Submitted to HCMA on behalf of the City of Burnaby

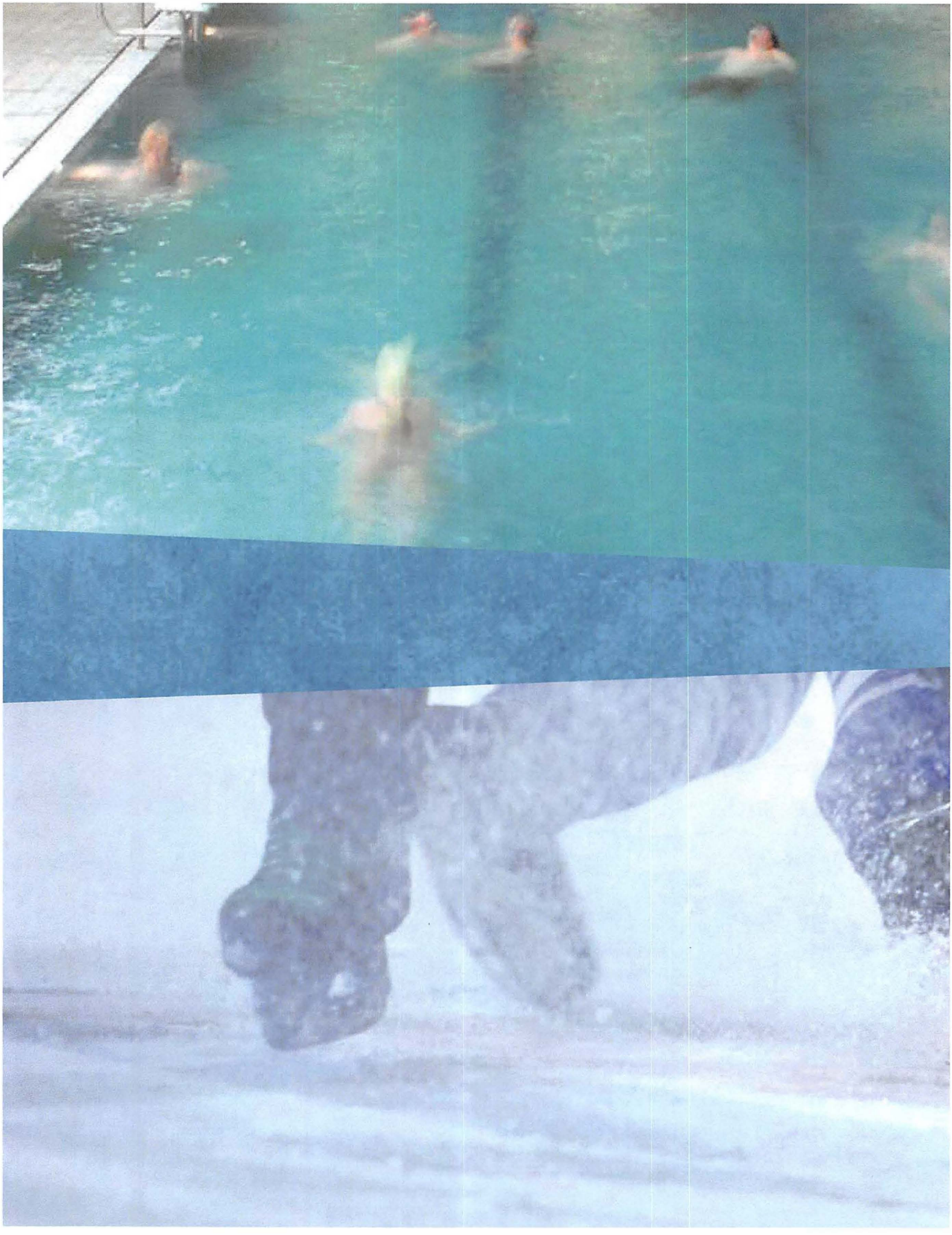
Burnaby Lake Aquatic and Arena Facility

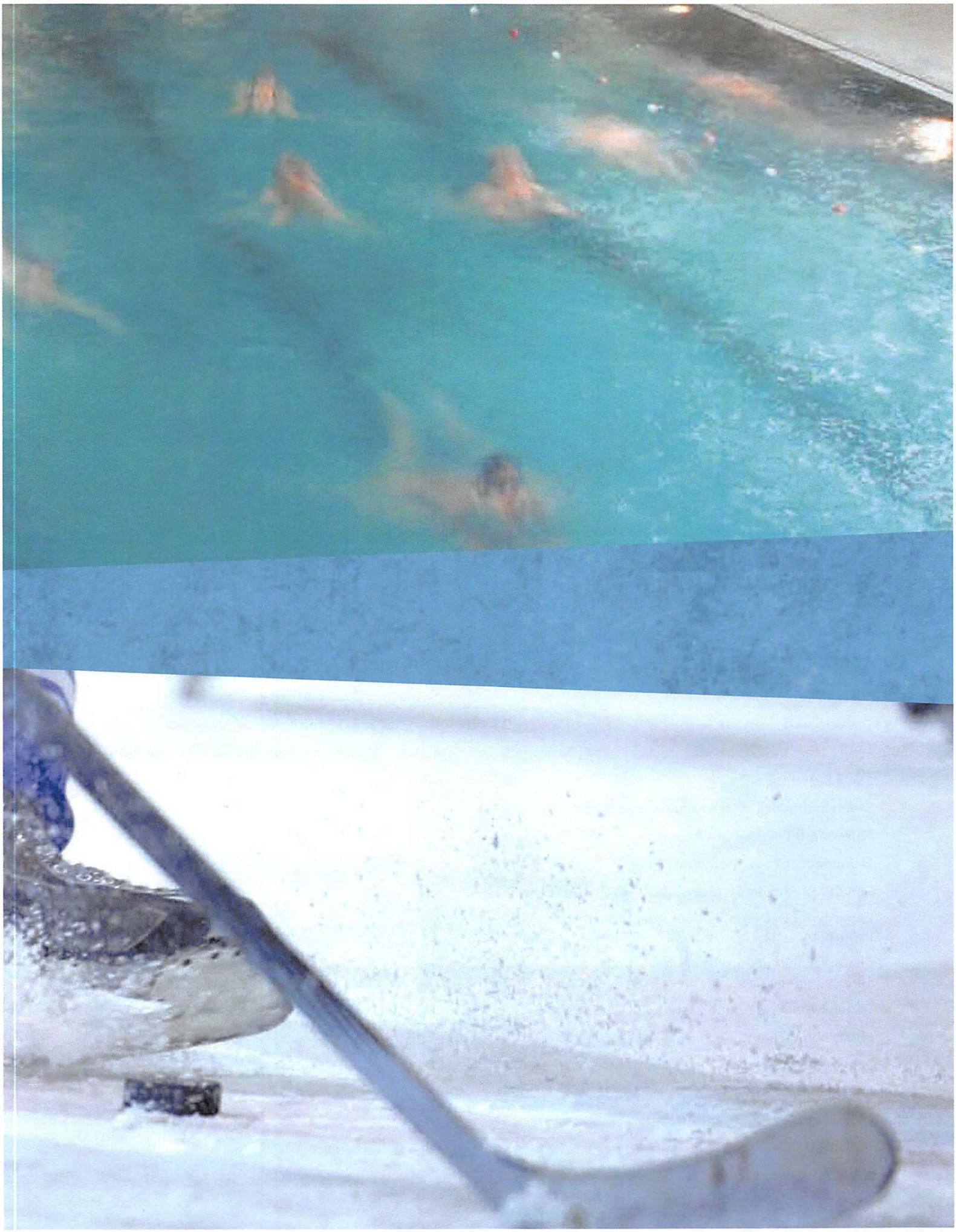
July 2019

City of Burnaby

HCMA

RC strategies + PERC





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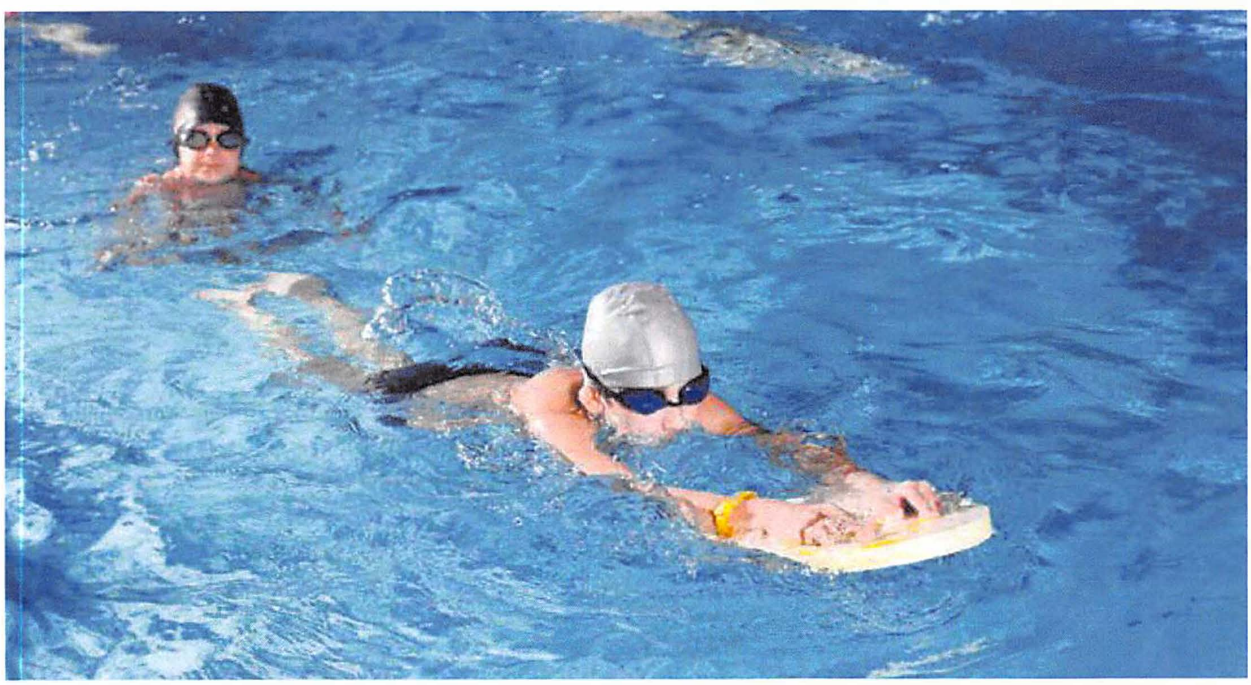
Introduction

In April of 2019 the City of Burnaby retained HCMA to undertake a feasibility study of replacing its aging Burnaby Lake Arena and C.G. Brown Pool. As part of that project HCMA retained RC Strategies+PERC to prepare a Needs Assessment for both a replacement pool and a replacement arena. This report is the result of that Assessment.



