448	[Signature]
Matt Nerveter	4831 Windjammer Dr	604-789-1536	[Signature]
Sandra Flackhart	5500 Andrews Rd. # 412	604-250-9947	[Signature]

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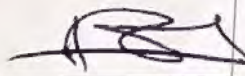
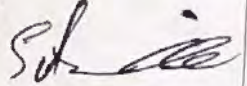
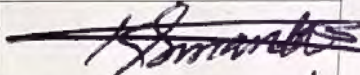
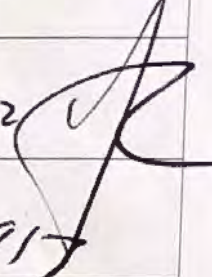
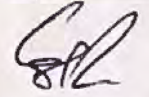
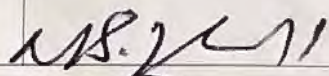
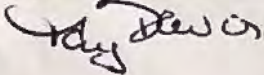
Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
Linda Ellis	10135 Lawson Dr.	604-241-4231	<i>L Ellis</i>
Simon Ellis	" "	" "	<i>SE</i>
CARLIE HOLLAND	12294 IMPERIAL DR	604-271-7217	<i>Offhand</i>
BRIAN COVERTON	34-10511 GILBERT ROAD	604 275-4908	<i>Brian Coverton</i>
Courtney Coverton	34-10111 Gilbert Rd	604 329 8650	<i>Courtney Coverton</i>
LINDA COVERTON	34-10111 GILBERT ROAD	604 275-4908	<i>Linda Coverton</i>
 			

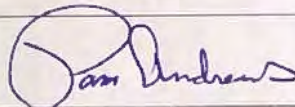

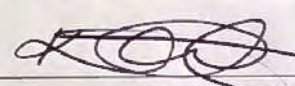
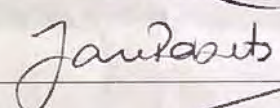
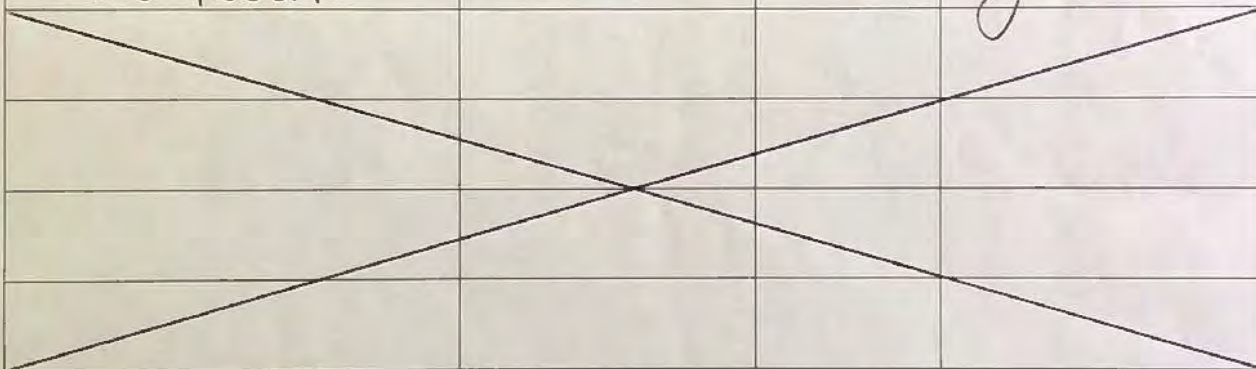
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Petition to the City of Richmond Requesting Improved Access to Steveston Pool

Resident name(s) (please print)	Home Address	Phone #	Signature
Eric Goodwin	4935 Mahood Dr. Richmond	604-347-3118	
AVTAR	10331 Brindley Richmond	604 2614277 A17	
BALDEV MANW	4180 Blundell	778 388	
SATTNAM GILL	3760 Fraser	604-649 6532	
KEVAL MANW	10600 Southridge Rd Richmond	604-295-6162	
Kelley Lin	8600 Saultair Dr. Richmond	604-786 3492	
Gurant Dahi		604 275-5917	
GURJANT KANHA	10751 Gilmer	778-322-5981	
R. Bicalette	8391 Bennett	778-55221 P01	
Wei xin Liu		778-887-7378	
MASON DIES	9811 DEAGLE Rd	604 723 6570	
TONY DAVIES	#5-13400 PRINCESS ST.	604-277-9983	

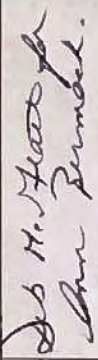
Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
Pam Andrews	322-4500 Westwater Drive Richmond BC	778-840-1269	
Catherine Andrews	322-4500 Westwater Drive Richmond, BC	7788401265	
Kirstin Clark	10880 No. 5 Rd. Richmond B.C. #319	7783868617	
Jane Roberts	#15-10771 Gilbertroad.	604-961-3123	
			

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Petition to the City of Richmond Requesting Increased Hours of Operation at the Steveston Pool

<u>Name(s) (please print)</u>	<u>Home Address</u>	<u>Phone #</u>	<u>Signature</u>
Ann Bermack	15-4220 Steveston Highway	604-274-5293	 Ann Bermack

****Please Note:**
 The above individual, **Ann Bermack**, is a regular swimmer for many years at Steveston Pool. She was unable to sign this Petition due to a serious family emergency. Ann insisted that her name and contact information be added to this Petition and, if contacted by City Hall, she will verify her support of this Petition.



City of Richmond

Report to Committee

To: Parks, Recreation and Cultural Services Committee
From: Marie Fenwick
Director, Arts, Culture and Heritage Services
Re: Steveston Harbour Authority Archway Sign - Request for Funding
Date: November 1, 2019
File: 11-7000-01/2019-Vol 01

Staff Recommendation

That a funding contribution of \$50,000 be approved from the Council Community Initiative Account to support the Steveston Harbour Authority Archway Sign, and that the expenditure be included in the Consolidated 5 Year Financial Plan (2020-2024), as outlined in the staff report "Steveston Harbour Authority Archway Sign – Request for Funding" dated November 1, 2019 from the Director, Arts, Culture and Heritage Services.

Marie Fenwick
Director, Arts, Culture and Heritage Services
(604-276-4288)

Att. 1

REPORT CONCURRENCE		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Finance Department	<input checked="" type="checkbox"/>	
Transportation	<input checked="" type="checkbox"/>	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	INITIALS: 	APPROVED BY CAO

Staff Report

Origin

At the September 25, 2018 Parks, Recreation and Cultural Services Meeting staff received the following referral:

That staff consider the request of the Steveston Harbour Authority to place a new archway on City property at Sixth Avenue, including options to showcase the heritage value of the proposed archway location, and report back.

This report supports Council's Strategic Plan 2018-2022 Strategy #3 One Community Together:

Vibrant and diverse arts and cultural activities and opportunities for community engagement and connection.

3.3 Utilize an interagency and intercultural approach to service provision.

3.4 Celebrate Richmond's unique and diverse history and heritage.

Analysis

On September 25, 2018, Robert Kiesman, Chair, and Cheryl Muir, Community Representative, from the Steveston Harbour Authority (SHA) Board of Directors attended the Parks, Recreation and Cultural Services Committee meeting to provide an update on the recent activities and the future vision for the SHA. At that time, they presented the concept for an archway sign at the Sixth Avenue entrance to the SHA Gulf Site and expressed their desire to work with the City on the proposed archway. As a result of the discussion that followed, staff were referred to consider the request and report back.

On October 28, 2019, the City received a letter with a proposed design for the archway sign and a formal request for \$50,000 to support the detailed design, construction and installation of the archway sign (Attachment 1). The proposal indicates that this represents 1/3 of the total project cost, with the remaining 2/3 being funded by the SHA and the Musqueam Indian Band.

The proposal indicates that the SHA expects the archway sign to achieve the following:

- promote the fishing industry;
- "stamp" the site for fishing-related development, as required by the Steveston Harbour Authority's mandate;
- produce a collaborative, positive project that reflects the interlocking relationships between governments, industry, the public and First Nations in Steveston; and
- act as a catalyst for the additional fishing-based capital projects at the Gulf Site.

The archway sign will be located on Department of Fisheries and Oceans Small Craft Harbour Property. It is expected the sign will be fabricated and installed by February 28, 2020. The SHA will be responsible for all ongoing maintenance and care of the sign.

Financial Impact

\$50,000 for this project is available in the Council Community Initiatives Fund.

Conclusion

Steveston Harbour has been the hub of commercial activity in Steveston throughout the community's history. At the turn of the century, tall ships from around the world could be found in the harbour to load salmon for international markets. Today the Steveston Harbour continues to be home to more than 500 commercial fishing vessels and encompasses over 17.5 hectares, making it the largest small craft harbour in Canada.

The installation of the proposed archway sign along a prominent walking path used by both residents and tourists will help to celebrate the importance of the fishing industry, past, present and future.



Marie Fenwick
Director, Arts, Culture and Heritage Services
(604-276-4288)

Att. 1: Proposal Letter from the Steveston Harbour Authority



October 28, 2019

STEVESTON HARBOUR AUTHORITY

12740 Trites Road, Richmond, B.C. V7E 3R8 604-272-5539 Fax 604-271-6142

Harold Steves, Chair
Parks, Recreation and Cultural Services Committee
City of Richmond
Via Email: hsteves@richmond.ca

Dear Councillor Steves,

RE: SHA ARCHWAY- 6TH AVENUE – REQUEST FOR \$50,000 FROM CITY OF RICHMOND

As discussed at our presentation to the Parks, Recreation & Cultural Services Committee in late 2018, I am happy to advise that Steveston Harbour Authority (SHA) has finally received a quotation for \$150,000 for the design, construction and installation of the archway at the entrance to the Gulf Site at Sixth Avenue and Chatham Street. As discussed with your Committee, the City of Richmond, and the Council of the Musqueam Indian Band, the cost of the archway will be split three ways on an equal-share basis. We also expect that the Department of Fisheries and Oceans will be providing in-kind support, in the form of pile driving and other logistical support.

I have attached a copy of the design which outlines the dimensions for your information. Please note that this design has been revised numerous times as a result of extensive comments from BC Hydro over the past several months. Further, please be reminded that the overall style of the archway is similar to the archway that was erected at our fish sales float in July 2017.

We expect that fabrication of the archway will commence in early December. We are extremely excited about the archway as it will achieve the following objectives:

- promote the fishing industry;
- "stamp" the site for fishing-related development, as required by Steveston Harbour Authority's mandate;
- produce a collaborative, positive project that reflects the interlocking relationships between governments industry, the public and First Nations in Steveston; and act as a catalyst for the additional fishing-based capital projects on the Gulf Site.

Please make arrangements to have the City of Richmond contribute \$50,000 to the cost of building the archway, representing 33.3% of the maximum cost for the project. We request that these funds be provided directly to the SHA in order that we can disperse the funds to the engineers and other contractors.

Please contact Jaime Gusto, General Manager of the SHA, in the event that you require any further information or documentation in order to process our request.

Yours truly,

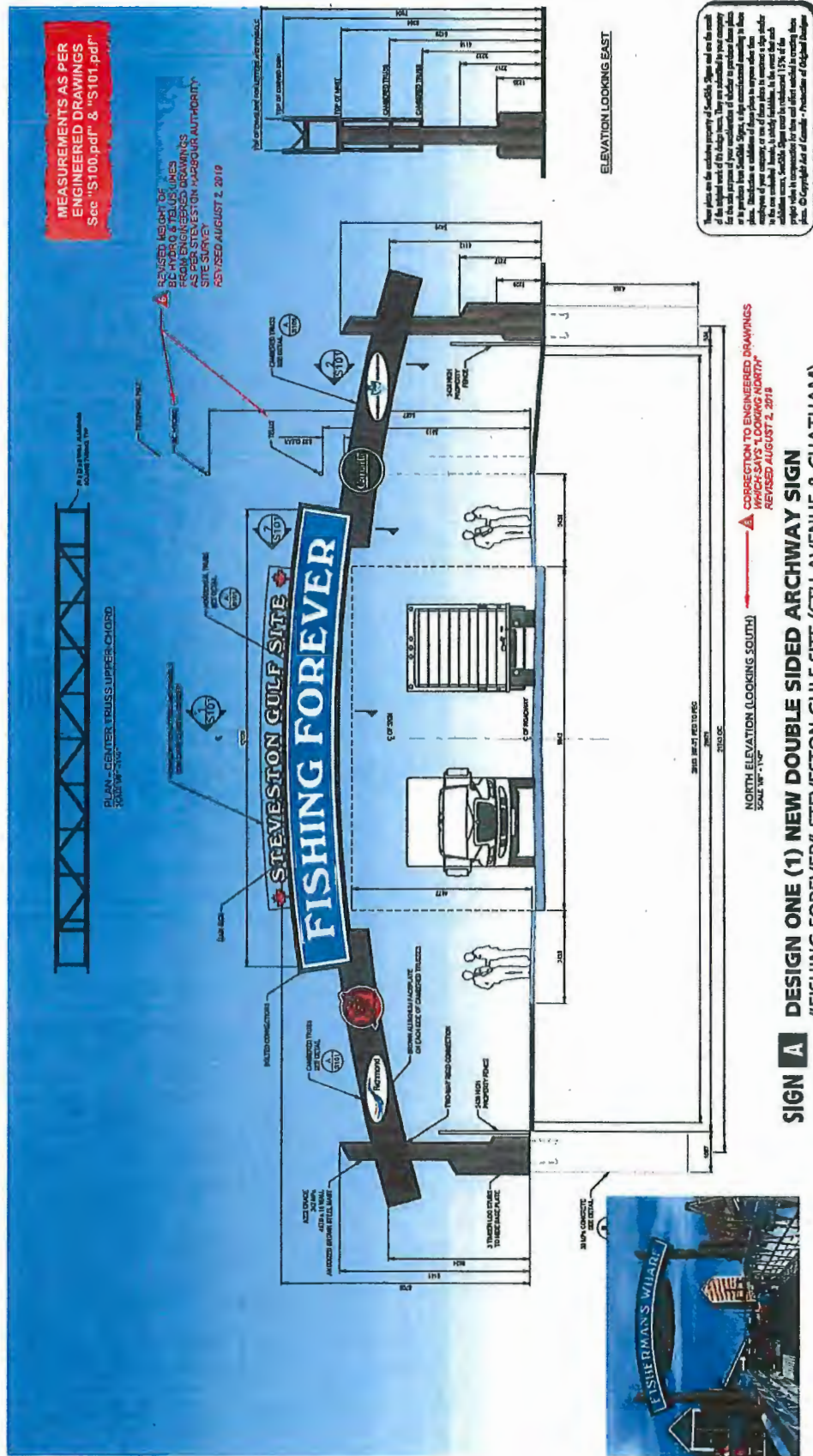



Robert Kiesman, Board Chairman
Steveston Harbour Authority

CC: SHA Board of Directors
Jaime Gusto, General Manager
Marie Fenwick, Director of Art, Culture & Heritage Services

Enclosures (2)





 SEASIDE SIGNS & DESIGNS	phone: 778.551.0396 email: info@SeasideSigns.com web: www.SeasideSigns.com	DATE 10-31-2018 SCALE as noted	PROJECT NAME Fishing Pier ADDRESS 6th & Chatham	CLIENT Streveston Harbour Authority ADDRESS NONE	CONTACT Jaime Do Costa PHONE 604-272-5539 EMAIL jdoim@investorstributor.com	The approved drawings is for your review and approval before the building begins. Seaside Signs will not be responsible for problems or discrepancies that will arise necessarily have presented by the proper review of the drawings. * Steel can vary from standard sizes. ** Client is provide additional 120 x 40 sign (each) with ground stake (each 12' x 4' if the drawing)	DATE 11-19-2018	DATE 03-20-2019	DRAWING NUMBER 18-1031	Sheet 2 of 8
							DATE 11-21-2018	DATE 07-23-2019		
							DATE 01-10-2019	DATE 08-02-2019		
							DATE 03-08-2019	DATE 08-13-2019		



City of Richmond

Report to Committee

To: Parks, Recreation and Cultural Services Committee
From: Todd Gross
Director, Parks Services
Date: October 31, 2019
File: 10-6550-07/Vol 01
Re: **The Public Tree Management Strategy 2045: A Plan for Managing Richmond's Public Urban Forest**

Staff Recommendation

1. That the Public Tree Management Strategy 2045, as detailed in the staff report titled "The Public Tree Management Strategy 2045: A Plan for Managing Richmond's Public Urban Forest," dated October 31, 2019 from the Director, Parks Services, be endorsed; and
2. That the Council Policy for the Public Urban Forest, as detailed in the staff report titled "The Public Tree Management Strategy 2045: A Plan for Managing Richmond's Public Urban Forest," dated October 31, 2019 from the Director, Parks Services, be endorsed.

Todd Gross
Director, Parks Services
(604-247-4942)

Att. 2

REPORT CONCURRENCE		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Law	<input checked="" type="checkbox"/>	
Engineering	<input checked="" type="checkbox"/>	
Sustainability	<input checked="" type="checkbox"/>	
Development Applications	<input checked="" type="checkbox"/>	
Policy Planning	<input checked="" type="checkbox"/>	
Building Approvals	<input checked="" type="checkbox"/>	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	INITIALS: 	APPROVED BY CAO

Staff Report

Origin

The purpose of this report is to present Council with an update to the existing Urban Forest Management Strategy (2001) and set the goals and objectives for the sustainable stewardship of all City owned trees through the Public Tree Management Strategy 2045 (the “Strategy”) (Attachment 1) and a Public Urban Forest Policy (Attachment 2) for Council’s consideration.

This report supports Council’s Strategic Plan 2018-2022 Strategy #2 A Sustainable and Environmentally Conscious City:

Environmentally conscious decision-making that demonstrates leadership in implementing innovative, sustainable practices and supports the City's unique biodiversity and island ecology.

2.1 Continued leadership in addressing climate change and promoting circular economic principles.

2.2 Policies and practices support Richmond's sustainability goals.

2.4 Increase opportunities that encourage daily access to nature and open spaces and that allow the community to make more sustainable choices.

This report supports Council’s Strategic Plan 2018-2022 Strategy #4 An Active and Thriving Richmond:

An active and thriving community characterized by diverse social and wellness programs, services and spaces that foster health and well-being for all.

4.3 Encourage wellness and connection to nature through a network of open spaces.

This report supports Council’s Strategic Plan 2018-2022 Strategy #6 Strategic and Well-Planned Growth:

Leadership in effective and sustainable growth that supports Richmond's physical and social needs.

Background

In 2001, the Urban Forest Management Strategy was adopted by Council as the guiding document for the management of trees on public lands under the jurisdiction of the City of Richmond. The primary objectives of the 2001 strategy were to outline standardized arboricultural management practices and respond to the then emerging issues of tree selection for sites under overhead power lines, tree replacement ratios, general pruning practices and tree removal criteria. The document reflected the best management practices and service level expectations at that time.

In the intervening years, the City has experienced rapid growth, densification and redevelopment, particularly in the City Centre area and along arterial roads. The number of trees the City is managing has increased dramatically through development and expansion of the parks and open space system. Newer City parks, such as Terra Nova, the Garden City Lands and Railway Greenway, are sites where there have been significant tree plantings in recent years. The increased number of trees the City is managing, the constraints of growing healthy trees in an urban environment and the effects of climate change are emerging as significant challenges. Consequently, an update to the strategy was undertaken.

This update to the 2001 Urban Forest Strategy is intended to set the direction for City policy and management practices for the trees on public land through to 2045. Adoption of this Strategy will demonstrate the City's continued commitment to maintaining a healthy urban forest and the prudent management of this valuable natural asset.

The Public Urban Forest

The City's entire urban forest is broken into two distinct categories: trees on public land and those on private property. City-wide, the urban forest contains approximately 360,000 trees.

For the purposes of the proposed Strategy, the public urban forest is defined as trees growing on City owned land in parks, medians and boulevards in streets, road rights of way, civic properties and natural areas. This also includes many of the trees located on Richmond School District No. 38 lands managed and maintained by the City. Richmond's public urban forest does not include trees located on land managed by Vancouver International Airport (YVR), Ministry of Transportation (MOTI) Roadways, Vancouver Fraser Port Authority properties nor trees located in the Agricultural Land Reserve on private property. The public urban forest is comprised of approximately 100,000 trees. Within this area, the City has formally inventoried approximately 19,000 trees in parks and natural areas and approximately 37,000 street trees for a total of 56,000 trees. The remaining 44,000 trees, predominantly growing in natural areas, are managed less intensively than those in parks and streets and thus have not yet been inventoried.

The urban forest is measured in two ways: actual numbers of trees and canopy area (the combined area of all the City's tree canopy). While actual numbers of trees is an important metric for measuring success, the size and volume of the tree canopy is the more significant metric for several reasons. For example, large, mature trees with dense canopies will provide more ecosystem services (e.g., shading, stormwater management, carbon sequestration and removal of pollutants) than younger trees with much smaller canopies. To provide the maximum benefit, a healthy urban forest should have a significant, contiguous urban tree canopy cover.

The following table outlines the proportions of areas of public land on which the urban forest is located and the overall percentage of canopy coverage.

Table 1: Area Proportion of Public Land Canopy Summary

Canopy Location	Total Land Area (ha)	Canopy Area (ha)	Percent Canopy Cover within Location	Percent of Public Land Canopy
Parks/Schools	728	177	24%	35%
Roads	1,553	237	15%	46%
ROWs	289	96	33%	19%
Total Public Land	2,570	510	20%	100%

The Benefits of Trees

The City's public urban forest is managed as a civic infrastructure asset which increases in value and in the benefits it provides over time. As a natural resource and legacy for future generations, it provides numerous services, and health and wellness benefits such as:

- Enhancing urban environments by providing shade, beautification, a sense of place and recreational opportunities;
- Providing ecosystem services which moderate the effects of extreme heat, winds and precipitation; and
- Supporting biodiversity by providing habitat and a food source for urban wildlife.

Supporting Plans and Strategies

The Public Tree Management Strategy supports aspects of the following City strategies and plans:

- Parks and Open Space Strategy (POSS): An update to the Urban Forest Strategy was identified as an outcome of this POSS. An update would recognize the value of the ecological network, manage the urban forest to maximize ecosystem services and develop a deeper awareness of the benefits of the urban forest with the public.
- Official Community Plan (OCP): Street trees are identified as a key community asset to be protected and enhanced. New tree planting, developing a Public Realm Planting Master Plan and the protecting and enhancing existing trees are listed as key objectives of the Plan.
- Ecological Network Management Strategy (EN): Hubs, sites and corridors on public land throughout Richmond contain significant stands of trees. Preserving, maintaining and planting trees at these locations will increase the ecosystem services these lands provide.
- Integrated Rainwater Resources Management Strategy: Trees, landscaping and open spaces are identified as key components to improving water quality, minimizing erosion and reducing peak flows during storm events. The goals and outcome of this strategy directly tie into those of the EN and POSS including enhancement of natural habitat and riparian areas to manage stormwater runoff and water quality.

- Community Energy and Emissions Plan (CEEP): It is broadly recognized that trees provide climate adaptation and mitigation benefits as defined above. The Strategy will be an important input into the new Community Energy and Emissions Plan that is currently underway.
- Metro Vancouver: Metro Vancouver has published reports and guiding documents related to management of the urban forest in the emerging context of climate change. The City will reference these resources when considering the implementation of the arboricultural best management practices, such as tree species and site selection.

Community Consultation and Stakeholder Input

The Strategy benefitted from an extensive public consultation review, feedback from the Advisory Committee on the Environment (ACE) and workshops with City of Richmond staff.

Public Consultation

In fall 2017, the public was asked to share their views of Richmond's public urban forest through the City's *Let's Talk Richmond* public consultation portal and a booth at the Richmond Harvest Fest hosted at the Garden City Lands in September 2017. A total of 138 people chose to respond with a completed survey. The survey presented a range of questions regarding the public perception of the current public urban forest, what changes they would like to see and how they would rate the trees on their street or what they valued in an urban forest.

