



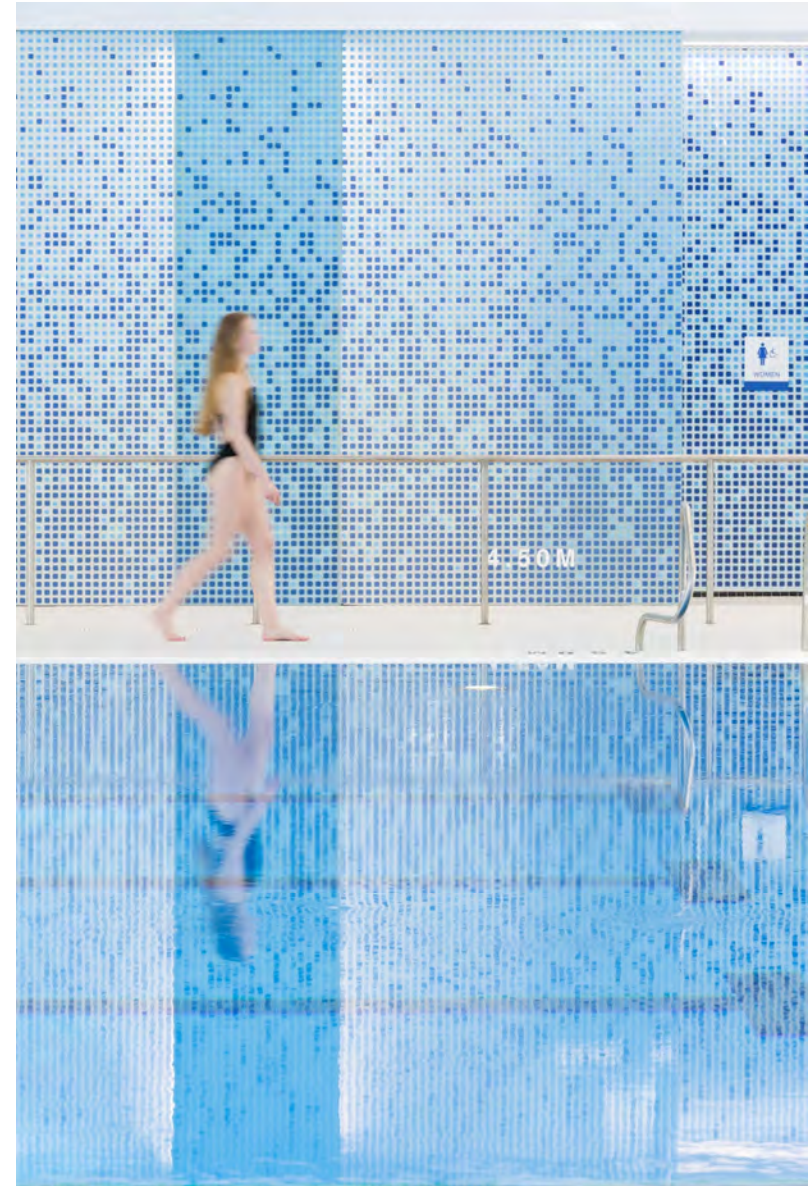
YELLOWKNIFE Aquatic Centre

Concept Design Report Presentation

Prepared for: City of Yellowknife
November 2020



Introductions



What we have been asked to do:

Phase 1

1. Review & confirm information in the Pre-Design Plan for an Aquatic Centre with a 52m lane pool
2. Interview Mayor & Council, and City of Yellowknife departments
 - February 2020: Mayor & Council direction to also include a 25m lane pool as part of the Concept Design study
3. Develop and implement a Public Consultation process to obtain feedback about the programming for the new Aquatic Centre, and evaluate public interest in a 25m vs. 52m lane pool
4. Develop Concept Designs based on feedback from the public consultations
 - Includes two concept designs (25m and 52m lane pools), along with capital and O&M costs
5. Present the Concept Design Plan to Mayor & Council

Phase 2

... if Council approves the Design Plan

1. Council decision on 25m or 52m lane pool
2. Prepare Bridging Documents to be used by the City to solicit proposals from design-build contractors

25m or 52m Lane Pool?

Typically strongly influenced by the nature of competitive and training programs that need to be accommodated

25m Lane Pool

- Competitive short course swimming events
- Rope dividers to allow for overlapping programming

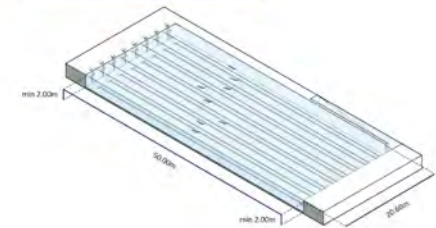
52m Lane Pool

- Competitive short course and long course swimming events
- Movable bulkheads to allow for overlapping programming

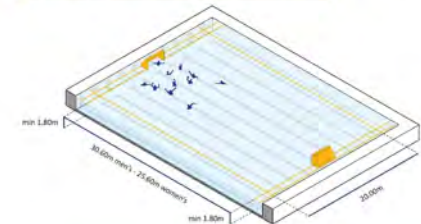
Unless there is a genuine requirement to train and host for 52 metre events, the additional length of pool does not typically drive user numbers for the facility. For this reason there are comparatively few 52 metre pools built in comparison to 25 metre pools.

Activities you can *only* do in a 52m pool:

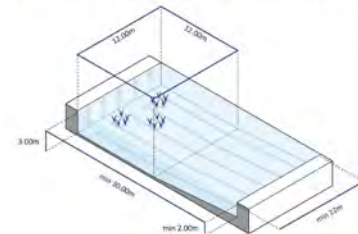
Race! 50m Long Course



Play! Water Polo Competitions



Dance! Synchronized Swimming Competitions



6 or 8 Lanes?