Background and Context

Regional Context

The City of Burnaby has a population of 232,755 living in approximately 100,000 private dwellings.[1] Centrally located in the lower mainland, Burnaby borders, and is within close proximity to, a number of urban municipalities including Vancouver, New Westminster, Coquitlam, Port Moody, and the District and City of North Vancouver. Due to Burnaby's central location, the City's recreation facilities have the potential to serve a broader regional market.

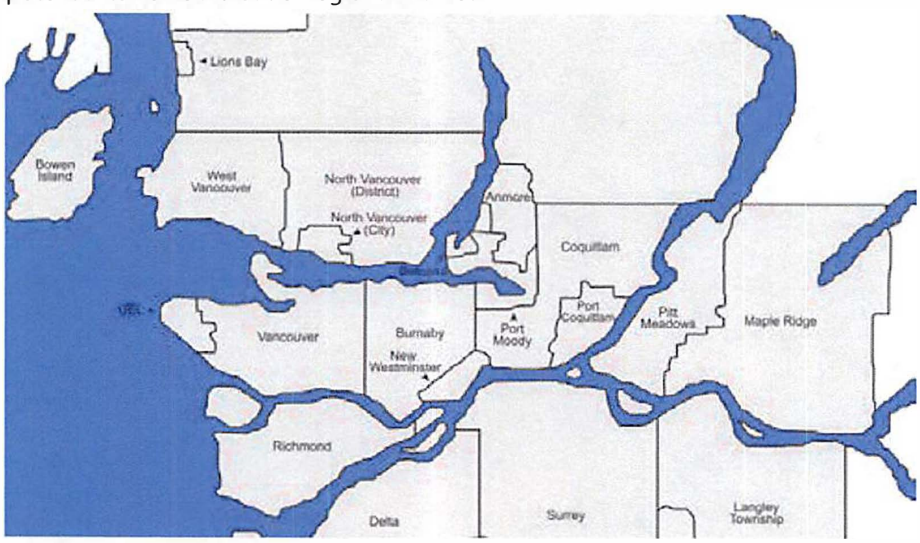


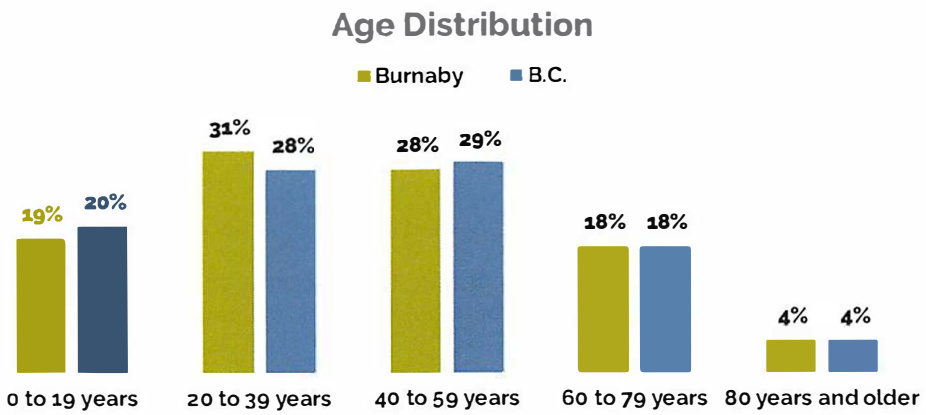
Image: tourismvancouver.com

1 Statistics Canada 2016.

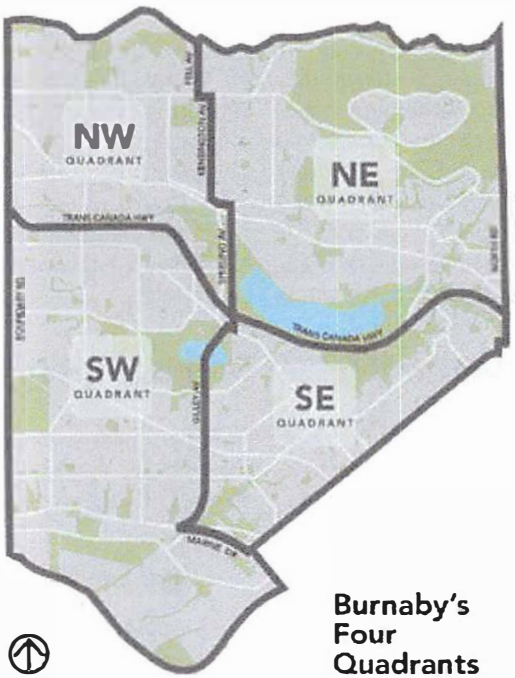
It is also important to note that some of these neighbouring municipalities are developing new aquatic facilities that could attract Burnaby residents. Coquitlam is building the Burquitlam YMCA pool and complex near Burnaby's northeast border and another new pool is slated in Coquitlam's Fraser Mills neighbourhood which is just beyond Burnaby's southeast border. To the south of Burnaby, New Westminster is building a new 50 meter pool to replace the existing one at the Canada Games Pool. Vancouver, which is adjacent to Burnaby's west border, has plans to replace pools including at least one in near proximity to Burnaby. The City of North Vancouver is also building a recreation facility with a new pool, located just off Highway 1 to the north of Burnaby across Burrard Inlet.

Population and Demographics

Burnaby's age distribution is fairly similar to Metro Vancouver Regional District. The only notable difference, as seen in the graph below, is in the young adult category, as Burnaby's proportion of residents 20 to 39 years is 3% higher than the region's.



Burnaby has lower levels of income compared to the region as a whole. While Metro Vancouver's median after-tax household income was $63,365 in 2015, Burnaby's was over $6,000 less at $57,107. In addition, in the 2016 Statistics Canada census, Burnaby's prevalence of low income families based on the low-income cut-offs, after tax (LICO-AT)[2] registered at 17.8% of the population compared to 13.9% throughout Metro Vancouver.



Burnaby's Four Quadrants

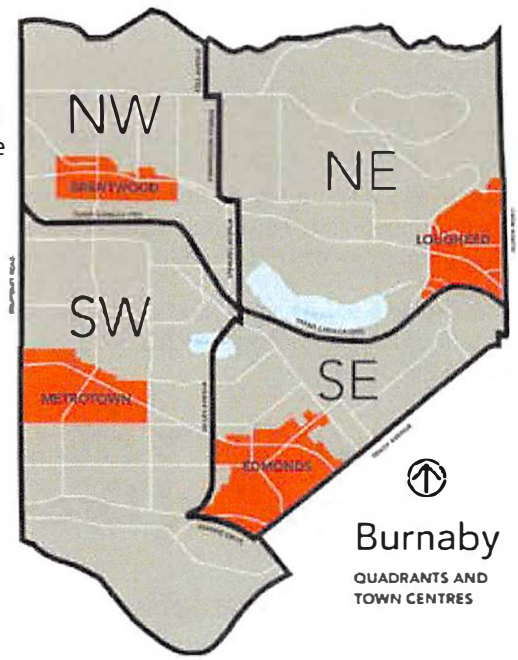
Burnaby's proportion of recent immigrants, residents who moved from outside of Canada between 2006 and 2016, is 14.1%. This proportion is higher than in Metro Vancouver during the same timeframe (11.8%). In the last five years, immigration was most prevalent from countries such as China, Philippines, India, and South Korea. Generally, these countries have less affiliation to using indoor ice arenas and indoor public pools.

In 2011, the City of Burnaby provided population statistics from each of its four quadrants. The populations and growth between 2006 and 2011 are displayed in the following chart.

Quadrant	Population (2011)	Growth (2006 to 2011)
NW	45,420	15%
NE	45,920	10%
SW	75,560	6%
SE	56,465	12%

2 The low income cut-offs (LICOs) are income thresholds below which a family will likely devote a larger share of its income on the necessities of food, shelter and clothing than the average family. The approach is essentially to estimate an income threshold at which families are expected to spend 20 percentage points more than the average family on food, shelter and clothing.

Burnaby recognizes one area in each quadrant as a Town Centre. 2011 statistics are also available for each of the City's four Town Centres as shown below. Metrotown had the largest population in 2011 but the lowest amount of growth since the previous census. Brentwood nearly doubled between 2006 and 2011 as it experienced 80% growth.



