

ROYAL VANCOUVER YACHT CLUB: COAL HARBOUR MARINA EXPANSION PROJECT

ACCOMODATION OF MULTIUSE RECREATIONAL WATERWAY WITHIN COAL HARBOUR

TECHNICAL MEMORANDUM

To:	Marcel Gelein (VFPA), Sean Baxter (VFPA), Dave Hart (VFPA), Jason Krott (VFPA), Elizabeth Harris (NPP)	From:	Russ Tyson
cc:	Chris Barnett (RVYC Asset Manager), Norm Allyn (CMO),	Date:	June 4 th -2019
Subject:	Multiuse Waterway Coal Harbour	Project No:	2018-15

Royal Vancouver Yacht Club Coal Harbour Marina Expansion Project

The Royal Vancouver Yacht Club (RVYC) has proposed to the Vancouver Fraser Port Authority (port authority) and the Navigation Protection Program (NPP) of Transport Canada (TC) a project to expand the existing RVYC Marina, in Coal Harbour, to increase the number of slips in the marina by 46. The reconfiguration significantly improves the current layout and meets best practices for marina design, making it more functional and operational, an overall improvement to the navigational environment. The area proposed for the lease expansion area is 8,553 sq. m (92,058 sq. ft.) based on the available water area outside of the navigational channel. In addition to the administrative channel design (36.4m) the overall channel includes an additional 27m (e.g. rowing lanes each 13.5m

wide) to accommodate rowing. The total width available for all users to navigate within Coal Harbour is 36.4m + 27m = 63.4m.¹ All mariners and users of Coal Harbour can navigate with no restriction within the 63.4m.

To ensure all users are accommodated within the waterway a benchmark review of similar waterways was undertaken, best practises identified, and various mitigative measures identified. Meetings with the Vancouver Rowing Club (VRC), and identification of their concerns was fundamental in the development of this plan.

Coal Harbour: A multiuse waterway

Coal Harbour area represents a multiuse waterway in which recreational powerboats and sailboats, small cruise ships (e.g. commercial) and recreational rowers co-exist. The diagram below sets out the current, proposed water lot and the overall administrative channel. It is noted that neither rowers nor recreational users are restricted to navigate within the administrative channels depicted on the exhibit.



¹ This is approximate and based on the width from the RVYC water lot lease expansion to the port authority jurisdiction on the other side of the channel.

Port Authority Port Information Guide

While Coal Harbour represents a multiuse recreational waterway that has evolved from its industrial beginnings 150 years ago, it is noted that under the port authority document titled “Port Information Guide”, and the related safe boating guide, permitted marine uses are defined in Coal Harbour.

The port information guide was created pursuant to Section 56 of the Canada Marine Act and aligned with the standards of the International Harbour Masters Association. It contains a set of localized practices and procedures designed to promote safe and efficient navigation within the waters of the port authority and support efforts to protect the marine environment. The practices and procedures contained in the guide apply to all vessels in the port, including pleasure craft and recreational vessels.

Section 8 Port Navigation, Sub section 8.19 Recreational Vessels states:

“For safety reasons, vessels engaged in fishing, personal watercraft such as jet skis, row boats, canoes, and vessels, sailing or proceeding without mechanical power, are not permitted within the boundaries of First Narrows TCZ (TCZ-1), Second Narrows TCZ (TCZ-2) and all areas of Vancouver Harbour in between.... No person shall operate any pleasure craft under the power of oars or paddles:

- *In a traffic separation zone,*
- *Within 300 metres of a vessel at anchor”*

While the port information guide infers that rowing is not permitted in Coal Harbour, the port authority and all stakeholders acknowledge that rowing has been, and will continue to be, a valued user of this multiuse waterway, and regulators will continue to pursue the preservation of rowing. The exhibit below illustrates the Burrard Inlet portion of the safe boating guide.

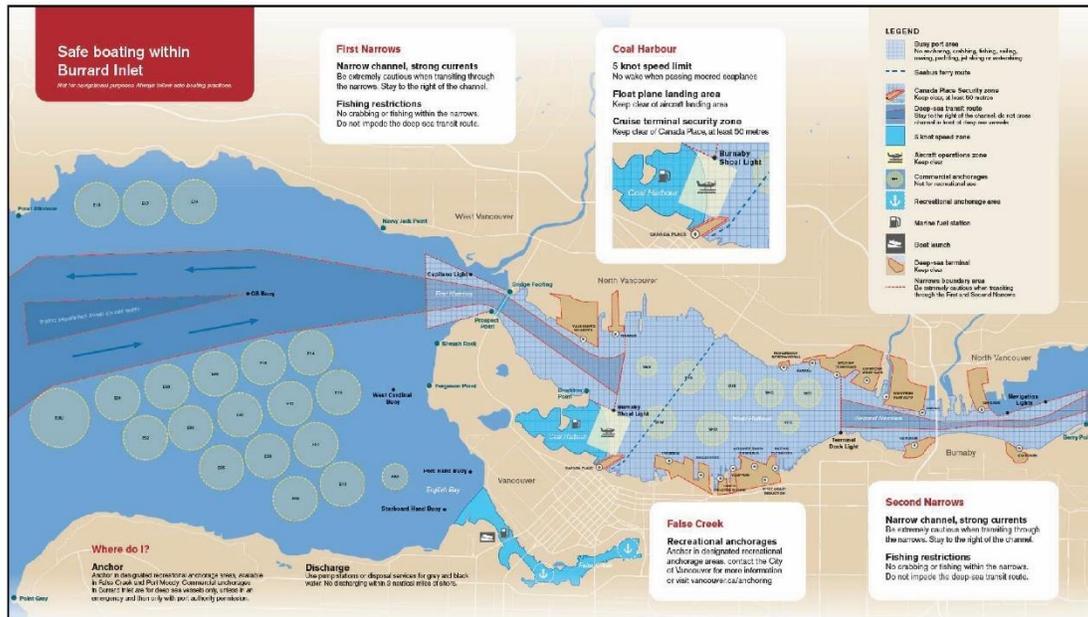


Image: Safe Boating Guide – Burrard Inlet

According to the safe boating guide – Burrard inlet Coal Harbour, a 5-knot limit within the harbour, float plane landing area, Cruise Terminal security zone, are illustrated all of which the proposed expansion avoids. The legend notes that the Coal Harbour is within a “busy port area” in which **no** anchoring, sailing, fishing, rowing, paddling, or jet skiing is allowed.