The number of lanes will impact the type of competitive events that can be held in a facility

Advantages of 8 Lanes vs. 6 Lanes

- Local swim organizations often want 8 lanes to allow for more swimmers to train and participate per heat
- More attractive for sport tourism than 6 lanes
- Increases the capacity of the lane pool (for lane swimming or other activities)
- Accommodates water polo
- Minimal construction cost increase for the additional two lanes

TAG / MJMA recommend proceeding with 8 lanes, for either a 25m or 52m length pool

Aquatic Activities	RIMP Existing	25m Pool (6 Lane)	25m Pool (8 Lane)	52m Pool (6 Lane)	52m Pool (8 Lane)
Climbing Wall	●	●	●	●	●
Diving Board	●	●	●	●	●
Public Swim	●	●	●	●	●
Family Swim	●	●	●	●	●
Lane Swim	●	●	●	●	●
Aqua Jog	●	●	●	●	●
Swim Lessons	●	●	●	●	●
Aqua Adult	●	●	●	●	●
Aqua Fit	●	●	●	●	●
Lifeguard Training	●	●	●	●	●
Scuba	●	●	●	●	●
Underwater Hockey	○	●	●	●	●
Kayaking	●	●	●	●	●
Dragon Boat Racing	●	●	●	●	●
Pool Slide	○	●	●	●	●
Inflatable Obstacle Course	○	●	●	●	●
Retractable Obstacle Course	○	●	●	●	●
Lifesaving Sport Training	●	●	●	●	●
Lifesaving Sport Competition	○	●	●	●	●
Synchronized Swimming Training	○	●	●	●	●
Synchronized Swimming Competition	○	○	○	●	●
Women's Water Polo Training	○	○	●	●	●
Women's Water Polo Competition	○	○	○	○	●
Men's Water Polo Training	○	○	●	○	●
Men's Water Polo Competition	○	○	○	○	●
25m Competition Training	●	●	●	●	●
25m Competition (Local & Regional)	●	●	●	●	●
25m Competition (Provincial)	○	○	○	○	○
50m Competition Training	○	○	○	●	●
50m Competition (Local & Regional)	○	○	○	●	●
50m Competition (Provincial)	○	○	○	○	○
50m Competition (National)	○	○	○	○	○

● 52m pool divided with moveable bulkhead into two 25m basins
 ○ Requires 5 x 25m warm up lanes
 ○ Requires 10 x 52m pool with additional 8 x 25m warm up pool

*Table compares only pool basin sizes and does not consider additional facility requirements needed for competitions.
 *Swim meet competition source: Swim Canada New Construction Pool Guidelines (Appendix C)

Competitive Events

There are limitations in the types of regulated competitive events that can be held in an Aquatic Centre depending on its design

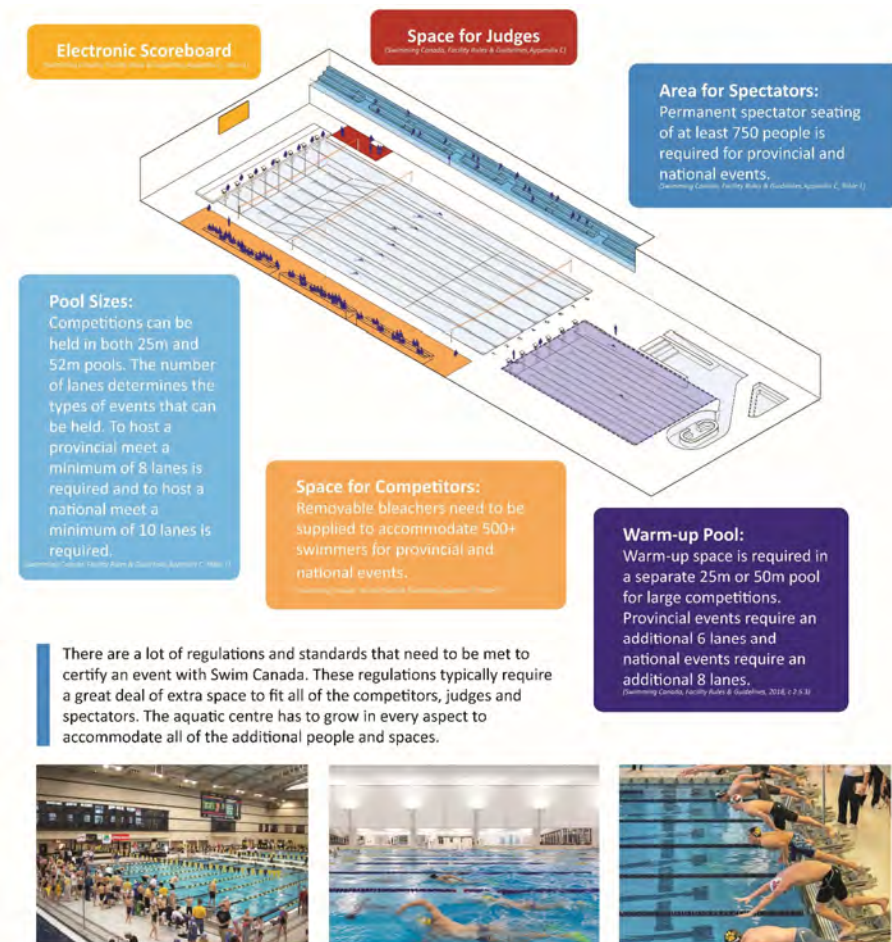
Local & Regional Events

- Both Local and Regional regulated competitions can be held in a 25m or 52m, 6 or 8 lane pool

Provincial & National Events

- None of the concept design options being considered for the new Yellowknife Aquatic Centre could accommodate regulated Provincial or National competitions without a sizable increase in building area, including additional spectator seating and additional warm up lanes (Swimming Canada guidelines)

Requirements for Regulated Provincial & National Competitions (Swimming Canada)



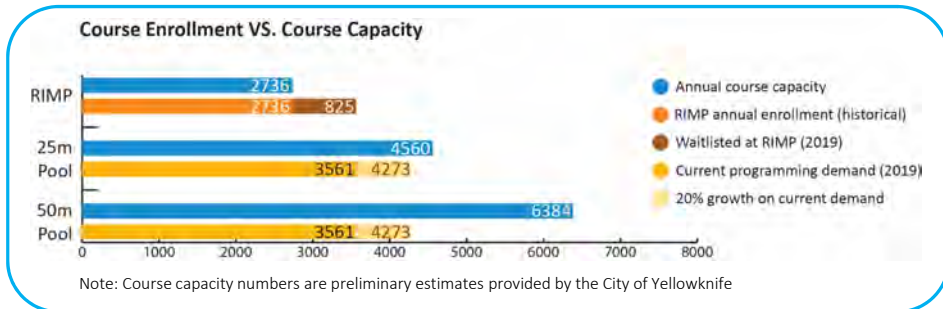
Capacity and Demand

User demand at RIMP includes:

- Programming or course enrollment (e.g. swim lessons)
- Admissions and passes (e.g. public lane swim)
- Facility rentals by clubs and special events

Capacity can be calculated based on:

- Maximum occupancy according to pool guidelines
- Staffing capacity, based on a lifeguard-to-swimmer ratio