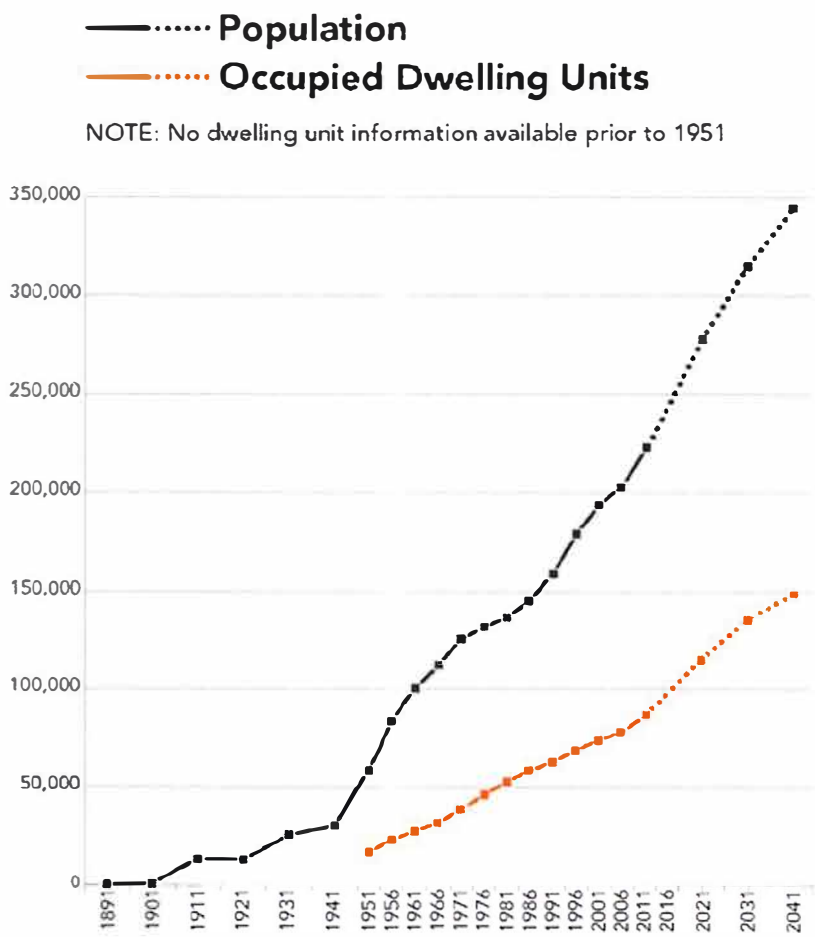
Town Centre	Population (2011)	Growth (2006 to 2011)
Brentwood (NW)	11,705	80%
Lougheed (NE)	15,105	17%
Metrotown (SW)	24,889	4%
Edmonds (SE)	23,750	20%

Projected Growth

Burnaby's population grew by 4.3% between 2011 and 2016 which is a lower percentage of growth compared to that experienced by Metro Vancouver (6.5%). According to the City's Official Community Plan, the population is projected to reach 314,000 by 2031, amounting to an average increase of approximately 1.6 percent per year. The population growth between 2031 and 2041 is projected to grow at an average annual rate of 1.0 percent to reach 345,000 by 2041.

Growth projections for each Town Centre were also presented on the Official Community Plan. Brentwood, which is in the City's Northwest quadrant, is expected to reach 52,600 by 2041.

Burnaby's Historical and Projected Growth Trends



Town Centre	Population (2011)	Projected Population (2041)	Projected Growth (2011-2014)
Brentwood (NW)	11,705	52,600	349%
Lougheed (NE)	15,105	22,400	48%
Metrotown (SW)	24,889	66,800	168%
Edmonds (SE)	23,750	46,500	96%

The proposed site for the two replacement facilities is centrally located at the intersection of the four planning quadrants; making it almost equally accessible by all four City planning areas.

Need for a New Indoor Pool

The context within which indoor aquatic needs are investigated and planning for aquatic spaces has been undertaken in this assessment warrants some introduction. There are a few definitions and four background concepts and that require understanding.

Some Definitions

To provide some context for understanding the remainder of this report, a few definitions are in order:

Demand for Aquatics Services – All demand for all seven categories of aquatics services includes current swims (by definition, all existing swims in public indoor pools are a demonstration of demand) plus frustrated demand (where demand has been registered but not fulfilled due to a capacity constraint, as evidenced by swim lesson registration waitlists and requests for swim lane rental that cannot be fulfilled) and latent demand (where, if you build a new facility, some might be motivated to try it out even if they haven't registered their demand before hand).

Capacity for Delivering Aquatics Services – Calculated using proprietary formulae, this is the physical capacity of an indoor pool or pools to accommodate demand. Assumptions about how the capacity is operated are usually used to qualify an estimate of what the capacity is. For example, if a pool is primarily used as a recreational facility, the capacity may increase. If it is primarily used as fitness facility or sport training facility, the capacity may be reduced. The capacity calculations used in this report assume a typical mix of uses in all seven categories.

Swim Rates – This is a measure of the total swims in a given population expressed as a ratio of swims per capita. If, for example, the swim rate remains constant, and the population grows, the total number of swims will increase. If the swim rate increases over time, the total number of swims would increase faster than the rate of population growth.

Utilization Rates – Total use of indoor pools in swims can be expressed as a percentage of available capacity. If demand exceeds capacity for indoor swimming in some or all of the aquatic service categories, it can be a justification for adding more capacity.

It is worth noting that once a city supplies sufficient capacity to meet all demand, if it continues to add capacity, that usually does not mean that the number of swims will increase. Just because you double capacity, doesn't mean you double the number of swims or the swim rate.

Seven Categories of Indoor Aquatic Services

Sometimes, when both indoor and outdoor aquatics services are being assessed, the consultants break all aquatic services into nine categories. However, when the investigation is restricted primarily to indoor aquatic services, seven categories are used to assess both current and future need. Each requires a slightly different configuration of aquatic spaces, water temperature or operation to optimally deliver the service. They are as follows:

- **Recreational Swimming** (i.e. swimming for fun);
- **Skill Development** (e.g. swim lessons primarily, but also other skills taught in a lesson format);
- **Fitness Swimming** (both lane swimming and water based fitness classes);
- **Sport Training** (e.g. aquatic sport club training sessions);
- **Special Events** (e.g. swim meets and other aquatic sport competitions);
- **Therapy and Rehabilitation** (where those that are injured, frail, or have disabilities are active in water because it supports their body weight; either in a program, or individually);
- **Leadership Training** (e.g. Bronze Medallion, Bronze Cross, NLS courses).

Almost all indoor aquatic services and needs can be categorized under one of the above headings.

Three Modes of Pool Operation

Similar to other recreation facilities, there are also three modes of pool operation as follows:

- **Drop-in**, where individuals and families decide to visit a facility and swim on a case by case basis;
- **Program**, where users pre-commit, through a registration process, to a series of uses that typically involve some instruction or leadership, and are scheduled at a predetermined time;
- **Rental**, where a group rents some aquatic space, and then controls the users and uses of that space.

The seven categories of aquatic service are typically accommodated within the three modes of operation as summarized in ***Figure One***.

Figure One

Primary Modes of Operation for Each Category of Aquatic Service

	Three Modes of Operation		
Categories of Aquatic Service	**Drop-In**	**Program**	**Rental**
Recreational Swimming	■		■
Skill Development		■	
Fitness Swimming	■	■	
Sport Training			■
Special Events			■
Therapy and Rehabilitation	■	■	■
Leadership Training		■	

Understanding the seven categories of aquatic service and how they are met within the three modes of operation is important to the assessment of existing aquatic facilities and in planning for any new aquatic amenities in The City of Burnaby.

Economics of Pool Operation

Some important economic aspects of the delivery of aquatic services apply to aquatic facility planning.

- The **Capital Cost** of an indoor pool, unlike most other forms of buildings, correlates more directly with the volume of the facility than the floor area. This is because the deeper the water, the more air above the water is typically required, and both water depth and ceiling height are very important and costly considerations when developing an indoor pool; as both require large amounts of mechanical systems (water treatment systems which vary with the volume of water, and HVAC systems for handling highly humid, chemical laden air) associated with those volumes. Two pools with the same floor area can have signficantly different construction costs if one has more deep water and higher ceilings than the other.
- **Operating Costs** for indoor public pools are highly regulated and largely fixed. About 70% of the operating costs of a typical pool are relatively or completely fixed (ie. they don't vary whether there is one person swimming or 40 people swimming in the pool enclosure) and are associated with a minimum number of lifeguarding staff, water quality systems, management staff, insurance, utilities, and staffing a customer service control point; none of which vary directly with the volume of use.
- **Operating Revenues** are almost all variable. In other words, if use increases by 10%, operating revenues go up roughly 10% as the revenue associated with swims in each category of aquatic service is largely constant on a per swim basis.
- Because of the previous two points, it is very important, from an economic and environmental sustainability point of view, to **operate a pool as close to full capacity as is reasonably possible.** A pool operating at a fraction of its total capacity has a high operating cost, a low operating revenue, and a very high net subsidy and energy consumption per swim. A pool operating close to its full capcity has a high operating cost, a high operating revenue, and a much lower net subsidy and energy consumption per swim.

  Another way of viewing this relationship is to acknowledge that every additional swim a pool is able to generate will trigger more operating revenue than operating cost and won't increase energy consumption proportionately. That means a community should try to size its pool or pools to meet current and short term (i.e. ten years) future needs, and not the needs of the very long term future, as "overbuilding" capacity in the short term to meet long term needs will likely result in operating subsidies per swim that are so high that they collectively exceed the cost of adding to the existing pool or building another pool far into the future when the community needs it.

All of the above contextual comments are very important in the sizing and configuring of pool spaces and planning for long term aquatic needs. To ensure the right kinds and amounts of aquatic spaces are built it is important to consider:

- the proportion of total aquatic use that will be generated in each of the three modes of operation;
- the proportion of total swims that will be generated in each of the seven categories of aquatic service;
- the total swims that result from the first two bullets above translated into a set of aquatic spaces that will optimally respond to those needs, resisting the temptation to "overbuild" spaces which won't be used for 20 years or more;
- while providing all core aquatic services, attempt to fill gaps in the supply left by other existing pools in the region and not duplicate service in categories which are more specialized and represent fewer swims;
- that as many current aquatic needs are met within a context of the least amount of volume of space;
- that all pools will be operated as close to full capacity as is reasonably possible to avoid unnecessarily high subsidies per swim.

The final few points above need to be considered as decisions about the proposed new aquatic centre at Burnaby Lake are made.