Creation of a Multiuse Waterway

As part of the Coal Harbour Marina Expansion Project (project), the continued accommodation of rowing has been a critical component of the RYVC Coal Harbour feasibility and planning process. The document “A Guide to Multiple Use of Waterway Management” Second Edition, the National Water Safety Congress, has been referenced to guide the discussions and assumptions underlying multiuse channel design, and certain principles have been integrated into the technical aspects of the proposed multiuse channel and the rowing traffic pattern outlined herewith.

Channel Design 2011

The evolution of the expansion project has occurred over ten years, with the initial planning in 2008. Preliminary meetings in 2012 with the port authority confirmed the need to verify the availability of a potential water lot lease area expansion, that would only be feasible if a comprehensive channel design review was undertaken and such an expansion could be accommodated for.

At the time, RYVC issued a report entitled “Coal Harbour Expansion Project Master Plan” that referenced a channel design in accordance with the Permanent Association of Waterborne Transport (PIANC) Approach Channel

Guidelines (2007). While the PIANC guidelines were satisfied the VRC, as a key stakeholder of the waterway was concerned regarding the lack of accommodation for recreational rowing. The port authority suggested that RVYC ensure additional channel width was included to accommodate rowing. It was suggested by VRC, that as an initial starting point reference should be made to standard widths for rowing lane requirements.

From a 2011 design perspective, the Coal Harbour Marina Expansion Master Plan (2011) cites the International Rowing Federation (FISA) Rules of Racing and related By-Laws to support provision of rowing lanes for training.²

The FISA Rules of Racing outline all the rules and protocols associated with the sport to promote consistency. The Rules of Racing are referenced to provide the study team insight into potential width requirements associated with accommodating rowers within Coal Harbor, via the identification of acceptable widths for rowing lanes. In this case racing lane widths were referenced. While it is acknowledged that FISA rules are specific to international and world racing events (which do not occur within Coal Harbor), training is the focus of VRC activities. VRC has noted such widths are not adequate as those beginners tend to wander throughout the entire channel. VRC has since confirmed that training requirements are significantly different than racing. However, for design of international rowing lane width standards were utilized and used a proxy associated with training requirements.

Appendix 1: By-laws to Rules 35 to 37 – Courses; outlines course requirements in accordance with all international standards related to rowing championships and world stage events. Under Appendix 1: By-law to rules 35-37- Courses: Section 2.1 Stretches of Water it states for courses that host international events:

*“A standard international course (for international and world regattas) shall be straight and shall not have less than 6 lanes. The minimum length of water necessary to contain the standard course is 2,150m.³ For a course for master’s the minimum length is 1,150m, the standard international course should be at least 108m wide **and the average width per rowing lane of 13.5 m.**”*

The FISA Rules of Racing also provide insight into the requirements for rowing training courses, as identified by By-law Rule 56, “Traffic Rules on the Course”, which states:⁴

*“The traffic rules for **training** shall identify at least one clear lane of water (13.5 m) as a neutral lane between crews travelling in opposite directions on the water. If it is not possible to provide*

² FISA was founded on June 25, 1892 in response to the growing popularity of the sport of rowing, and the consequent need for uniformity of regulations over such matters as race lengths, boat composition, and weight classes)

³ Appendix 1 By-laws to Rules 35 to 37 - Courses Section 2 Stretches of Water General (Section 2.2)

⁴ It must be emphasized that VRC is considered a rowing “training/learning facility” (by VRC mandate) and does not undertake organized events (i.e. status for international or world events) and therefore the Master Plan focus on the related training requirements outlined in the Rules of Racing (Rule 56).

the neutral lane, then the crews travelling in opposite directions must be separated by a “swimming lane” or equivalent, as a continuous physical barrier.”⁵

As part of the Master Plan’s preparation the rowing channel design considered two 13.5 m lanes (one for outbound and one inbound, to support a rotational traffic pattern (noted in the Multiple Use Waterway Management document). The rowing lanes were separated by the designed navigational channel for recreational/motorized vessels (i.e. which provided separation between in bound and outbound skulls and equates to the suggested swimming lane noted in rule 56).⁶

It was during that time, the VRC noted they did not accept the channel design to accommodate rowing, although the motorized channel design reflected the PIANC Guidelines and the channel widths for rowing were from international rowing standards, and the equivalent of a swimming lane was established.