The number of lifeguards available to be on deck at once should be considered a more immediate limiting factor than the maximum allowable occupancy

Ruth Inch Memorial Pool



Example 25m Pool



Above & right: graphic representation of maximum occupancy for sample facility designs, where one figure represents 100 people (based on BC Guidelines for Pool Design)

Example 50m Pool



Community Consultation

Objectives

1. Inform the community about the project, including the differences between a 25m and 52m lane pool
2. Evaluate public interest in proceeding with a new Aquatic Centre with a 25m or 52m lane pool, or not to proceed with a new Aquatic Centre at all
3. Confirm the spaces and amenities that the community would like to see in a new Aquatic Centre

Process and Participation

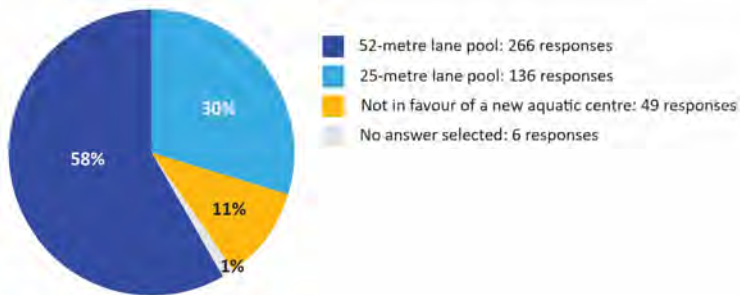
Three in-person consultation sessions, and an online information package and survey

Four-question survey: **456** total survey respondents



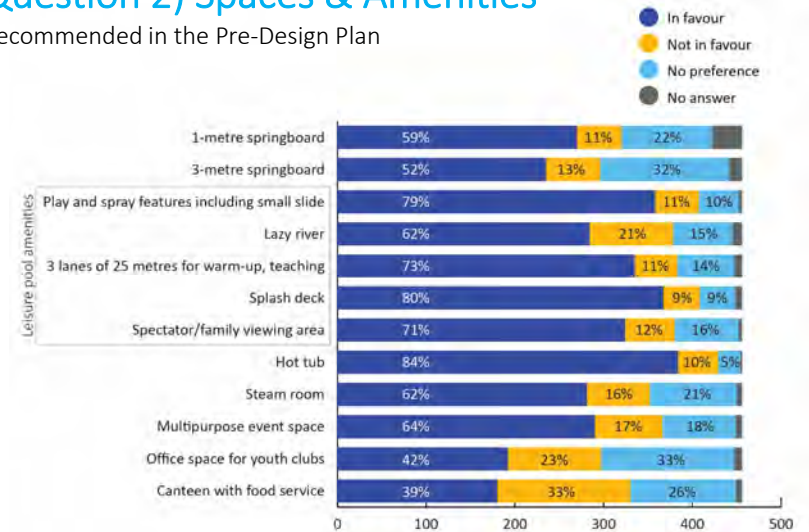
Community Consultation

Question 1) Lane Pool Length



Question 2) Spaces & Amenities

Recommended in the Pre-Design Plan



Question 3) Additional Amenities

In addition to the Pre-Design Plan recommendations



Question 4) Further Feedback



Site

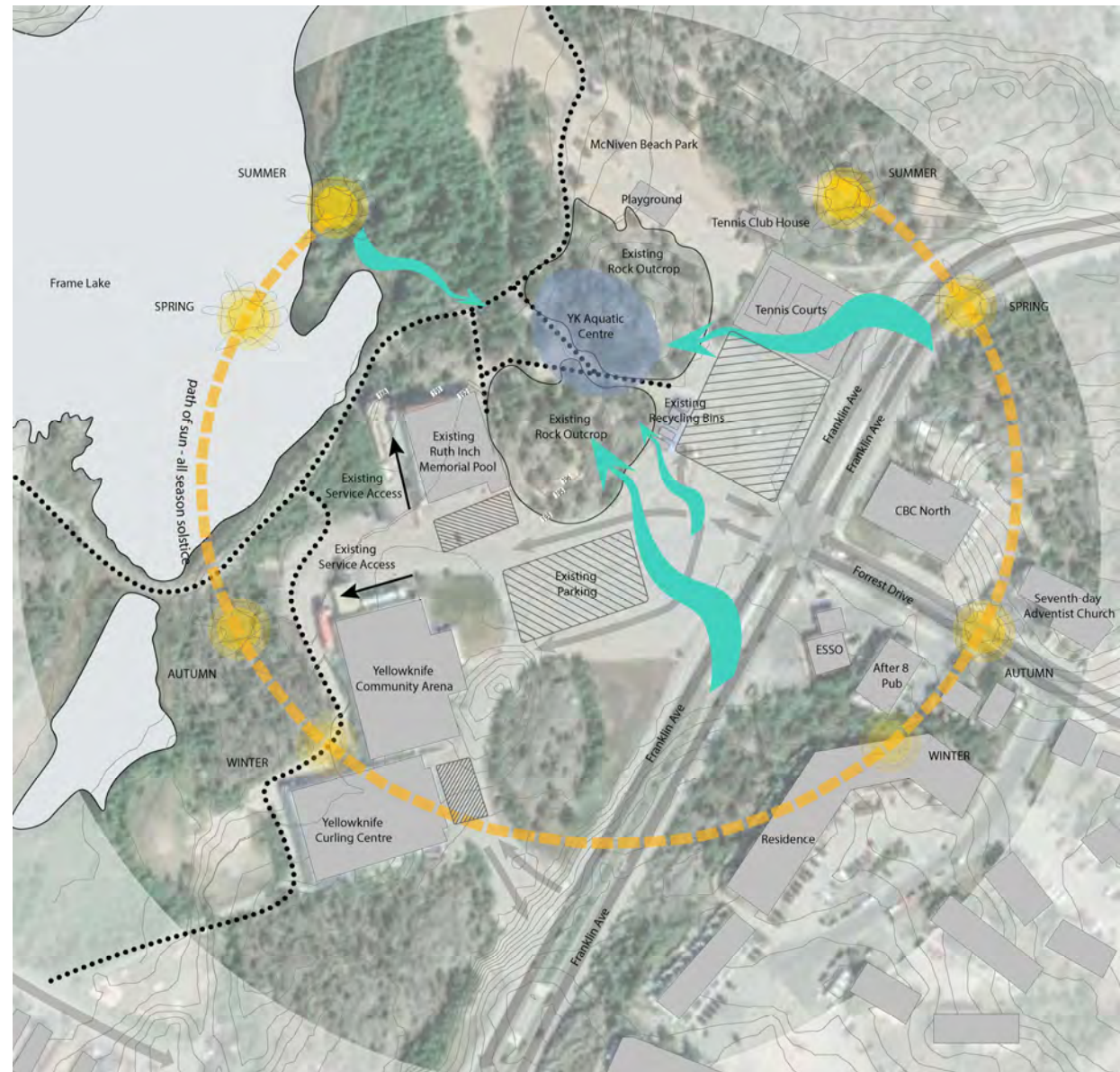
Ruth Inch Memorial Pool

(east of RIMP, at the location of the old pitch & putt site)