Benefits of Aquatic Services

Although public aquatic facilities are among the most expensive facilities that a community can provide, almost all communities invest heavily in them because of the tremendous benefits that accrue from their use. These benefits contribute to healthy, active individuals and communities and include:

- Water safety – learning how not to drown, one of the most basic of human needs and public services especially for communities close to natural waterways;
- Learning and improving skills in swimming, diving and other water sports;
- Fitness and conditioning in a medium that is least consumptive and least likely to result in injury because of the buoyancy of the water;
- Rehabilitation and therapy services to those with disabilities, injury or frailty;
- Social opportunities in water or on deck that connect people and reduce feelings of isolation;
- Family opportunities to come together in a recreational setting conducive to all family members;
- Mixing segments and subsets of the community with an activity that is worldwide, appeals to people of all ages and abilities;
- Leadership training for young people;
- Extensive volunteering opportunities;
- Special events that rally community identity, spirit and pride;
- Sport Tourism opportunities associated with swim competitions.

It is for the above reasons that there is justification in public aquatic swimming facilities to subsidize the operation quite highly. In addition to taxpayers having to contribute to the capital costs of indoor pools, the typical recovery rate[3] for an indoor pool is between 30% and 70%, with taxpayers paying the remainder of the operating costs.

3 Recovery rate is the proportion of all operating costs that are recovered from users through user fees. The complement of recovery rate is subsidy rate. They both add to 100%.

Capacity for Delivering Indoor Aquatic Services in Burnaby

The capacity of the existing four indoor aquatic facilities to deliver many or all of the seven categories of aquatic service relates to:

- The amount of surface area of the existing pool tanks;
- The depth of water in those pool tanks;
- Programming and scheduling of the tanks (i.e. different uses can result in different amounts of use in the same water surface area and depth);
- The total hours available each year.

Given a few standard assumptions about the above four bulleted criteria, which are noted in ***Appendix A***, the total capacity for aquatic service can be measured by the formula noted below:

- For water less than 5 feet deep, indoor pools have a capacity to deliver up to 65 swims per year for each square foot of water surface area;
- For water more than 5 feet deep, indoor pools have a capacity to deliver up to 25 swims per year for each square foot of water surface area.

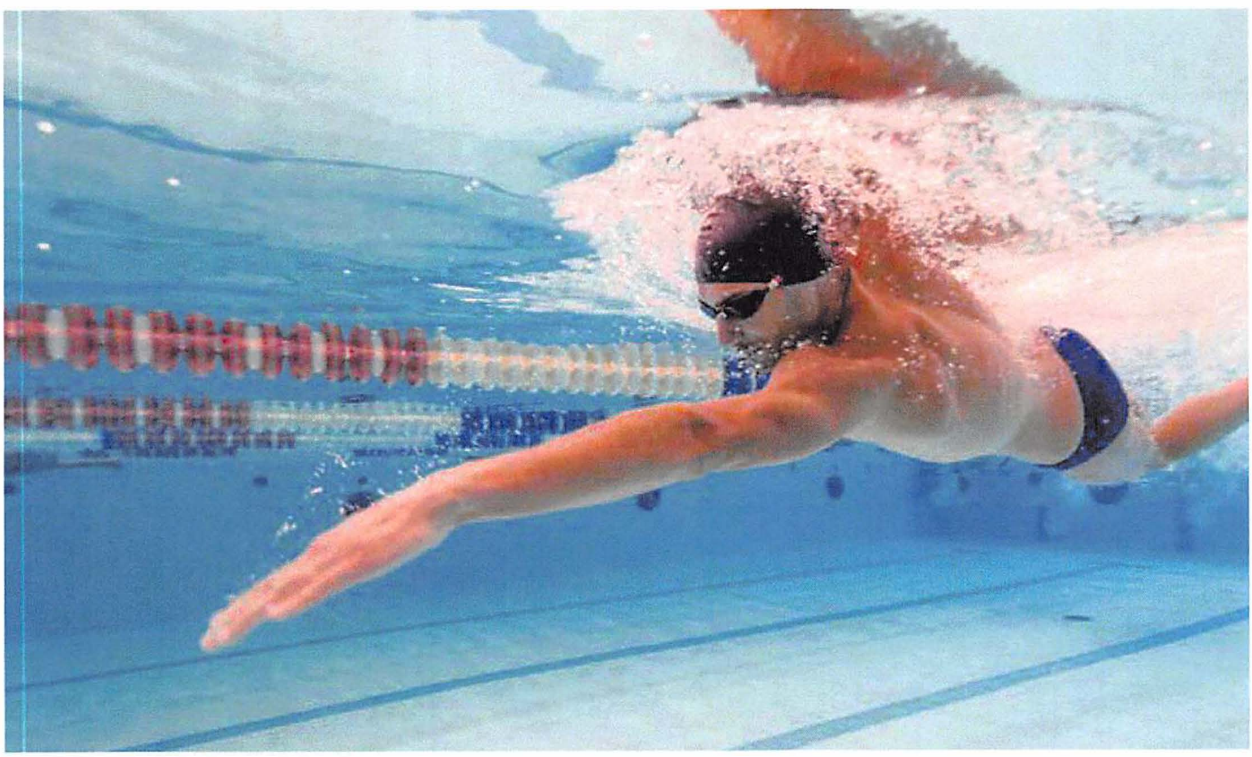


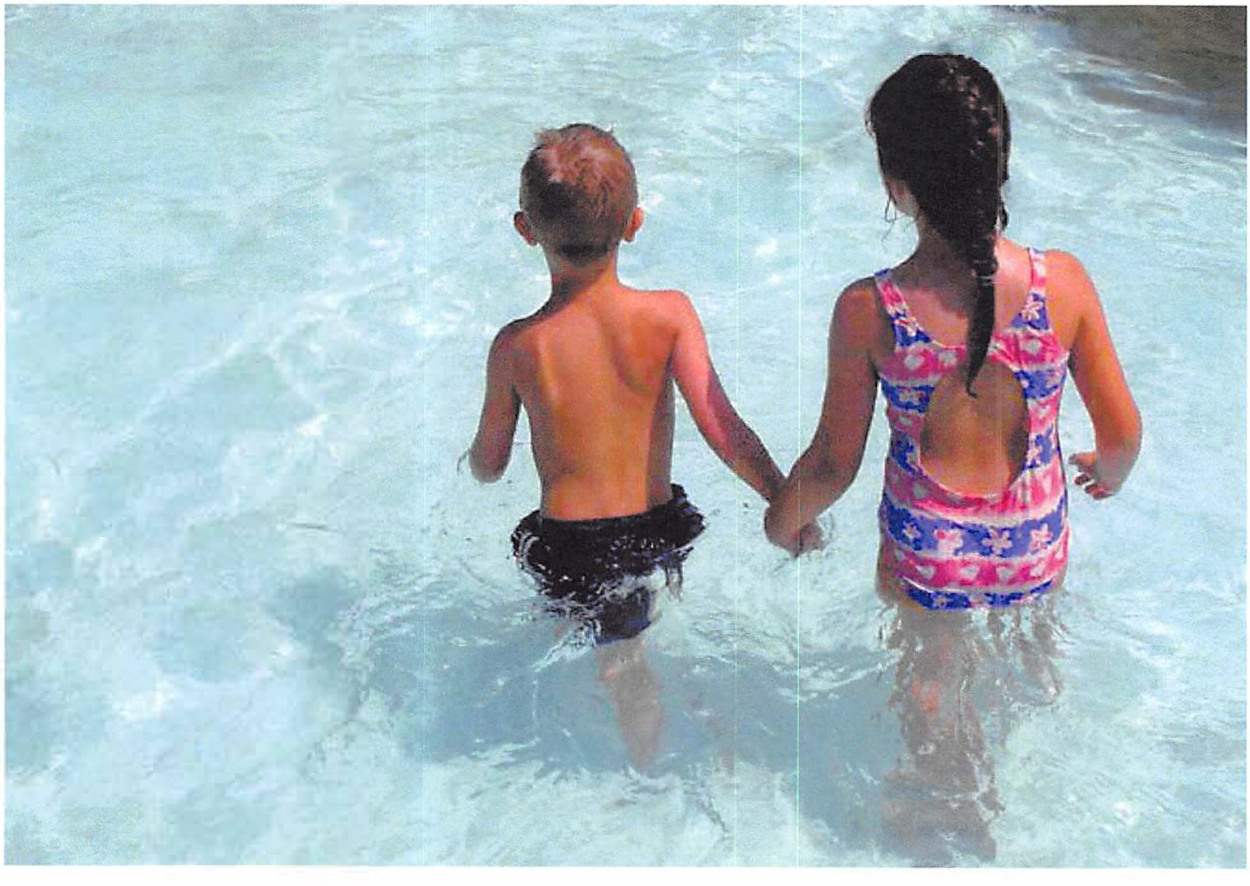
Figure Two summarizes all existing physical capacity for indoor aquatics in Burnaby. The totals have been calculated using previously noted proprietary formulae developed by the consultants over the past four decades of pool planning (see ***Appendix A***) and are easily defensible.

Figure Two

Summary of Existing Capacity to Accommodate Indoor Aquatic Services

Facility	Eileen Dailly Aquatic Centre	Bonsor Pool	C.G. Brown Pool	Edmonds Pool	Totals
Total	405,000	325,000	195,000	390,000	1,295,000

In addition to the above referenced existing capacity, there is a proposed new Aquatic Centre which would replace the C.G. Brown Pool. Determining the total capacity of that pool and how it needs to increase service in the seven categories of aquatics service is the focus of this segment of this Needs Assessment Report.