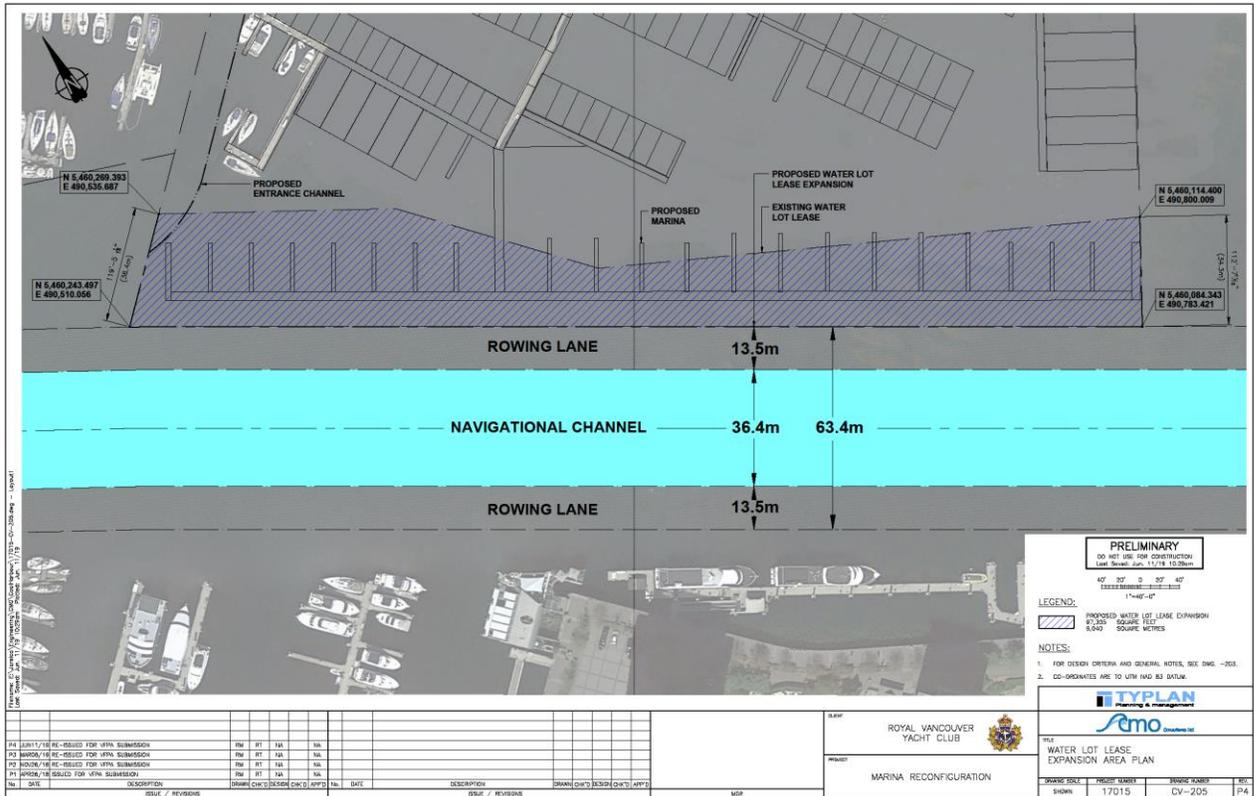
Channel Design (2016)

The PIANC 2007 Approach Channel Guidelines were repealed and superseded by the PIANC 2014 revisions, and as continued discussions with the port authority were pursued regarding the project, the port authority requested the RVYC undertake a revised channel design to verify that the channel could be designed to accommodate both maritime vessels (based on PIANC 2014) and rowing lanes. RVYC worked directly with the port authority, due to their familiarity with the PIANC 2014 guidelines, in preparing a new channel design. The revised channel design is presented in Appendix B Navigational Channel Design of the port authority Project Permit submission for reference. The design included the retention of two 13.5 m rowing lands to accommodate rowing.

The exhibit below provides a conceptual outline of the administrative navigational channel inclusive of the proposed rowing lanes. It is noted that the channels are administrative only and that mariners can navigate anywhere within the 63.4 m channel width.

⁵ Rules of Racing and Related By-laws – By-law to Rule 56 Traffic Rules on the Course

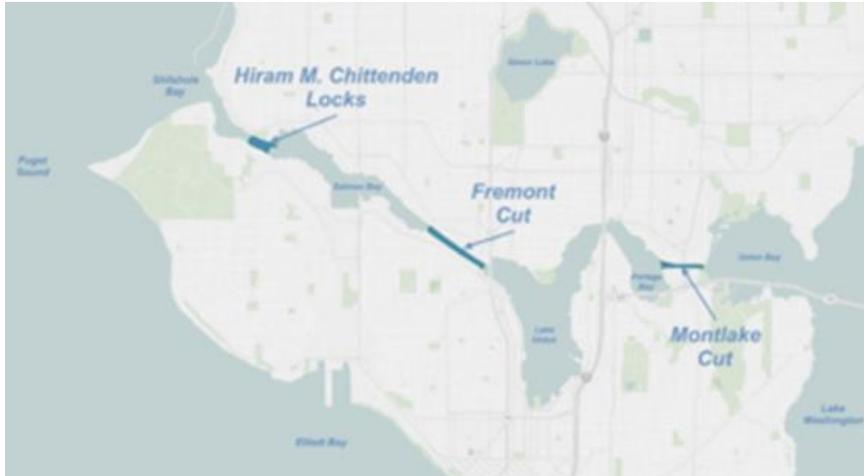
⁶ A guide for Multiple Use Waterway Management Second Edition National Water Safety Congress



Benchmark: Lake Washington Ship Canal and the establishment of a Rowing Traffic Pattern

To provide further insight into the issue of protecting rowing in a multiuse waterway the RVYC study team investigated a similar waterway in Seattle that supports commercial, sail, power use and paddle sports, as a benchmark to better understand best practises that could be applied to Coal Harbour . The waterway is known as the Lake Washington Ship Canal (which has established a rowing traffic pattern within and abutting the canal) and specifically notes the Montlake Cut, a narrow portion of the waterway in which commercial, sail, power, and paddle sports (rowing) are accommodated for.

Over 100 years ago construction the of the Montlake Cut began that connected Lake Washington to Lake Union, named the Lake Washington Ship Canal. Once constructed, a connection between Lake Washington, Lake Union and the Pacific Ocean was established, accessible via a series of locks. The exhibit below illustrates:



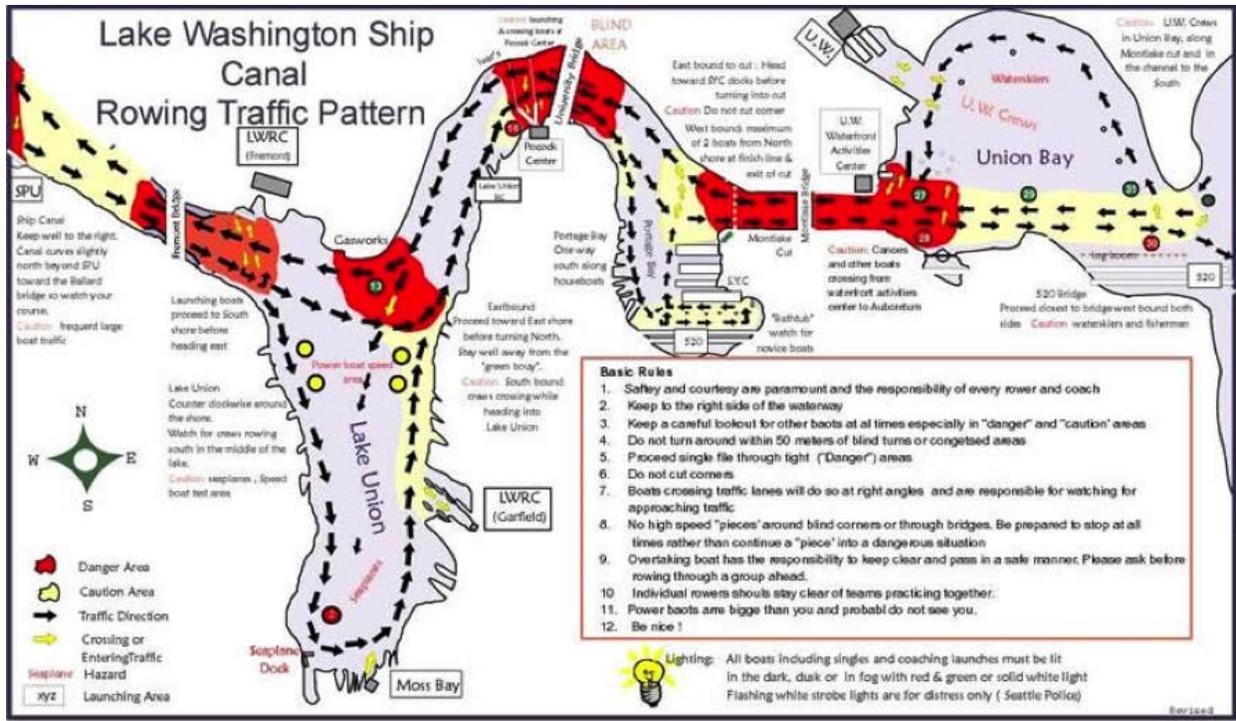
The Lake Washington Ship Canal was constructed primarily for commercial navigation. Since that time industrial maritime navigation has been partially replaced by what has become a world class location for recreational uses and a truly multiuse corridor supporting vast variety of vessels types that share the waterway. It is the site of the internationally known Windemere Rowing Race, an annual event, and other events such as the Head of the Lake Regatta. Continued commercial, motor boat, sailboat and rowers all transit the area. It is also noted that the frequency of transits via the ship canal is significantly greater than Coal Harbour. For this reason, the area represents a benchmark regarding multiuse corridors and is discussed below, in relation to lessons learned (mitigation) that could potentially be adapted for Coal Harbour, widths of waterway dedicated to rowing.

Existing commercial operations supporting barge movements, tug, and tow operations, as well as sail and motorized transits along the ship canal that are generated from the numerous marinas abutting its shores. It is also noted that there are several rowing clubs located along the entire ship canal, that exhibit the ability to coexist in such a multiuse waterway.

Reference to a short YouTube video is provided to provide context to the various uses along the waterway (<https://www.youtube.com/watch?v=ONmU-fWeOhw>). The YouTube video provides insight into the multipurpose nature of the waterway.

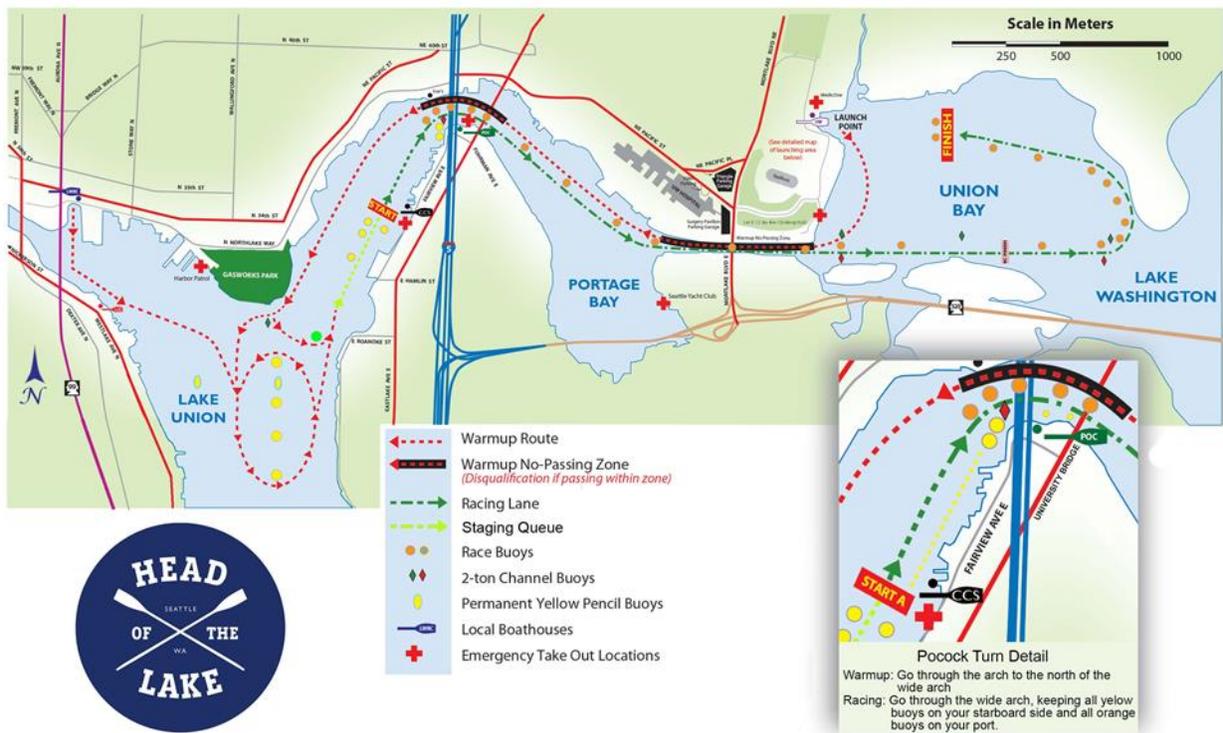
To accommodate continued rowing along the ship canal and promote multiuse, the Lake Washington Ship Canal Rowing Traffic Pattern scheme has been established to help facilitate and better understand rowing patterns and identify conflict areas between competing uses within the ship canal.

While a number of regulatory and legislative issues arise regarding implementing such a plan in a Canadian context (i.e. Canada Marine Act, Navigation Protection Act), there appears to be potential to create something similar within Coal Harbour with the specific intent to educate and inform all stakeholders regarding rowing issues and improve user safety. The Lake Washington Ship Canal Rowing Traffic Pattern is illustrated on the exhibit below .