- Selected by City Administration following a site evaluation exercise comparing the two sites recommended in the Pre-Design Plan (RIMP site & Multiplex/Fieldhouse site)

Site selection matrix compared three studies undertaken for each site:

- Desktop Geotechnical Evaluation
- Phase 1 Environmental Assessment
- Traffic & Parking Study



Concept Designs

Building Program

Additional amenities that Council may wish to consider following public consultation:

Waterslide

- Indicated by 10% of survey respondents
- Approx. \$1.4M additional construction cost

Area increase from Pre-Design Plan

- COY Office Space
- Lease Space
- 2nd Floor Spectator Seating
- Coat/Boot Room
- Additional Mechanical/Service Space
- Building Circulation & Structural Allowances

From 2018 Pre-Design Plan:

Public Areas

- Vestibule
- Lobby
- Coat/Boot Room*
- Public Washrooms
- Canteen
- Change Rooms (universal design)
- Multipurpose Rooms (2)
- Spectator Seating (2nd floor)

Private Areas

- Administration
- Janitor room

Building Services

- HVAC
- Pool systems
- Electrical

Natatorium

- Lane pool (25m or 52m)
 - 6 lanes**
 - 1m and 3m spring boards
 - 2 x 1m wide movable bulkheads (in 52m option)
 - Ramp entry (25m), accessible lift (52m)
- Leisure Pool
 - Beach entry
 - Play and spray features including small slide
 - Lazy river
 - 3 lanes of 25m
- Splash Pad
- Therapy Pool
 - Ramp entry
- Steam Room
- Storage (general & youth clubs)
- Office space (youth clubs)

* added to the program by TAG

** TAG recommends an 8 lane lap pool.

Additional Spaces added since Pre-Design (by the City of Yellowknife):

City of Yellowknife Office Space

Community Services Department

- 5 offices

Lease Space

- Ability to subdivide into two spaces if necessary

Concept Designs

Key Design Concepts

Key Design Concepts have been identified in response to the site, feedback from the community, and good design practices. These include:

- Community focused environment
- Lobby as the “heart” of the building (centrally located, social space, views to the natatorium)
- Creation of an exciting interior public space
- Inclusive Design
- Reflection of local Indigenous Culture
- Ability to host competitive events
- Incorporation of natural light
- Preserve and work with the natural landscape where possible
- Connection to McNiven Park and McMahon Frame Lake Trail
- Building servicing separate from public entrance