Generally, residents were very supportive for having more trees planted in City parks and streets. Residents responded that they valued trees for their role in reducing the effects of pollution, supporting habitat for native plants and animals, heritage and beautification factors and that they provide a pleasant environment for people to gather and socialize. Concerns raised ranged from the aesthetics of trees, conflicts with utilities, managing leaf litter and increasing species diversity and native tree plantings. A sample of the survey has been included in an Appendix of the Strategy.

Advisory Committee on the Environment (ACE)

Staff formally presented to ACE at two meetings (October 2017 and January 2019) and several times by way of an update when presenting on other Parks-related topics. The Committee also provided feedback by submitting one completed *Let's Talk Richmond* survey which summarized their collective input.

Overall, the Committee expressed very strong interest in tree and urban forestry issues within the community and showed support for the Public Tree Management Strategy and the direction it was setting for the future public urban forest.

Staff Workshops and Review

In September 2018, two staff workshops were conducted to garner a cross-departmental input for the development of the Strategy. The goals of the workshops were to define common challenges for working around, maintaining and protecting City trees and identify opportunities for

improving Richmond's urban forest management and tree protection practices. Additionally, input was provided on measures to improve existing tree retention protocols and methods to encourage more planting on public land.

Analysis

Strategy Overview

The Public Tree Management Strategy has a 25-year outlook which aligns with the City's projected population growth rate and development patterns as envisioned in the City's Official Community Plan. Staff recommend using a 25-year timeframe as it is a reasonable period which reflects the expected growth rates of trees in our climate, and the results of revised tree management practices (see below) should become apparent within this timeframe.

The vision for the City's public urban forest is embodied in the following vision statement:

Richmond's public trees are managed as a high-value, civic asset. Richmond trees are beautiful, resilient and sustainable and are supported by the community for the benefits they provide.

Strategy Goals, Targets and Objectives

The goals of the Public Tree Management Strategy are:

- Conserve and protect the public urban forest;
- Manage and maintain a healthy and safe public urban forest;
- Enhance and expand the extent and health of the public urban forest; and
- Educate and engage with the community on the benefits of the public urban forest and provide opportunities for community stewardship.

Through the process of developing the Strategy, the following targets and objectives were set for each of the four goals:

Table 2: Goal – Conserve and Protect

Target:	30% of City trees have a diameter greater than 40 cm by 2045.
Objectives:	The urban forest is valued as an integral part of the City's civic infrastructure.
	City tree conservation and protection is prioritized and implemented on all City and urban development projects.

Table 3: Goal – Manage and Maintain

Target:	Tree mortality is less than 3.5% for City trees less than 10cm diameter by 2045 and maintenance practices maximize the healthy life-span of mature trees.
Objectives:	All inventoried City trees are managed within a preventative maintenance program.
	City tree care and maintenance operations are based on industry best management practices and standards to ensure continuous improvement.
	City tree care and maintenance operations are continuously adapted to climate change.
	City tree risk is managed to maintain public safety.

Table 4: Goal – Enhance and Expand

Target:	Increase canopy cover over the public realm from 20% to 30% by 2045.
Objectives:	Public urban forest canopy cover increases to enhance community and ecological health benefits.
	Standards for City tree planting infrastructure and species selection are continuously adapted to climate change.

Table 5: Goal – Educate and Engage

Target:	Engage 1,000 people per year on the role and value of Richmond's public urban forest.
Objectives:	The City regularly updates the public about the urban forest's critical role in community health and wellness.
	Public activities that harm City trees are minimized.
	Stewardship opportunities are provided for people to connect with the urban forest.
	City project designers, planners and the consulting arborist community are educated about City Tree Management Protocols.

Each objective is accompanied by a number of proposed actions and timeframes for implementation which will help the City reach the four set targets. The timeframes for achievement vary from the near term (2020) to longer timeframes as well as continuous re-evaluation and monitoring. For additional information for the targets, actions and timeframes, please see Chapter 5 of the Strategy.

Public Urban Forest Canopy Targets

The City currently plants a significant number of trees every year. The Strategy sets an aspirational yet achievable target of a city-wide average 30 per cent public urban forest canopy (from the current 20 per cent overall average). In support of this target, more trees will be planted on public land thereby increasing the public tree canopy.

The City replaces approximately 300 trees removed every year due to decline, development impacts or storm damage. However, this number can vary substantially from year to year depending on weather events and construction projects.

The City also plants new trees on public land through Capital Projects or development related activity (off-site contributions associated with new developments secured through Servicing Agreements). Considerations for sites identified for new trees include existing site conditions and constraints such as utilities (above and below ground), existing programmed spaces (e.g., sidewalks, driveways, sports fields, pathways, playgrounds, etc.), available soil volumes, future capital improvements (e.g., road expansion), etc.

The following table summarizes the current and projected tree planting density, the potential number of sites in park and street locations and the projected public urban forest canopy target.

Table 6: Public Urban Forest Canopy Cover Targets

Location	Current Number of Trees Per Hectare (ha)	Estimated # of Tree Planting Spots	Target Number of Trees Per Hectare (ha)	Target Canopy Cover (%)
Parks	37	10,000	55	40
Streets	19	20,000	30	20
City-wide Public Urban Forest Canopy Cover Target:				30

It is estimated that the canopy cover target will be achieved by 2045.

Climate Change and the Urban Forest

Climate change in our region is projected to result in warmer, drier summers, fewer frost free days, more frequent extreme rainfall and storm events and rising sea levels. Richmond's public urban forest will be impacted by these changes. When urban forests perform poorly, the adverse impacts of climate change can be magnified; these include infrastructure damage, higher maintenance costs, tree loss and reduction of the overall canopy. The Strategy provides direction on a number of climate change-specific responses the City can take to improve the health, longevity and overall resiliency of our existing public urban forest. These responses include:

- Increasing the diversity of trees planted;
- Consideration of adverse impacts on native species thus limiting planting opportunities;
- Consideration of more frequent or severe drought or storm events (e.g., extreme weather);

- Planting to mitigate the urban heat island effect; and
- Increasing the public tree canopy area.

Current Public Urban Forest Management Practices

The Urban Forestry Section of Parks Operations manages the public urban forest. City arborists and other staff receive professional training and certification through the International Society of Arboriculture (ISA). Ongoing training is required to maintain certification and ensures arboricultural best management practices are implemented to maintain trees managed by the City. The following is a brief summary of current management practices.

Tree Pruning and Maintenance

The City's current maintenance model provides resources to only prune those trees identified through service requests. Typical requests for maintenance address storm damage, adverse impacts from development or for general maintenance. Accordingly, some trees may not be serviced until they are adversely impacted. Between January 2016 and December 2018, staff responded to approximately 5,100 urban forestry service requests ranging from simple enquiries to tree pruning or removal. On average, approximately 300 trees are removed and approximately 2,168 trees are pruned per year.

Tree maintenance practices have evolved with the emergence of environmental and habitat issues such as nesting birds. Staff monitor and hire Qualified Environmental Professionals (QEPs) to ensure nesting birds are not adversely impacted by tree maintenance activities. This includes altering work plans in response to nesting seasons or the presence of bird nests.

Tree Compensation Fund

When City-owned trees are adversely impacted, the City collects tree compensation monies to offset tree replacement costs resulting from those impacts. Adverse impacts to public trees include unauthorized cutting or removal (as defined by the Tree Protection Bylaw No. 8057) or impacts from development activities. Since its inception in 2004, the fund has collected approximately \$3.8 million.

- Unauthorized Tree Work: Unauthorized work includes City trees which are pruned, removed or otherwise adversely impacted due to work conducted by the members of the public. Parks staff inspect the impacted tree(s) and coordinate with Tree Preservation Group staff to determine the value of a fine. The fine's value is based on a number of factors including the tree's size, age and condition at time of impact. Fines are applied and deposited into the Tree Compensation Fund.
- Development Impact: Sometimes, development activity, both on and off-site, results in tree removal. When tree removals are associated with redevelopment, the City seeks replacement planting for on-site trees at a 2:1 ratio with the first recourse to always replace trees within the development site. For trees which cannot be planted on-site, cash-in-lieu tree compensation monies are contributed to the City by the developer. While some trees may be lost due to development activity, the tree replacement ratio ensures

there is a net increase of trees in the public urban forest. Relocating healthy trees onto City land is also a viable practice with all associated relocation costs borne by the developer.

Contributions to the Tree Compensation Fund are utilized to fund replacement and re-location (e.g., tree spading) tree planting projects and young tree watering for up to three years after planting. Staff propose to review the current cash-in-lieu compensation process and increase the rate from the current \$500 per tree to \$750 to reflect the current cost to plant new trees (based on a cost recovery model).

Tree Planting

The City plants many trees every year to replace those lost due to age or decline, storm damage, or development activities. Trees are also planted as part of Capital Projects approved by Council and as part of the development process. Servicing Agreements between the City and a developer typically secures City-owned off-site improvements, including tree planting in streets, parks and plazas. The majority of City tree planting projects are funded through the Tree Compensation Fund.

The following table summarizes the number of trees planted between 2013 and 2018.

Table 7: Number of Trees Planted between 2013 and 2018

Year Planted	Trees Planted by Parks	Public Trees Planted Via Servicing Agreements	Total Trees Planted
2018	1,858	518	2,376
2017	552	227	779
2016	509	202	711
2015	834	464	1,298
2014	412	322	734
2013	555	392	947

In 2015, the City planted, as part of the Railway Greenway project, 620 trees and in 2018, the City planted 1,310 trees on the Garden City Lands. In fall 2019 and early 2020, approximately 290 trees will be planted as part of the upgrades to London-Steveston Park and approximately 500 trees will be planted in the Railway Greenway and McCallan Park area between Granville Avenue and Westminster Highway. As part of this project, approximately 140 trees will be sourced from the City's own Gilbert Nursery. Of the trees the City has planted in parks and on streets in the past three years (1,326 total), only 12 trees died due to vandalism or disease.

The number of trees provided through Servicing Agreements is significant. Currently, the annual average provided to the City through this process is approximately 500 trees. Planting rates vary depending on the size of project and the area of public land adjacent to or fronting the development site. For example, approximately 1,200 trees will be planted by 2021 as part of a Servicing Agreement in Hamilton Highway Park. Staff work with proponent consultant teams to institute design and planting best management practices including adequate, uncompacted soil volumes, provision of irrigation and suitable tree selection according to the site conditions. Trees planted through development are maintained for a minimum of one year by the developer. Any

trees which die during this period must be replaced and successfully established, for a minimum of one year, prior to the trees becoming the responsibility of the City and accepted as new City infrastructure assets.

New Tree Watering

Aside from selecting the right tree for the right location, initial watering after planting is a key success factor for any new tree. Establishment watering results in higher survival rates, as well as healthier and more resilient trees. Trees that are planted in locations that do not have irrigation are provided a slow release watering bag which is refilled periodically by staff throughout the growing season.

Information and Management Systems: LiDAR and GIS

In 2017, an image of the City's entire urban forest canopy was captured utilizing a remote sensing technology called LiDAR. The image created a 3D model of Richmond's forest canopy, buildings, roads and power lines. With this information, a public and private land tree count of approximately 360,000 trees was calculated. This information was also used to confirm the current canopy cover on public land (22 per cent) and established the baseline from which future change will be compared to. Staff intend to repeat this process every few years to monitor the rates of change. It should be noted that this information can be used for a number of other planning initiatives including calculating urban development rates and areas of pervious and impervious surfaces.

In the past two years, staff have developed a Geographic Information Systems (GIS) map inventory of all City parks and their assets as well as street trees. With mobile technology, individual and groups of trees have been classified and recorded as detailed in the following section.

Updated Public Urban Forest Management Practices

The Strategy sets out the direction for several new initiatives in response to emerging arboricultural best management practices and as an adaptive measure in response to climate change.

GIS Inventory

Establishing and maintaining a GIS inventory of the public urban forest is an industry-wide current best management practice. The inventory will be continuously updated as existing unclassified trees are captured, new trees are planted or existing trees are serviced. To further inform urban forest management, the information captured through this inventory will be used to:

- Monitor mortality and failure rates to identify problem planting sites, health issues or species to avoid;
- Monitor tree condition to inform succession planning for tree replacement;
- Track progress towards meeting the Strategy's targets; and

- Communicate tree locations, benefits and health information internally and externally.

Proposed Preventative Maintenance Program

The Strategy proposes to transition the current management of the public urban forest from a demand driven system to a preventative maintenance program model. Essentially, this would entail that each City tree will be visited (inspected and, if required, maintenance work executed) a minimum once every five years for street trees and every 10 years for park trees.

Preventative maintenance of the public urban forest will optimize its value and the services it provides. While this program may increase the cost of managing the urban forest, it will ultimately reduce the number of service requests, reduce risk management, safety and liability concerns and help identify potential threats to the health of the urban forest. A demand driven system will still operate concurrently to responding individual requests or emergency pruning (e.g., storm damage or tree failure).

Tree Species Selection

The effects of climate change are becoming more apparent where trees that once thrived in Richmond now either struggle or die. For example, the Western Red Cedar, a native and important tree species in British Columbia's forests, has been observed to be struggling in certain areas where they once thrived. Adapting to this "new normal" means planting species that can thrive in these emerging climatic conditions. Metro Vancouver has recently published updated tree species resources which staff will be utilizing to inform tree species appropriate to Richmond's climate and soil conditions. Tree species selection criteria includes (but not limited to:

- Native vs. non-native;
- Deciduous vs. coniferous (evergreen);
- Disease resistance;
- Drought and pollution tolerance;
- Size and shape at maturity; and
- Existing species diversity at site.

Public Urban Forest Policy

The City does not currently have a Council adopted Policy pertaining to the public urban forest. The proposed Public Urban Forest Policy (Attachment 2) establishes the City's philosophy on the importance and function the urban forest in the community.

The purpose of the proposed Public Urban Forest Policy is to provide Council an opportunity to affirm the vision, goals and objectives presented in the Public Tree Management Strategy and confirm the City's position regarding the important role the public urban forest plays in our community. The policy will also serve to provide the public, Council and staff the decision-

making framework concerning the management of City owned trees, the standards guiding the City's best management practices and the overall scope of work conducted by Parks Services.

Highlights of the Public Urban Forest Policy include the following:

- A definition of the Public Urban Forest as managed by the City;
- The City's mission statement to sustain and expand the urban forest to deliver multiple benefits to the community including resilience to climate change;
- The goals of the Public Tree Management Strategy;
- An overview of the core urban forestry practices performed by the City including planning, inventory, risk management, planting, watering, pruning, tree removal and integrated pest management; and
- A commitment to conduct the work to industry recognized best management practices per the International Society of Arboriculture.

Next Steps

Upon Council's approval of the Strategy, work will begin to activate the Five-Year Implementation Plan (the "Plan"). Actions will be implemented according to the stated timeframes outlined in the Plan, but periodically reviewed to allow for emerging priorities and resource management trends.

Priorities include an Analysis and Resource Assessment (the "Assessment") to identify the budget, staffing and equipment implications associated with the proposed transition from a reactive to a preventative maintenance model. There are also operational implications to increasing the number of trees the City plants in order to achieve the 30 per cent public tree canopy cover target which would also be considered in the Assessment. In 2020, staff will report to Council with options for implementing this new maintenance model, including any estimated budget impacts.

Also in 2020, staff will develop the criteria for a rating system for evaluating and prioritizing demand driven maintenance and removal requests. Further, staff will also review and quantify the data on past tree failures and risk claims to inform the development of a tree maintenance response plan for problem species or locations.

In the broader context, the Strategy identifies the need to develop a City-wide urban forest strategy for trees on both public and private land. Many of the same issues outlined in the Strategy also affect trees growing on private property. Taking a holistic approach to all 360,000 trees growing in Richmond will integrate the management goals of the Public Tree Management Strategy with those of the much larger private urban forest. A terms of reference for this city-wide strategy, which will describe the scope, key project stakeholders and a public consultation plan, will be prepared by staff for Council approval.

In the interim, Parks staff will work in concert with relevant City departments to support the management and health of the city-wide forest.

Suggested next steps include:

- A comprehensive review of the Tree Protection Bylaw No.8057 be undertaken by staff and report back to Council on suggested changes;
- Review the cash-in-lieu process and increase the compensation rates in the Tree Compensation Fund;
- Consider the creation of a customer service focused “one-stop shop” approach for City tree related issues (both public and private trees); and
- Increase community engagement opportunities to instill a stewardship ethic in Richmond residents to protect and expand the public urban forest, including watering City boulevard and new tree plantings by residents.

Financial Impact

None.

Conclusion

The Public Tree Management Strategy sets the direction to increase the city-wide average to 30 per cent public urban forest canopy, to increase the rate of new tree planting, transition from a demand driven to a preventative maintenance program, and increase community stewardship and resident involvement in their public urban forest.

Updating our urban forestry management practices will position the City to better adapt to the effects of climate change and growth and change in the urban landscape. The goals, objectives and actions outlined in the Strategy will guide the City’s decisions to ensure a healthy, beautiful and resilient urban forest is enjoyed by future generations of Richmond residents.

Adoption of the Public Tree Management Strategy and the Public Urban Forest Policy will signal to the community the City’s strong commitment to growing the urban forest and taking a leadership role in the region by setting a benchmark for increasing the size of the urban forest.



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- Att. 1: City of Richmond Public Tree Management Strategy 2045
2: The Public Urban Forest Policy



CITY OF RICHMOND PUBLIC TREE MANAGEMENT STRATEGY 2045

A Plan for Managing Richmond's Public Urban Forest

November 2019



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Acknowledgements

This document was prepared by the City of Richmond Community Services Division Parks Services Department.

The Public Tree Management Strategy was endorsed by Richmond City Council on Date (Day, Month, 2020).

Malcolm Brodie, Mayor

Chak Au, Councillor

Carol Day, Councillor

Kelly Greene, Councillor

Alexa Loo, Councillor

Bill McNulty, Councillor

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The Project Team would like to acknowledge the valuable input we received from the public and internal staff stakeholders. The Strategy benefited greatly from all of your contributions!

2045 VISION...

Richmond's public trees are managed as a high-value, civic asset. Richmond trees are beautiful, resilient and sustainable and are supported by the community for the benefits they provide.



Executive Summary

Changing the way Richmond manages City-owned trees

Richmond's urban forest is key to developing a world class city and maintaining a livable environment for citizens. Trees are the keystone organisms of the urban forest and their management is a priority for the City. Trees are living, life-supporting natural assets that provide Richmond with benefits like shade, stormwater interception, air quality improvements, beautification and habitat. However, climate change, urban densification and technology are presenting new challenges and opportunities for managing public trees. In response, the City has developed the Public Tree Management Strategy to direct urban forest management until 2045. **This Strategy is focused on trees managed by the City only.**

The Strategy contains some key actions that will shift City tree management practices towards a more resilient and sustainable future:

Conserve and Protect

The City will target increasing the proportion of large diameter City trees (>40 cm diameter) from 18% to 30% of the population by 2045. The priority actions are to implement:

- City Tree Policy to guide City tree protection, removal, replacement and maintenance decisions.
- City Tree Management Protocol to update the process and standards that apply when City trees are affected by City capital and development related activities.

Manage and Maintain

The City will maintain tree mortality rates in young trees below 3.5% and maintenance practices will maximize the healthy life-span of mature trees. The priority actions are to:

- Expand the City's young tree watering program to include 3 years after planting, with 4th year trees watered if necessary.
- Shift from demand-based to preventative young tree pruning and establish a tree pruning cycle.

- Develop and implement a 5-year staffing, equipment and budget plan to enable the transition from demand to preventative maintenance.

Enhance and Expand

The City will target an increase in canopy cover **on public land** from 20% to 30% by 2045. The priority actions are to:

- Plant at least 850 shade trees per year (in addition to replacement and restoration tree planting).
- Develop a Public Realm Planting Master Plan to guide species selection, local diversity targets, planting character and planting schedules.

Educate and Engage

The City will enhance the existing stewardship opportunities and education to target engaging 5,000 people by 2025. The priority actions are to:

- Create an interactive City tree map linked to the City's tree inventory that reports individual tree data and ecosystem services.
- Provide stewardship opportunities such as tree or understory planting, invasive species removal and citizen science projects.
- Investigate opportunities to partner with homeowners in single-family neighbourhoods to care for newly planted trees in City boulevards.
- Investigate opportunities to work together with local First Nations and other levels of government to develop appropriate stewardship activities for native forests.

The Strategy's Action Plan provides the roadmap for growing an urban forest that is beautiful, resilient and sustainable and is supported by the community for the benefits it provides.



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An aerial photograph of a suburban neighborhood. In the foreground, there are several houses with dark roofs and green lawns. A road with a white line runs through the middle of the image. In the background, there are more houses and a large area of trees. The sky is blue with some light clouds.

1

The Public Tree Management Strategy

Planning the City's public urban forest of 2045

1.1 Introduction

The Public Tree Management Strategy (the Strategy) provides the framework for **managing trees on City property**. It is an update to the 2001 Urban Forest Strategy and summarizes the current state of the resource, the challenges ahead, and provides the direction to implement the City's vision for managing public trees out to 2045:

Richmond's public trees are managed as a high-value, civic asset. Richmond trees are beautiful, resilient and sustainable and are supported by the community for the benefits they provide.

The urban forest includes all of the trees, vegetation, soil and associated natural processes across Richmond's landscape. The urban forest functions as green infrastructure by providing services and benefits to the City. Trees are the keystone structure of the urban forest – there is no forest without trees. Richmond's public trees are an important part of the City's infrastructure assets.

The City of Richmond has a significant urban forest comprised of approximately 360,000 trees on public and private property in the city. Of those, it is estimated that approximately 100,000 are on public land, that is, on streets, parks and natural areas. The City maintains an inventory of 56,000 trees in streets and parks but has not inventoried trees in natural areas.

The Strategy's emphasis on **trees in the public urban forest** acknowledges the important role the City plays in maintaining healthy trees and a healthy community. The rapid pace of development and a changing climate is affecting the quantity and characteristics of Richmond's public trees. These changes demand a response and a renewed focus on the City's tree management practices.

This Strategy incorporates best management practices, such as preventative tree maintenance and climate suitable species selection, that will improve the health and resilience of the City's trees. It recognizes the City's desire to expand the urban forest, and the benefits that the community will receive. Finally, it identifies the budget and resources required to deliver the program efficiently and meet the community's expectations for a well-managed urban forest on City lands.

Public trees are managed by the City Parks Department but the urban forest is enjoyed and cared for by everyone.

City of Richmond Tree Facts (as of 2019)

City Wide	
Richmond land area	12,760 ha
Richmond % canopy cover	12 %
Estimated trees citywide	350,000+
Public	
Public land area	2,570 ha
Public land % canopy cover	20 %
Public tree canopy area	510 ha
Trees inventoried (individual and groups)	56,000
Estimated tallest tree (poplar)	50 m
Largest diameter tree measured (sequoia)	2 m
Largest canopy spread measured (elm)	23 m

Richmond's Public Tree Management Strategy is for the public urban forest...



1.2 Urban Forest Policy Context

The 2045 Public Tree Management Strategy will work alongside Richmond's current environmental strategies to ensure that trees are a valued and integrated part of the City's natural assets.

Supporting Policies and Plans

The Official Community Plan, Regional Growth Strategy and high-level City Policies and Plans provide the broad context for why the City needs an urban forest and more comprehensive guidance for managing public trees (this Public Tree Management Strategy and Operations Manual).

The City's policies for managing public trees are comprised of several integrated components:

1. The Public Tree Management Strategy (this document);
2. The City Tree Policy;
3. The Public Tree Operations Manual (an internal departmental manual); and
4. The Public Parks and School Grounds Regulation Bylaw No. 8771 and the Tree Protection Bylaw No. 8057.

These components support the overarching vision, processes and regulations that govern public tree management and protection. Trees on private property in Richmond are maintained by the relevant landowner and their removal or replacement is regulated by Richmond's Tree Protection Bylaw.

City Environmental Strategies

The City's suite of environmental strategies work together to implement these higher level plans by guiding environmental protection, park and trail development, urban forest management, rainwater management and dike upgrades across the city.