There are several organized and sanctioned races that occur along the entire length of the ship canal so at a regional level of review such a scheme would be helpful. For example, one race includes the three-mile course that starts in Lake Union along "boathouse row" with Seattle's iconic Space Needle in view. Rowers wind beneath the University Bridge into Portage Bay and through the Montlake Cut to Lake Washington where the course takes a turn back toward Husky Stadium to the finish line near the entrance to Conibear Shell house at the University of Washington.

A portion of course location is presented in photographs below to illustrate the spatial context and multiuse characteristics of the area. The photographs reference the Montlake Cut. The Montlake Cut is one of the most photographed locations within the University of Washington and represents a finish line location to the world renowned Windemere Cup Race. Refer to exhibits below to illustrate the various uses using the cut. The exhibit following provides details on the rowing routes.



As illustrated in the exhibit above, a “warm up no passing” lane as well as a “racing lane” has been identified for transits through the Montlake Cut for non-competitive events. The photographs clearly illustrate the restricted nature of the cut and the magnitude of vessel transits that occur in the area.

In discussion with representatives from the Head of the Lake Rowing Club to ascertain the actual widths of the lanes for those transiting the Montlake Cut, Megan Ricci provided the following information. While not specifically designed for training the lanes, the widths due provide insight into requirements in narrow locations and multi-use locations:

- No passing lane 10 m + rowing lane 12.5 m= total administrative width 22.5 m
- Width available for safe rowing passage 35 m
- Total width of Montlake Cut 50 m (shore to shore)

Due to the restrictive nature of the Montlake Cut and multi-use characteristics of the waterway questions were posed regarding mitigative measures that could potentially be applied to improve boater safety. Channel widths, rowing widths were noted, development of a rowing traffic pattern identified, safety and enforcement, educational information, as well as signage and enforcement noted. The list or criteria is discussed below in context to what has been done along the Washington Ship Canal and Montlake Cut compared to Coal Harbour. Mitigative measures are also noted.

Table 1 Multiuse Waterway Criteria: Montlake Cut and Coal Harbour Comparison

Criteria	Montlake Cut	Coal Harbour	Potential mitigative measure for Coal Harbour	Regulatory Implication	Suggested Mitigation for Coal Harbour
Multi Use Corridor	Yes Commercial, recreational and paddle Frequency High Use	Yes Commercial recreational and paddle Frequency Moderate Use	Apply multiuse waterway guidelines approach to Coal Harbour to facilitate paddle-oriented recreation	Principles of multiuse corridor could be incorporated with limited regulatory implications to port authority and NPA if focused on safety, information and education	Ideology could be adopted
Development of Rowing Traffic Pattern	Yes Rowing Lane Traffic Pattern forms part of the Lake Washington Ship Canal navigational strategy- no regulatory implications	No Rowing Traffic pattern in place for recreational user's in Coal Harbour Focus was on channel design (width) in accordance PIANC and FISA rowing standards	Yes Potential establishment for use in Coal Harbour for educational and information purpose only	Rowing Traffic Pattern would have to be for education and information only as potential legislative and regulatory implications with port authority and NPP may arise	Mapping the scheme feasible for all stakeholders regulatory and legislative e implications are a potential issue
User Communication and Education	Extensive throughout the Ship Canal Army Corps of Engineers, University of Washington Rowing Clubs and Port of Seattle were all part of the solution	None	Port authority could implement through emerging safe boating program	User communication and education needed no legislative implications	Undertake Basin wide user communication and education plan
Overall Navigational Channel Width	45 m	36.4 m motorized + 27 m rowing = 63.4m	Total channel width for all users 63.4 m no restrictions to	Proposed rowing lane widths are only administrative intended to accommodate rowing	Channel lines will not be charted nor are rowers required to stay within the rowing

			where rowing can occur	in the design process rowers can still navigate throughout the entire channel	lanes idea is to defer to the rowing traffic scheme/pattern
Rowing Channel Widths No Passing lane /Training lane	10 m	Two 13.5 m rowing lanes (27m)	27 m however acknowledge the rowers are not restricted to the lanes	Proposed rowing lane widths are only administrative intended to accommodate rowing in the design process rowers can still navigate throughout the entire channel	Channel lines will not be charted, no liability as to where they row
Racing lane	12.5 m	2, 13.5 m rowing lanes supported (27m)	27 m however acknowledge the rowers are not restricted to the lanes	Proposed rowing lane widths are only administrative intended to accommodate rowing in the design process rowers can still navigate throughout the entire channel	Channel lines will n no liability as to where they row to be charted,
Buoy Markings	Yes	No	While no racing occurs, rowers use line of sight to triangulate rowing backboards identifying such features and confirm they exist for rower safety	No regulatory implication if buoys are not present new line of sight created as flashing markers on K float	Not practical but line of sight key for rowers and should be noted or established to assist in training for both upstream and downstream
Speed Restrictions	7 knot restriction	5 knot restriction		5 knot restriction in Coal Harbour less than Seattle	No change
No Wake Signs	'No Wake' signs are posted Rowing signs acknowledged	"No Wake" Signs are not posted No Caution rowing signs posted	Signage at all points of access should be considered	No regulatory implication	No Wake signs to be posted
Scheduling	Generally, schedule around high use periods (i.e. use early mornings with preferred conditions)	Generally, schedule around high use periods (i.e. use early mornings with preferred conditions)	Scheduling of rowing activities could be communicated with boaters	Scheduling of rowing activities could be communicated with boaters	No change however education plan could improve stakeholder understanding
Planning Emergency Stops	Yes	Yes	Internal Training	Internal Training	
90 Degree Turns	Yes	Yes	Internal Training	Internal Training	

Safety Lights	Skulls Equipped with starboard port and stern lights	No			Not applicable no rowing at night
Punitive Measures	Record registration number and report to Coast Guard	No measures in place	Boaters must understand the rules and have consequences to large wakes and speed impacting rowers	Port authority may be able to put in place pending Boater Safety Initiative	Future potential resultant from port authority Recreational Boating Plan

Meetings with the Vancouver Rowing Club

Three meetings were held with the executive of the VRC prior to the project application being submitted to the port authority. The meeting dates and key points of discussion are outlined below.