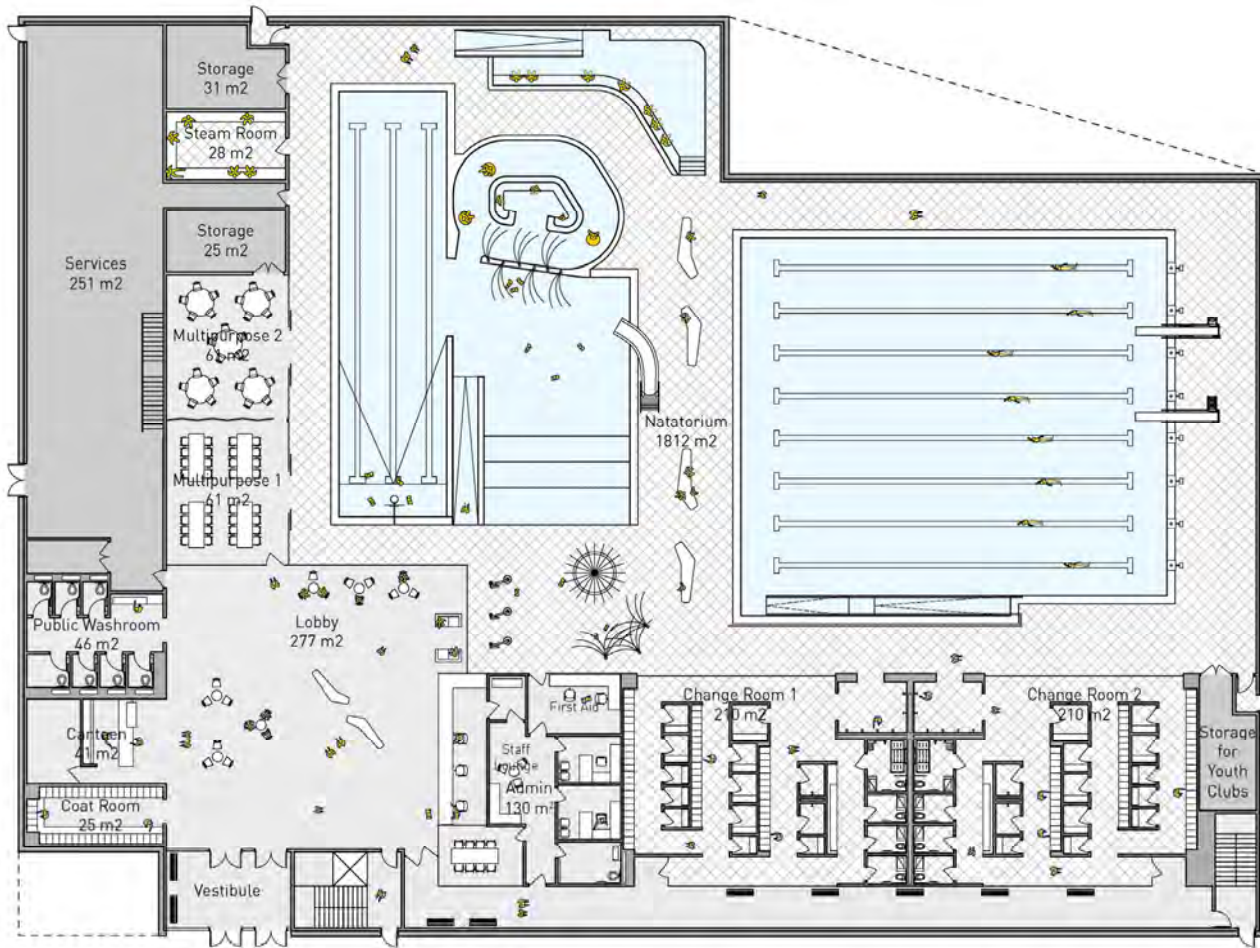
Concept Designs

Option 1 – 25m Lane Pool

Site Plan



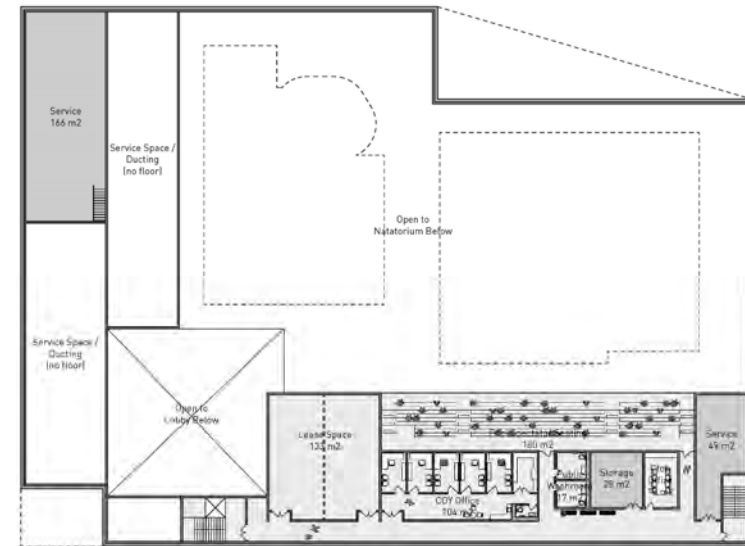
Concept Designs



Main Floor

Option 1 – 25m Lane Pool

Building Plans

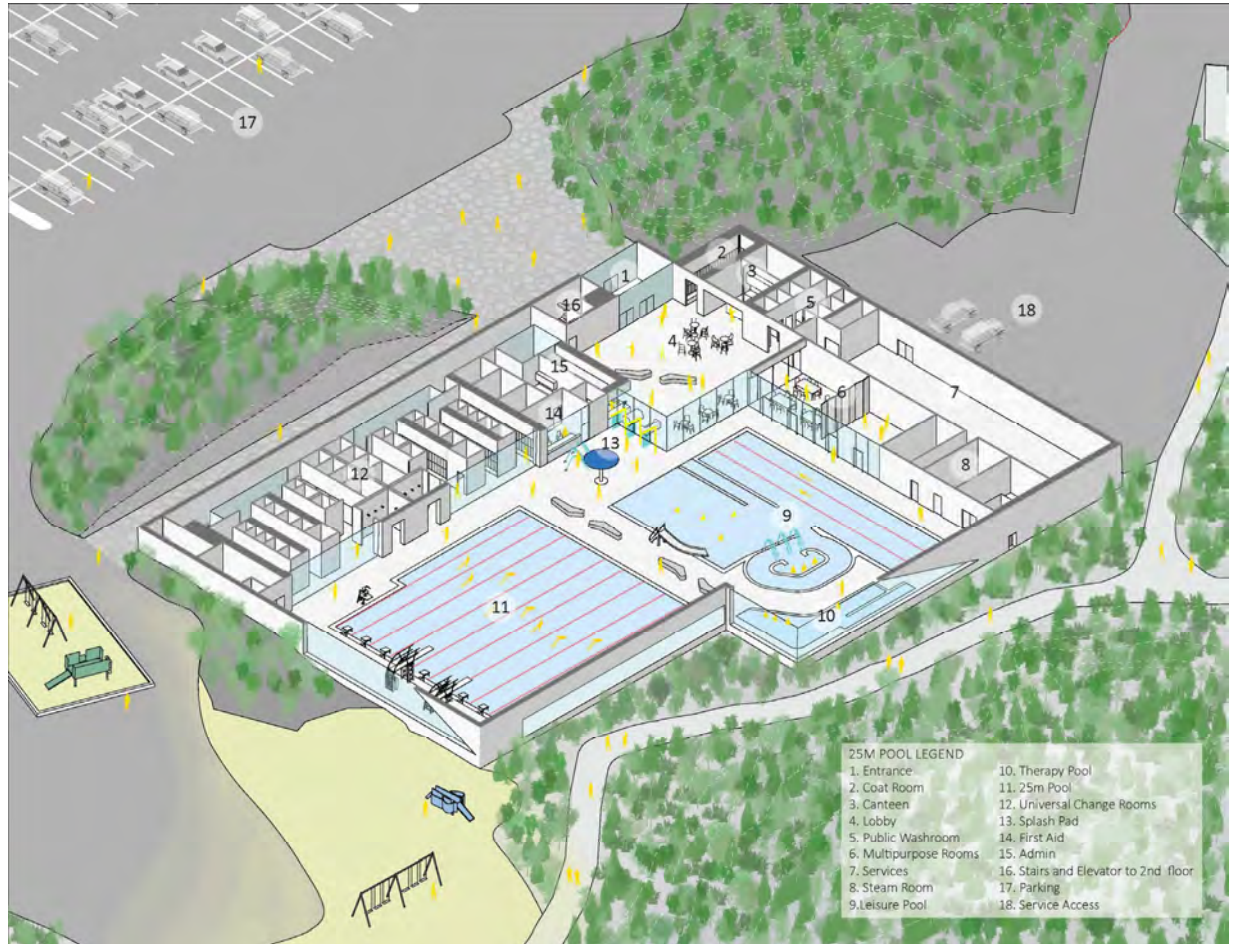


Second Floor (shown at smaller scale)