These strategies integrate with one another and inform the land use tools used to effect change on the ground. Land use tools guide the form of development and can be employed to support the urban forest.



1.3 Strategic Framework

The Public Tree Management Strategy outlines the plan for managing Richmond's public trees to 2045. The strategic framework for the plan is driven by the City's vision for Richmond as *"... the most appealing, livable and well-managed community in Canada"*.

The chosen planning horizon for the Strategy is 2018 to 2045, which reflects both the time it takes for trees to grow and aligns with the 2041 vision of Richmond's Official Community Plan.

Over time, urban forest management, urban development and climate change will impact the health, quantity and distribution of trees in the urban forest. The Strategy anticipates these impacts and responds with objectives and actions to be achieved over the next 27 years. The Strategy also provides metrics to monitor success over time and enable adaptive management to address the uncertainty associated with the long planning horizon.

Goals

Four goals capture the policy, practice and resource recommendations to provide a resilient and sustainable public tree resource for the future. The Strategic framework's four goals are:

1 Conserve and Protect

2 Manage and Maintain

3 Enhance and Expand

4 Educate and Engage





2 Urban Forest History and Benefits

This section describes the history of Richmond's urban forest and presents some of the ways the urban forest is valued.

2.1 History of the Urban Forest

Richmond's historic landscape was quite diverse and considerably different from what exists today. There were extensive bog ecosystems with species such as cranberry, blueberry, Labrador tea and sphagnum moss. On higher ground, grasslands predominated. Trees and forests were not in fact the predominant plant community at the time.

Forest vegetation occurred on the riverbanks and some higher ground. Forest types included spruce forest (spruce, willow, alder and crabapple), mixed wet (cedar, hemlock, spruce, alder, willow and yew) and mixed woodland (cottonwood, alder, willow and crabapple) and bogs often contained shore pine (North et al. 1979).

Agricultural and urban settlement significantly altered Richmond's landscape, changing hydrology, excluding fire and introducing new plant species. Richmond's present day urban forest is largely the result of the tree planting that has followed urban development in the last one hundred years. It is conceivable that the landscape today contains more trees than it did historically.

Richmond was incorporated as a municipality in 1879 and Steveston and London's Landing were the earliest subdivisions. Urban development was fairly slow until the 1950s. Early subdivision design sometimes retained trees on private land but did not typically include planting street trees (Cook, 2002).

In 1958, Desmond Muirhead Associates developed street tree planting plans for subdivisions. Their recommendation was to plant trees in diverse groups rather than linear style to provide variety (Cook, 2002). The plans identified shore pine to be widely planted to distinguish the municipality subregionally (Cook, 2002).

To implement these plans, the City established a Local Area Improvement Plan process that allowed neighbourhood associations to apply for street tree planting. Richmond Park, Gilmore Park and Burkeville subdivisions were planted at that time. The group planting style is evident in those subdivisions today.

From the 1960s, subdivisions typically included more vegetation. Westwind and Montrose developments included linear street tree planting. In the 1990s, there was an extensive City planting and beautification effort culminating in Richmond winning the 1999 Nations in Bloom award.

The City developed its first urban forest strategy in 2001, ahead of many municipalities. Today, Richmond's city-wide canopy cover is 12%. The City is planting hundreds of trees each year and all new developments are required to include street trees and landscapes as part of the approval process. More recently, new planting technologies such as soil cells and structural soil are available to improve tree growing conditions in built up areas of the city. Implementing new technologies and best practices in urban forestry has helped the City to increase the rate of tree planting to its highest level.

City parks were commonly established after the 1940s. Most parks in the

Fashions in tree planting

Common species used in the...

1950s:

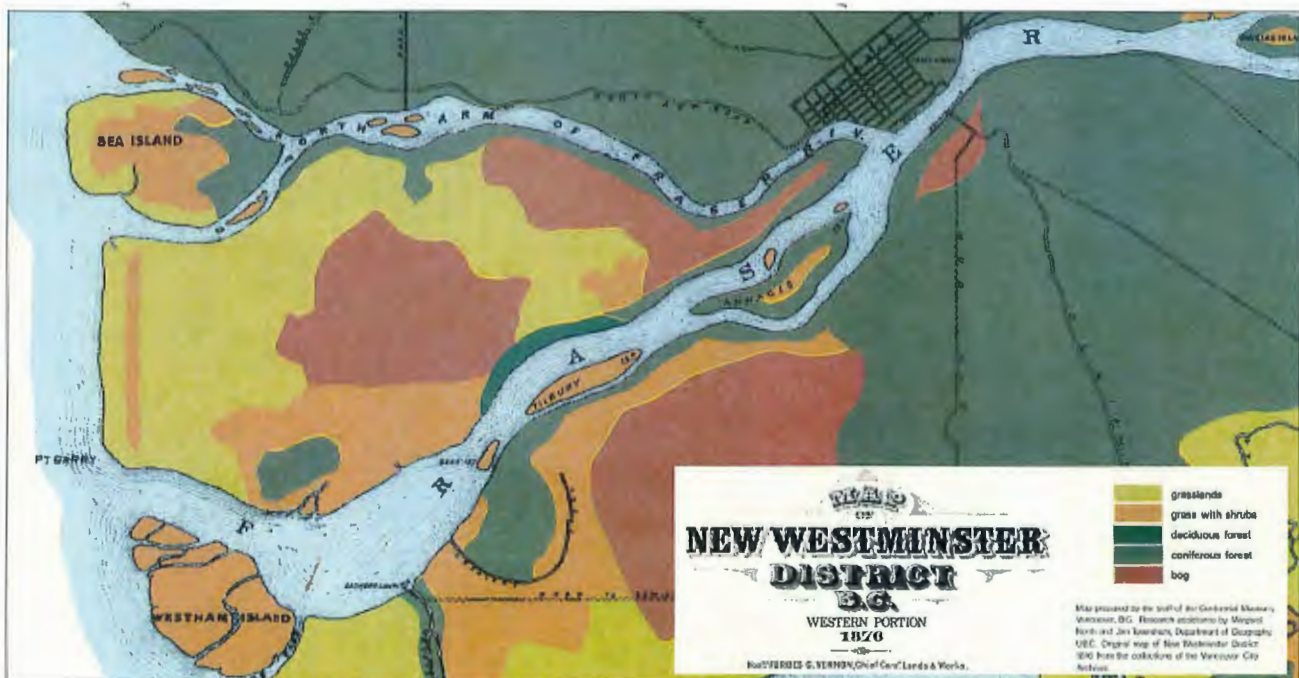
shore pine, Douglas-fir, deodar cedar, paper birch, purple leaf plum, flowering crabapple, flowering cherry, Lombardy poplar, oak, tulip tree, monkey puzzle

1960s:

shore pine, flowering crabapple, tulip tree, purple leaf plum, oak, hawthorn, birch and horsechestnut

Since 2000:

maple, magnolia, cherry plum, oak, apple, dogwood, birch, beech, liquidambar, katsura, western redcedar, pine, spruce and hawthorn



Historically, Richmond was dominated by grassland, shrubland and cranberry bog. Forest ecosystems of western red cedar, hemlock and spruce were limited to isolated patches on Lulu Island and Sea Island.

system are smaller neighbourhood or community parks. Richmond's largest protected natural area is the 80 ha Richmond Nature Park, acquired in the 1970s. Today there are 133 parks that protect 778 ha of open space. Other than the Nature Park, which contains remnant bog ecosystems, most parks contain a mix of native and introduced tree species often in manicured or old farm landscapes.

While most of Richmond's urban forest originates

after the 1950s, there are trees that date back to at least the early 1900s (City of Richmond, 2005). One example is highlighted in the photos below – the image on the left shows Minoru Race Track in 1951 and, on the right, the same site with City Hall today. The tree highlighted and possibly others, appear to have been retained when the area was redeveloped for the new City Hall. This tree has the largest canopy spread of any measured in Richmond today.



Aerial image of Minoru Race Track in 1951 (left) and City Hall in 2018 (right) at the same location with arrow pointing to a tree present then and now – this tree has the largest canopy spread of any in Richmond!



The aerial image above shows Richmond in 1935. Most of the landscape is farmland other than large areas of bog.

2.2 The Value of Richmond's Public Urban Forest: the Many Benefits of Trees

Richmond's trees and green infrastructure, just like roads, sewers and dikes, are performing a public utility function. When healthy and well managed, the urban forest produces 'ecosystem services' often defined in four distinct but inter-connected categories:

- **Cultural:** benefits that relate to how people value the urban forest in our way of life such as for beautification, sense of place, spirituality, recreation and tourism.
- **Provisioning:** direct products of trees and forests, such as fruits, nuts, or medicines.
- **Regulating:** benefits from the regulation of ecosystem processes like pollination, air and water quality, storm water flow, shade and cooling. With climate change, the role of trees to mitigate extreme heat and precipitation becomes increasingly important.

- **Supporting:** benefits from supporting habitat, biodiversity and enabling natural processes to occur that maintain the conditions to support life – supporting services are essential to the production of all other ecosystem services.

Some ecosystems services can be assigned a dollar value. In BC, the Municipal Natural Assets Initiative is piloting valuation approaches with several municipalities. The US Department of Agriculture (USDA) provides the i-Tree suite of tools, which enable valuations of some ecosystem services provided by trees. The Council of Tree and Landscape Appraisers provides methods for valuing tree assets. Valuations enable trees and green infrastructure to be accounted for in a city's asset management approach or when calculating compensation. Not all ecosystem services can be measured with the tools referenced above but new methods for valuing natural assets are likely to become available over the term of this Strategy.

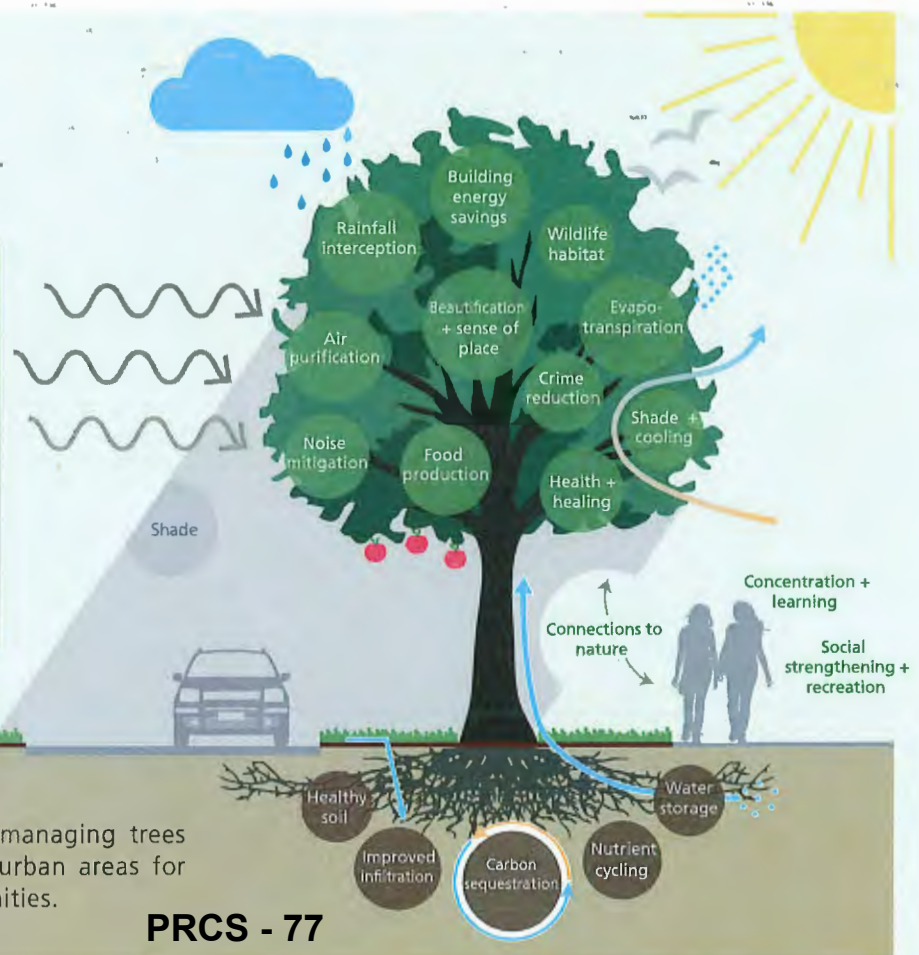
Urban forest benefits

The urban forest is a critical part of Richmond's appeal and livability.

Trees serve to:

- beautify and cool the city
- intercept rainwater
- remove pollutants
- provide habitat for wildlife
- connect people to nature

... among many other benefits.



Urban forestry is...

the art, science and technology of managing trees and natural systems in and around urban areas for the health and well being of communities.



Studies in Japan of *Shinrin-yoku*, or forest-air bathing, have linked the practice to improved immune system response, reduced stress and depression, and lower glucose levels in diabetics (Morita et al. 2007, Ohira et al. 1999)

Street and Park Tree Value

The City has inventoried 56,000 trees and tree groups in streets and parks. However, counts of tree canopies from Light Detection and Ranging (LiDAR) suggest that there are more than 100,000 trees on public land when natural forests are included. The City also manages an estimated 3,000 trees on Richmond School District sites.

Of the City’s tree inventory, about 44,000 single trees have been measured for size and species in streets and parks. Consultants used i-Tree Eco to estimate the value of these trees. The i-Tree Eco program estimates structural value, carbon storage and sequestration, air pollution removal and avoided runoff. The structural value is a modified Council of Tree and Landscape Appraisers (CTLA) method for estimating the cost of replacing an existing tree with a similarly sized tree in the same location. The map below shows the location of inventoried trees in Richmond with the highest structural value.

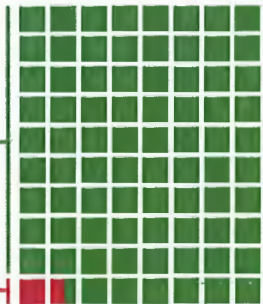
2018 Structural and Functional Value Estimates¹ for Richmond’s Inventoried Trees

BENEFIT	AMOUNT	\$ VALUE
Structural value	44,057 trees	83,000,000
Total carbon storage	11,710 tons	410,000
Annual Pollution removal	4.9 tons	40,600
Annual Carbon sequestration	276.2 tons	9,670
Annual Runoff Avoided	25,130 m ³	58,400
Annual Oxygen Produced	736.6 tons	Not assessed

¹ These values are based on species and dbh in the tree inventory of 44,000 trees. Tonnes are 1,000 kg. Dollar values in i-Tree are carbon @\$35/ton, avoided runoff @ \$2.34/m³, pollution removal - CO @ \$1,486/ton, ozone @ \$6,741, NO₂ @ \$1,006, SO₂ @ \$366/ton and PM2.5@ \$234,081/ton based on adverse health effects and US national median externality costs.

City tree structural value
(replacement cost)
~ \$83 million

Annual management cost
~ 1.5 million



Map of High Value Trees in Richmond

Large-diameter sequoias, elms and maples make up the very high value trees in Richmond. Other high value specimens include oaks, deodar cedar, London plane, pine, Douglas-fir, tulip tree and western redcedar.

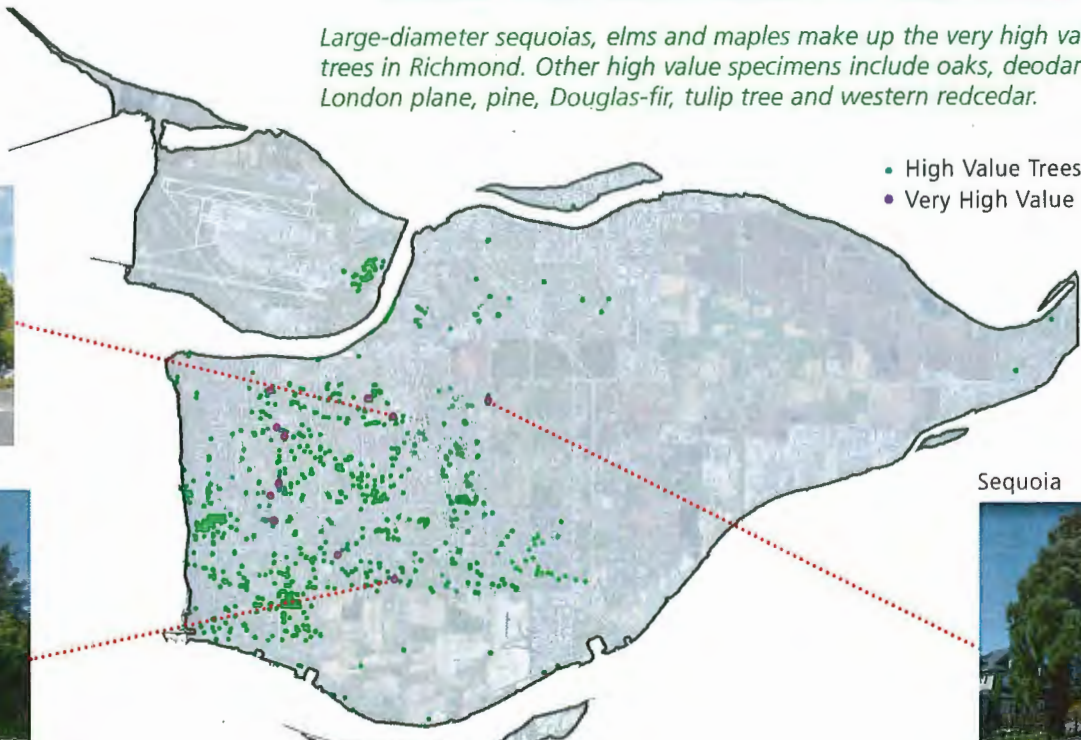
Elm at City Hall
(see page 7 for more information)



Maple



- High Value Trees
- Very High Value Trees



Sequoia



2.3 What We Heard from the Public

In 2017, the public was asked to share their views on Richmond's urban forest through the City's *Let's Talk Richmond* public consultation portal and at Richmond Harvest Fest, a public event held at the Garden City Lands on September 30th, 2017.

A survey asked people to comment on their satisfaction with trees in their local area. A total of 138 people responded.

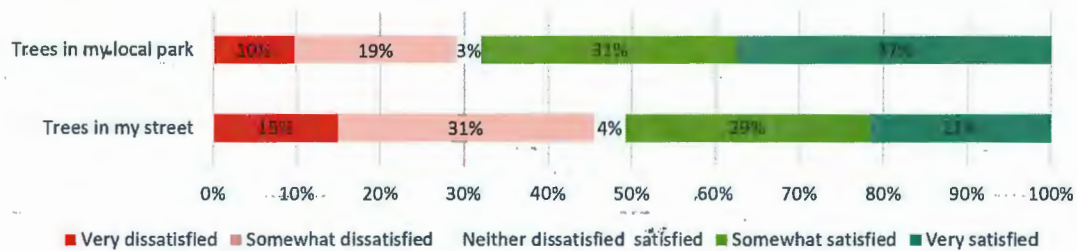
The majority of survey respondents (68%) were satisfied with the trees in their local park. However, respondents were divided on their satisfaction with trees in their street (46% were dissatisfied, and 51% were satisfied; see graph below).

The survey also showed six pictures ranging from low to high canopy cover and with uneven or uniform street tree planting styles. People were asked to indicate which photo was most similar to their street now, and then which photo they would most prefer their street to look like. Some of the survey highlights are listed below.

What respondents streets look like today:

- 45% said uneven street tree planting akin to the diverse group planting style promoted in the 1960s (see page 6).
- 25% said uniform tree planting with small or young trees.
- 20% said they had no trees in their streets.

How satisfied respondents were with the trees in their local area...



What most respondent's streets look like today...



What most respondents would prefer their streets to look like...



What respondents would prefer the trees in their streets to look like:

- 43% said large trees, uniformly planted resulting in very high canopy cover.
- 26% said uneven group tree planting style already common in Richmond.
- 22% said medium trees, uniformly planted.

What respondents most valued about the urban forest:

- Regulating stormwater run-off and mitigating flooding.
- Reducing air pollution.
- Supporting habitat for native plants and animals.
- Heritage and beautification.
- Pleasant places for people to interact and socialize.

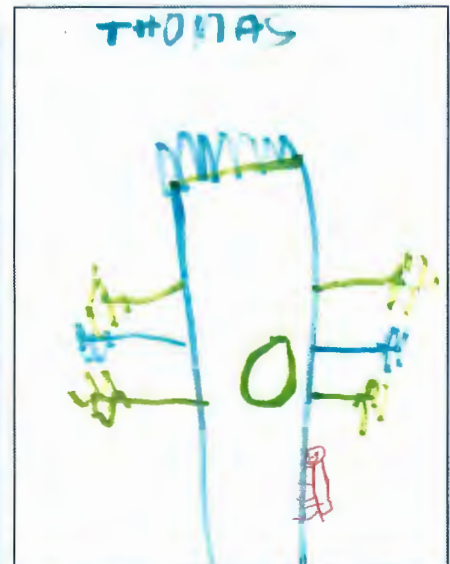
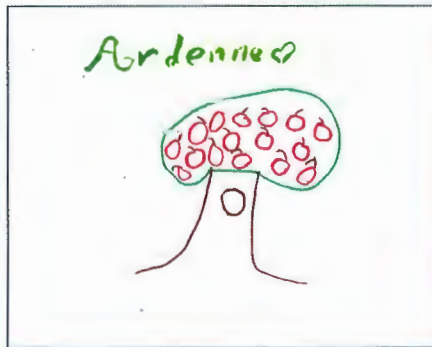
Reasons why respondents were dissatisfied with trees in their streets or parks:

- Recent tree removals or damage to trees.
- Lack of tree cover.
- Utilities conflicts, leaves clogging drains and problems caused by tree roots, such as uneven sidewalks.

Opportunities for improvement raised by respondents:

- Increase canopy cover and uniform large or medium tree planting in streets.
- Reduce conflicts with utilities.
- Improve tree protection and maintenance including managing leaf litter in the fall.
- Increase species diversity but plant native tree species whenever possible.

Kids were asked to draw their favourite tree at Richmond Harvest Fest-2017. Visible themes in the drawings included colour, play, food and wildlife habitat.



3 Status and Trends

This section describes the current state of Richmond's urban forest and how it is changing. Several methods were used to analyze past and present urban forest status including LiDAR, historical aerial photos, vegetation maps, and the City's tree and habitat inventory data.

LiDAR is flown with a laser sensor shooting pulses down to the ground surface to create a 3D model of the ground below. The City collected LiDAR data in August 2017 to measure the extent of Richmond's tree canopy and permeability.

The points can then be classified into different features like trees, buildings, roads, powerlines and so on. Some of the products of the LiDAR used in this section include canopy mapping, impermeable area mapping, and tree heights. LiDAR collected in the future will enable detailed canopy change monitoring. The City will conduct flights every few years to monitor the change.

Example image of a LiDAR point cloud (in three dimensions, showing raw data that will be processed to generate a map of tree canopy.



3.1 Tree Canopy

Tree canopy is a common metric used to describe the extent of a city's urban forest and a tool to monitor its change over time. To visualize it, imagine looking down from an aerial view at the green layer of tree crowns (leaves and branches) below.

City-Wide Tree Canopy

Canopy cover across the city was 12% based on 2017 LiDAR capture. This estimate includes public and private properties, as well as land areas in the Agricultural Land Reserve and Vancouver International Airport.

While there isn't a precise means to estimate Richmond's pre-contact forest cover, historical vegetation mapping suggests that roughly 1,600 ha (~12%) of Richmond supported deciduous-coniferous forest, with additional cover in forested bog areas. The remainder of the approximately 11,200 ha (~88%) of the city supported grass or shrub cover.