Meeting Number 1: Vancouver Rowing Club September 10th, 2018 5 pm -7pm

A meeting was held at the VRC on September 19th 2018 at 5pm. Those in attendance were Peter Powers (RVYC), Carmen Derricott (RVYC), Chris Barnett (RVYC), Russ Tyson (TyPlan), Dan Tresa (VRC Past President), Dimas Cariverio (VRC Captain Rowing), Betsy Segal (VRC President), and Keith Jolly (Past President).

In preparation for the meeting, RVYC provided the VRC with the following information, which complied with relevant navigational sections from the RVYC Project Permit submission to the port authority (that was ultimately to be forwarded to the port authority for permitting purposes). The data included the following:

1. Appendix B of the Project Description submitted to Port authority: Navigational Channel Design Coal Harbour: As part of the overall process of the expansion project, the port authority requested that a comprehensive channel design study be undertaken for the Coal Harbour channel that reflects the:
 - a) Permanent Association of Waterborne Transport Approach Channel Guidelines (PIANC 2014) to ensure the channel is designed to current international standards.
 - b) Reference to multiple use of the waterway, we have referenced the document: A Guide for Multiple Use Waterway Management (National Association of State Boating Law Enforcement) with specific reference to planning for rowing.
 - c) International standards outlined in the International Federation of Rowing Associations (FIFA rowing lane standards were referenced and incorporated into the design) intended to further protect and reduce conflicts between boaters and rowers in the area.

RVYC has committed to an education plan to further outline and define means to reduce conflicts within the harbour and promote safety. RVYC anticipates working with VRC to deliver this program. It is noted that the Port authority participated in this design process and has agreed to the design through the harbour master's office review.

2. 17015-CV-208 (Vessel Access): All attempts to reduce access to the channel via blind maneuvers (vessels reversing into the channel) reduced to promote overall safety.
3. 17015 -CV-205B (Navigational Channel and Expansion area): This exhibit illustrates the proposed expansion area in relation to the overall channel design (that has been designed with the cooperation with Port authority) in relation

to the other stakeholders. It is noted on the exhibit available future water lot expansion areas available to others resultant from the channel design. The navigational channel as presented was administrative in nature and not intended to be represented any navigational chart, nor had it any liabilities associated with it. The channel lanes were simply a means of ascertain whether all users could be accommodated for based on best managment practises and channel design standards.

In summary the key message presented by RVYC was:

- The channel design includes current best practices for channel design and meets all the established guidelines for navigation.
- Rowing has been considered and provides for two non -designated 13.5 m rowing lanes 27 m.
- Port Authority has accepted the design of the channel based on best practices.

In response, VRC indicated that such a plan would represent the death of rowing. The main concern voiced was the use of international rowing standards as the width for training purposes. Training has nothing to do with international course races, which are not held at the VRC, but it must be understood that in a training environment in which novices and intermediate's row, they tend to maneuver all over the place and by designating a rowing lane width upon which they are to navigate was a ridiculous assumption.

RVYC noted that the channel design was an administrative function only and was undertaken at the bequest of the port authority to ensure that the multiple users of the waterway could be accommodated for, based on best practises for channel design and referencing rowing lane requirements. The VRC forwarded a letter of concern to RVYC.

Both parties agreed that a Rowing Traffic Scheme, like what has been established in the Port of Victoria would go along way to educating boaters of rowers needs and activities.

The key point of miscommunication was that all users have the right to navigate throughout the entire 63.4 m channel and are not restricted to any administrative lines depicted on the mapping.

The groups agreed to meet future to discuss the project.

Meeting Number 2 : Wednesday October 24th, 2018 4-6pm

Dan Tresa, Matthias Uhlenbruck, Dimas Cariveiro (invited) graciously met with Russ Tyson, Chris Barnett (invited), Carmen Derricott (invited) at the VRC with the specific purpose to undertake a site visit on the water to provide first hand experience rowing in Coal Harbour. The following observations regarding rowing were noted:

- Rowers especially beginners and those in training due not follow straight lines (observed at racing) but rather due to inconsistencies with their strokes tend to meander through the channel.
- There is an outbound and inbound route. The outbound follows the south shore of the Harbour just north of the proposed maneuvering lane. The inbound traffic aligns themselves with the sails of the port authority building and the cardinal markers at the entrance of Coal Harbour.
- Turns are most difficult for beginner rowers and turning usually requires two 90 degree turns to align themselves back with the VRC.

- Weather dependent rowers either row to the edge of the old Customs House Dock and then turn, or in difficult weather/ water conditions turn at the Westin Hotel to avoid waves and winds.
- It is very apparent that vessel speed and the resultant wake are a significant safety concern to those in skulls and the general boater has no idea the potential safety issues that arise as a result of such wakes and speeds they travel.
- While there are numerous points of ingress and egress for vessels on the south side, areas of concern Westin Bayshore / Coal Harbour marina ingress and egress points. This is exacerbated when rowers are faced with winds and waves at the Coal Harbour inlet.

Meeting Number 3: November 5th, 2018 Meeting with VRC 5-6:30

A meeting was held at the VRC 1:00pm-2:30pm on Nov 5th, 2018. Those in attendance included Carmen Derricott (RVYC General Manager), Robbie Hausch (Coal Harbour Expansion Project Steering Committee), Chris Barnett (RVYC Asset Manager) Russ Tyson (TyPlan) and Dimas Cariveiro (VRC Rowing) and Keith Jolly (VRC Past President). The following key points were discussed.

VRC reiterated the importance of training in Coal Harbour, noting that they have been doing it for 103 years, have over 200 members and are responsible for the safety of their members/users. Any reduction in the channel width would severely limit the ability for the club to row.

