Whistler Multi-Use Recreation Facility

Investigative Study

Prepared for the Resort Municipality of Whistler

Prepared by

David Hewko

Planning + Program Management

December 2015

1 Overview and Key Findings

The purpose of this Study has been to investigate the capital and operational costs for a potential new indoor multi-use sport facility to be located in Whistler, BC.

1.1 Overview

To guide the Study, hypothetical building programs were developed by the municipally led project working group. This group included representatives from the municipal Recreation and Leisure Advisory Committee, School District 48, Whistler Sport Legacies Society, and municipal resort parks planning and recreation facility staff. In addition to their experience and knowledge, the working group was further informed by the recent public engagement process for the new municipal Recreation and Leisure Master Plan.

Two indoor program options were initially developed to inform building space requirements:

- an indoor half-sized soccer pitch surrounded by space for ancillary sport uses (synthetic flooring to accommodate a curved radius track along with flexible use sport courts); and
- an indoor half-sized soccer pitch Fieldhouse without the ancillary sport uses.

The Study investigated the estimated capital and operating costs to accommodate these two program options within four different building types, and at four different potential sites. The four different building types are:

- an air-supported fabric structure (ASFS or 'bubble');
- a rigid-frame fabric structure (RFFS or 'Sprung-structure');
- a fabric building with pre-engineer structural skeleton; and,
- a pre-engineered metal building (PEMB).

A fifth building type, institutional quality equal to that of the existing Meadow Park Sports Centre, was not considered due to higher capital cost.

The four different potential sites considered through this Study are:

- Spruce Grove Park - Waldorf School site;
- Cheakamus Crossing - below and adjacent to Bayly Park;
- Whistler Secondary Community School - existing field space; and,
- Myrtle Philip Community Elementary School - existing field space.

Site development costs for each location were excluded from this analysis as further information and site servicing analysis are required.

Later on in the Study a third hypothetical program was developed – an outdoor full-sized artificial turf soccer pitch. This was considered at each of the four locations noted above and the results including operating and capital costs are included within this Study.

1.2 Key Findings

Potential Sites

- Each of the three program options can fit on each of the four potential sites. Note however:
  - any facility at Spruce Grove Park will require the relocation of the Whistler Waldorf School;
  - an indoor facility at the Spruce Grove Park will likely require the greatest off-site development work for flood mitigation;
  - the Cheakamus Crossing site servicing costs will be high due to distance to existing services;
  - the Cheakamus Crossing site was provided to the municipality by the Province for employee housing and not sports infrastructure;
  - the Whistler Secondary Community School site does not provide an additional field to the community; and
  - the Myrtle Philip Community School sites either eliminate green space valuable to the school programming or do not provide an additional field to the community.
- Beyond what is listed in the immediately preceding points each site has its own unique characteristics that generate individual opportunities, constraints and potential development cost issues. While some of these are identified within this Study, this list is not exhaustive or quantified, and requires further investigation.

Snow Load

- Whistler's snow load and desired clear span increase building costs dramatically.
- Snow load increases operation costs for fabric buildings.
- No North American manufacturer has built a fabric building with the desired large clear span in a location with an equivalent snow load to Whistler.

Service Life

- Building service life is inversely proportional to capital cost. A fabric building's outer shell will have an expected building life of 10-15 years. A pre-engineered metal building has an expected service life of 25-30 years. An institutional quality building (not studied) has the longest service life at 40-60 years.
- Artificial turf has a limited lifespan of typically 7-10 years, upon which it will need to be replaced.

Indoor Facility Capital and Operational Costs

- Cost are estimates based upon precedent examples and best information available, and are in current dollars.
- There exists an inverse relationship between building capital cost and operating cost: the least costly building to erect (ASFS bubble) would have the highest annual operating cost. With the pre-engineered metal building, the opposite would be true.
- Operational costs for the larger indoor facility option range between $468,000 to $625,000 per year.
- Operational costs include annual contributions to a turf replacement fund.
- Capital costs for the larger indoor facility option range between $5,900,000 for the air supported bubble to $11,100,000 for the pre-engineered building.
- Capital costs exclude any on or off site development costs, land acquisition costs or applicable taxes.

Outdoor Facility Operational and Capital Costs

- The operational costs for an outdoor full-sized artificial turf soccer pitch are approximately $33,000 annually. This excludes an annual $100,000 contribution to a turf lifecycle replacement fund.
- Capital costs for an outdoor full-sized artificial turf soccer pitch are in the order of $3,200,000. This excludes any on or off site development costs, land acquisition costs or applicable taxes.