The map below summarizes the tree canopy by census dissemination blocks. Canopy cover

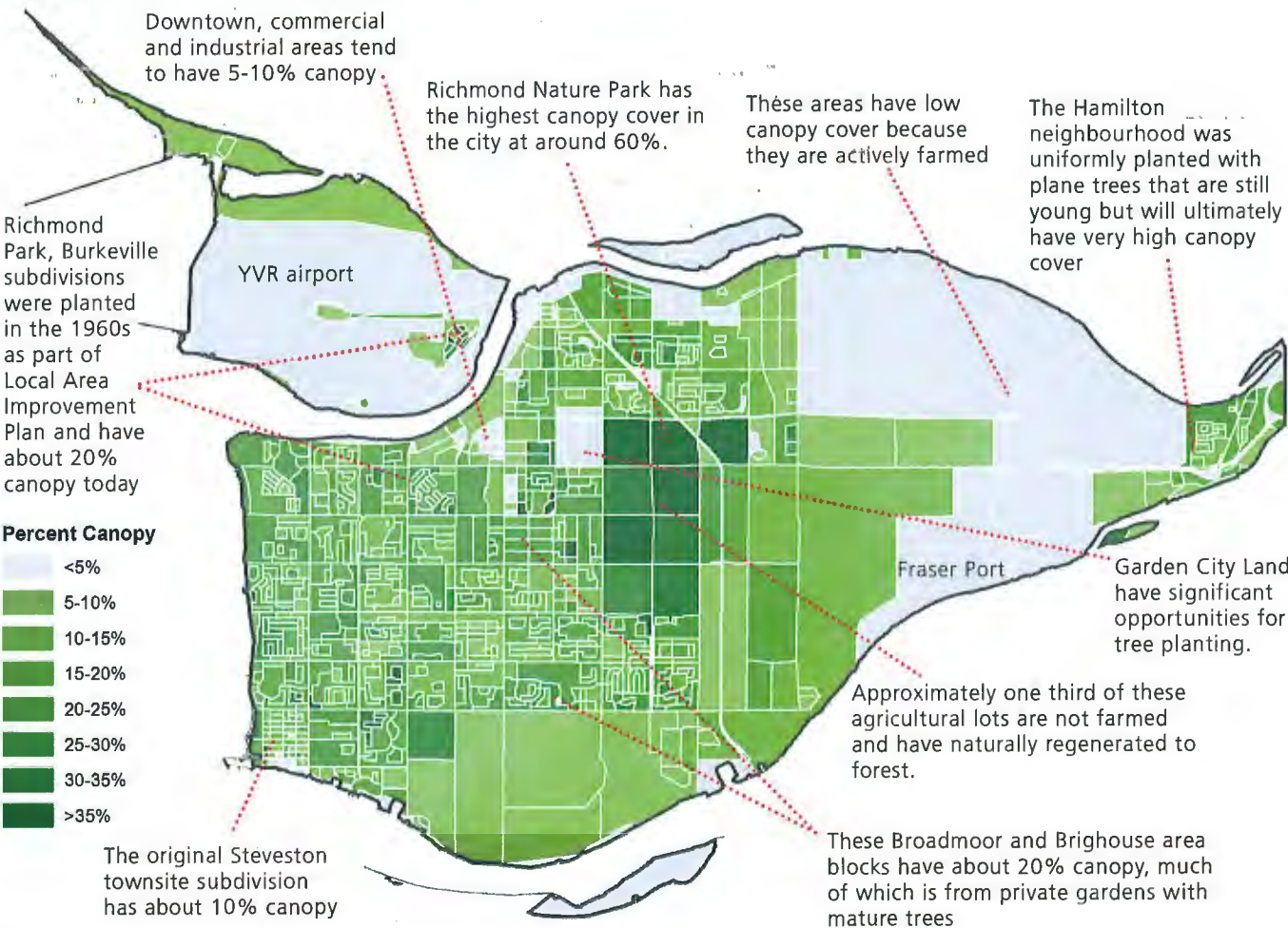
is concentrated in Richmond's residential neighbourhoods, parks, natural areas and fallow farmland that has regenerated to forest.

Public Tree Canopy

Tree canopy over public land averages 20%. Within parks canopy cover is higher, averaging 24%, while on street boulevards canopy cover is lower, averaging 15%.

This Strategy sets a target to increase canopy cover over the **public realm** from 20% to 30% by 2045. This target is aspirational yet realistic in that it aims to plant out two-thirds of the potential sites in the City presently (factoring in that utility conflicts will eliminate up to one third of potential planting sites).

Map of Richmond's City-Wide Tree Canopy



Regional Canopy Change

Changes in canopy cover globally are tracked by University of Maryland scientists using satellite imagery. The Global Forest Cover Change dataset maps forest loss between 2000 and 2017 (Hansen et al. 2013).

While this dataset cannot detect isolated individual tree loss, it is good for showing large-scale changes across the landscape. Province-wide, the area of canopy loss exceeds the area of canopy gain in more than 90% of BC municipalities.

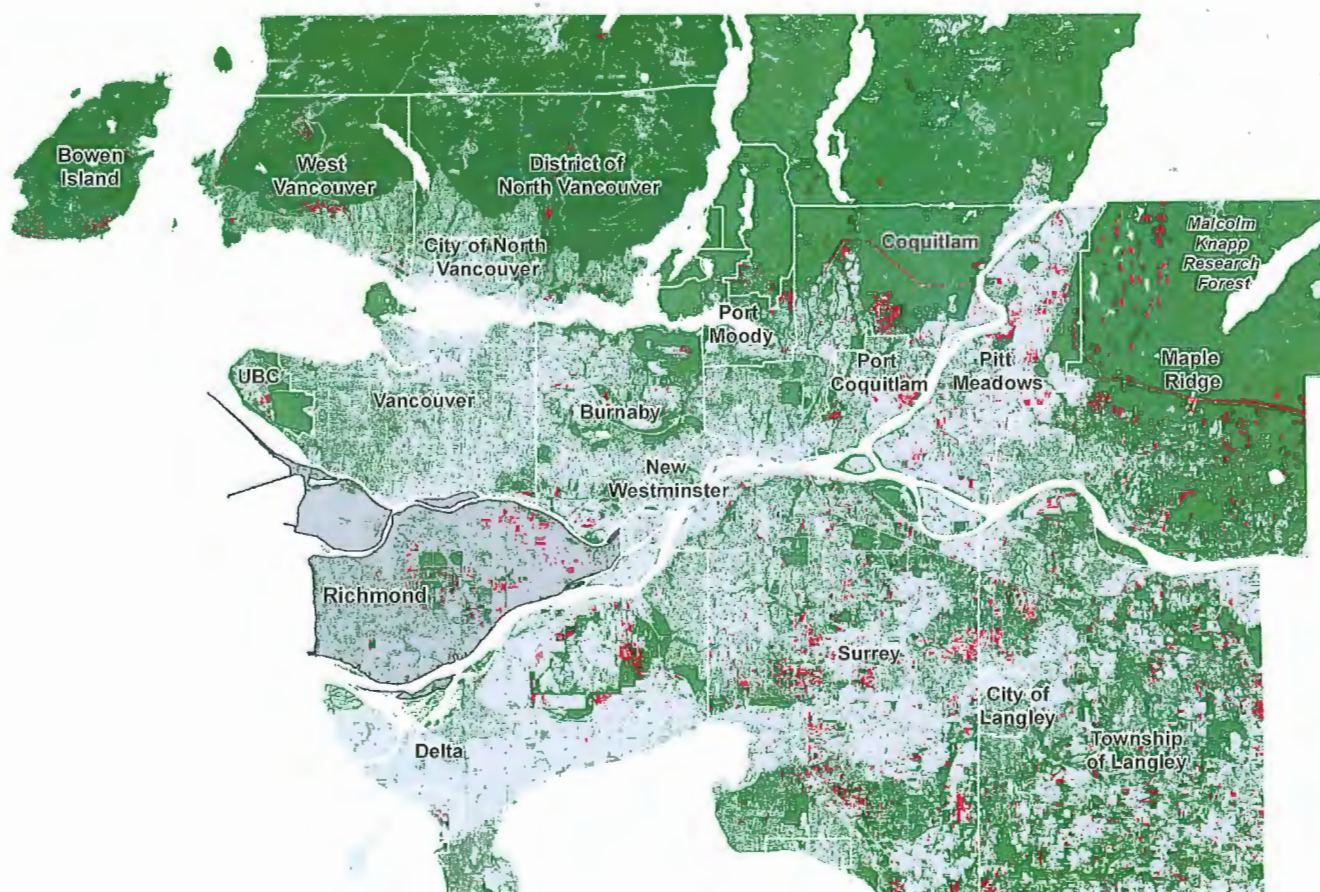
In the map below, the green canopy for the region is sourced from Metro Vancouver's land cover classification data. The red areas showing loss are sourced from the Global Forest Cover Change data.

Richmond's Canopy Change

In Richmond, the areas showing red are mostly associated with agricultural use and cropping changes rather than actual tree loss. While some urban losses are visible – for example commercial and town home developments in City centre – in general the tree canopy has been relatively stable since 2000. Canopy changes not detectable in this dataset are typically planting and removal of individual or small groups of trees. Canopy losses in Richmond have primarily occurred on private land.

In Richmond, large areas are under the jurisdiction of the federal or provincial governments, including YVR Vancouver International Airport and Fraser Port, or are within the Agricultural Land Reserve. While some of these land uses preclude tree planting, the City can work with these agencies and landowners to plant suitable trees on adjacent city roads and properties where possible.

Map of regional canopy and canopy loss



3.2 Richmond's Native Forests and Bogs

Richmond's natural areas today bear little resemblance to vegetation surveyed pre-1880s (see the map on page 17). Agriculture, urbanization, hydrological changes and peat mining have permanently impacted the landscape and altered ecosystems.

The 2002 habitat inventory identified 568 ha of bog and upland forest in Richmond that provides habitat for small mammals and birds such as woodpeckers, great blue heron, red-tailed hawks and barn owls. Approximately 120 ha of this native forest habitat is protected in Richmond's park system and most of the remainder is within the Environmentally Sensitive Areas (ESAs) Development Permit Area that applies to private land.

Present day bog habitats are dominated by paper and European birch or lodgepole pine. Dryland and riparian forest habitats include birch woodlands, black cottonwood and alder forests at the river's edge, and scattered stands of non-native trees like black locust, oak and maple. Understory vegetation

in natural areas typically consists of a mix of native species, like salal, blueberry, ferns, and non-native species such as Himalayan blackberry.

Even though they have been affected by human settlement, Richmond's native forests and other ESAs provide essential habitat for urban biodiversity and critical ecosystem services. Bog habitats store carbon in the underlying organic soils. Native forests provide habitat for native bees and honeybees that pollinate hundreds of hectares of blueberries. Riparian forests help to moderate water temperatures by casting shade over aquatic habitats.

Enhancement and restoration in parks and ESAs are likely to improve the quality of Richmond's native forests over time. However, climate change and urban development will also place pressure on these natural areas and increase the risk of disturbance events like wildfire. The City monitors the health of and changes in natural areas with tools such as LiDAR.



The map below shows vegetation surveyed between 1858 and 1880. The 2002 habitat inventory is overlaid on the map to show the current extent of native vegetation relative to the past.

Richmond's largest remnant habitat areas are currently found along shorelines, in riparian areas, parks and greenways. Smaller habitat patches are found embedded within the matrix of urban and agricultural land uses.

Map of 1880s and 2002 habitats

Map legend

2002 Habitat Inventory

GRASS AND GRASSLIKE PLANTS

br s ct Tidal marsh: bulrush(br), sedge(s), cattails(ct).

g Prairie*: grass(g).

g W hh ca Prairie grass with shrubs: grass(g), willow(W), hardhack(hh), crabapple(ca).

SHRUBS

ca Crabapple(ca).

W Willow(W).

W ca hh r Mixed shrubs: Willow(W), crabapple(ca), hardhack(hh), rose(r).

SHRUBS/MOSS

lt cb P Labrador tea: Labrador tea(lt), cranberry(cb), salal, pine(P).

cb P Cranberry marsh*: cranberry(cb), pine(P).

m P Moss with scrub pine: sphagnum (m), scattered pine (P), hemlock, spruce.

WOODLAND

Cw Mixed Woodland: Cottonwood(Cw), alder, willow, crabapple.

CONIFEROUS FOREST

C H S Mixed wet: Cedar(C), hemlock(H), spruce, alder, [cottonwood], willow, yew, [crabapple], ferns.

S W Spruce: Spruce(S), willow(W), alder, crabapple, vine maple, briars.



3.3 Soils and Permeability

Soil and water are essential for healthy tree growth. In urban areas, soils are often removed and replaced with much smaller amounts of topsoil or paved with impervious surfaces that water cannot pass through. These conditions impact tree health and resilience by restricting the volume of soil for roots to grow in and the amount of water available to trees.

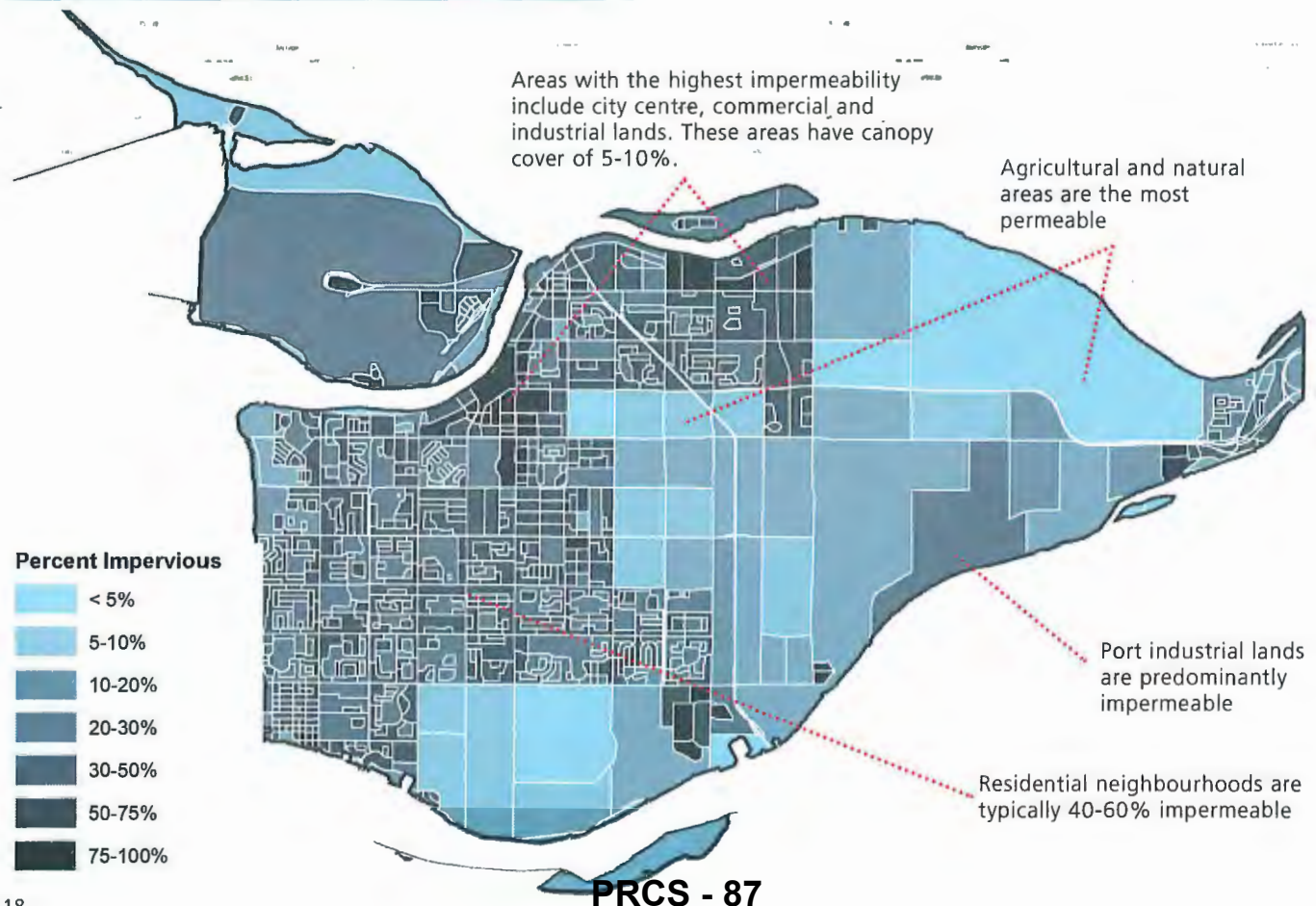
Richmond's native soils are typically silt loam to silty clay loam textures originating from marine and fresh water sediments. Where peat bogs occur, the soils are organic. Richmond also has introduced soils in urban areas. Richmond's soils are poorly drained and have high water tables in most months but drought conditions can occur in summer. Richmond's high water table restricts the depth of rooting for trees and vegetation. This is a unique and challenging situation for tree planting.

The map below summarizes impermeability by city section. Other than on agricultural land, Richmond's urban forest canopy tends to decrease with increasing impermeability. Once impermeability exceeds about 50%, canopy cover becomes more limited.

Urban Tree Planting Challenges

The urban parts of the city have much higher impermeability than agricultural areas because of the coverage of roads and buildings. Impermeability in urban areas is likely to increase as neighbourhoods densify with larger building coverage and parking to accommodate more people. Areas with more buildings, asphalt and concrete surfaces also tend to be hotter because they absorb more heat. To sustain a public urban forest canopy in areas with high impermeability, planting sites need special improvements like structural soil or soil cells that allow for adequate soil and rainwater storage for tree roots under paved areas.

Map of Richmond's impermeable cover



3.4 City Trees: the Urban Forest Today and Tomorrow

This section reports on several metrics useful for describing the status of the City tree population and its future trends. The City recently collected an inventory of its trees on streets and in developed parks (i.e., outside natural areas) so they can be mapped to monitor tree health and assist in scheduled maintenance. More than 56,000 trees have been inventoried and numerous additional tree stands are found in our parks.

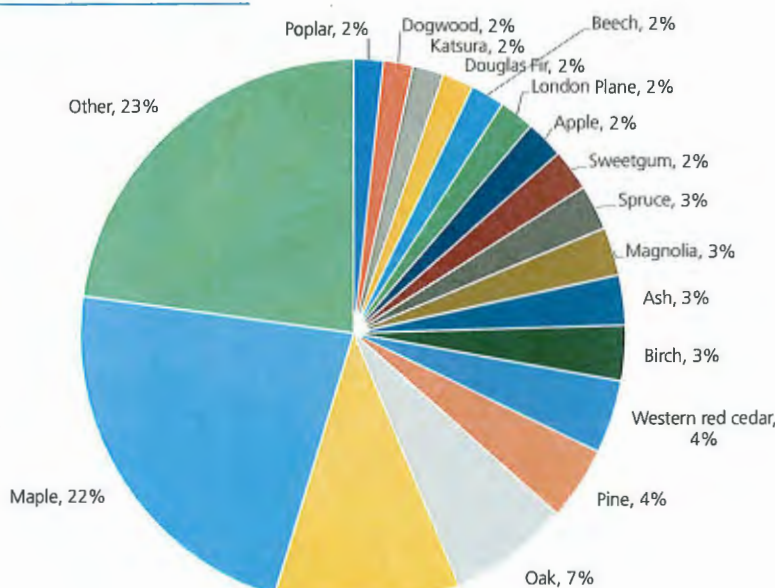
Tree Diversity

The diversity of an urban tree population is a useful indicator of vulnerability. In general, the more homogenous a population is in terms of species or genetic diversity, the more vulnerable it will be to pest and disease attack and impacts of climate change. Similarly, a population that lacks age and life-expectancy diversity will go through cycles of mass removals. When trying to reduce vulnerability and grow a resilient tree population, several types of diversity are important to consider.

Tree type and dominance

The pie graph shows the most common trees planted in Richmond. The 10-20-30 rule-of-thumb recommends that populations have no more than 10% of any species, no more than 20% of any genus and no more than 30% of any family

Richmond's Most Common Street and Park Trees



(Santamour, 1990). However, recent guidelines for a sustainable urban forest suggest that 5-10-15 diversity rule should be targeted city-wide (Leff, 2016). Richmond's tree inventory has a very high proportion of maple (22%) relative to other types of trees, and cherry/plum is also prominent (11%).

To understand which types of trees are dominant in terms of size, the relative *basal area* (cross-sectional area of all the trees stems) and *leaf area* (square metres of leaf surface) are useful measures. The genera that are both common in number and large in size are providing most of the ecosystem services in Richmond's streets and parks (excluding natural areas).

The maple genus is by far the most common and largest contributor to leaf and basal area on public land. Cherry/plum and oak are also large contributors relative to other genera.

With 40% of Richmond's tree population comprised of only three genera (maples, cherry/plum and oak), Richmond's tree canopy is vulnerable to disease or disturbance affecting these trees. **Diversifying the types of trees used in the City is necessary to reduce vulnerability in the tree population and a priority for future tree planting plans.** Diversity can be increased by using alternative species in new planting locations and by strategically replacing species in some locations when trees reach the end of their lives.

Age and size distribution

Age and size diversity are important for maintaining a relatively stable urban forest population over time. Using size as a proxy for age, the 40:30:20:10 guideline (Richards, 1989) recommends a breakdown by tree age class shown on the graphic below.

Richmond has a good proportion of young trees to support future canopy growth. However, there are fewer mature and old trees than are recommended by the guidelines due to Richmond’s young urban forest. The size distribution of the City tree population reflects both the City’s increased planting efforts over the last 20 years and the removal of some older trees due to hazard and development. **Retention of existing large trees on City property should be prioritized whenever possible.**

Genetic and structural diversity

Genetic diversity between individuals is important for adaptation to pests, disease and future climate. While we do not have an easy way to measure genetic diversity among urban trees, we can assume that urban forests are less genetically diverse than native forests because of clonal nursery cultivation. This creates vulnerability if genetically identical individuals are all susceptible to a pest or disease. **Increasing the genetic diversity of nursery stock should be prioritized.**

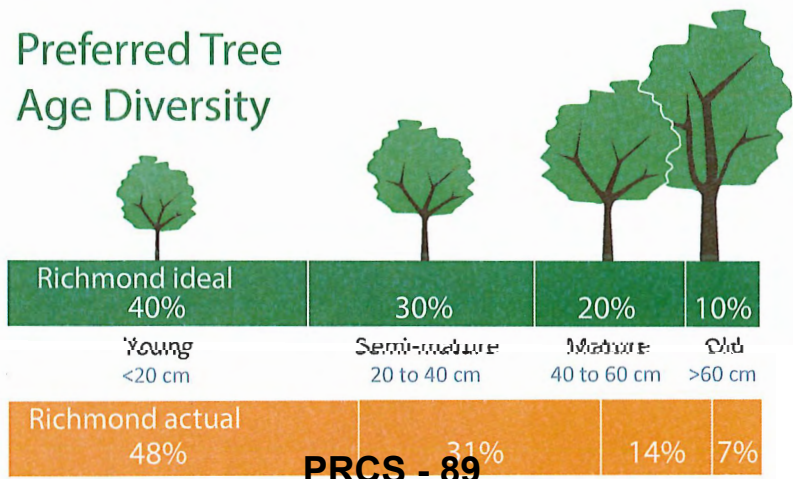
Structural diversity is especially important for habitat and includes having a variety of tree sizes, layers, ages, decay classes, woody debris and understory plants. Most streets and developed parks have low structural diversity compared to native forests. Often risk to people or property means that it is not suitable to have decaying trees, debris or understory in urban areas. **Structural diversity should be enhanced in natural parks or locations where there are few people or targets, to improve the habitat value of an area and ultimately the resilience of Richmond’s biodiversity.**

Tree Health and Planting Rates

Richmond’s public urban forest is generally in good health based on the inventory data collected to date which shows a relatively low incidence of pests and diseases. Birch bronze borer is killing birch across the region and drought is impacting some trees but overall population mortality rates are relatively low.

The most common reasons for removing trees on public land are in response to storm damage, end-of-life decline, disease or conflicts with development such as road widening and upgrades, driveways or new utilities or facilities. **The City removes approximately 300 trees per year and is planting about 850 new and replacement shade trees¹ per year as well as mass plantings for forest restoration in parks.** However, this number can vary substantially from year to year depending on weather events and construction projects.