Characteristics of Current Indoor Aquatics Services and Spaces

To project future rates of indoor swimming in Burnaby it is important to note that in Canada virtually all urban centres have swim rates in the range of 4 to 8 times the City's population, or 4-8 swims per capita. Where a City falls within that range typically relates primarily to the number, quality and variety of indoor pools that are accessible to the public and secondarily to the size of the community. In communities with a few older facilities, not conducive to meeting some of the categories of aquatic service, they are usually in the lower half of that range. In communities with lots of excess capacity, all in high quality pools which offer a wide range of environments optimized to meet all seven categories of aquatic service, the community usually realizes swim rates in the upper half of that range. That said, the larger the urban centre, the fewer swims per capita it is likely to realize. Communities the size of Burnaby are typically in the 4-6 swims per capita range. The only occasions that the consultants have measured swim rates at or slightly above the 8 swims per capita level, has been in very small communities with a high quality multi-use aquatic centre. However, no larger urban centres have exceeded the 8 annual swim per capita range and almost all of them are between 4 and 6 swims per capita.

As ***Figure Three*** shows, Burnaby currently realizes about 4.84 swims per capita. It summarizes all existing use of indoor aquatics in Burnaby in 2018.

Figure Three

Current Documented Swims in Burnaby Indoor Pools in 2018

Use Type	Eileen Dailly Aquatic Centre	Bonsor Pool	C.G. Brown Pool	Edmonds Pool	Totals
Program	73,233	59,700	41,019	73,005	246,957
Drop-in	306,229	131,907	92,829	320,321	851,286
Rental	520	11,681	14,373	3205	29,779
Total	379,982	203,288	148,221	396,531	1,128,022

Figures Two and Three show that the existing indoor pools are operating about 87% of capacity, which is an optimum situation to be in. As usage starts to approach 100% of capacity, the quality of each swim can start to degrade due to crowing or conflicts between categories of use. Operating at about 85 to 95% of available capacity is an ideal situation.

Figure Four, takes the totals from ***Figure Three*** and combines them with an analysis of pool operating schedules and discussions with pool staff. It provides a rough estimate of how the current swims break down by category of aquatic service.

Figure Four

Summary of Estimated Existing Use of Indoor Pools

Facility	Eileen Dailly Pool	Bonsor Pool	C.G. Brown Pool	Edmonds Pool	Totals	Percent of Use
Recreational Swimming	225,000	90,000	55,000	280,000	650,000	58%
Skill Development	71,000	67,000	40,000	62,000	240,000	21%
Fitness Swimming	73,000	30,000	30,000	40,000	173,000	15%
Sport Training	500	12,000	14,000	2000	28,500	3%
Special Events	0	1000	2000	0	3,000	0%
Therapy and Rehab	10,000	3000	2000	10,000	25,000	2%
Leadership Training	1000	1000	5,000	2000	9,000	1%
Total	**379,500**	**204,000**	**148,000**	**396,000**	**1,127,500**	**100%**

The totals in ***Figures Three and Four*** show that Burnaby residents are currently swimming at a rate of about (1,127,500/232,795) 4.84 indoor swims per capita. However, the City is projected to grow to about 314,000 in the next twelve years to 2031 and to about 345,000 residents by 2041. So, the current swim rate would trigger an additional (4.84 x 81,205) 393,032 swims annually by 2031. That would result in adding capacity to accommodate future growth over the next ten to twelve years but not add capacity that will remain unused for more than fifteen years. Accommodating ten to twelve years of growth at 4.84 swims per capita would add about 393,032 swims annually.

Due to current frustrated and latent demand shown in future sections of this report, there is reason to believe that the swim rate can and will be increased by at least one swim per capita, and possibly up to 1.16 swims per capita or at least 314,000 annual swims and possibly 364,240 annual swims, which would take the City up to a level of 6 swims per capita; a level beyond which very few communities the size of Burnaby have ever experienced. That would add an additional (364,240 + 393,032) 757,272 swims per year. In the case of replacing the CG Brown pool, which currently has annual capacity for 195,000 swims, that would require a total capacity in a new pool of about (757,272 + 195,000) 952,272 swims annually. Developing a pool with much more than one million swims would result in operating unused capacity for many years at a high net subsidy for local taxpayers.

It is also prudent to monitor the swim rate over the next ten years to determine if some residents are using new facilities in neighbouring communities that will likely come on stream during that timeframe. To the extent that some Burnaby residents will use new pools in Coquitlam, Vancouver, North Vancouver or New Westminster, the swim rate used for planning additional pool capacity in Burnaby may need to be adjusted.

Also, the entire 952,272 new swims don't necessarily need to be provided at the C.G. Brown replacement facility. Some could be provided in conjunction with redevelopment of another pool in Burnaby or in a new fifth indoor pool.

General Trends in Aquatic Activity

The consultants have worked on pool projects across Canada for four decades and are prepared to document the following trends in aquatic services which apply to the last ten years.

- The number of swims in the swim lesson category tend to track the number of young children in the community. The vast majority of young children now learn to swim. So, the market is quite saturated. Once you get close to 100%, you can't go any higher. That means that growth in lessons will be determined by the number of new children in that marketplace. In Burnaby, while the overall population is aging, there is a relatively high proportion of young adults moving into the City. This will result in a continuing supply of children that need to learn to swim. Swim rates in this category will likely remain quite constant, so the increase in swim lessons will be due to population growth.
- Fitness swimming is growing quite quickly. Because water is a non-consumptive environment in which to get and remain physically fit, there are large numbers of teens, adults and seniors that will swim laps and attend water-based fitness classes. Swim rates in this category will likely continue to rise, so the total number of swims in this category will grow faster than the rate of population growth.
- Recreational swimming is very popular and will continue to be so. Swim rates are high and will continue to be high. But, they are so high now that there isn't much room to increase the rate of swimming per capita in this category, so the rate should remain constant and the number of swims will increase at the rate of population growth.
- Local swim clubs report growth in membership which is about the same as rates of population growth. Membership in aquatic sport clubs across Canada has kept pace with or typically been less than the rate of population increase. In fact, the proportion of young children and teens registered in aquatic sports has not increased for two decades. However, the total number of swims in this category in Burnaby is much lower than is expected and experienced in most Canadian cities. And, existing pools aren't well positioned to serve this category. The consultants believe that this category is under served now and that there is frustrated and latent demand for a great deal more activity in this category. Once that under served need has been accommodated, the swim rate in this category should remain stable and will increase in proportion to population growth.
- There are very few special events in aquatic sports accommodated within Burnaby pools now. As with the above sport training category, there is a need for more events. But, the total number of aquatic competitions in BC has remained constant for decades even as new competition pools have been built. So, once additional meets are accommodated this will not be a growth area in aquatic service delivery.

- Therapeutic and rehabilitation uses of water is on the rise. In fact, this is one of the fastest growing categories of aquatic service. While the numbers are small currently, the rate is likely to continue to grow as the population continues to age. Therefore, the number of swims in this category will increase faster than population growth over the next ten years and beyond.
- Leadership training will be in great demand in the near term future as increased pool capacity will require more paid staff and volunteers in an aquatic environment. While small in number of swims, this category will continue to grow at least as fast, and likely faster than the rate of population growth.

Overall, it is likely that total swim rates will likely increase over the next ten years if sufficient new capacity is provided. However, it may be there will be some modest increase is aquatic behaviour due to long term trends and demographic shifts in the makeup of the Burnaby population. For that reason, it is important to monitor swim rates over time and make adjustments to plans for provision of aquatic services.

Public Engagement

Because each community is unique, and aquatic services must reflect that uniqueness, the above planning formulae that reflect averages in other communities must be adjusted for each community based on unique values, needs and aspirations. Attempts have been made to capture these in a public engagement process which included stakeholder workshops (see appendix B) and a public survey (results documented in a separate report). Both of these processes show that there is significant demand for increased aquatics capacity in most of the categories of aquatic service.

Some Tentative Conclusions

From the above technical analysis and from the results of the Public Engagement processes conducted in association with this study (see specific results in a separate report) several conclusions become clear.

- Two of the existing four indoor pools in Burnaby are older and are more underutilized. While some people enjoy using those facilities, they often report that their enjoyment relates strongly to the relaxed nature and lack of competition for space that comes from the underutilization.
- The two newer facilities are relatively well used and are quite popular. They are utilized to a high proportion of their capacity.
- Overall, the indoor pools in Burnaby don't have much excess capacity that could be used to add significant numbers of swims. In fact, they are collectively utilized to such a high degree of capacity that it can be concluded that they collectively frustrate some current demand for swimming; especially in areas of swim lessons, sport training and competition events.
- Use at C.G, Brown has declined over the past ten years. At least some of this decline can be attributed to the opening of the Edmonds Pool, a newer, much higher quality aquatics environment. This validates the point above that excess capacity in a pool does not mean that all needs have been met.
- Overall, there are about 4.84 swims per capita. This represents the middle of the likely range for a large community (between 4 and 6 swims per capita) and usually suggests that there is sufficient frustrated and latent demand to increase the total number of swims into the top half of the range. It is very likely that a new pool in Burnaby to replace C.G. Brown, if it has sufficient capacity, could increase the total rate of indoor swimming in Burnaby to at least 5.84 swims per capita, and possibly up to six swims per capita. This increased rate, coupled with growth in the population over the next ten to twelve years suggests a need to accommodate an additional 757,000 swims per year over that timeframe.
- There is documented evidence that there is excess demand for swimming lessons as waitlists verify that excess need.
- There is also documented evidence of need for rental space by swim clubs to accommodate more sport training. Collectively groups have indicated that they need substantially more space and would rent it if it were available. This need comes from a workshop on May 23rd 2019 at which a broad range of local and regional aquatic sport organizations were represented.
- Most of the need for the sport training category of aquatic need has been accommodated at the C.G. Brown and Bonsor pools. Sport training currently represents about 22% of the use of C.G. Brown and about 9% of its revenue from users. This shows that accommodating sport training, which would typically only realize about 60 uses per hour in that facility, as opposed to the 100+ uses which can be accommodated within the same space each hour for recreational uses or swim lessons, may not be the most cost effective category of aquatic use financially, but the need for this category of use is still high and unmet. The consultants expected to find that pool rentals for sport training would make

up about 5-10% of all swims in the four public pools in Burnaby (an average from other communities) but this category makes up only about 3% of all uses currently; further evidence of this underserved aspect of the aquatics market.