Further detail on each of these subjects is included within the Study. The Study concludes with a short suggestion of next steps.
Detailed capital and operating cost information can be found in **Appendices A – F**.

2 Building Program - Large Facility Option

2.1 Background

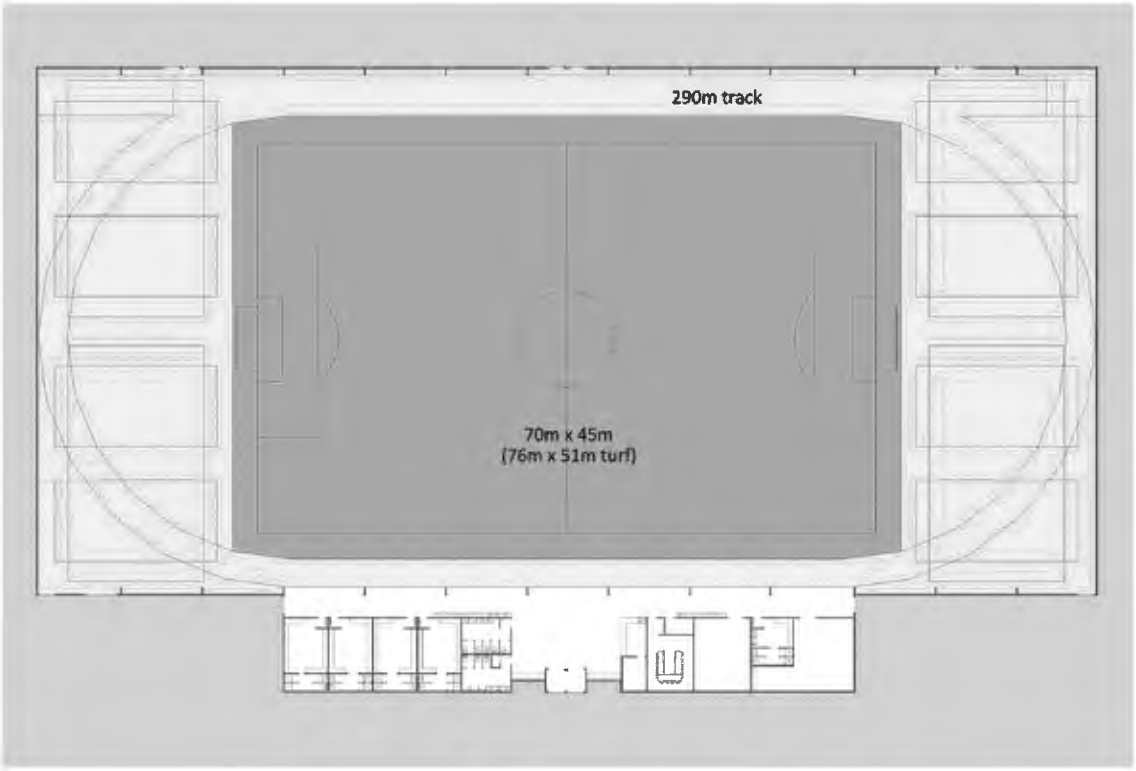
To inform a building program, the client convened a working group comprised of members of the Recreation and Leisure Advisory Committee (including the Council representative), representatives from the School District 48 and Whistler Sport Legacies Society, and municipal managers of recreation and resort parks planning.

This group initiated its programming discussion by considering a larger multi-use facility centered on the primary use of soccer but providing opportunities for additional uses. While there is greater capital and operational costs for a larger facility, a multi-use facility means there is greater revenue generating potential to offset long term operational costs.

2.2 Program

The program option below is referred to as the 'Large Facility option'. It meets the known desire for indoor soccer, and includes additional synthetic sport flooring four court space for other uses. The mix of flooring types allows for a higher density of users and greater diversity of users as well, and potentially lead to greater annual revenues used to offset operating costs.

The hypothetical building program is an 88,000 square foot facility that includes a 70m x 45m (228' x 146') artificial turf playing surface surrounded with a 3m (10') safety buffer perimeter. The turf area would be about 41,000 sf.



Concept Layout - Large Facility

There would be an additional approximately 38,000 sf of synthetic sport flooring (poured-in-place or sheet good) with floor markings for a 290-metre indoor track or four high-school sized basketball courts (sub-dividable into 8 volleyball or 16 badminton or combined to form two indoor tennis courts). Netting would be used to separate the turf area from the synthetic flooring area.