1 Shade trees are young trees installed at a larger size (e.g., > 3 m height or > 4 cm caliper) and are typically what are planted into streets or landscaped parks. Shade trees tend to account for the largest proportion of City planting and maintenance budgets.



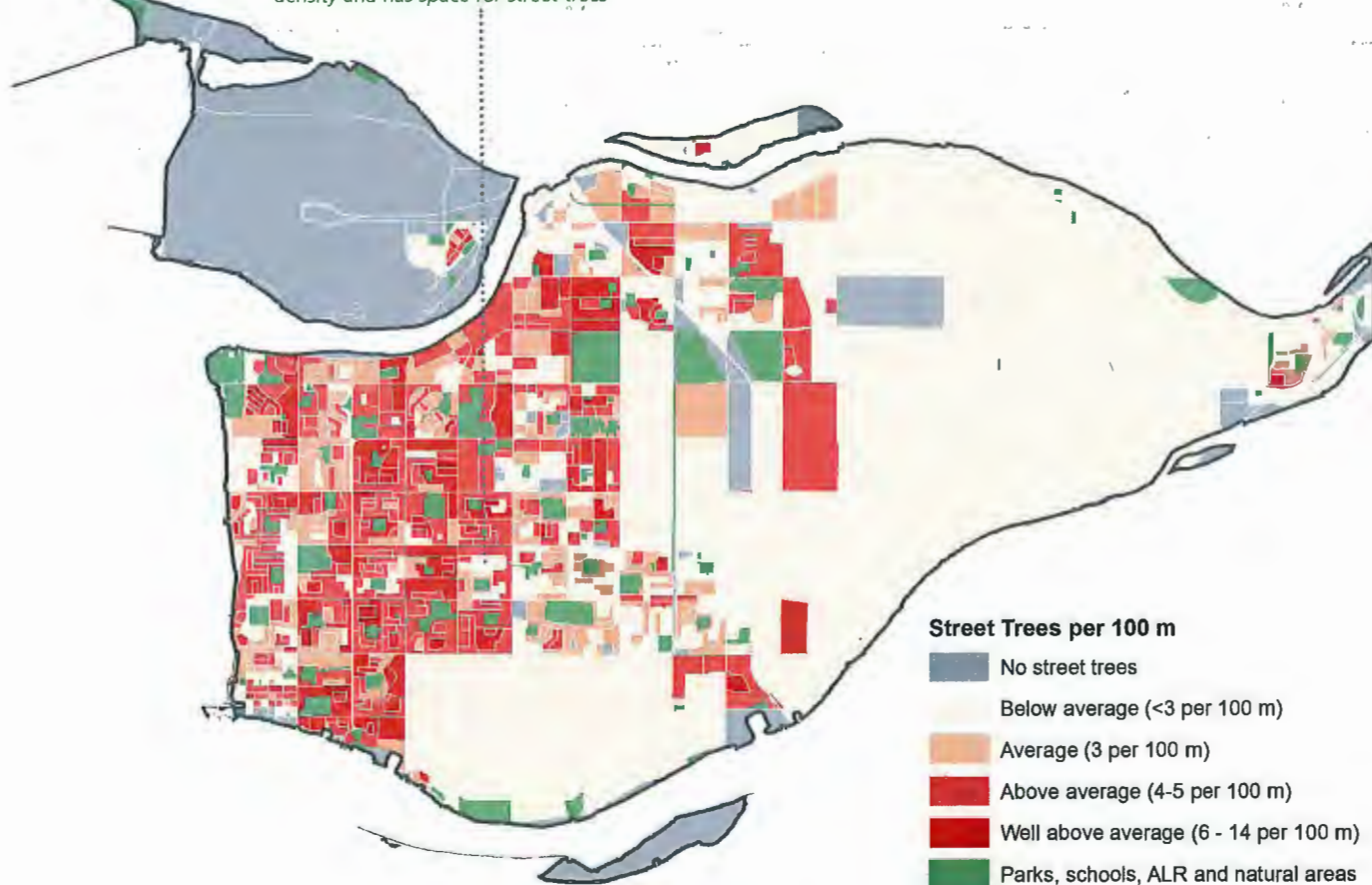
City Tree Distribution

Richmond's 56,000 inventoried trees and uninventoried natural area trees are distributed across streets and parks, and are most abundant in residential rather than agricultural parts of the city.

Map of street tree density by block



This residential block has below average street tree density and has space for street trees



PRCS - 90

Street Tree Density

Richmond has approximately 1 City street tree for every 6 people. In terms of planting density, Richmond's streets are planted at an average density of 3 trees per 100 m, or 19 trees per ha. For comparison, Vancouver has approximately 1 street tree for every 4 people and an average of 6 street trees per 100 m, or 49 street trees per ha.

Street trees (within the City's rights-of-way) are absent in some locations because private landscaping is near the edge of the street and doesn't leave space for a public tree. Roads in agricultural areas often lack sidewalks or defined boulevards for street tree plantings. In other locations, underground services, overhead power and telephone lines, or the extent of impervious surfaces limit the space for planting new trees.

An analysis of planting opportunities found that at least 20,000 new trees could be planted in streets, which would increase median tree density to 30 trees per hectare. Residential streets present a significant opportunity to increase the City's public urban forest canopy.

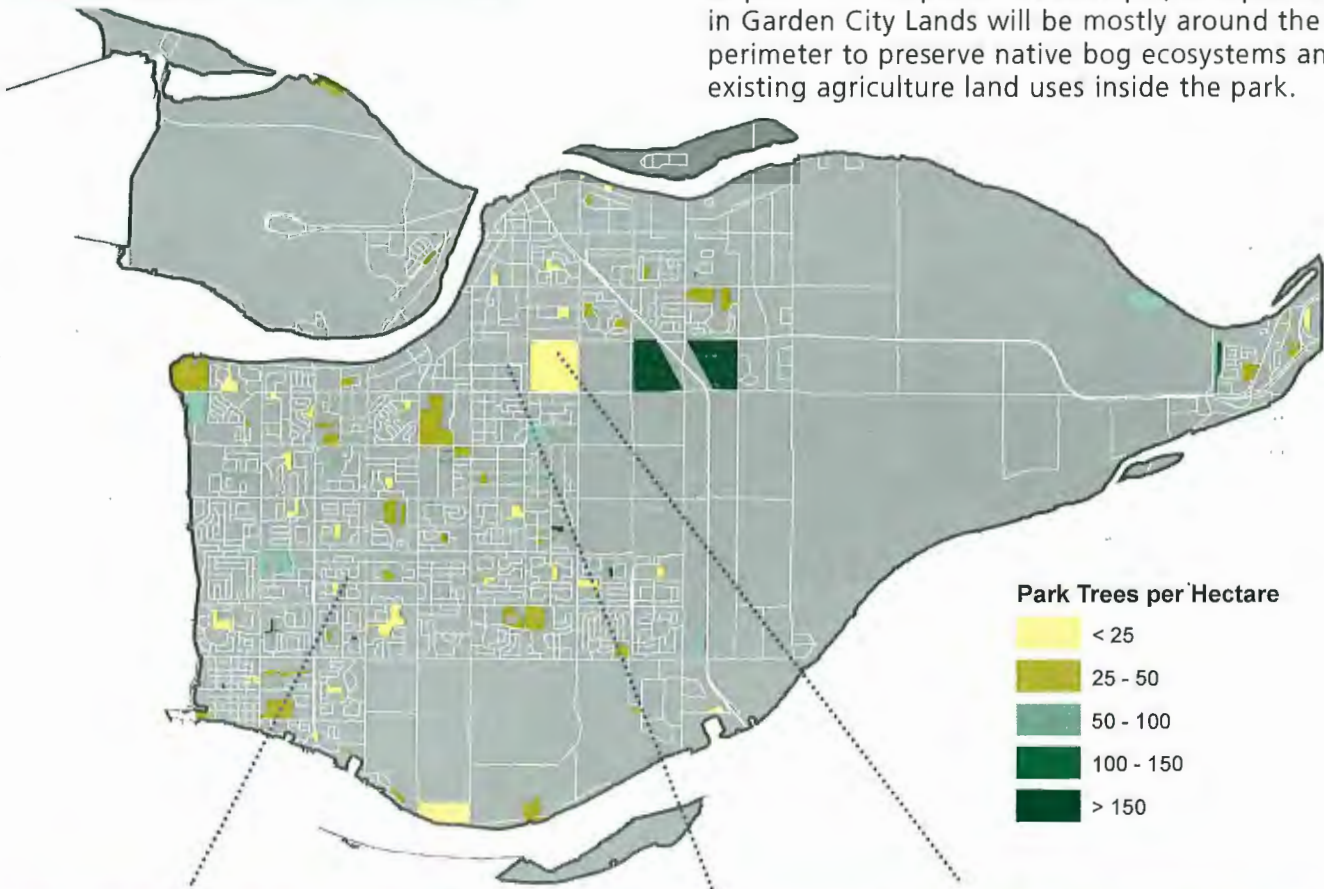
Park Tree Density

Tree density in parks is largely determined by park use. For example, parks with extensive sports fields support a relatively low density of trees. By contrast, natural area parks often have very high tree density.

Park tree density is highest in Richmond Nature Park, and lowest in the Garden City Lands.

It is recommended that City parks with available open space be considered for tree planting as a high priority. Across all parks, the median tree density is 37 trees per hectare. Most Richmond parks have space for additional trees. An analysis of planting opportunities found that at least 10,000 new shade trees could be planted in parks, which would increase median tree density to 55 trees per hectare. Planting in parks will help to move canopy cover from 20% towards the 30% target for Richmond's public realm. Other park uses will need to be considered as part of these plans. For example, tree planting in Garden City Lands will be mostly around the perimeter to preserve native bog ecosystems and existing agriculture land uses inside the park.

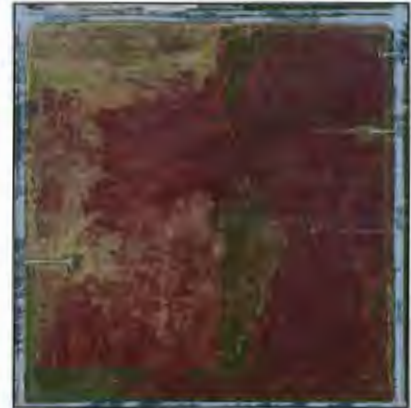
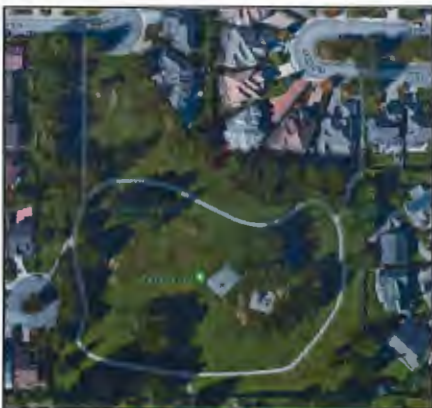
Map of number of trees by park



The median tree density in parks is 37 trees/ha

Richmond Nature Park is almost entirely forested

Garden City Lands has very few trees



City Planting Opportunities

Richmond's plantable spots have been estimated by identifying the permeable spaces on public land that could potentially support shade trees.

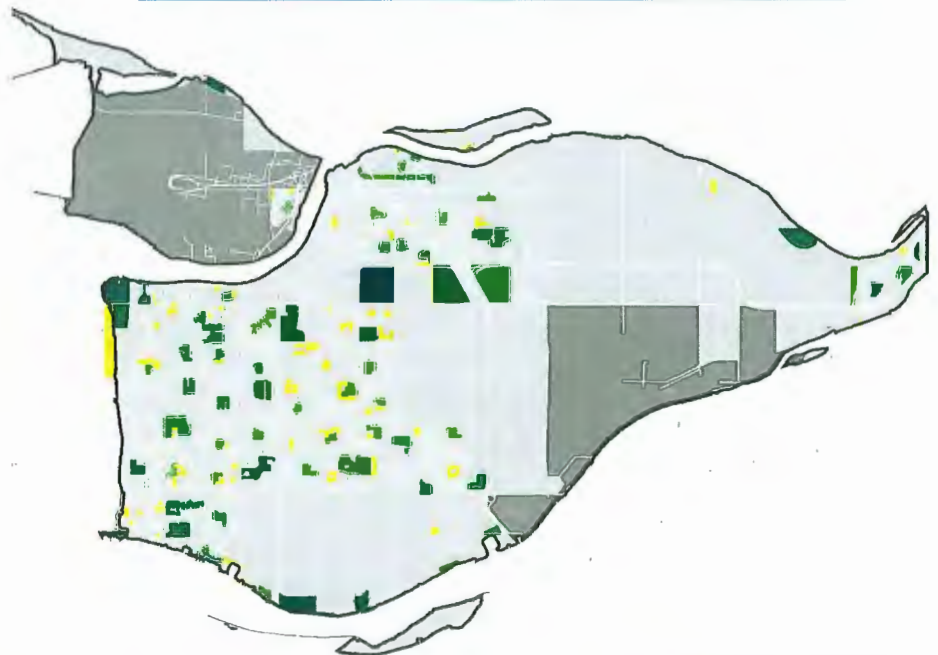
Roads have approximately 20,000 potential shade tree planting spots. The map below shows where these opportunities are concentrated in the roads around each block. Many opportunities are on the public right-of-way attached to private residential landscapes.

This analysis does not account for utility conflicts. It is expected that further analysis of constraints will reduce the total opportunities by up to one-third, therefore the annual planting target aims to plant out approximately 20,000 of

these sites over the next 25 years. As well, forest restoration or new parkland planting may provide mass planting opportunities that have not been captured by this analysis.

In parks and schools, approximately 10,000 potential shade tree planting spots have been identified outside active uses (e.g., sports fields). The map below shows the number of opportunities in each park.

Map of tree planting opportunities by park



Map of street tree planting opportunities





4 The Future of the Public Urban Forest

This section covers the challenges and opportunities that will shape the future of Richmond's public trees, and describes how the City's management practices can be adapted in response.

4.1 Climate Change and Forest Health

Climate change projections for the Metro Vancouver Region predict an average annual temperature increase of 3°C in the 2080s (Metro Vancouver, 2016). As climate changes, the management of Richmond's public trees will have to be altered and adapt to the new reality.

Several conditions important for future tree growth are presented in the table below. The values reported are averages for Metro Vancouver but are similar for Richmond, which has lower average precipitation and warmer average temperatures than other parts of the region.

Climate variable	Past (1971 - 2000)	2080s projected* (2071 - 2100)
Extreme maximum temperature	30°C	37°C
Duration of dry spells	21 days	29 days
Summer precipitation	206 mm	147 mm
Frost days	79 days	17 days
Growing season length	252 days	331 days

* Projected change is based on modelling for Metro Vancouver using the Intergovernmental Panel on Climate Change's Representative Concentration Pathway 8.5 scenario (RCP8.5), which assumes there is no coordinated effort to reduce global greenhouse gas emissions by the end of this century (or "Business as Usual"). In producing its Climate Action Plan, Richmond used RCP2.6, which assumes global greenhouse gas emissions will peak by 2020 and decline thereafter.

What does this mean for Richmond's trees?

Based on work completed to assess the risk and vulnerability of the region's urban forest (Metro Vancouver, 2017), Richmond's urban forest is likely to experience:

1. Reduced growth and increased mortality due to...

- Reduced water availability and increased length of drought in summer.
- Waterlogging of soils and localized freshwater flooding within City parks in fall, winter and spring.
- Longer wildfire seasons and an increased frequency and duration of wildfires.
- More hot days that exceed species specific growth optimums.
- More frequent and severe pest outbreaks and variety of pests.
- Ongoing windstorms and severe weather events.

2. Increasing diversity of species tolerant of Metro Vancouver's climate due to...

- Longer growing season, milder winters and fewer damaging frosts.

Most tree species that occur in Richmond today are expected to be able to persist in a changing climate. However, climate change will place more stress on trees.

How can we adapt trees in Richmond's urban areas?

Richmond's urban forest will be less vulnerable to climate change if the following recommendations are implemented:

- Plant species well suited to both site and future climate, and trial new species.
- Provide planting sites that maximize permeability, soil volume and quality.
- Provide adequate water to young trees and, where possible, irrigation of street trees adjacent to new development sites.
- Promote strong branch structure by pruning trees when young and regularly throughout their lives.
- Protect public trees from the impacts of construction activities.
- Mitigate impacts to and from private utilities and civic infrastructure.
- Monitor and adapt management to changes in urban trees, natural forests and peat bogs.

Implementing these adaptation measures will create more resilient urban forest population. A healthy urban forest will complement the City's adaptation efforts by providing cooling refuges, absorbing rainwater and preventing erosion, reducing air pollution, buffering severe wind and sequestering carbon.

Low vulnerability

- Right species and right place
- Adequate, good quality soil volume
- High permeability
- Adequate young tree care and proactive pruning
- Tree protection



High vulnerability

- Wrong species or wrong place
- Above and below ground conflicts
- Low soil volume or compacted soil
- Low permeability
- Inadequate maintenance
- Inadequate tree protection

Tree graphic from Metro Vancouver's Urban Forest Climate Adaptation Framework (Metro Vancouver, 2017)

4.2 Parks and the Ecological Network

Parks and Open Space

Development and management of Richmond's park and open space system is guided by the 2022 Parks and Open Space Strategy (POSS). This Strategy can support POSS outcomes by:

- Managing a high value and resilient urban forest in parks to maximize ecosystem services.
- Connecting the City's green network to create a healthy and resilient city-scape.
- Protecting and enhancing soils, trees and green infrastructure to improve the City's sustainability.
- Diversifying and transforming the management of resources.

In turn, parks and open spaces play an important role for implementing this Strategy by providing space to plant more trees, room to grow large trees, and provide a more stable environment for trees to reach maturity. Parks also provide more opportunities for habitat and biodiversity where shrubby understories, downed wood and snags, and mostly native species can be supported. In natural areas ecosystem processes like nutrient cycling, windthrow and vegetation succession can often be left to occur with limited management

intervention.

Ecological Network

Ecologically valuable areas in Richmond have been defined as part of the Ecological Network (EN). This includes larger areas such as Richmond Nature Park, Terra Nova Rural Park, Sturgeon Bank, South Arm Islands, and smaller areas such as parks, school yards, fields and meadows. These areas support habitat for birds, insects and wildlife, including migratory shorebirds and waterfowl, and salmon.

This system of natural areas, as well as developed parks and greenways and green infrastructure, are the basis of the Ecological Network (EN). The connectivity of each area is a key success factor to creating a healthy and viable corridor for habitat health and vitality.

The protection and enhancement of the EN enriches the health and livability of Richmond and provides access to nature within increasingly urban neighbourhoods. The EN also plays an important role in increasing Richmond's resilience to climate change by providing ecosystem services like flood mitigation, carbon storage, supporting biodiversity and enabling natural processes to occur. Along with mature trees, understory plants and soils



The components of the EN are defined below and on the map as:

Hubs: natural areas greater than 10 hectares. Capable of supporting entire and diverse populations of animals and plants associated with ecological functions.

Sites: smaller, non-linear areas of natural ecosystems providing "stepping stones" as connections between hubs.

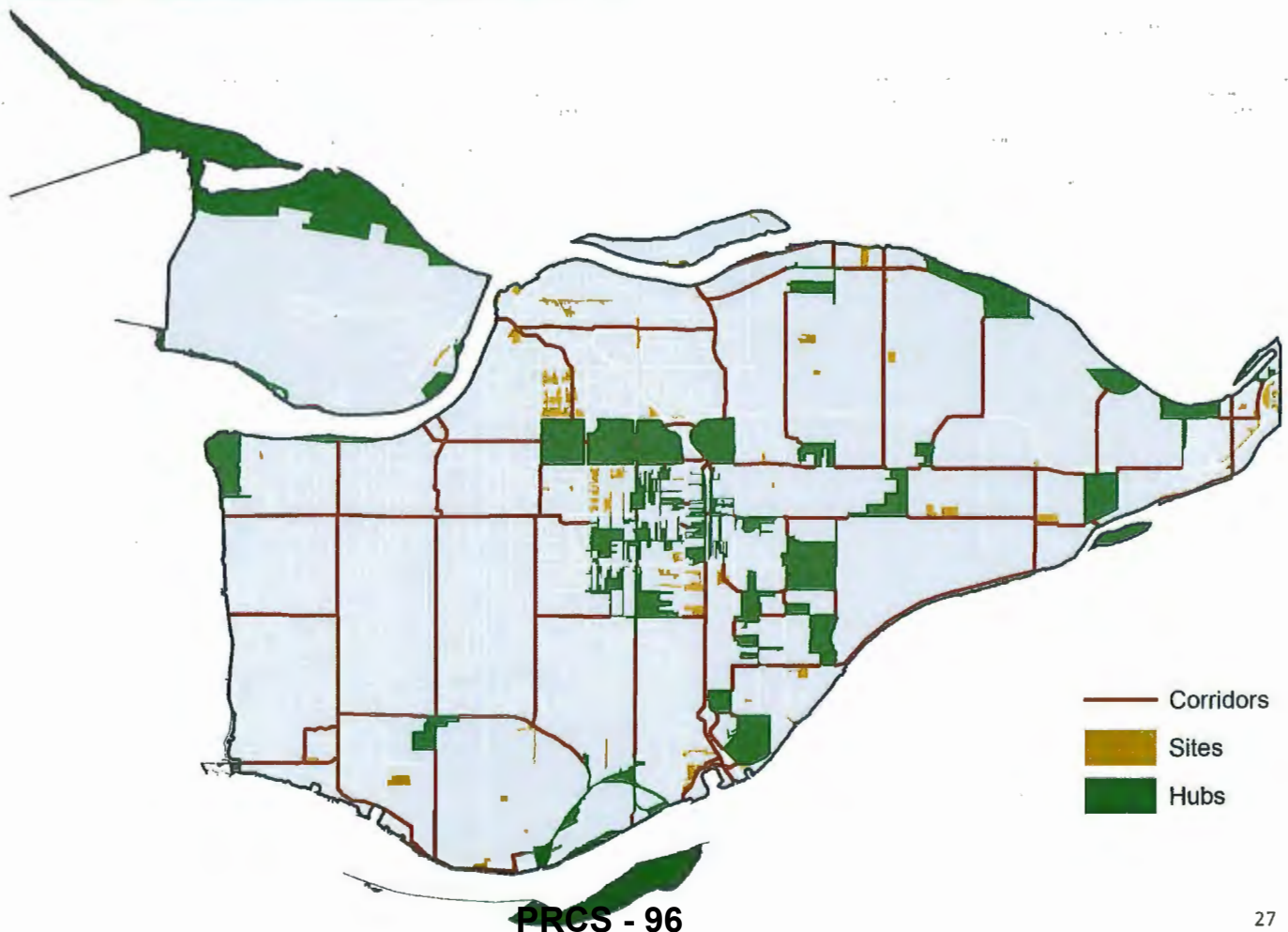
Corridors: linkages that facilitate movement of species, water, nutrients and energy between hubs and sites. Urban forest canopies add to the connectivity of corridors.

Additionally, Riparian Management Areas (RMA) are a critical component of Richmond's Ecological Network. These sites are often located in setback areas straddling both public and private land in and around watercourses, where trees form a major portion of the structure of valuable habitats.

The urban forest occurs in and around the Ecological Network, and the Public Tree Management Strategy can integrate the goals and objectives of the Ecological Network on public land by:

- Increasing tree cover along corridors and buffering the edges of hubs, sites and City-owned lands generally to enhance ecological connectivity and habitat.
- Increasing the use of green infrastructure on boulevards in developing and redeveloping neighbourhoods to reduce runoff, improve water quality, and encourage the use of native plants.
- Retaining and enhancing tree cover and vegetation.
- Retaining and enhancing permeability and soils for water filtration and storage.
- Encouraging restoration and enhancement of vegetation and wildlife habitat and features.
- Enabling urban forest stewardship initiatives.