- There is also documented demand for more aquatic sport competitions. Some of these would be new events in the region. Some would be relocated events currently accommodated at other venues. But, there is clear and demonstrated need for additional events for age group and masters swim meets, water polo competitions, underwater hockey events and synchronized swimming meets. This comes from direct input from local and regional aquatic sport organizations at a workshop on May 23rd.
- It is likely that the current rate of 4.84 swims per capita will increase if additional appropriate capacity is developed. An increase of 1 to 1.16 swims per capita is considered a modest goal. It represents additional swims in the sport training, fitness swimming, therapeutic and rehab swimming and special events.

Given the bullet points above the most underserved categories of aquatics service that require more urgent attention currently are listed as follows:

- **Aquatic sport training** (there is potential to increase by four fold the number of swims in this category, in the short term adding an additional 90,000 swims annually)
- **Swim lessons** (there is potential to increase this category of swimming in Burnaby by 60%, mostly due to population growth, by adding about 160,000 swim lesson visits over the next ten years, with about 40,000 of that total immediately a new pool is available. Some of this increase would be attributed to moving some existing school swims from outdoors to indoors as new indoor capacity becomes available and some of that increase would be potential increase in school sponsored indoor swim lessons during fall and winter months)
- **Therapy and rehabilitation** (there is a potential to more than double this category of swimming, adding capacity for over 65,000 swims annually gradually over time in this, the fastest growing segment of indoor aquatic service).
- **Competitive events** (there is potential to increase the number of swims in this category ten fold over the next ten years, adding an additional 30,000 swims annually with a significant percentage of that in the immediate future)
- **Leadership training** (there will be a need to add about 10,000 more swims annually in this category to staff a new larger pool)

As the population grows, there will also be a need for more **recreational swims** and more **fitness swimming**. But, these will likely grow in proportion to population increases.

The need for new capacity can be broken down generally as shown in ***Figure Five***.

Figure Five

Breakdown of Proposed Replacement Capacity for New Indoor Pool

Category of Aquatic Service	Need for New Capacity	Replace Existing Swims at CG Brown	Total Capacity for New Pool	Proportion of Capacity Provided
Recreational Swimming	220,000	55,000	275,000	30%
Skill Development	160,000	40,000	200,000	22%
Fitness Swimming	180,000	30,000	210,000	23%
Sport Training	90,000	14,000	104,000	12%
Special Events	30,000	2,000	32,000	4%
Therapy and Rehab	65,000	2,000	67,000	7%
Leadership Training	10,000	5,000	15,000	2%
Total	**755,000**	**148,000**	**903,000**	**100%**

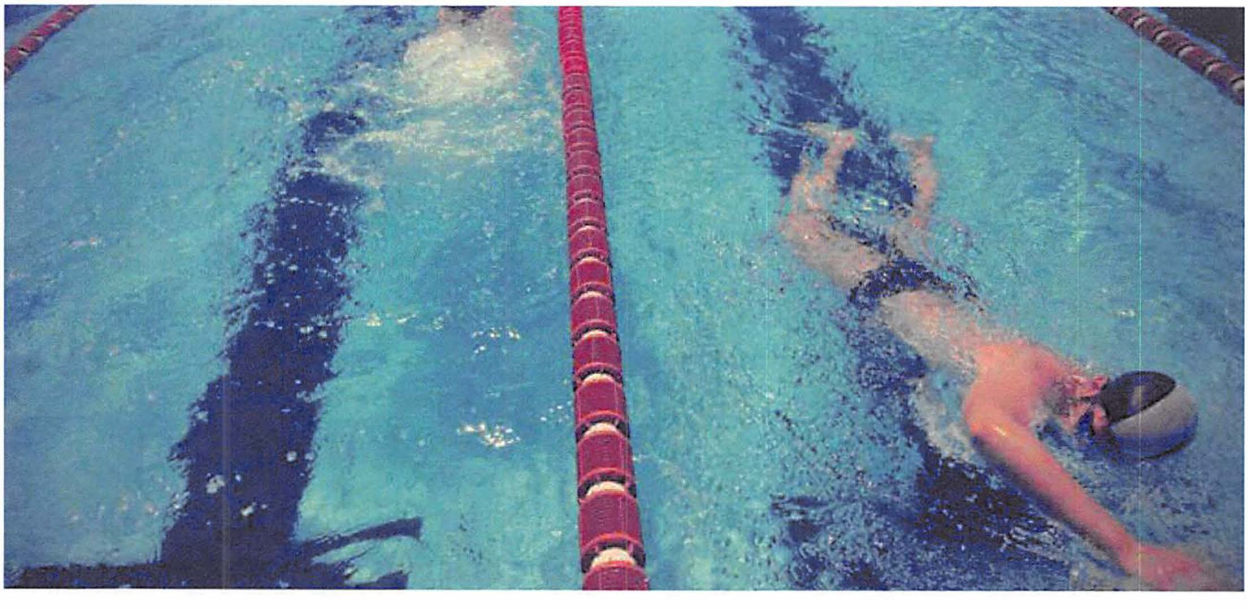
In order to deliver the total service level shown in ***Figure Five***, one option would be to provide the following components of space.

- A shallow water leisure tank of about 3200 sq. ft. of water surface area which would be used for recreational swimming, some entry level skill development, therapy and rehabilitation and some warm up/ cool down space during swim competitions (capacity for 208,000 swims annually)
- A 50M ten lane tank with a combination of shallow and deep water suitable for fitness swimming, sport training, skill development, leadership training and some special events (capacity for 605,475)
- A 25 M shallow water tank suitable for sport training, fitness swimming, skill development (capacity of (234,000 swims pe year)
- All appropriate on deck and off deck support spaces to serve the aquatic uses and social aspects of facility use.

The above described pool tanks would have annual capacity for approximately 1,047,475 swims, which is about 16% more than is justified in ***Figure Five***. However, building a smaller pool would not provide the configuration of spaces to ideally meet the categories of swimming which are most under served. So, it is likely worth building capacity for just over 1 million for an additional few years of growth now than to reduce the amount of space developed in the new facility to ideally meet the types and amounts of uses for which there is demonstrated need.

The new aquatic facility described in the bullets above would not reach the total swims shown in ***Figure Five*** for 10-12 years, and would therefore need to support some unused capacity for that period, so the net public subsidy per swim may be higher in the new facility than the current average for the four existing pools.

It is also worth noting that if a CG Brown replacement pool of less than 1 million swims is developed due to budget or site constraints, there are other aquatic pool projects in Burnaby that might proceed over the next ten years which could fill the gap created.



Need for Arena Capacity in Burnaby

The City currently has three publicly provided and publicly accessible indoor arenas which provide arena ice services during winter months of the year and dry floor activity during the summer months. There are two additional public ice arenas under construction in the City. There are also six privately provided arenas at the Burnaby Eight Rinks and one at the Burnaby Winter Club. In the surrounding area there are ice arenas in Coquitlam, New Westminster, Surrey, Vancouver, Port Moody and North Vancouver.

The three existing city operated arenas have prioritized serving local minor sports participants and also provided some public skating and skating instruction. While there is some adult use of these facilities, many adults have become used to using the privately provided ice rinks. All three existing public ice surfaces are very well used, and there is evidence of some significant latent and frustrated demand for more ice time by existing ice using groups and for skating programs and public skating sessions.

Impact of New Twin Pad

The two new ice sheets will increase local supply by 60%. They will also increase the average quality of the arena use experience and provide a twin pad which is more suitable for some uses (e.g. some tournaments and special events) than the existing single pad facilities offer. There will be significant expansion of the availability of ice and dry floor capacity for minor sports, instructional programs and public drop in uses. To the extent that the new arenas under construction will meet needs into the foreseeable future, the replacement ice surface at the Burnaby Lake Arena will simply renew the existing supply of ice on the site. Until the impact of the expanded supply of ice can be measured and monitored for several years, it will be difficult to assess need for any expansion or contraction of arena ice in the future.

Need for Additional Spaces in Burnaby

If a new indoor arena and a new indoor pool are to be developed to replace the Burnaby Lake Arena and the C.G.Brown Pool, consideration should be given to additional ancillary and support spaces which would complement and support the two major activity areas. The most important amenities required to support the replacement pool and arena will be as follows:

- Dedicated fitness spaces, including some areas with dedicated fitness equipment for both cardio, and strength training, and flexible space for dry land fitness classes and fitness activities with moveable equipment.
- Multipurpose spaces for ancillary programming, child minding, classes to support leadership training, user groups meetings and temporary hosting of special events.

APPENDIX A

Calculating Pool Capacity

There are three types of Definitions of Annual Capacity for Swimming.

- The first is legal capacity and that is calculated by a provincially mandated formula. No pool has ever been able to achieve this instantaneous capacity on a year round basis.
- There is theoretical physical capacity, which assumes infinite demand, and a line up of users waiting at the door whenever the pool is open, ready to enter as soon as someone leaves the facility. No pool has ever been able to reach this threshold either. It would be similar to the legal capacity above.
- There is practical capacity which is achievable in isolated cases where a community resists building additional capacity as it grows and demand exceeds available capacity. This results in a lower estimate of capacity than the previous two. Very few pools achieve this threshold, but because some have, it allows for calculations to be made about what is actually possible and practical. Even with this definition, there will be off peak periods where additional use could theoretically be accommodated, but never is because demand is not constant during all opening hours.

This appendix provides details of the third type of capacity above and is based on experience working in hundreds of pools over the past forty years in Canada. It is a proprietary calculation and assumes the following:

- Applies only to indoor aquatic facilities (outdoor pools serve a slightly different market and has different characteristics and assumptions);
- An operating format of approximately 5000 hours per year, which is the average that existing pools are available for use;
- Only using the main tanks in a pool enclosure (not whirlpools);
- Charging fees which don't create a significant barrier to use;
- And, best attempts are made to meet all seven of the categories of aquatic service.