Concept Designs

Option 1 – 25m Lane Pool

Axonometric View



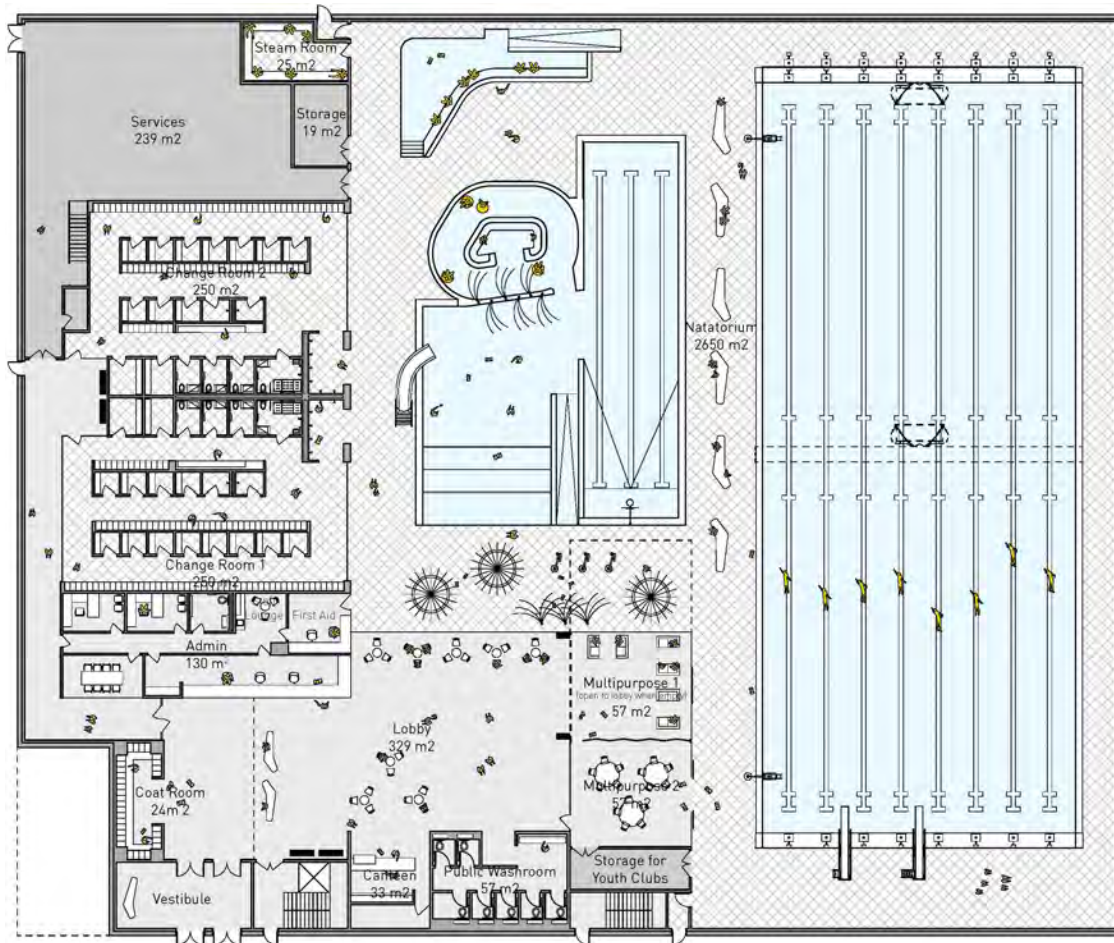
Concept Designs

Option 2 – 52m Lane Pool

Site Plan



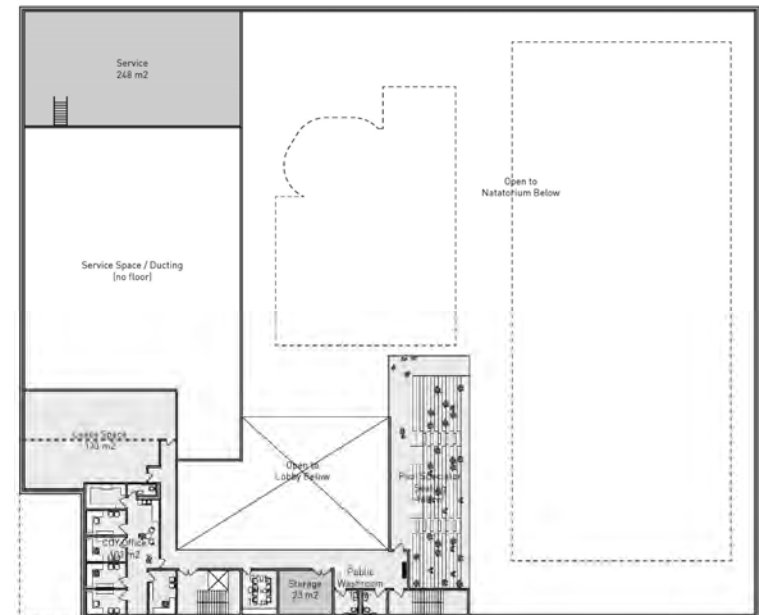
Concept Designs



Main Floor

Option 2 – 52m Lane Pool

Building Plans

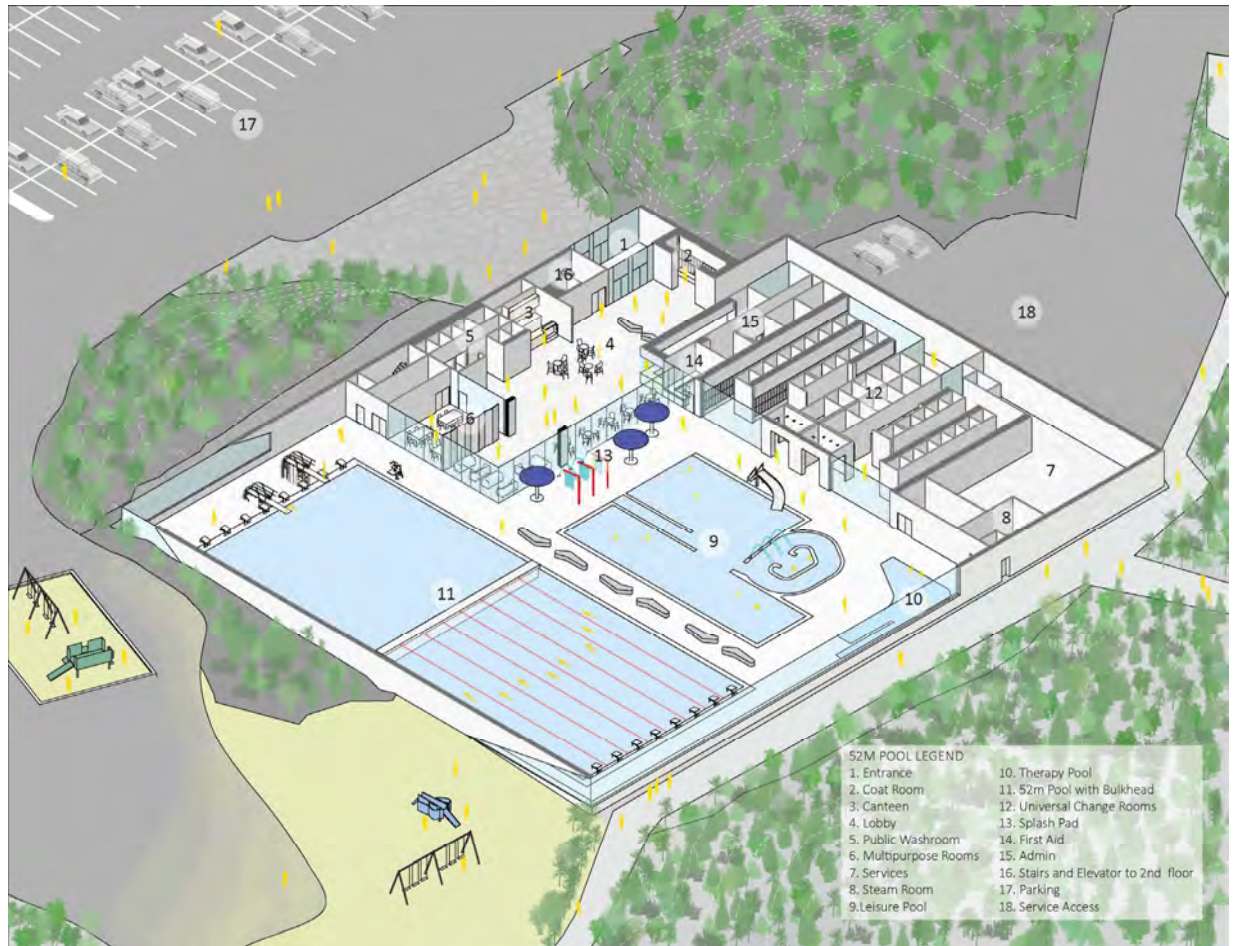


Second Floor (shown at smaller scale)

Concept Designs

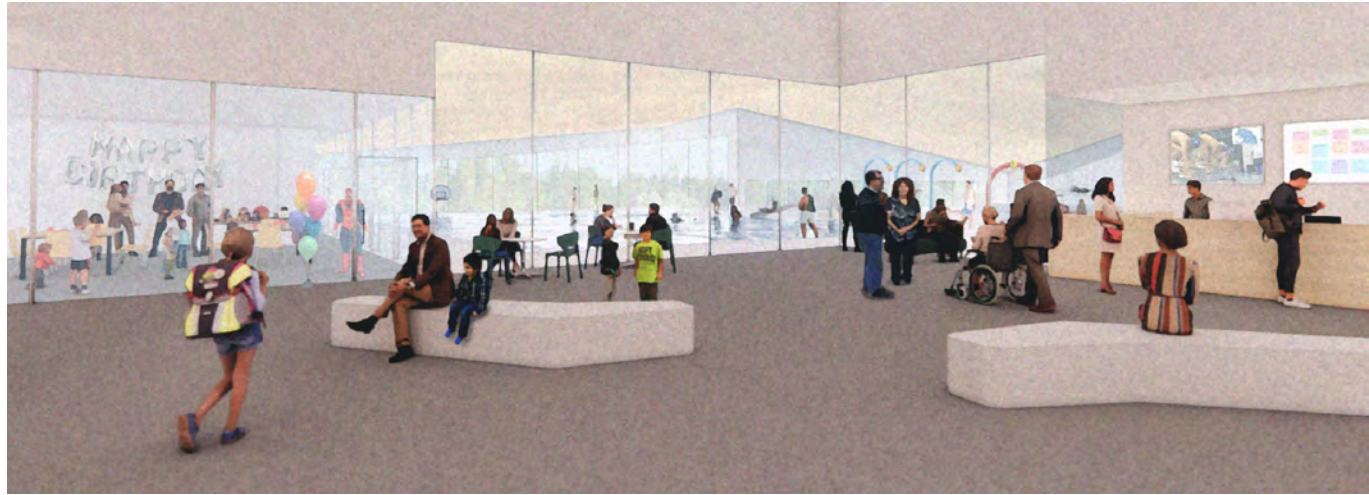
Option 2 – 52m Lane Pool

Axonometric View



Concept Designs

Perspective Views



Class D Cost Estimate

- Option 1a – 25m, 6 lane pool **\$52.4M**
- Option 1b – 25m, 8 lane pool **\$53.4M**
- Option 2a – 52m, 6 lane pool **\$61.7M**
- Option 2b – 52m, 8 lane pool **\$63.7M**

20-30% degree of accuracy

Pre-Design Plan cost estimates:

- 25m, 6 lane pool: **\$38.2M**
- 52m, 6 lane pool: **\$49.8M**

Cost increase due to:

- Proponents Design allowance, District Biomass connection, Covid-19 allowance

Other factors that affect the cost estimates:

- Building Area
- Phase of Design

	OPTION 1a 25m, 6 lane pool (4,554m ²)	OPTION 1b 25m, 8 lane pool (4,698m ²)	OPTION 2a 52m, 6 lane pool (5,192m ²)	OPTION 2b 52m, 8 lane pool (5,466m ²)