Map of Ecological Network Components



4.3 Integrated Rainwater Management and Flood Protection

Lulu Island, being relatively flat and on average one metre above sea level, relies on dikes to prevent flooding. Runoff is managed by either draining water with gravity or pumping it out during high tides. Richmond's drainage system has been carefully engineered and includes channelized watercourses, sloughs and ditches. The dike system prevents flooding during high water levels and will be upgraded to adapt to projected sea-level rise. Three key documents guide the management of stormwater and flood protection in Richmond:

1. The Flood Protection Management Strategy.
2. Dike Master Plans.
3. The Integrated Rainwater Resource Management Strategy.

Flood Protection Management Strategy

Under the City's Flood Plain Designation and Protection Bylaw, construction grades are raised to protect habitable space from flooding. Grade changes often have adverse impacts on existing tree health as a result of construction impacts and changed groundwater behavior. Planning for public tree planting must also avoid, where possible, locations subject to future grade changes.

Dike Master Plans

Council adopted Dike Master Plan Phases 1, 2, 3 and 5. The City is currently developing Dike Master Plan Phase 4. Trees are not recommended for planting within the dikes structure, as they

compromise the structural integrity of the dike and restrict access for maintenance. The Strategy acknowledges that some trees will likely need to be removed for dike upgrades and that trees will not be planted within the dike structure. Any tree removals associated with dike upgrade projects will be replaced elsewhere in the city.

Integrated Rainwater Management

Richmond's Integrated Rainwater Resource Management Strategy (IRRMS) is focused on minimizing the negative impacts of future development on drainage infrastructure and ecological health, reducing potable water use, addressing sedimentation issues, and supporting the City's Ecological Network. The IRRMS goals and strategies are closely aligned with those of the Public Tree Management Strategy in that they address habitat quality, impervious surfaces and enhancement of green infrastructure to increase ecosystem services and rainwater infiltration.

This Strategy can complement implementation of the IRRMS goals and strategies by:

- Encouraging rainwater harvesting and reuse as alternatives to potable water use for irrigation of trees and vegetated landscapes.
- Selecting trees with drought tolerance traits.
- Prioritizing tree planting and forest restoration within the Ecological Network.
- Encouraging use of green infrastructure for rainwater management on public lands.



4.4 City Trees Operations

City trees need management to maintain a healthy and safe urban forest that benefits the community. Operational costs are higher in the first few years of a tree's life and decrease as trees mature. Costs increase again when trees become stressed or over-mature. As illustrated in the graphic below, maximizing tree health and life expectancy is important for two main reasons:

1. The longer a tree stays healthy in the landscape, the less often the City incurs the high costs of removal and replanting.
2. Ecosystem services benefits grow as trees mature. The longer a tree lives, the longer it produces maximum benefits.

Maximizing both the establishment success of young trees and the healthy life-span of mature trees is the best way to delay removal and replanting.

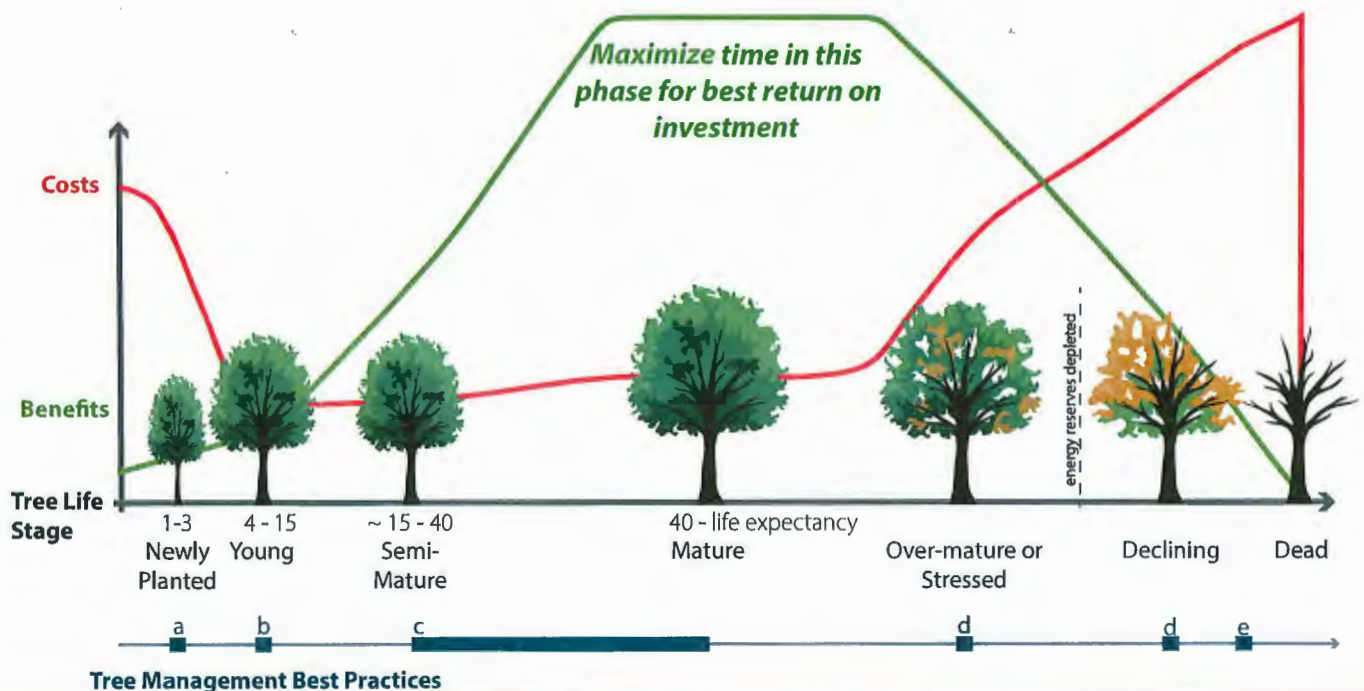
Richmond has developed a City Tree Policy and Public Tree Operations Manual (PTOM) to establish the standards, practices and processes the City uses to manage public trees under Community Services - Parks jurisdiction.

The policy and PTOM address:

- Planning and design for tree planting.
- Planting including soil volume and technical standards for planting.
- Maintenance and plant health care.
- Inventory and risk management.
- Succession planning and removal management.

This Strategy, the policy and PTOM provide the guidance to shift the City's tree management from the current program of demand driven management towards a planned, preventative approach that will improve the life expectancy of and benefits from City trees.

Magnitude of Life Cycle Costs per Tree for Maintenance Activities



a. Planting and young tree watering

b. Young tree pruning

c. Proactive inspection and pruning cycle

d. Tree health and risk management treatments

e. Removal & stump grinding

Planting the Future Urban Forest

The City has been planting an average of 850 public shade trees per year in addition to hundreds of smaller trees planted in parks for forest restoration. These trees are a combination of new and replacement street and park trees planted by City crews and through development activities or stewardship volunteers. Funding sources for tree planting include City capital budgets, Tree Compensation Fund, and grants. Presently, the rate of planting exceeds the rate of removals.

An analysis of potential planting areas on public land has identified approximately 30,000 individual sites for shade tree planting. Further analysis is needed to filter out locations with constraints such as utilities and land use plans and it is likely the total sites will be fewer.

New planting sites are also created with developments when parks or streetscapes are upgraded, new parks are built, or when areas are retrofitted with green infrastructure to manage rainwater.

By setting a target to plant **850 new trees per year**, in addition to replacement trees and restoration plantings in parks, public canopy cover should increase from 20% to 30% by 2045. Based on present tree removal numbers, the planting program (City and developer planted trees) would require a net increase of approximately 300 trees

per year above current levels; this figure may vary with removal rates. The canopy forecast assumes that Richmond's canopy area will grow by 1.5% (7 hectares) each year on public land to reach the target by 2045. This canopy increase is forecasted from both the growth of existing trees as well as from planned new plantings and the replacement of every tree lost.

Planting out all available sites is one of the main ways Richmond can maximize ecosystem services from the urban forest. To ensure that new tree plantings are successful, the City will:

- Plant the right tree in the right place.
- Plant from a diversity of species using high quality planting stock.
- Consider the suitability of species and stock to future climate in all planting decisions. This may include altering the balance of native tree species composition or sourcing seed from warmer, drier climates.
- Provide good soil, growing conditions and water for young trees.
- Partner with and educate residents and community groups to plant and care for young trees.



City Tree Planting Prioritization

Richmond's data on canopy cover, street tree density and population density was used to prioritize blocks where public tree planting is a priority. Areas in and around 'Ecological Network' are a priority for planting to meet the objectives of the Ecological Network Strategy regardless of low, moderate or high priority ratings defined below. In these areas, the focus will be on native plant species and connecting green spaces to enhance habitat.

Areas that rated as 'Low' priority are census blocks with any one of:

- Fewer than 10 people per hectare.
- More than 6 street trees per 100 metres.
- Canopy cover greater than 30%.

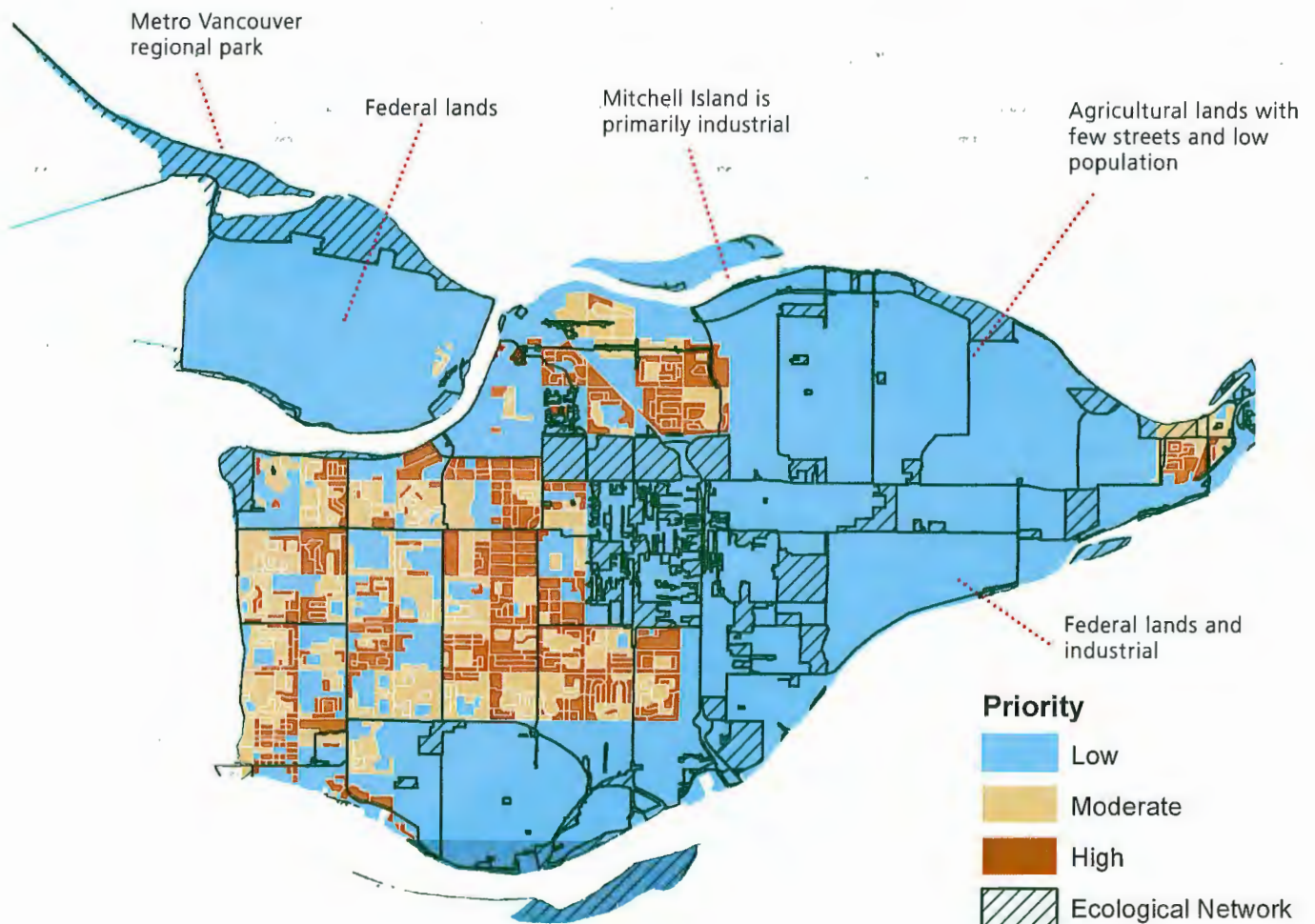
Areas that rated as 'Moderate' priority are census blocks with:

- Fewer than 100 people per hectare.
- Fewer than 6 street trees per 100 metres.
- Canopy cover less than or equal to 30%.

Areas that rated as 'High' priority are census blocks with:

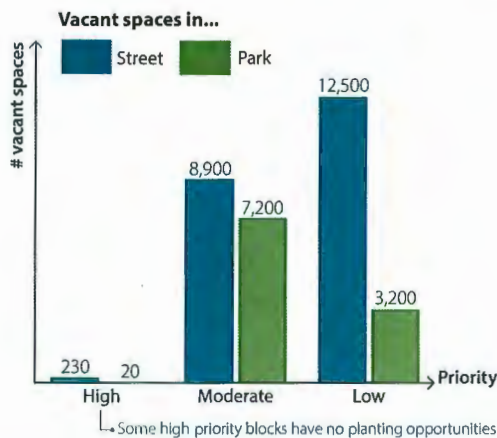
- More than 100 people per hectare.
- Fewer than 6 street trees per 100 metres.
- Canopy cover less than or equal to 30%.

Map of Priority Planting Areas



PRCS - 100

In total, approximately 30,000 potential public planting opportunities have been identified:



Creating New Planting Opportunities

The graphic at right illustrates "typical", "ideal", and "engineered" planting scenarios. Many high priority areas have high impermeability because of extensively paved sidewalks and roadways. Increasing canopy cover in these locations will require the creation of "engineered" planting sites using innovative approaches such as structural soil or soil cells. As planting technologies and best practices evolve, the City will look to test and implement new methods to grow more trees successfully in these challenging urban environments.

In Metro Vancouver's climate, it is recommended that between 0.3 and 0.6 cubic metres of soil be provided for every 1 square metre of tree canopy, though this can be reduced when multiple trees share the same volume or when sites are irrigated.

Supporting New Tree Plantings under Servicing Agreements

When trees are planted on public property as part of development Servicing Agreements, they are maintained by the Agreement holder for the first year. The City ensures trees are planted per applicable landscape best management practices, with approved soil volumes, and with irrigation systems connected to private water connections. Upon completion of the maintenance period, City staff again inspect the trees and any dead or deficient trees are replaced prior to final acceptance by the City. Once accepted as a new city asset, the trees are inventoried into the City's geographic information system and then maintained by the

City. Irrigation systems remain the maintenance responsibility of the landowner.



"TYPICAL" | INADEQUATE SOIL VOLUME



"IDEAL" | ADEQUATE OPEN SOIL VOLUME



"ENGINEERED" | OPEN VOLUME + STRUCTURAL / CONSTRUCTED SOIL VOLUME

Streetscape soil volume illustration from Metro Vancouver's Urban Forest Climate Adaptation Framework (Metro Vancouver, 2017)

Maintenance

Maintenance needs differ for trees throughout their life-cycle (see page 30 for a graphic summary):

- Young trees need water to establish their root systems and structural pruning to set up good branch structure.
- Once trees reach 15 years of age, they can move onto a preventative pruning cycle that involves periodic inspection and pruning when required. Trees stay on this pruning cycle as long as they are healthy and safe.
- As they near the end of their lives, or become stressed for other reasons, trees need more intensive care until they return to health or the decision is made to remove them.

Demand versus Preventative Model

Richmond's urban forest currently is managed primarily on a demand basis. This means trees are maintained as they come to the attention of staff through service requests initiated primarily by residents or staff that identify issues.

Recognizing that preventative maintenance would be a more sustainable and financially responsible approach, the City is beginning to transition its operations to a scheduled pruning cycle. Each year, City crews will work through a section of Richmond inspecting trees and pruning (when needed). Each full cycle will take five years to complete for streets and about ten years in parks. That means every inventoried public tree will be visited by City crews in that period. As well, some high-use areas will be inspected more frequently.

A demand system will still operate alongside so that crews can respond to emergency pruning or tree health issues as they arise (for example, storm damage or tree failure).

The transition to preventative maintenance will initially increase the cost of the City's urban forest operations. However, once the first cycle is complete, the frequency of demand pruning requests is expected to drop.

With climate change, tasks related to drought and pest management are expected to become a larger operational cost. Presently, City trees are in good health and few trees require watering once established except during extreme drought. Several pests, such as Asian Longhorn Beetle, Japanese Beetle (currently quarantined in Vancouver), Gypsy Moth and Emerald Ash Borer are potential threats to Richmond's forest; however, none of these pests have yet been detected in the City.

Priorities for maintaining a healthy and resilient tree resource are to:

- Transition to preventative maintenance including a block pruning cycle and young tree pruning to promote good structure at maturity.
- Water young trees until they are established (at least the first three years after planting).
- Monitor plant pest threats.



Tree Protection and Removal

Trees are civic assets, just like roads, sidewalks and sewers. As such the City conserves and protects its trees to the greatest extent possible. City tree protection and removal are regulated by Tree Protection Bylaw No. 8057, the Public Parks and School Grounds Regulation Bylaw No. 8771 and are further guided by the City Tree Policy. Staff, as authorized and guided by these policies and bylaws, must make a decision to protect or remove a City tree whenever development or City works are planned in their vicinity. Tree removal should be viewed as a last resort.

Priorities for improving tree protection and providing staff with the tools to make transparent decisions about removals are to:

- Implement the Council adopted City Tree Policy to guide protection and removal decisions and processes.
- Quantify and share the value of trees according to their appraised amenity value, role in carbon sequestration, stormwater capture and water quality improvement and providing building energy savings.
- Improve referral procedures, information sharing systems and tree protection standards internally so that City trees and potential conflicts are consistently identified and managed.

Inventory

Currently, the City inventories the trees it maintains to record the species, size, location, condition and work history of City trees. It is an essential tool for all aspects of urban forest operations but particularly for enabling preventative maintenance and monitoring health and risks. The inventory will be continuously updated and improved over the course of the pruning cycle by City crews using geospatial-enabled mobile technology. Inventory methods will be updated as technology evolves. To further inform urban forest operations, the inventory will be used to:

- Monitor mortality and failure rates to identify problem planting sites, health issues or species to avoid.
- Monitor tree condition to inform succession planning for tree replacement.
- Track progress towards meeting Strategy targets.
- Communicate tree locations, benefits and health information internally and externally.



Inspection and Risk Management

Inspections are used to identify and assess the health and condition of City trees. Inspection programs are one way to mitigate risk by ensuring the trees are providing maximum enjoyment and safety to the City and residents. Inspections are also a way for the City to identify appropriate pruning requirements, tree health and where, a risk is suspected or identified, the additional actions to investigate, monitor and/or mitigate risk. Tree removal is considered only as a 'last resort' to risk management; arboricultural best practices will be implemented first before outright removal is considered.

City trees will now be inspected in coordination with the pruning cycle. Inspections will be done by staff qualified to conduct Tree Risk Assessments. The appropriate allocation of resources for staffing and training will be required to support this enhanced risk management approach.

Typical risks from City trees include limb or tree failures and root damage. Damage to private property or individuals could result in increased costs to the City. A preventative maintenance program is expected to reduce the City's exposure to claims. Priorities to reduce risk exposure are to:

- Inspect trees periodically in coordination with the pruning cycle.
- Inspect and assess a tree when a service request is received.
- Document inspection procedures to support the City Tree Policy.
- Document actions to investigate, monitor and/or mitigate risk.



4.5 Community Stewardship

Community stewardship supports urban forest management in Richmond's parks and enables residents to learn about the urban forest and its value. Occasionally, public trees are intentionally or accidentally harmed by people. Stewardship programs help to educate the public about the important role trees play and how to properly care for them. Richmond runs urban forestry volunteer stewardship, community outreach and public education through Parks Programs.

Volunteer stewardship is focused on engaging individuals and groups in specific activities such as tree planting and invasive plant removal, as well as forming partnerships for managing specific areas. For example, Paulik Park is maintained in partnership with the Richmond Garden Club.

Community outreach programs include Adopt-a-Tree, which allows groups to take ownership of a planting program to beautify a public space. The City identifies the locations, develops the planting plan and provides the plant materials, equipment, tools and Parks staff support to plant the trees and assist in their care.

Public education involves sharing information about the urban forest, its benefits and how to care for it in a manner which engages and empowers volunteers with little to no training in tree care.

These programs extend the work of urban forest operations to provide both environmental and social benefits to the community. Priorities for community stewardship are to:

- Share information and data about the urban forest's critical role in community health and wellness.
- Educate the public to avoid activities that harm trees.
- Educate the public about how to properly care for trees and partner in stewardship activities.
- Support people to connect with nature through urban forest stewardship.

Stewardship programs also serve to communicate the importance of preserving trees on private properties, particularly mature trees and trees located in Environmentally Sensitive Areas.





5 Strategy Objectives and Action Plan

In Chapter 1, the four strategic framework goals were defined as:

1 Conserve and Protect

2 Manage and Maintain

3 Enhance and Expand

4 Educate and Engage

The following section details the targets and actions under each of these goals and outlines a phased 5-Year Implementation Plan (see page 44).

The Action Plan defines the actions for growing an urban forest that is beautiful, resilient and sustainable and is supported by the community for the benefits it provides. The 5-Year Implementation Plan outlines how implementation will move forward.

Parks Services will align its annual work plans with the 5-Year Implementation Plan. The Action Plan and Implementation Plan will be regularly reviewed and revised as required to respond to performance reporting and the resources available in the Capital and Operating budgets.

5.1 Conserve and Protect

TARGET: 30% of City trees have a trunk diameter greater than 40 cm by 2045.

Objective A. The urban forest is valued as an integral part of the City's civic asset infrastructure	Time-frame
Action A.1: Implement a Council adopted City Tree Policy to guide City tree protection, removal, replacement and maintenance decisions.	2019
Action A.2: Prepare an analysis of the impact of the shift of public tree management practices on the Operating and Capital Budgets.	2020
Action A.3: Quantify and track the value of the services provided by the public urban forest as it grows including appraised amenity value, carbon sequestration, stormwater capture and water quality improvement and building energy savings.	2022
Action A.4: Review the processes and resources required for tree preservation and protection.	Ongoing
Action A.5: Share the City Tree Inventory on the City's internal mapping system and publicly on the Richmond Interactive Map.	2021
Objective B. City tree conservation and protection is prioritized and implemented on all City and urban development projects	Time-frame
Action B.1: Regularly update the Public Tree Operations Manual to define the process and standards that apply when City trees are affected by City capital and development related activities.	Ongoing
Action B.2: Annually review compensation and replacement rates for public trees impacted by development.	Ongoing
Action B.3: Review the administration of the tree protection process to improve customer service.	2021
Action B.4: Explore options to increase enforcement or inspection capacity for protection of City trees.	2021
Action B.5: Coordinate the review of the Tree Protection Bylaw in relation to public tree protection with other City departments.	2020
Action B.6: Explore the potential to apply conservation covenants in cases where a high value City tree or stand is being protected at the rezoning or subdivision stage so that ongoing protection is tied to the property title.	2021
Action B.7: Continually review the City Supplementary Specifications and Detail Drawings to reflect best practices for tree planting and tree protection, including critical root zones.	Ongoing
Action B.8: Manage trees in the Ecological Network as a key element of the forest ecosystem.	Ongoing
Action B.9: Consider the creation of a Heritage Tree Program in collaboration with the Province.	Ongoing

5.2 Manage and Maintain

TARGET: Tree mortality is maintained below 3.5% for City trees less than 10 cm diameter and maintenance practices maximize the healthy life-span of mature trees.