RVYC acknowledged that this is an issue, one in which RVYC takes seriously and their attendance today was to continue to identify issues and resolve with VRC. RVYC stated that the navigational lines depicted on the exhibits originally forwarded to VRC were simply administrative in nature, not intended for navigation. Most importantly, they are not intended to restrict anyone's (i.e. rowers or boaters) ability to navigate throughout the entire channel (63.4 m width at RVYC). Rather, the channel lines shown were simply outlined for the sole purpose of determining whether multiple uses could be accommodated for from an administrative perspective, and if based on best practices for navigational channel design, a multiple use of the waterway could be accommodated for. Commercial and motorized and sail vessel channel design was determined via a channel design based on the Permanent Association of Waterborne Transport (2014) Approach Channel Guidelines (the standard the port authority uses) and provision for two rowing lanes of 13.5 m as identified based on the International Federation Rowing (FISA), for racing as well provision for a swimming lane.

VRC indicated that the width of the rowing lanes was irrelevant (e.g. the use of international racing regulations lane width,) as it does not reflect the training needs of the VRC membership as they do not tend to follow straight lines when training and learning how to row. RVYC reiterated not to focus on the navigational lanes depicted on the administrative exhibit but rather note the fact that rowers and all other stakeholders have the right to navigate within the 63.4 m width of the entire channel provided safe boating practices were observed. VRC indicated that for training purposes they required a 40 m width either side of the channel, to undertake mock races a total of 80 m.

RVYC noted that if the project does not proceed the design technically enables a developer to develop on the south side of the channel displacing the linear nature of the Harbour headline, that would effectively be the death of rowing, as it introduces another 90% turn preventing training over the 1000m stretch. Since the RVYC proposal is first in line in relation to port authority permitting, this proposal has priority. It was understood that Concord Pacific on behalf of the Westin Group that would likely secure the additional area for a marina type development. At the time of the inquiry regarding the channel design the Port authority contacted RVYC regarding the status of the expansion project, asked if the Coal Harbour Expansion project is to proceed otherwise the port authority would have to entertain another proposal. As RVYC application was being proceeded with, it remained first in line, indirectly protecting rowing in perpetuity and establishing a linear headline in the process in the north. By RVYC proceeding with the application, it is deemed that RVYC and VRC could create a win win, scenario where rowing is protected in

perpetuity, the rowing club secures an area for future development and the RVYC expands Coal Harbour, while implementing significant safety and educational improvements for rowers.

RVYC stated that the Montlake Cut, in Seattle which forms part of the Lake Washington Ship Canal, represents a perfect benchmark upon which rowing training lanes could be referenced in relation to an existing multi-use waterway. The Lake Washington Ship Canal accommodates recreational, commercial and paddling sports. The location also supports several rowing clubs.

By Google map measurements the Montlake Cut (shore to shore) width is 50 m, however the available rowing width is 35 m (where they can safely row (whereas Coal Harbour is 63.4 m). The actual channel widths for non-racing events in the Montlake Cut consists of a no passing lane of 10 m and a rowing lane of 12.5 m, totaling 22.5 m (whereas we have a rowing lane 12.5 m inbound and 12.5 m outboard totaling 27m). This represents an additional 4.5 m width than the non-racing no passing and racing lane in the Montlake Cut. VRC did not comment on the width of these rowing lanes but noted that the area was highly restricted, and that for racing purposes, the Montlake Cut was sometimes closed to racing. However, racing does not occur in Coal Harbour.

RVYC indicated that the last meeting between VRC and RCYC the group spoke about the need to develop a "Rowing Traffic Scheme /Pattern" intended to provide insight to all stakeholders (i.e. small commercial operators, larger operators, sailboats, powerboats, paddling vessels) that could be used to improve safety and improve awareness. VRC agreed that this would be a good idea for Coal Harbour. Reference was made to the Victoria Rowing Scheme and the Washington Shipping Canal Rowing Traffic Pattern of which the Montlake Cut was part. VRC agreed that this should be pursued and would be beneficial for the entire Harbour and safety of users.

RVYC noted that based on their benchmark review of other jurisdictions and how multi-use waterways were managed, it was noted that a key mitigative measure for addressing safety was via a robust communication and educational plan with all users. VRC agreed that this would be a good idea. RVYC has committed to such an educational and information plan as stated in the project description submitted to the port authority as part of this proposal.

RVYC mentioned that they also understand that the port authority Harbour Master's office is taking a more proactive role in recreational boating within the Harbour means of addressing smaller commercial and recreational use conflicts evident from increasing complaints in which boating regulations are not being followed. VRC agreed this is an issue. It is understood that Port authority plans to embark on a Recreational Boater Safety program to address this issue. VRC also agreed that this would be a good idea to participate.

RVYC provided an illustration of a preliminary rowing traffic scheme for VRC consideration, based on both the Victoria Harbour Traffic Scheme and the Lake Washington Ship Canal rowing scheme. Interest was identified from the VRC side and noted the following comments:

- Rowers do not row in the maneuvering lanes as illustrated and suggested that the exhibited line will be moved (lines were just illustrative, but lines modified)
- VRC indicated that the expansion would reduce the available width and that they would lose the ability to align themselves with the Canada Place Sails, range markers high point at Coal Harbour and the VRC dock. They also acknowledged that they could now align themselves with the navigational lighting required for "K" float.
- VRC noted continued concern regarding the western end of "K" float being blind spot, RVYC agree to replace the proposed larger motorboats at both the west and east end of the "K" float with smaller sailboats.