The formula is quite simple and is listed below:

- For water surface area which has water less than 5 feet deep, a total of 65 swims per year per sq. ft. can be realized;
- For water surface which has water 5 ft. or more of depth, a total of 25 swims per year per sq. ft. can be realized;
- So, we add the two above.

According to the above formula, the current capacity for annual indoor swims in Burnaby is about 1,295,000 as noted in the calculations below.

Bonsor

6 lane 25 m lap pool (4 ft – 12 ft) plus 12 m extension is a total of 5737 sq. ft. of which 2293 sq. ft. is deep water and the remaining 3444 sq. ft. is shallowKiddies pool is 646 sq. ft. all shallow

So, the shallow water has annual capacity for (4090 sq. ft. x 65) 265,850 swims and the deep water has (2293 sq. ft. x 25) for a total of 57,318. Therefore, the total capacity is about 323,168; say 325,000 swims per year.

CG Brown

6 lane 25 m lap pool (3 ft – 12 ft) totals about 3552 sq. ft. of water surface area, of which 40% is shallow

Small leisure pool totals about 70 sq. m. or about 753 sq. ft. of shallow water

Whirlpool (doesn't get included in the capacity calculation)

So, the shallow water in the main tank and all of the small leisure tank has annual capacity for (2174 sq. ft. x 65) 141,310 swims and the deep water has (2131 sq. ft. x 25) for a total of 53,275. Therefore, the total capacity is about 194,585; say 195,000 swims per year.

Edmonds (Fred Randall)

6 lane 25 m lap pool (3.5 ft – 12 ft) with stairway entrance and wheelchair accessible lift which totals 4037 sq. ft. of which 1615 sq. ft. is deep and 2422 sq. ft. is shallow

Warm leisure pool with two lap lanes which totals 2691 sq. ft. all of which is shallow

Kiddies pool which totals 250 sq. ft. which all shallow

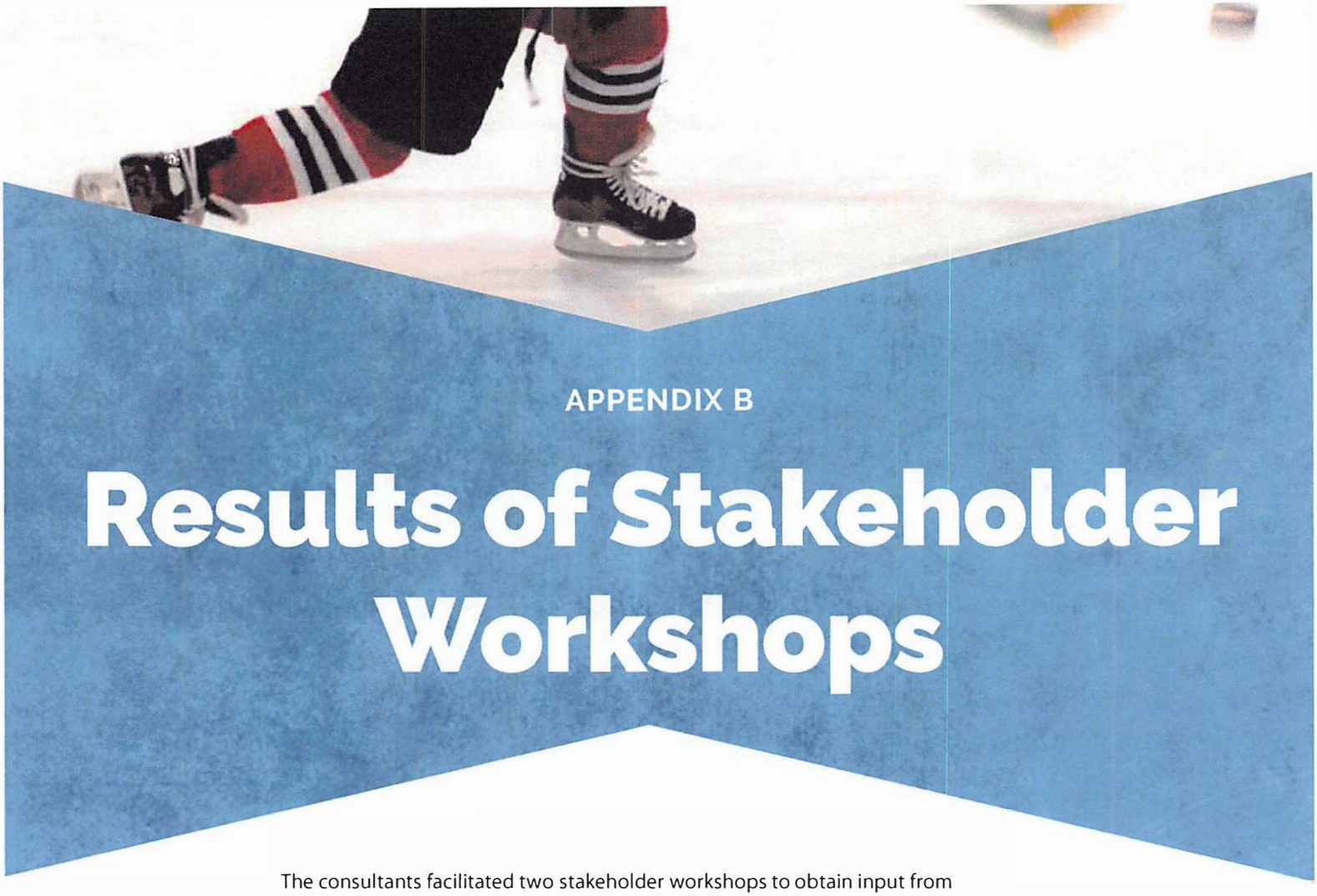
So, the shallow water has annual capacity for (5363 sq. ft. x 65) 348,595 swims and the deep water has (1615 x 25) for a total of 40,375. Therefore, the total capacity is about 388,970; say 390,000 swims per year.

Eileen Dailly

25m x 6 lane rectangular tank with a deep water alcove on one side which totals 4628 sq. ft. of water surface area of which 1200 sq. ft. is deep water and the remaining 3428 sq. ft. is shallow.

Separate leisure tank of 2368 sq. ft. of water surface area, all shallow

So, the shallow water has annual capacity for (5796 sq. ft. x 65) 376,740 swims and the deep water has (1200 sq. ft. x 25) for a total of 30,000. Therefore, the total capacity is about 406,740; say 405,000 swims per year.



APPENDIX B

Results of Stakeholder Workshops

The consultants facilitated two stakeholder workshops to obtain input from current users of pools and arenas in Burnaby. This appendix summarizes the input documented at those events.

Aquatics Stakeholder Focus Group May 23rd 2019

There were 25 participants in all, representing nine organized swim groups (including two from SFU) as well as one PSO (water polo) and five members of the swimming public representing fitness swimmers, senior swimmers and swim lessons. Overall, the nine groups represented about 1565 members (not all of which are based in Burnaby, as a few groups use various pools around the region). Five years ago, those same groups report membership of about 1340, which suggests significant growth in the recent past.

The following represents the sum of responses to the written input form which was completed by participants.

Which categories of aquatics are you or your group primarily involved in? (Circle all that apply)

1.	Recreational Swimming (Fun)	11
2.	Lessons	9
3.	Fitness	13
4.	Sport Training	12
5.	Special Events	9
6.	Rehab/Therapy	4

In your opinion, which of the above categories are most needed in a new aquatics facility?

1.	Recreational Swimming (Fun)	1
2.	Lessons	2
3.	Fitness	1
4.	Sport Training	8
5.	Special Events	8
6.	Rehab/Therapy	1

Which of the following three types of categories of enhancement should we be focussing on?

1.	Increased quantity (more of the same aquatic experiences)	4
2.	Increased quality (improve the quality of the existing experiences)	11
3.	Add new experiences (services not currently available)	11

One person added "health and wellness" to the list

What kinds of support or ancillary spaces are needed to support or complement the aquatics services?

- Room for spectators (5)
- More rooms for instruction (6)
- Wide range of fitness training/weight room (7)
- Hot tub
- Multi-level parking (2)
- Storage space for club use (5)
- Lots of deck space (7)
- No steep drop off from shallow to deep
- Spectator seating close to the lanes where lessons take place
- Need more parking spaces
- Running track (2)
- Family change rooms (2) and large change rooms (2)
- Timing systems and office for every club to use (2)
- Starting blocks
- Longer than 50M tank, ten lanes, deep water
- Awards podium
- Gymnastics
- Dance room (2)
- Officials rooms for volunteers

To what degree should the new facility be for local (Burnaby) users vs. regional or provincial users?

- Mostly Burnaby, but if not used by Burnaby, consider regional and provincial
- Local residents have to be a priority, but with a different emphasis than other pools
- All users
- Regional and provincial users
- 100% local
- 90/10 locals to outsiders
- When other pools close, users come to our pool and things get very crowded for three weeks during aquafit classes
- Burnaby first, but should also support national and international events
- Because of the lack of good competition facilities in Lower Mainland, residents of other communities will come and use our pool also
- If there is a good outdoor training pool, then regional/provincial would be a priority. But with no upgrade to outdoor pools then local clubs should be a priority.
- International 100%
- Both locals and others
- Everyone, not just local residents
- If we build it for the big international events, locals can use it also

To what extent should the new aquatics facility focus on aquatics users vs. spectators?

- Aquatic users are the focus, spectators are only there for lessons and competitions
- Users for sport training is the priority. Accommodate spectators as budget permits
- Aquatic users
- Spectators are essential to competitive user experience
- Both. Design retractable safety netting to protect public form water polo
- 90/10 users to spectators
- Users should have priority, but use flexible seating for versatility
- Mostly users but some stands required for competitions
- The primary use should be users, which includes coaches
- 75% users 25% spectators
- Users are first priority
- Both
- For any competitions, there needs to be a designated area for spectators with enough room to handle it. This keeps the pool deck free for athletes and officials.