Objective C. All inventoried City trees are managed within a preventative maintenance program	Time-frame
Action C.1: Develop a best practices tree pruning and preventative maintenance program on a 5 year pruning cycle.	2020
Action C.2: Develop a 5-year staffing, equipment and budget plan to enable the transition from demand to preventative maintenance.	2020
Action C.3: Develop parameters and a rating system for evaluating and prioritizing demand maintenance and removal requests.	2020
Action C.4: Quantify data on past tree failures and risk claims and develop a tree maintenance response plan for problem species or locations.	2020
Objective D. City tree care and maintenance operations are based on ISA Best Management Practices, ANSI Standards to ensure continuous improvement	Time-frame
Action D.1: Maintain regular Parks Urban Forestry staff training, participation in industry workshops and conferences, and industry standard certifications.	Ongoing
Action D.2: Regularly update the Public Tree Operations Manual and implement the practices identified.	Ongoing
Action D.3: Continuously review and update urban forestry procedures, practices and standards to ensure they meet current industry standards.	Ongoing
Action D.4: Maintain the City's tree inventory simultaneously with the pruning cycle.	Ongoing
Objective E. City tree care and maintenance operations are continuously adapted to climate change	Time-frame
Action E.1: Review the City's young tree watering program in response to the impacts of climate change.	2020
Action E.2: Monitor mortality and failure rates to identify problem planting sites, insufficient watering or species prone to failure.	Ongoing
Action E.3: Monitor forested natural areas for vegetation decline and loss of ecosystem functions.	Ongoing
Action E.4: Continuously adjust storm response practices and monitor species prone to breakage and failure	Ongoing
Action E.5: Continuously update integrated pest management practices and monitor pest activity.	Ongoing
Action E.6: Maintain contact with the Canadian Food Inspection Agency's Plant Pest Surveillance Unit to obtain or exchange current information on plant pest threats.	Ongoing

Objective F. City tree risk is managed to maintain public safety	Time-frame
Action F.1: Map and rank locations and risk management factors throughout the City and establish a risk inspection frequency.	Ongoing
Action F.2: Continue to follow ISA Tree Risk Assessment criteria for evaluating and prioritizing tree risk assessment and response.	Ongoing
Action F.3: Work together with Engineering and Public Works to define tree planting standards and develop a standard approach for managing trees growing adjacent to the dike system, in Riparian Management Areas, Environmentally Sensitive Areas, and drainage watercourses.	Ongoing



5.3 Enhance and Expand

TARGET: Increase canopy cover over the public realm from 20% to 30% by 2045.

Objective G. Public urban forest canopy cover increases to enhance community & ecological health benefits	Time-frame
Action G.1: Develop more comprehensive public streetscape/urban realm tree planting standards incorporating municipal best practices and targets for soil volume, tree spacing, permeability and utility conflicts and update these in the City Supplementary Specifications detail drawings.	2021
Action G.2: Develop a Public Realm Planting Master Plan to guide species selection, set local diversity targets, planting character and planting schedules.	2021
Action G.3: Strive to plant 850 new trees per year (in addition to replacement trees and restoration plantings) in parks and streets, focusing on moderate and high priority areas. Target no single genus exceeding 10% of the city-wide population (excluding native trees).	Ongoing
Action G.4: Develop design strategies to allow for and to expand groves of trees and expanding plantable sites in the urban realm through planning and urban design.	2021
Action G.5: Explore options to improve the quality and survival of developer-planted trees through a review of tree planting and maintenance practices.	Ongoing
Action G.6: Review inspection and enforcement process for developer planted trees.	2020
Action G.7: Quantify the public urban forest's stormwater storage capacity to help implement the Integrated Rainwater Resource Management Strategy.	Ongoing
Action G.8: Collect aerial thermal and LiDAR imagery every 5 years to monitor ongoing change of the urban forest canopy.	2023
Objective H. Standards for City tree planting infrastructure and species selection are continuously adapted to climate change and urban development.	Time-frame
Action H.1: Continuously update species lists and selection criteria for future climate resilience and site suitability.	Ongoing
Action H.2: Continuously update practices and standards for tree planting infrastructure (e.g., tree pits, soil trenches, soil cells, structural soil etc.) and soil volumes.	Ongoing
Action H.3: Explore opportunities to work with the nursery industry to source tree species that are expected to be resilient to future climate.	2022
Action H.4: Undertake a review of Gilbert Road nursery operations and optimize its potential as a source for City tree planting projects.	2022

5.4 Educate and Engage

TARGET: Engage 1,000 people per year on the role and value of the Richmond's public urban forest.

Objective I. The City regularly updates the public about the urban forest's critical role in community health and wellness	Time-frame
Action I.1: Produce and distribute information illustrating tree benefits and explaining the urban forest's role in improving community health and wellness.	2020
Action I.2: Create an interactive City tree map linked to the City's tree inventory that reports individual tree data and ecosystem services.	2021
Action I.3: Promote greater awareness of the Public Urban Forest Policy and the Tree Protection Bylaw.	Ongoing
Objective J. Activities that are detrimental to City trees are minimized	Time-frame
Action J.1: Produce and distribute information:	2021
<ul style="list-style-type: none"> Defining activities that harm trees. Explaining alternative practices where relevant to avoid harming trees. On how to report vandalism or damage to trees. 	
Action J.2: Encourage behavioural change among individuals or groups that have caused harm to City trees through targeted education or participation in damage restoration.	Ongoing
Objective K. Stewardship opportunities are provided to connect people with the urban forest	Time-frame
Action K.1: Provide stewardship opportunities such as tree or understory planting, invasive species removal and citizen science projects for the public.	Ongoing
Action K.2: Create new opportunities to partner with residents to water newly planted trees in City boulevards.	2021
Action K.3: Produce and distribute information on:	2020
<ul style="list-style-type: none"> tree watering instructions in times of drought. how to properly care for private trees. how to identify and report City trees in need of care. 	
Objective L. Increase awareness of best management practices for tree protection and retention across all City departments	Time-frame
Action L.1: Provide City Engineering and Public Works Operations staff on the best management practices for working around trees.	2020
Action L.2: Create a quick reference guide for the requirements and standards for arborist reports, tree protection and construction practices when working near City trees.	2020
Action L.3: Engage with other municipalities and senior levels of government to share effective urban forestry best management practices and tree preservation efforts.	Ongoing

5.5 Measuring Success

Regular monitoring and evaluation will be conducted to ensure that the Public Tree Management Strategy is meeting these goals, objectives and targets. Monitoring will inform updates to the Public Tree Management Strategy and Action Plan.

Beginning in 2020, the Parks Division will collect the appropriate data for performance reporting to:

- Measure progress towards targets.
- Track changes in budgets and resource allocation.
- Evaluate the effectiveness of programs.
- Monitor progress on priority actions.

Performance reporting will be conducted every five years. The benefits of continually measuring results are improved performance, enhanced accountability, greater cost effectiveness and increased innovation.

5.6 Next Steps

Trees managed by the City's Parks Department are located on public land but are part of the larger, city-wide urban forest. A significant portion of the City's forest is located on private land. Management of trees on private land is the responsibility of individual land owners and is regulated through the administration of bylaws and policies.

There are numerous opportunities and challenges to ensuring trees located on private property are preserved. Parks is committed to working in concert with relevant City departments to support a systematic implementation of policy and regulatory updates to encourage the overall health of the City's urban forest.

The City will look at broad, City-wide tree management policies and procedures to consider how to better serve the public with more efficient services regarding trees on both the public realm and private property. This would include the following suggested reviews and new initiatives, including:

- Development of a City-wide Urban Forest Management Strategy (to consider trees in the public and private realms).
- Considering updates to the relevant sections of the Official Community Plan (e.g., Development Permit Guidelines and tree canopy targets for public open space).
- Developing city-wide urban forest canopy coverage targets.
- Considering the creation of a customer service focused "one-stop shop" approach to tree related issues.
- Increase community engagement opportunities to instill a stewardship ethic in Richmond residents to protect and expand the public urban forest.



5.7 Five-Year Implementation Plan

Goal	2019 / 2020	2021	2022	2023	2024
CONSERVE AND PROTECT					
Objective A. The urban forest is valued as an integral part of the City's civic asset infrastructure	A.1				
	A.2				
			A.3		
			A.4		
		A.5			
Objective B. City tree conservation and protection is prioritized and implemented on all City and urban development projects			B.1		
			B.2		
		B.3			
		B.4			
	B.5				
		B.6			
			B.7		
			B.8		
			B.9		
MANAGE AND MAINTAIN					
Objective C. All inventoried City trees are managed within a preventative maintenance program	C.1*				
	C.2				
	C.3				
	C.4				
Objective D. City tree care and maintenance operations are based on ISA Best Management Practices, ANSI Standards to ensure continuous improvement			D.1		
			D.2		
			D.3		
			D.4		
Objective E. City tree care and maintenance operations are continuously adapted to climate change	E.1*				
			E.2		
			E.3		
			E.4		
			E.5		
			E.6		
Objective F. City tree risk is managed to maintain public safety			F.1		
			F.2		
			F.3		
ENHANCE AND EXPAND					
Objective G. Public urban forest canopy cover increases to enhance community & ecological health benefits		G.1			
		G.2*			
			G.3*		
		G.4			
			G.5		
	G.6				
Objective H. Standards for City tree planting infrastructure and species selection are continuously adapted to climate change and urban development.			G.7		
				G.8*	
			H.1		
			H.2		
			H.3		
			H.4*		
EDUCATE AND ENGAGE					
Objective I. The City regularly updates the public about the urban forest's critical role in community health and wellness	I.1*				
		I.2*			
Objective J. Activities that are detrimental to City trees are minimized			I.3		
		J.1*			
Objective K. Stewardship opportunities are provided to connect people with the urban forest		J.2			
			K.1*		
Objective L. Increase awareness of best management practices for tree protection and retention across all City departments	K.3*				
	L.1				
	L.2				
			L.3		

* Recommendation with budget implication. Resourcing implications are not reflected in this table but staffing increases for planting and maintenance are anticipated.

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Appendix A: Public Survey



City of
Richmond

City of Richmond Urban Forest Management Strategy Survey

Parks Department
6911 No. 3 Road, Richmond, BC V6Y 2C1

The City of Richmond is developing an Urban Forest Management Strategy (UFMS). Trees and forests provide important benefits for our community's health and well-being. The Strategy will give us the vision for what our urban forest will be and will set out principles and targets to make our vision a reality.

Please complete and return this survey to the City of Richmond by **Sunday, November 12, 2017**.

What is an Urban Forest Management Strategy?

An Urban Forest Management Strategy guides how we protect and manage trees on public and private land in urban areas. The Strategy will provide the vision for what our future urban forest will be and a framework for how to get there.

Why do we need an Urban Forest Management Strategy?

The strategy will provide City of Richmond public, City Council and staff with a better understanding of the urban forest and what needs to be done to ensure a healthy urban forest legacy for future generations. Recommendations in the strategy will guide staff in decisions on budgeting and prioritization of urban forest work including tree protection, maintenance and inventory programs, street, park and native tree planting and stewardship.

We want to hear from you

This survey will take about 15 minutes to complete. It will be available in paper form and online at LetsTalkRichmond.ca until Sunday, November 12 at 11:59 p.m. The survey results will be used to help guide the vision, objectives and targets for the future management of trees and natural systems that make up the City's urban forest.

DEFINITIONS

Urban Forest: The urban forest includes all of the trees, vegetation, soil and associated natural processes found across our city's landscape - on both public and private lands including parks, schools, streets, parking lots, back yards, and apartment complex grounds.

Canopy Cover: One way to understand the extent of the urban forest is to measure the urban tree canopy; envision the layer of leaves, branches and tree stems when viewed looking down from above.

Urban Forest Management: The art, science and technology of managing trees and natural systems in and around urban areas for the health and well-being of communities.

URBAN FORESTRY SURVEY

1. I am a Richmond resident:

☐

Yes

☐

No – thank you for your interest.

2. I think it is most important for the urban forest to:

Tick only one box in each row.

		Least Important			Most Important	
		1	2	3	4	5
A	Support habitat for native (local) plants and animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	Regulate storm water run-off and improve flood protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C	Reduce air pollution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D	Buffer wind	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E	Sequester and store carbon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F	Reduce noise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G	Regulate temperature by shading and cooling streets and buildings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H	Provide a place for heritage trees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I	Beautify Richmond	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J	Provide pleasant spaces for people to interact and socialize	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K	Attract tourists to improve the local economy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L	Provide spaces that reflect Richmond's cultural diversity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M	Provide spaces of spiritual or exceptional personal meaning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N	Increase property prices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
O	Provide spaces for people to play sports or do other recreational activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P	Contribute to Richmond's identity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q	Produce food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. I am satisfied with the number, condition and size of:

Tick only one box in each row.

		Very dissatisfied			Very satisfied	
		1	2	3	4	5
A	Trees in my street	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	Trees in my local park	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain why you selected the ratings above.

For questions 4 and 5, please consider the following photos:



A. Few or no trees



B. Regularly spaced small trees



C. Unevenly spaced, variously sized trees



D. Regularly spaced, medium trees



E. Regularly spaced, large trees

4. Looking at the photos above, my street is most similar to: _____

5. Looking at the photos above, I would like my street to look like: _____

6. In the last year, I have:
Please check all that apply:

A	Watered trees	<input type="checkbox"/>
B	Planted a tree on private property	<input type="checkbox"/>
C	Pruned a tree on private property	
D	Assisted a family member or neighbour with their tree needs	<input type="checkbox"/>
E	Applied pesticides to a tree or garden	<input type="checkbox"/>
F	Participated in a not-for-profit's tree planting activity	<input type="checkbox"/>
G	Obtained a permit to protect or remove trees on a development site	<input type="checkbox"/>
H	None of the above	<input type="checkbox"/>

7. On my own property, I plan to do the following in the next year:
Please indicate how likely you are to undertake the following actions. Tick only one box in each row:

	Very unlikely		Neither likely or unlikely		Very likely	
	1	2	3	4	5	
A	Plant one or more <u>large</u> tree (e.g. > 15 m tall at maturity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	Plant one or more <u>medium</u> tree (e.g. 10 – 15 m tall at maturity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C	Plant one or more <u>small</u> tree (e.g. < 10 m tall at maturity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. I feel the following:
Tick only one box in each row.

	Strongly disagree		Neither agree or disagree		Strongly agree	
	1	2	3	4	5	
A	Public street trees are well cared for by the City	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	Trees in parks are well cared for by the City	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C	Natural areas are well cared for by the City	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. I think it is most important for the City to:*Tick only one box in each row.*

		Least Important			Most Important	
		1	2	3	4	5
A	Plant more trees in streets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	Plant more trees in parks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C	Plant more trees in natural areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D	Protect trees on private land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. I feel the following about each of these statements. The City should:*Please indicate how much you agree with each of the following statements. Tick only one box in each row.*

		Strongly disagree		Neither agree or disagree		Strongly agree
		1	2	3	4	5
A	Plant more trees and increase urban forest canopy cover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	Strengthen the tree bylaw so that more trees are retained during development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C	Require replacement trees that are medium or large at maturity, rather than small at maturity if there is enough space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D	Require replacement trees for every tree removed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E	Require replacement trees for every tree removed unless the tree was hazardous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F	Increase the tree permit fee (\$50) to fund more enforcement of the City's tree bylaw	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G	Set a minimum requirement for permeable surface on private land in new developments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H	Encourage people to plant trees on private property by selling trees at a low cost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I	Encourage people to plant trees on private property by educating them about how to select, plant and care for trees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. I would like to learn:
Select up to three choices.

A	How and when to water trees	<input type="checkbox"/>
B	How and when to prune tree branches	<input type="checkbox"/>
C	How to choose the right tree for my yard	<input type="checkbox"/>
D	How to keep trees healthy during construction	<input type="checkbox"/>
E	How to manage tree pests and diseases	<input type="checkbox"/>
F	How to protect mature trees during development	<input type="checkbox"/>
G	I am not interested in learning about trees	<input type="checkbox"/>

Other:

--

12. The things I MOST VALUE about Richmond's urban forest are:

A. _____

B. _____

C. _____

13. The things I LEAST VALUE about Richmond's urban forest are:

A. _____

B. _____

C. _____

14. It is the year 2050, 33 years from now. My ideal image of Richmond's urban forest is:
Optional question, please complete if your time allows.

--

15. I would like to be contacted about...

Check all that apply

- ☐ Future consultation for Richmond's Urban Forest Management Strategy
- ☐ Urban forest events and volunteer opportunities

Please provide email: _____

16. I heard about this public engagement through:

Check all that apply

- ☐ Newspaper ad (Richmond News)
- ☐ News story written by reported in local newspaper
- ☐ LetsTalkRichmond.ca email sent to me
- ☐ LetsTalkRichmond.ca website (not an email from this site)
- ☐ City of Richmond website (Richmond.ca)
- ☐ Twitter
- ☐ Facebook
- ☐ Poster in a City facility
- ☐ Poster in a retail store in my community
- ☐ Word of mouth

Some information about me:

It's important that we hear from a diverse group of people and perspectives. The following questions help us determine how the feedback we received represents the community.

17. **My home postal code is:** _____

18. **I fall into the following age group:**

- ☐ Less than 18
- ☐ 18-34
- ☐ 35-54
- ☐ 55+
- ☐ Prefer not to answer

19. **I have lived in Richmond**

Choose one option

- ☐ My whole life
- ☐ A long time (6 or more years)
- ☐ I have moved here in the past 5 years
- ☐ Prefer not to answer

20. **I was born in Canada**

Choose one option

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

21. **My first language is**

Choose one option

- ☐ English
- ☐ French
- ☐ Cantonese
- ☐ German
- ☐ Japanese
- ☐ Mandarin
- ☐ Persian (Farsi)
- ☐ Punjabi
- ☐ Russian
- ☐ Spanish
- ☐ Tagalog
- ☐ Prefer not to answer
- ☐ Other (please specify): _____

Thank you for your time and feedback



PRCS - 123





Page 1 of 2	The Public Urban Forest	Policy <policy no.>
	Adopted by Council: <date>	

1. POLICY <POLICY NO.> :

It is Council policy that:

- 1.1 The purpose of this policy is to serve as a statement of values that will guide the City of Richmond's actions in managing the public urban forest.
- 1.2 The public urban forest, which includes all the trees growing on City owned land in parks, medians and boulevards in streets, road rights of way, civic properties and natural areas is a civic asset which increases in value and in the benefits it provides over time.
- 1.3 The City of Richmond will manage, sustain and expand the City's urban forest on public land in order to deliver multiple health and wellness benefits to the community including resilience to climate change and mitigating the urban heat island effect.
- 1.4 Parks Services will manage the public urban forest with the view it is a shared resource and a legacy for future generations of Richmond residents.
- 1.5 This policy supports the Public Tree Management Strategy's goals to:
 - (a) Conserve and protect the public urban forest;
 - (b) Manage and maintain a healthy and safe public urban forest;
 - (c) Enhance and expand the extent and health of the public urban forest; and,
 - (d) Educate and engage with the community on the benefits of the public urban forest and provide opportunities for community stewardship.
- 1.6 Protecting the public urban forest is the primary objective of the City. Without compromising public safety, tree removal will be considered as a last resort and only after all other options are first considered.



Page 2 of 2	The Public Urban Forest	Policy <policy no.>
	Adopted by Council: <date>	

- 1.7 The City will enhance and expand the public urban forest according to the best management practices of the International Society of Arboriculture by:
- (a) Planting and watering new trees;
 - (b) Performing scheduled preventative maintenance and responding to Service Requests which may include pruning and removal;
 - (c) Maintaining an up-to-date inventory of the public urban forest; and,
 - (d) Performing regular inspections and implementing risk management mitigation measures.
- 1.8 Parks Services staff or their designate will implement best management practices including planning, inventory, risk management, planting, watering, pruning, tree removal and integrated pest management (as required).
- 1.9 The City encourages the residents of Richmond to enjoy this shared asset and help to nurture and grow our trees through volunteer stewardship and planting opportunities.
- 1.10 This policy is applicable to all trees located on City owned land and according to agreements with other public entities including BC Hydro, Telus and other third party providers.



City of Richmond

Report to Committee

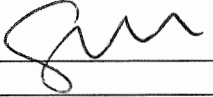


To: Parks, Recreation and Cultural Services Committee
From: Todd Gross
Director, Parks Services
Date: October 31, 2019
File: 06-2345-20-GCIT1/Vol 01
Re: Garden City Lands Update and Site Activation Plan

Staff Recommendation

That the staff report titled "Garden City Lands Update and Site Activation Plan," dated October 31, 2019, from the Director, Parks Services, be received for information.

Todd Gross
Director, Park Services
(604-247-4942)

Att. 2

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

Staff Report

Origin

At the Council meeting held on May 14, 2018, staff received the following referral:

That staff work with Kwantlen Polytechnic University and others to explore alternate farming methods and paludiculture and windrows for future farming on the Garden City Lands.

The purpose of this report is to respond to the referral and update Council on staff's efforts to explore viable options which would facilitate farming in the approximately 8 ha (20 acres) agricultural fields in the southwest corner of the Garden City Lands (the "Lands"), and identify the recommended directions to provide public access throughout the site.

Background

In 2010, the City purchased the 55 ha (136 acres) Garden City Lands from the Federal Government, and the planning for the future of the Lands began in 2012. As a result of a robust public consultation process, the Legacy Landscape Plan was developed and subsequently endorsed by Council in June 2014. The Legacy Landscape Plan provides a framework for the future development of the Lands based on the site's ecology, history, civic context and agricultural status as part of the Agricultural Land Reserve (ALR).

A Park Development Plan (the "Plan") (Attachment 1) was created based on the direction provided by the Legacy Landscape Plan. The Plan guides staff's implementation of the park program and vision of the Legacy Landscape Plan, including approximately 16 ha (40 acres) of agricultural fields on the western half of the site. Portions of the Plan implemented to date include the development of the 8 ha (20 acres) farm leased to Kwantlen Polytechnic University (KPU), the perimeter recreational trail, extensive plantings and the construction of a pond. In the southwest corner of the Lands, an 8 ha (20 acres) field is envisioned to become incubator farm plots, demonstration gardens and community gardens. The entire agricultural zone on the Lands will be managed according to organic farming best practices.

In 2017, the Agricultural Land Commission (ALC) approved the placement of soil on the farm area leased to KPU. The placement of soil was a condition of the Licence to Use Agreement between the City and KPU. The ALC's approval was based on low level contamination being present in the existing soils and that the placement of imported soils over the predominantly peat-based soil would minimize the release of sequestered carbon.

In summer of 2017, the City imported soil suitable for agricultural purposes onto the Lands to establish the first phase of the KPU research and teaching farm measuring approximately 2.6 ha (6 acres). Initially there were challenges with the quality of the soil that was imported (e.g., low fertility and electrical conductivity) but they have been addressed with the addition of soil amendments and the implementation of a quality control procedure. Since that time, KPU has begun actively farming the site and implementing site infrastructure improvements, including a greenhouse, hoop houses and processing area. When a viable source of soil is identified, the remaining 5.4 ha (13 acres) of KPU's leased lands will receive soil for the purposes of farming.

Parks staff have been active on the site with regular maintenance activities such as mowing and ongoing watering of planting installed in late 2017 and early 2018. As of summer 2018, no new capital improvements have proceeded on the Lands.

Analysis

In order to explore all viable farming practices on the Garden City Lands, staff conducted a review of alternatives to placing soil, farming practices suited to the existing peat based soils and remediation techniques to manage existing site contamination. The review focused on the following three key characteristics of the soil on the site:

- i) **Soil Properties:** peat based soils with a high water table;
- ii) **Remnant Peat Bog:** sequestered carbon embodied in the peat; and,
- iii) **Impacts of Historic Activities:** historic activities have resulted in low-level contamination throughout the site.

Based on these site characteristics, the following two studies were commissioned:

- 1) Review of the Rationale for Fill Material: A review of the data collected on the existing contaminants in the area proposed for agricultural production, the viable remediation methods and the recommended next steps following current Contaminated Site Regulations (CSR) best management practices (Attachment 2). Additionally, staff commissioned an update to the 2017 Human Health and Ecological Risk Assessment (HHERA).
- 2) Review of Peat-Based Farming Practices: An agricultural feasibility study which evaluated the existing soils, all potential soil and water management strategies which would result in viable agriculture, and which crops might be grown according to the potential soil and water management strategies, including limiting the release of sequestered carbon.