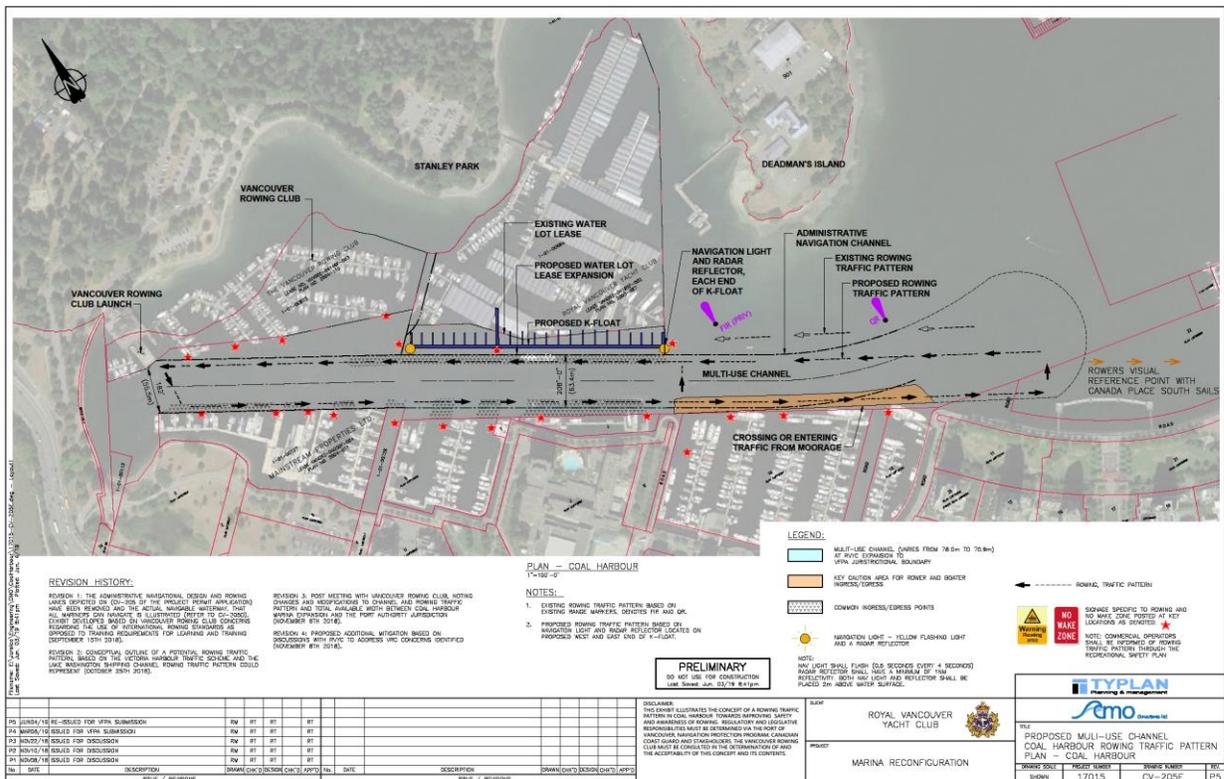
Additional mitigative techniques identified but not discussed at the meeting which potentially be implemented as a result of discussions with VRC include:

- Vessels mooring at “K” float will be required to moor bow towards Coal Harbour. This would enable all boaters (sail, power commercial and rowers) to be aware of departing vessels and docking vessels. RVYC members will be told that rowers have right of way until they pass.
- Large mirrors will be placed on “K” float to better provide visual awareness of vessels in and abutting the rowing lanes.
- Permanent signage posted for members to remember rowing activity and that we must give way, keep clear, watch wake etc.
- Add rowing traffic plan of VRC showing rowing lanes to be posted in the mermaid café and on website
- As well as a paper handout for all Coal Harbour moorage members.

Based on meeting with VRC regarding the requirements of rowing RVYC has developed a preliminary rowing traffic pattern map highlighting the rowing patterns of the VRC, the identification of key area of caution, and noted mitigative measures to address concerns regarding rowing. While the administrative width of the rowing lanes is still a contentious issue with VRC is noted that rowers can row throughout the entire 63.4 m width of the channel at any given time.

This preliminary rowing traffic pattern is meant for information only and must be fully vetted with the VRC. Other recommendations of this report, inclusive of the rowing traffic pattern, creation of a recreational boating safety plan (update) and educational and informational communication tools should be discussed between stakeholders the NPP and Port authority.

A preliminary outline of the rowing traffic scheme is presented below.



Conclusions and Recommendations

This memorandum outlines the measures undertaken to by RVYC to address the Vancouver Rowing Club (VRC) concerns voiced throughout three informational meetings held with VRC during the period of September to November 2018, regarding the proposed Coal Harbour Marina Expansion Project (Project). The ability to maintain the multiuse nature of the waterway within Coal Harbour, that would also enable the project to proceed, while preserving and enhancing rower safety and use was the objective. The memorandum outlined:

- the channel design methodologies used;
- the issues that have arisen;
- a benchmark that reflects successful multi waterway planning (the Lake Washington Ship Canal Rowing Traffic Scheme and rowing patterns via the Montlake Cut);
- Proposed mitigation.

This memo also explores the rowing lanes and widths established via the Montlake Cut to provide insight into widths that should be accommodated for in relation to Coal Harbour. Based on the above the following conclusions and recommendations are presented.

Conclusions

The provision of 63.4 m of navigational channel width in Coal Harbour appears provide adequate width to accommodate continued training for rowers in Coal Harbour. While 27 m of the total 63.4 m is identified to support rowing, it is recognized that junior and intermediate rowers in training do not follow straight lines and will intrude into areas identified for motorized vessel transits. The administrative lines presented to the VRC represented benchmarks in order to ascertain if all marine uses could be accommodated for, but do not reflect that fact that rowers can utilize in the entire 63.4 m channel.

Recommendations

To facilitate improved safety throughout the Coal Harbour basin the following recommendations should be pursued by stakeholders and the regulators:

1. Creation of a multi-use strategy for Coal Harbour;
2. Define a rowing traffic pattern within the Harbour to facilitate to better define in a non-regulatory context how when and where rowers navigate in the channel;
3. User communication and education (both motor craft sail and recreation (paddle boats));
4. Signage be utilized such as rowers present, no wake, and speed limit postings a strategical location;
5. Line of sight landmarks be highlighted to assist rowers align for downstream and upstream transits (e.g. the new navigational lights on “K” float.

Next Steps

The development of a plan specific to protecting the safety of the rowing community in perpetuity is the objective of this evolving process. While neither the RVYC nor VRC can deliver this plan in isolation to the regulatory environment in which they operate this preliminary outline represents and presents a conceptual rowing traffic scheme, that represents a starting point upon which the stakeholders (RVYC, VRC, Harbor Cruises, local Marinas etc.) can collaborate with the regulators (Navigation Protection Program (NPP) and the Port authority) to better coordinate multiuse in Coal Harbour with the key objective towards improving safety.

RVYC has attempted to reference guidelines and incorporate input from stakeholders to identify a preliminary plan of action and potential mitigative measures, however further study is required that addresses user and stakeholder concerns and the regulatory environment in which such operations must work.