Either the track would be operated or the courts, but not both at the same time as lines are over-lapping. The reason for this is the capital and operating cost for a dedicated track would be cost prohibitive, but if the track were scheduled only for certain times of day and the rest of the time the courts are operational, the chances for a more sustainable operation are greatly improved. The track straight-away could also be used for 100-metre sprints.

The remaining 8,000 sf would be for four team rooms, public washrooms, a control counter and staff office, a meeting room, first aid room, referees change room, storage and mechanical rooms (some mechanical rooftop or suspended internally). There is also a large lobby space with banks of day-lockers. Storage could be accommodated in the void spaces between structural columns in the Fieldhouse.

The facility would have a peaked roof or apex of at least 40-feet if not higher (the higher the peak, the more easily snow could be shed from the roof).

2.3 Annual Operating Estimates

In summary, annual operating costs are estimated to range between $468,000 to $625,000 per year. The least costly to build (air supported bubble) is the most costly to operate, and the most expensive to build (pre-engineered metal building) is the least expensive to operate. Rationale for this and other details are discussed in Building Type Options section of this report (section 4.0).

Detailed annual operating estimates for this option are included in **Appendix A** of this Study.

3 Building Program - Small Facility Option

3.1 Background

As mentioned previously, the client convened a working group comprised of members of the Recreation and Leisure Advisory Committee (including the Council representative), representatives from the School District 48 and Whistler Sport Legacies Society, and municipal managers of recreation and resort parks planning in order to inform the building program

The working group felt it appropriate to consider a more modest facility to meet basic needs.

3.2 Program

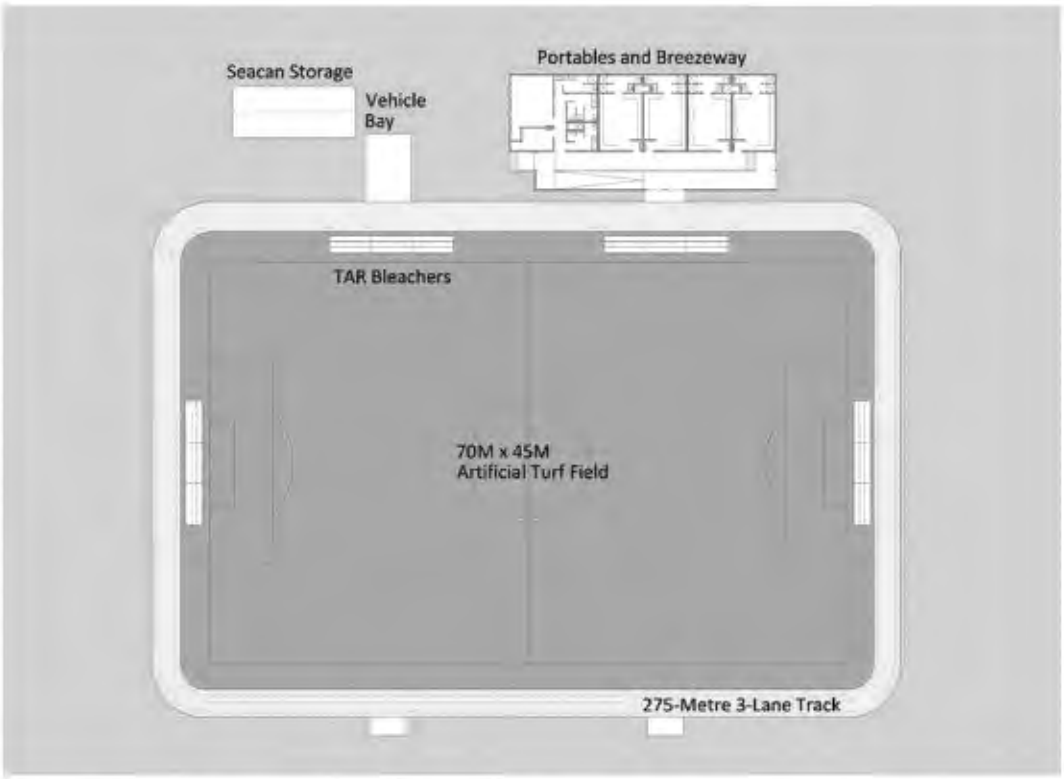
In this 'Small Facility option' a half-sized artificial turf soccer pitch is surrounded by a warm-up track (limited in use by its right-angle corners). Necessary support and mechanical space is also provided.

This facility would be about 80% turf and would be focused on field sports as opposed to the mix of field and court sports of the larger option. The half-pitch would be suitable for games for U-10 and under, further sub-dividable into two smaller pitches or four smallest pitches for mini-soccer. Older age groups could practice on the half field.