What else do we need to know when planning for a new aquatics facility?

- Purchase only quality equipment as pool has to last for 50-60 years
- Water temperature must be uniform through entire pool
- Relatively cool water – 28-29 C, not 30 C
- Focus on flexibility and long term health
- There is a distinct lack of and need for a competitive swimming pool. Currently only Victoria and Kamloops can host provincial level meets. BC has a lack of competitive pools so BC swimmers have been left behind. Pool needs to include a 50M tank for competitive swimming and a cool down tank
- Lack of pool resources severely impact our quantity and quality of what the sport of water polo currently offers. Local pools force Burnaby athletes to travel to Langley, Richmond, Vancouver and Surrey for practices and games. The growth of our club has been affected. If each sport has the space to train from young children to seniors water polo will keep the connections in the connections in the sport. We have no water polo for beyond youth. This new pool will connect this bridge.
- Somehow keep the wonderful roof we have over the pool now. Build the new 50M tank next door. We also need a large sauna, hot tub, gym and steam room. Incorporate pull out seating to make best use of space.
- Most who attended this meeting aren't individual seniors. Seniors need water running, hot tub, sauna, steam room and a leisure pool
- 50M tank please, with 10 lanes which will allow us to host international meets, and a cool down tank or extension of the 50M tank. Pull out bleachers for competitive swimmers in between races plus stands for spectators
- Boardroom for meetings and drug testing
- If it is high performance, include input from NSO's and PSO's. For events, include accommodation for VIPs, sponsors, officials and volunteers
- Do it right from the outset. Don't be afraid to spend the money to create a great facility. Think hosting of BC and Canada Games and larger events. Be energy efficient and environmentally friendly. Be careful of the technical aspects. For example, include the width of the tile in the measurements so that you can have higher level meets. Watch the lighting.
- Focus on special events. BCSSA Provincials In August have 1000 competitors. 2018 was hosted in Guildford, but spectator area was small due to its being on deck. Additional bleachers couldn't be brought in because engineers said there was a weight issue. Addressed by having standing room areas and a big screen in the adjacent area.
- If spectator seating is on deck, need a "magic carpet" for spectators to walk on without taking off shoes. Removable diving boards to clear walking space for water polo referees.
- Water polo groups are starving for pool time to rent at the premium rate.
- Technology equipped.
- There needs to be starting blocks, lots of electrical outlets to run timing equipment, timing displays on the wall, spectator seating, warm up and warm down tank. We need three tanks; two 50M tanks and one 25M tank with movable floor.

In addition to completing input forms, there was lots of discussion under the four headings below.

Trends

- High performance aquatics athletes are now leaving Burnaby and leaving the province because of a lack of high quality training facilities
- The memberships in our groups is increasing (e.g. summer swim club)
- Clubs have stopped coming to meets at Bonsor due to how bad a facility it is
- Parents have increasingly higher expectations of facilities for their kids
- We are now using more digital systems in our training methods
- There is increasing interest in health and using pools to foster health
- There is increasing fluidity in gender identify
- Aquatic competitions in Western Canada are increasingly going to communities outside the Lower Mainland
- There is increasing need to accommodate more fully people with disabilities
- There is an increase in the number of adults that want to learn to swim; especially adults new to Canada
- There is an increasing desire to learn to swim in warmer water

Components of a Success New Pool

- Ten lane fifty meter by twenty-five meter main tank with lots of deep water for water polo, synchro swimming, underwater hockey and diving
- Also need a separate warm down tank (some thought it could be an extension of the main tank)
- Lots more capacity overall than we have now
- Look to UBC for a model of how to do it right, but they don't have enough spectator seating
- Environmentally friendly
- Lots of storage for user groups
- Lots of deck space – there is never enough
- Lots of spectator seating – many commented that it should be separate from the pool deck
- Spectator seating needs to have good sight lines from every seat and be comfortable
- Spectator seating on each side of the main tank is ideal
- Awards podium
- Electronic timing and an electronic display board
- Ensure we have lots of digital connectivity and careful attention to power supply
- A hot tub

- Training and fitness area for dry land training
- A dance area and a trampoline area
- Starting blocks
- Good acoustics and a good PA system
- An outdoor pool tank also
- Female change rooms need to be larger
- Put bathrooms on both ends of the pool so we don't waste five minutes when a judge needs to use one
- During construction we need to have a pool to use
- Use high quality durable materials that will last the life of the facility
- Free lockers, where you get your coin back
- Consider stacked parking above or below ground

Issues that are Likely Outside our Terms of Reference for this Project but Nevertheless Need to be Recorded

- Put an air support dome over Central Park outdoor pool
- Find another site for the BLA arena so that we have enough room for all the pool spaces we need
- Consider expanding the site by using some of the area behind CG Brown pool now
- We need more supporting infrastructure for large meets close to the pool

Other Issues

- We have to focus on health and wellness with every aspect of this pool
- We need not just a good pool but a great pool. Guildford is a good pool but Rexall Place in Calgary is a great pool.
- If you want a model for a truly great pool, go and look at the new Pan Am pool in Toronto

Arena Stakeholder Workshop May 22nd 2019

On May 22nd 13 individuals representing eight groups of arena users attended a Focus Group to provide input to the kinds of spaces needed in the new arena that will replace the Burnaby Lake Arena. The following notes represent all the important input that was recorded either on input forms or during discussion.

The groups generally represented about 2992 users, of which 1032 were primarily ice users and 1960 were primarily dry floor users. All indicated that their sport had more participants this year than five years ago. One, ball hockey, indicated that their numbers were "capped" due to a facility constraint, and could be higher by 10% if more dry floor time was available.

The following answers to input forms were recorded.

Which categories of arena use are you or your group primarily involved in? (Circle all that apply)

1.	Recreational Skating (Fun)	2
2.	Skating Lessons	3
3.	Ice Sport Leagues	4
4.	Ice Sport Tournaments	3
5.	Dry floor use	6
6.	As a spectator for sport or special events	2

In your opinion, which of the above categories are most needed in a new arena facility?

1.	Recreational Skating (Fun)	1
2.	Skating Lessons	1
3.	Ice Sport Leagues	2
4.	Ice Sport Tournaments	2
5.	Dry floor use	4
6.	As a spectator for sport or special events	1

Of the following three types of aquatics categories of enhancement should we be focussing on?

1.	Increased quantity (more of the same arena experiences)	3
2.	Increased quality (improve the quality of the existing experiences)	3
3.	Add new experiences (services not currently available)	1 (wave pool)

What kinds of support or ancillary spaces are needed to support or complement the arena services?

- Dressing rooms
- Meeting rooms (larger than what we have now - twice the size of Lakeview Room)
- Water bottle fill stations in each dressing room
- Skate rental shop
- Storage lockers for groups
- Handicapped access
- Restaurant and bar
- Viewing area

To what degree should the new facility be for local (Burnaby) users vs. regional or provincial users?

- Facility should enable the largest number of local users to engage in sport, but it needs to be at a higher design quality in order to attract regional and provincial level play.
- First priority Burnaby, then regional and provincial
- All levels of use
- Local users come first
- All users

To what extent should the new arena facility focus on users vs. spectators?

- Participants, definitely
- Users
- 65% users, 35% spectators
- Both

What else do we need to know when planning for a new arena facility?

- We need better ice times, not just more
- Electronic devices for game sheets
- Rink at floor level for accessibility and small children
- The great location will equal even higher demand
- If you build it, they will come
- For something different, how about play space for siblings of kids using the arena.
- Ball hockey needs 3-4 hours of floor time per team per week and we have 50 teams. We currently only have 40 hours per week at Burnaby Lake Arena. We need a year round dedicated dry floor facility.

During the discussion, the following points were recorded.

What is needed?

- More and better change rooms to accommodate mixed genders
- Good wifi
- Full access by all citizens is a must
- Lacrosse numbers are going up but we don't have enough practice time
- Number of ball hockey players is capped due to a facility constraint. We have a wait list. We need a year round dedicated dry floor space
- There is a move to electronic game sheets for minor hockey
- There is a wait list in skating lessons
- Ringette teams need to share practice ice times
- When we share ice times cross-wise, make it convenient to set it up and to get on and off the ice
- Need storage space for the bumpers we use to separate the ice into two cross-wise sections
- Need a larger surface that at BLA now
- New sheet needs higher quality sheets, and seats should be on the side, not the end
- How about two sheets side by side with a viewing area in the middle so you can look both ways, and have food and beverage service while spectating
- For parents watching practices and games of their kids, make it a high quality spectator experience
- Ensure that you can see the entire ice sheet from all spectator seats. Sight lines have to be good. And, don't put up so many posts in the glass above the boards that it impedes the sight lines.
- Need lots of seating in the skate lobby for kids can put on skates easily.

- Have skate flooring throughout
- Make corridors wide enough for more than one person with gear on to use at same time
- We need more time, but we also need better times. We have high school players on the ice until 11pm and that isn't good enough. Also, our early morning times are a problem.
- Need dry floor play area for siblings of kinds on the ice
- When the BLA is not in service, due to construction, what arrangements can be made for those users?
- Entrances and back entrances need to be easy and close to parking and drop off areas
- Better outside lighting
- Clubs could use vending kiosks to sell their branded stuff
- Need a dry land warm up area for skaters before they go on the ice
- Can we get a target goal for ball hockey players to use in the warm up area?
- Need more than one player tunnel from ice to dressing rooms to separate teams
- Private showers in the dressing rooms, and a shower in the officials room
- Make it easy for sledge hockey to use

Finally, the consultant asked all participants to score the need for a new arena on a five point scale against six categories of arena activity. The results were as follows.

Recreational Skating	3.3
Skate Lessons	3.6
Ice Sport	5
Dry Floor	4.5
Spectators	3.5

Facilitator's note: While the number of fixed spectator sheets was discussed, there was no consensus. Some wanted the same number of seats currently at BLA and others wanted more.