New Construction	\$23,552,200	\$24,036,700	\$28,176,600	\$29,135,500
Site Development (6700m ²)	\$1,445,400	\$1,445,400	\$1,445,400	\$1,445,400
Subtotal	\$24,997,600	\$25,482,100	\$29,622,000	\$30,580,900
General Requirements (20%)	\$4,999,500	\$5,096,400	\$5,924,400	\$6,116,200
Contractor Fee (7%)	\$2,099,800	\$2,140,500	\$2,488,200	\$2,568,800
Subtotal	\$32,096,900	\$32,719,000	\$38,034,600	\$39,265,900
Design and Pricing Allowance (12%)	\$3,851,600	\$3,926,300	\$4,564,200	\$4,711,900
Escalation Allowance (7.5%)	\$2,696,100	\$2,748,400	\$3,194,900	\$3,298,300
Construction Allowance (5%)	\$1,932,200	\$1,969,700	\$2,289,700	\$2,363,800
Total Construction Cost	\$40,576,800	\$41,363,400	\$48,083,400	\$49,639,900
Proponents Design Allowance (12%)	\$4,869,200	\$4,963,600	\$5,770,000	\$5,956,800
Connection to district biomass	\$1,654,100	\$1,654,100	\$1,654,100	\$1,654,100
Total Construction Cost - Including Design	\$47,100,100	\$47,981,100	\$55,507,500	\$57,250,800
Covid-19 Allowance (8+3%)	\$5,294,000	\$5,393,100	\$6,239,000	\$6,435,000
Total Construction Cost Including all Allowances	\$52,394,100	\$53,374,200	\$61,746,500	\$63,685,800