Site Soil Review

Soil concentrations of certain substances currently exceed the applicable BC Contaminated Sites Regulation (CSR) Agricultural Land (AL) standard and remediation of the soil is required. These standards are set by the Provincial Ministry of Environment and Climate Change Strategy (Ministry) and so the City must follow these regulations for the management of contaminated materials on the Garden City Lands.

The Ministry has defined several industrial or commercial activities which have a high likelihood of resulting in a site becoming contaminated. Two specific activities which have occurred at the Lands in the past include:

- 1) Rifle or Pistol Firing Ranges: A firing range operated in the central portion of the Lands in the early 1900s for approximately 30 years; and

- 2) Petroleum Product in Above-Ground or Underground Storage Tanks: As part of the former Transport Canada communications towers, there were diesel underground storage tanks (UST) on site.

At the Garden City Lands, several of the samples contained lead concentrations that exceeded the AL standards along with one or more of antimony, arsenic and molybdenum. The high concentrations of these metals indicate that these substances are likely associated with the former firing range and are not naturally occurring. In diesel UST associated areas and where historical communications towers were located, soil samples indicated higher hydrocarbon concentrations than AL standards. These findings are summarized in a map locating where the samples were taken and the identified contaminants in each sample's location.

The soil contamination is widely distributed throughout the site, but remediation is recommended for only the area west of the central dike currently bisecting the Lands from north to south. This area is designated for agricultural field crop production. In order to effectively manage the contamination and make it safe for agricultural activity, the site needs to be remediated. Due to the level of contamination in the remaining portion of the site, less intensive remediation strategies will be explored on a site specific basis. Remediation is defined as the management strategy utilized to make the site suitable for the planned uses whereby the contamination levels are addressed to meet applicable environmental standards. There are a number of remediation strategies based on industry standard best management practices that would be appropriate to use on the Lands to facilitate the proposed agricultural activities.

The four recommended options for the agricultural fields are:

- excavate and dispose contaminated soil off-site;
- cap with plastic liner;
- phytoremediation; or
- cap with uncontaminated imported soil.

Of these four options, only phytoremediation does not involve the importation of uncontaminated soil as part of an effective remediation strategy. The table on the following page summarizes the strategy and the respective pros and cons.

Table 2: Pros and Cons of Remediation Strategies for Garden City Lands (Abridged) (Source: Hemmera Inc, 2019)

#	Remediation Strategy	Pros	Cons
1	Excavate and dispose contaminated soil off-site	<ul style="list-style-type: none"> The farm area will meet numerical AL standards rather than risk-based standards removing the stigma that can be associated with leaving contamination in-situ Reduces long term liability by removing contamination from GCL 	<ul style="list-style-type: none"> This is the most expensive option due to the cost of excavating, transporting, and disposing of this soil Additional investigation of soil, groundwater, and soil vapour quality will be required to plan this work Fill material would still be required to backfill the void left behind by excavation
2	Cap with a plastic liner	<ul style="list-style-type: none"> Contaminated soil will be isolated from contact with humans and the environment, thereby, reducing the exposure risk to acceptable levels 	<ul style="list-style-type: none"> Does not reduce the existing contaminant volume or long-term liability Hydraulic issues with groundwater and stormwater management will need to be addressed and mitigated; drainage will be adversely impacted Fill material will still be required on top of the liner to create a growing medium for the farm
3	Phytoremediation (a process that uses plants to uptake contaminants from soil)	<ul style="list-style-type: none"> Potentially cost effective if conducted as part of an experiment or thesis Conducted in-situ Environmentally friendly 	<ul style="list-style-type: none"> Requires further analysis to determine feasibility May increase the presence of invasive species Not applicable for high concentrations of contaminants Slower than other treatments and often conducted in conjunction with additional treatment Restricted to growing the correct type of plants depending on efficacy Disposal of contaminated biomass to an approved facility required Requires regular re-testing of the soil to determine if soils meet AL standards

Table 2: Pros and Cons of Remediation Strategies for Garden City Lands (Abridged) (Source: Hemmera Inc, 2019) (continued)

#	Remediation Strategy	Pros	Cons
4	Cap the farm area with uncontaminated imported fill material	<ul style="list-style-type: none"> • Clean imported soil separates the growing medium from the contaminated soil • Contaminated soil will be isolated from contact with humans and the environment by clean imported fill, thereby, reducing the exposure risk to acceptable levels • A more sustainable approach to the traditional “dig and dump”, which consists of excavation of contaminated soil and transport to a licensed disposal facility 	<ul style="list-style-type: none"> • Does not reduce the existing contaminant volume in the existing parent material

Agricultural Capability Study

McTavish Resource and Management Consultants (McTavish) completed the Agriculture Capability Assessment study in their capacity as the City’s third-party certified agrologist for the Garden City Lands project. The primary goal of the study was to determine the soil characteristics and potential limitations to agriculture in the native peat soils currently on the site. Growing non-food crops were also considered.

McTavish concluded the agricultural capability of the site is currently poor (Class O4 and O5 per BC Agricultural Capability Classification system) with restrictions due to excess water, high acidity and the presence of soil contamination. Notwithstanding the soil contamination and the adverse impacts on peat based soils, the existing soils could be improved with the installation of drainage and addition of mineral soil, amendments and lime to offset the acidic conditions. This would improve the soils to a slightly higher classification (Class O3 and O4).

With this information, McTavish considered potential farming approaches including:

- farming the peat “as-is” (including *windrows*¹);

¹ An elongated mound made from compostable material. Richmond farmers have commonly utilized this method in soils with standing water to raise the rooting zone above the existing grade and thus permit planting to proceed. It is also commonly used as a method of producing crops.
(Source: <https://www.buschsystems.com/resource-center/knowledgeBase/glossary/what-is-a-windrow>)

- the traditional method of draining peatland;
- controlled drainage (known as *druckdrainage*²);
- flooding peatland (known as *paludiculture*³); and
- the placement of mineral soil over the peat.

The infrastructure requirements, crop suitability, capital investment requirements and greenhouse gas production were considered. The following table summarizes the evaluation criteria and conclusions of the various methods for improvement of the site's agricultural capability.

Table 1: Garden City Lands Agricultural Capability Summary Table (Source: McTavish, 2019)

Method	Requirements	Cost	Crop suitability	GHG production	Contamination	Feasibility
Farming peat "As-Is"	Water table management Soil amendment	Low	Few crops suitable	Moderate	Risk to human health.	Moderate. Not recommended due to human health risk, GHG production, and low crop suitability.
Peatland drainage	Drainage Soil amendment	Moderate	Pasture	High	Risk to human health.	Moderate. Not recommended due to human health risk and high GHG production.
Controlled drainage (<i>Drukdrainage</i>)	Drainage system and pumping system	High	Pasture Some food crops	Low	Risk to human health.	Low. Not recommended due to infrastructure requirements and high cost.
Flooding (<i>Paludiculture</i>)	Water source Specialized equipment	High	Grasses and sedges No food crops	Low	Risk to human health unknown. Requires input from contaminated sites specialist.	Low. Not recommended due to infrastructure requirements, high cost and low crop suitability.
Mineral soil placement	Clean, non contaminated fill Drainage system	Low	Wide variety of crops	Low	Risk mitigated by placement of clean, non-contaminated fill over peat.	High. Recommended to mitigate human health risk, low GHG emissions, and high crop suitability.

²A controlled drainage system developed in the Netherlands whereby the water table is maintained at precise level utilizing a pressurized drainage system. (Source: McTavish, 2019)

³ The practice of crop production on wetted predominantly peat-based soils whereby past practices drained peat soils prior to commencing agricultural production. Maintaining the a wetted peatland reduces greenhouse gas production and maintains biomass production. (Source: <https://en.wikipedia.org/wiki/Paludiculture>)

In order to fully realize the site's maximum agricultural capability to grow the widest range of crops while minimizing the potential for human exposure and risk, McTavish recommends placing one metre of uncontaminated soil to maximize the agricultural capability of the site. Placement of soil would still require an investment in a sub-grade field drainage system.

Next Steps

Soil Characterization and Delineation Study

As stated, contamination is widely distributed throughout the site. The four remediation strategies have been evaluated to address the identified soil contamination. To facilitate the capacity for the broadest agricultural production, the site needs to be remediated to Agricultural Land standards. The most feasible option was determined to be capping of the agricultural area with uncontaminated fill material; however, it would be premature to proceed with this option without additional testing of the existing soils.

In order to fully understand the existing contaminants in the soil and groundwater and to provide the most appropriate soil remediation strategy recommendation, staff will be proceeding with a comprehensive soil testing study. A Soil Characterization and Delineation Study would define the nature and extent of the contamination in the soil. The study will provide staff with an in depth report on the contaminations of the site and assist staff in defining the most appropriate soil remediation plan. Any remediation program would be reviewed in consideration of the agricultural activities envisioned to occur on the site. Until the study is completed and the plan is defined, no new soil will be imported to the southwest portion of the Lands.

Public Access and Site Activation

While the agricultural fields in the southwest corner of the site undergo further analysis and a remediation plan is completed, the remainder of the site is to be developed with the end goal of welcoming visitors to explore, learn and enjoy the Garden City Lands, including the construction of community gardens.

The City must submit a Non-Farm Use Application to the ALC to gain approval for all non-agricultural related activities and site features planned to be constructed on the Lands, including public access throughout the site. A Non-Farm Use Application will follow the standard City process, including reviews by the Food Security and Agricultural Advisory Committee and City Council prior to consideration by the ALC's South Coast Panel.

In March 2019, Council approved the construction of up to 100 community garden plots at the Garden City Lands. They will be included in the application to the ALC but with the understanding that they will be constructed as raised plots in order to separate them from the existing soil. The objective is to construct the community garden plots and related support infrastructure in 2020.

Financial Impact

None.

Conclusion

In order to fully understand the nature and extent of the contaminated material on the Lands, staff will be proceeding with a robust testing program of the southwest agricultural fields. This review will also consider how any potential remediation programs would maximize the agricultural production of the site with the end goal of having the Lands be a demonstration of sustainable agricultural and land management practices.

Concurrent to this testing program, staff would like to proceed with construction on the Lands with the end goal of providing a functioning and well programmed park for Richmond residents. Approval from the ALC is required in order to begin this process and permit full public access onto the site in a manner that is both safe for visitors as well as protecting the sensitive habitat on the site. Implementing aspects of the Park Development Plan, which do not require the importation of large volumes of soil onto the Lands, can still proceed and provide Richmond residents access to enjoy the entire Garden City Lands.



Alex Kurnicki
Research Planner 2
(604-276-4099)



Jamie Esko
Manager, Parks Planning, Design
and Construction
(604-233-3341)

- Att. 1: Garden City Lands Park Development Plan
2: Memorandum: Rationale for Fill Material (Hemmera)

Attachment 1



LEGEND

THE AGRICULTURAL LANDS

- 1 Multi-Functional Building and Parking
- 2 Rainwater Storage for Agricultural Irrigation
- 3 Farm Drainage Ditch
- 4 Agricultural Fields
- 5 Orchard
- 6 Demonstration Orchard
- 7 Community Gardens
- 8 Hedgerows & Beetle Banks
- 9 Sliding High Tunnels
- 10 Farm Fields
- 11 Soil Amendment Trials

THE BOG

- 12 Bog Conservation Area
- 13 The Fen
- 14 Boardwalk with Rest Points

THE RISE

- 15 Meadow / Informal Recreation
- 16 Children's Play

THE NODES

- 17 Garden City Lands Main Entrance
- 18 Entry Node
- 19 Entry Allée
- 20 Viewing Platform
- 21 Crosswalk
- 22 Parking Lot with Accessible Stalls
- 23 Parallel Parking with Accessible Stalls

THE DYKE

- 24 Multi-use Path with Farm Access

THE PERIMETER TRAILS

- 25 Native Forest Plantings
- 26 Street Trees
- 27 Perimeter Trails - Separated Paths
- 28 Rain Garden



Scale 1:1000



MEMORANDUM

Date:	November 4, 2019
To:	Alex Kurnicki, City of Richmond
From:	Hemmera
File:	989645-04
Re:	Garden City Lands – Rationale for Fill Material

Hemmera Envirochem Inc. (Hemmera), a wholly owned subsidiary of Ausenco Canada Inc (Ausenco), is pleased to submit this memo explaining the rationale for fill material within the proposed farm area at Garden City Lands (GCL), located in Richmond, BC. The location of GCL is shown on the attached **Figure 1**.

This memo will summarize the contaminated sites regime in British Columbia (BC) and explain how the BC Contaminated Sites Regulation (CSR) was used to identify contamination within the farming area at GCL related to historical activities, and why fill material is necessary to cover portions of the GCL farm area with uncontaminated fill before using them for agricultural purposes.

1.0 CONTAMINATED SITES REGIME IN BRITISH COLUMBIA

To understand why fill material is required, it's important to understand how GCL was deemed contaminated in the first place. This requires an understanding of how BC regulates contaminated sites. Properties like GCL, under municipal ownership, are governed by the environmental laws and regulations set out by the BC Ministry of Environment and Climate Change Strategy (Ministry). The overarching legislation for environmental work in BC is the *Environmental Management Act* (EMA) (2003), which regulates industrial and municipal waste discharge, pollution, hazardous waste, and contaminated sites remediation. Under EMA, the BC Contaminated Sites Regulation (CSR) (1997) regulates the identification and cleanup of contaminated sites.

The Ministry defines a **contaminated site** as an area of land in which the soil or underlying groundwater or sediment contains an amount or concentration that exceeds provincial environmental quality standards set up by the EMA and the CSR. To help with identification of such contaminated sites, the Ministry has created a list of industrial and commercial activities that have a high potential to contaminate sites. From this list, there are two activities of importance for the farming areas of GCL: 1) rifle or pistol firing ranges, because a firing range operated in the central portion of GCL in the early 1900s for approximately 30 years; 2) petroleum product in above-ground or underground tanks, because there was a diesel underground storage tank (UST) in use by the former communications operation. The identification of these commercial uses indicates a potential for contamination and was the impetus for the subsequent and ongoing environmental investigation.

2.0 ENVIRONMENTAL FINDINGS AT GARDEN CITY LANDS

Environmental investigations have been conducted at GCL since at least 2001 by several different consulting firms. Most recently, Hemmera compiled all the historical data and compared it to current CSR standards and prepared a Draft Soil and Groundwater Management Plan dated March 14, 2019. The relevant results are briefly summarized below.

To investigate the potential for contamination associated with the past historical uses including a firing range and communications towers, soil samples were collected across the proposed farm area. The main contaminants identified were lead and antimony, which are two of the primary metals associated with firing ranges. The contamination at firing ranges comes predominantly from the metals that are present in bullets and bullet jackets left on the ground after firing practices. Bullets are made primarily of lead with a copper-jacket, which includes copper as a gliding material over the lead core to help bullets withstand higher velocities. Over the years, other metals have been included in the lead alloy such as arsenic, cadmium, copper, silver, bismuth, molybdenum, tungsten and tin. Each of these elements, if present, typically makes up less than 1% of the total lead alloy that constitutes the bullet.

At GCL, several of the samples contained lead exceeding the CSR agricultural land use (AL) standard along with one or more of antimony, arsenic, and molybdenum. The high concentrations of these metals, known to be associated with bullets, indicates these substances are likely associated with the former firing range and are not naturally occurring. The locations where metal contamination was found to exceed CSR AL standards are shown on **Figure 1**.

The Draft Soil and Groundwater Management Plan also shows that hydrocarbon concentrations greater than CSR AL standards were identified in soil where the diesel UST associated with the historical communications tower was located. The location of this hydrocarbon contamination is illustrated on the attached **Figure 1**.

In conclusion, soil contamination has been identified within the proposed farming area at GCL. Identified contamination consists of metals associated with an historical firing range and hydrocarbons related to a former UST associated with the historical communication towers. Soil concentrations exceed the applicable CSR AL standard.

3.0 REMEDIATION STRATEGIES

Remediation refers to how the contamination will be addressed to make a site suitable for the planned uses, and the remediation strategy must be selected with the planned use in mind. In this case, the City of Richmond (City) has already started construction activities for urban farm fields, educational farm plots, and a demonstration orchard in the western portion of GCL. To determine whether the identified soil contamination beneath the farming area presents a risk to human health or the environment, Hemmera was commissioned to complete a risk assessment. This risk assessment concluded that risks were acceptable provided the soil contamination was removed or capped with uncontaminated fill material. Four remediation strategies were considered for the Site. **Table A** contemplates the pros and cons of these four strategies.

Table A Pros and Cons of Remediation Strategies for GCL

#	Remediation Strategy	Pros	Cons
1	Excavate and dispose contaminated soil off-site	<ul style="list-style-type: none"> The farm area will meet numerical AL standards rather than risk-based standards removing the stigma that can be associated with leaving contamination in-situ Reduces long term liability by removing contamination from GCL 	<ul style="list-style-type: none"> This is the most expensive option due to the cost of excavating, transporting, and disposing of this soil (see Table B, below for an order of magnitude estimate of these costs) Additional investigation of soil, groundwater, and soil vapour quality will be required to properly plan this work. Fill material would still be required to backfill the void left behind by excavation
2	Cap with a plastic liner	<ul style="list-style-type: none"> Contaminated soil will be isolated from contact with humans and the environment, thereby, reducing the exposure risk to acceptable levels. 	<ul style="list-style-type: none"> Does not reduce the existing contaminant volume or long-term liability. The existing ecosystem will likely be adversely affected. Hydraulic issues with groundwater and stormwater management will need to be addressed and mitigated; drainage will be adversely impacted. Fill material will still be required on top of the liner to create a growing medium for the farm.
3	Phytoremediation (a process that uses plants to uptake contaminants from soil)	<ul style="list-style-type: none"> Potentially cost effective if conducted as part of an experiment or thesis. Conducted in-situ. Environmentally friendly. 	<ul style="list-style-type: none"> Highly dependent on soil properties and environmental conditions and therefore requires further analysis to determine feasibility. May increase the presence of invasive species due to the less intensive farming. Not applicable for high concentrations of contaminants. Slower than other treatments and often conducted in conjunction with additional treatment such as nutrient enrichment. Restricted to growing the correct type of plants meaning the planned farming activities will be delayed by at least one growing season if not more depending on efficacy. Need to properly dispose of contaminated biomass to an approved facility at the end of each growing season at an added cost. Requires regular re-testing of the soil to determine if residual contaminant concentrations have dropped to less than AL standards.

#	Remediation Strategy	Pros	Cons
4	Cap the farm area with uncontaminated imported fill material	<ul style="list-style-type: none"> • Fill material is already required to provide better quality growing medium making this the most cost-effective strategy. • Clean imported soil separates the growing medium from the contaminated soil • Contaminated soil will be isolated from contact with humans and the environment by clean imported fill, thereby, reducing the exposure risk to acceptable levels. • A more sustainable approach to the traditional "dig and dump", which consists of excavation of contaminated soil and transport to a licensed disposal facility. 	<ul style="list-style-type: none"> • Does not reduce contaminant volume or long-term liability.

Below is more information about remediation strategies 1 and 3 - "Excavate and dispose contaminated soil off-site" and "Phytoremediation".

Phytoremediation

Phytoremediation refers to a technology that uses various plants to degrade, extract, contain or immobilize contaminants from soil and water. Phytoremediation started to gain popularity within the scientific community in the early 1990s. Numerous academic studies have been conducted over the years, however, a widespread commercial use as a remediation technique has not been achieved to date. The general reasons behind the lack of implementation are listed in **Column 4 of Table A** above. Given these barriers, there are no long-term studies that document costs required for the process on a commercial level.

The same factors that have prevented phytoremediation from widespread use apply for the Site as well:

- The effectiveness of the process is dependant on environmental factors (physical and chemical), which are uncertain. Environmental conditions and competing chemical reactions in nature may delay or impede the uptake of contaminants;
- The timeline of remediation is unknown. It is a long-term process that may take place over several growing seasons;
- The type of plant used in the processes is specific for the type of contaminant. For example, in the scientific community poplar and alfalfa seem to be considered most suitable for lead remediation in soil. However, this is based on limited field tests.
- Metals, as opposed to hydrocarbons, are not biodegradable. As such, the metals contaminants are stored within the plant biomass. This creates secondary contamination in the form of biomass that must be disposed in an approved facility that accepts metals contamination.
- The cost of remediation via phytoremediation for the Site is hard to determine given the lack of commercial applications of the method.

After considering the limitations, phytoremediation does not appear to be a viable remediation option for the Site. A possible exception might be in partnership with an academic institution keen to try and further develop this remedial strategy.

Excavate and dispose contaminated soil off-site

This remediation option would involve several tasks outlined in **Table B**, below.

Table B Tasks and Approximate Costs Associated with Excavation and Disposal

Task	Description	Estimated Order of Magnitude Cost
Additional Characterization and Delineation	<ul style="list-style-type: none"> Chromium speciation in soil Background assessment of arsenic and molybdenum in soil in the farm field areas Soil and groundwater characterization in the proposed KPU Creek and Lansdowne Canal Horizontal and vertical delineation of the metal contamination at sample location GCL14 Horizontal and vertical delineation of hydrocarbon contamination in TP01-2 (the Rise) Horizontal and vertical delineation of the hydrocarbon contamination in the former diesel UST area Investigation of all data gaps identified in the Draft Soil and Groundwater Management Plan 	\$80K - \$120K
Remedial Planning	<ul style="list-style-type: none"> Develop Remedial Plan Support with preparation of specifications and tender documents to solicit contractor bids for soil excavation and disposal 	\$20K
Excavation and Soil Disposal	<ul style="list-style-type: none"> Excavate KPU Farm Areas of the Site to 0.5 m depth and backfill to grade. (36-90K tonnes at \$55/tonne for excavation, disposal, and backfill – actual amount is dependent on the additional characterization and delineation task) 	\$2M - \$5M
Confirmation of Remediation	<ul style="list-style-type: none"> Confirmatory sampling program and Confirmation of Remediation Report 	\$35K - \$50K
Total		\$2.1M – 5.2M

After considering the four options, Hemmera recommends **Option 4: Capping the farm area with uncontaminated fill material**. Option 4 is the most feasible from the perspective of operations (capping with fill is substantially already complete and is required to improve the growing medium), finances (it is the most cost-effective), and sustainability (it avoids the need for excavation, trucking, and relocating the contamination to another location). Of note, three of the four most viable remediation options require sourcing and placement of clean soil at GCL.

4.0 SUMMARY

The farming area of GCL was utilized as a firing range for 30 years during the early 1900s and a diesel UST was in use by the former telecommunication operation. The Ministry considers the firing range and the former diesel UST as having high potential to cause contamination. As such, several environmental assessments were completed at GCL to investigate the potential for contamination. Metal soil contamination, specifically lead, antimony, arsenic and molybdenum - all metals associated with bullet manufacturing, was identified in several locations across the farm area. Hydrocarbon soil contamination was also identified in the vicinity of the former diesel UST associated with the communication operation. Four remediation strategies have been evaluated to address the identified soil contamination. The most feasible option was determined to be capping of the farm area with uncontaminated fill material. Of note, three of the four most viable remediation options require the placement of clean soil at GCL.

5.0 CLOSURE

The Work contained herein was performed in accordance with the Professional Services Agreement between Hemmera and City of Richmond, dated January 25, 2016 ("Contract"). This Report has been prepared by Hemmera, for sole benefit and use by the City of Richmond. In performing this Work, Hemmera has relied in good faith on information provided by others and has assumed that the information provided by those individuals is both complete and accurate. This Work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and project terms of reference; further, the findings are time sensitive and are considered valid only at the time the Report was produced. The conclusions and recommendations contained in this Report are based upon the applicable guidelines, regulations, and legislation existing at the time the Report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations

We have appreciated the opportunity of working with you on this. Please feel free to contact the undersigned regarding any questions or further information that you may require.

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FIGURE