Energy, Operations & Maintenance Costs

Option 1a – 25m, 6 lane pool	\$2.6M
Option 1b – 25m, 8 lane pool	\$2.7M
Option 2a – 52m, 6 lane pool	\$3.0M
Option 2b – 52m, 8 lane pool	\$3.2M

20-30% degree of accuracy

Largest Impact to Annual Costs are Operations (Staffing) Costs

Energy Modelling – Energy Usage and Costs

Enersys Analytics

- 52m pool has disproportionately higher energy use & cost than the 25m pool, relative to building area (the size of the natatorium drives energy use)

	OPTION 1a 25m, 6 lane pool	OPTION 1b 25m, 8 lane pool	OPTION 2a 52m, 6 lane pool	OPTION 2b 52m, 8 lane pool
Operations & Maintenance Costs*	\$2,281,560	\$2,353,700	\$2,601,190	\$2,738,460
Energy Costs	\$364,320	\$375,840	\$415,360	\$437,280
Total Annual Costs	\$2,645,880	\$2,729,540	\$3,016,550	\$3,175,740

* O&M costs include: staff salaries (accounts for approx. 83% of all O&M costs), communications, custodial & basic maintenance, security, maintenance & repair, water & sewer, building envelope, built-in equipment repair.

Note: Figures above are based on Hanscomb Quantity Surveyors estimates

	OPTION 1a 25m, 6 lane pool	OPTION 1b 25m, 8 lane pool	OPTION 2a 52m, 6 lane pool	OPTION 2b 52m, 8 lane pool
ENERGY USE AND O&M COSTS				
Annual Energy Use (Enersys)	12,500 GJ/year	13,200 GJ/year	15,700 GJ/year	17,300 GJ/year
Annual Energy Costs (Enersys estimate / Hanscomb estimate)	\$373,400 / \$364,320	\$394,500 / \$375,840	\$486,500 / \$415,360	\$541,100 / \$437,280

Annual Operating Subsidy

Estimated 2024 Tax Rate Increase

Revenue will be mainly influenced by:

- Staffing Availability
- User Demand

Not necessarily by the size or design of the physical facility

Annual Net Operating Expense (projected)

These estimates are based on numbers provided by the City of Yellowknife. A 25% margin of error is applied to each projection, as some variables for facility operations have yet to be determined.

	2022 Projections for RIMP	Projections for 25m, 6 lane pool	Projections for 25m, 8 lane pool	Projections for 52m, 6 lane pool	Projections for 52m, 8 lane pool
Revenue	\$ 662,072	\$943,894	\$974,446	\$1,138,224	\$1,197,254
Expenses	\$ 1,940,094	\$2,645,880	\$2,729,540	\$3,016,550	\$3,175,740
Net operating expenses	\$1,278,022	\$1,701,986	\$1,755,094	\$1,878,326	\$1,978,486
Recovery (estimated)	34%	36%	36%	38%	38%

estimated 2024 tax rate increase

1.13%

1.27%

1.60%

1.87%

Pros and Cons of each Option

Pros

	OPTION 1a 25m, 6 lane pool	OPTION 1b 25m, 8 lane pool	OPTION 2a 52m, 6 lane pool	OPTION 2b 52m, 8 lane pool
PROS	<ul style="list-style-type: none"> • Lowest construction, O&M costs and energy usage • Ability to host regulated local and regional competitions • Meets current pool demand plus growth • Staffing this size of pool to reach its maximum occupant capacity is more reasonable to achieve than in a larger pool 	<ul style="list-style-type: none"> • Ability to host regulated local and regional competitions • Allows for greater number of swimmers to train and compete per heat • Allows for water polo training & competitions (women's) • More attractive for sport tourism and lane swim capacity than its 6-lane counterpart • Meets current pool demand plus growth • Staffing this size of pool to reach its maximum occupant capacity is more reasonable to achieve than in a larger pool 	<ul style="list-style-type: none"> • Ability to host regulated local and regional competitions • Greater ability to accommodate multiple activities in the lane pool at one time • Allows for synchronized swimming competitions, and water polo training • Most recent public consultation indicated a preference for a 52m lane pool 	<ul style="list-style-type: none"> • Ability to host regulated local and regional competitions • Allows for greater number of swimmers to train and compete per heat • Allows for synchronized swimming and water polo competitions • More attractive for sport tourism than its 6-lane counterpart • Most recent public consultation indicated a preference for a 52m lane pool

Pros and Cons of each Option

Cons

	OPTION 1a 25m, 6 lane pool	OPTION 1b 25m, 8 lane pool	OPTION 2a 52m, 6 lane pool	OPTION 2b 52m, 8 lane pool
CONS	<ul style="list-style-type: none"> • Inability to host regulated provincial or national competitions • Inability to train for long course (50m) races • Fewer lanes means less capacity for lane swimmers and less efficiency in holding larger swim meets 	<ul style="list-style-type: none"> • Inability to host regulated provincial or national competitions • Inability to train for long course (50m) races 	<ul style="list-style-type: none"> • Inability to host regulated provincial or national competitions • Inability to host synchronized swimming or water polo competitions • Capacity of pool may be in excess of actual demand (pool may be under utilized) • Staffing this size of pool to reach its maximum occupant capacity will likely be difficult to achieve based on trained lifeguard shortages in Yellowknife and across Canada. 	<ul style="list-style-type: none"> • Highest construction, O&M costs and energy usage • geared mainly towards competitive swimmers, however still unable to host regulated provincial or national events without additional warm up lanes, spectator seating, and deck space • Capacity of pool may be in excess of actual demand (pool may be under utilized) • Staffing this size of pool to reach its maximum occupant capacity will likely be difficult to achieve based on trained lifeguard shortages in Yellowknife and across Canada.

Next Steps

City Council to Decide:

- 25m or 52m Lane Pool?
- 6 or 8 Lanes?
- Addition of waterslide to program?

Next Phases:

1. Bridging Documents (Jan-May 2021)
2. Issue RFP for project (Spring 2021)
3. Select Design-Builder (Summer 2021)
4. Public Referendum (Fall 2021)
5. If yes, Construction Begins (Spring 2022)

Questions