This option presents several layout opportunities with respect to support space.

3.3 Air-Supported Fabric Structure ('Bubble') - 54,500 sf

This option includes a half-sized 70m x 45m (228' x 146') artificial turf playing surface surrounded with a 3m (10') safety buffer perimeter and a three lane wide 275 metre long walking / jogging track with right angled corners. The track would be made of synthetic sport flooring.



Concept Layout - Air-Supported Fabric Structure ('Bubble'). No columns. Support spaces are linked portable buildings.

The support spaces are minimal and shown as portable buildings (ATCO-type) ganged together and linked by a weather protected breezeway and ramp (the portables will sit on pads with a floor elevation about 2-3 feet above grade). These total approximately 9,000 sf and include four team rooms, public washrooms, a control counter and staff office, a meeting room, first aid room, referees change room, storage and mechanical rooms.

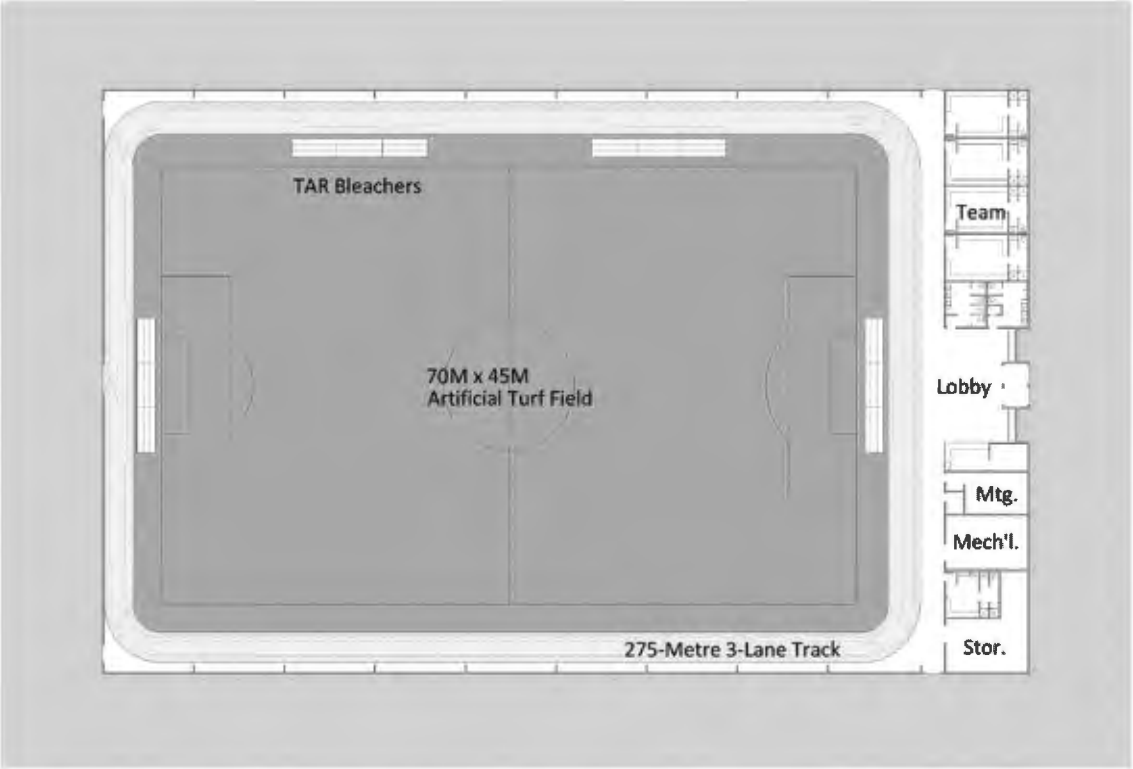
Storage is assumed to be economical Seacans placed outside the primary structure.

The bubble includes four pressurized exit vestibules, one large enough for a truck to drive into.

3.4 RFFS or PEMB 60,000 sf

This option includes the same half-sized 70m x 45m (228' x 146') artificial turf playing surface surrounded with a 3m (10') safety buffer perimeter and a three lane wide 275 metre long walking / jogging track with right angled corners. The track would be made of synthetic sport flooring.

This facility is larger in area owing to the structural columns along the perimeter walls and the voids between columns.



Concept Layout - Rigid-Frame Fabric Structure or a Pre-Engineered Metal Structure (both with columns)

The support spaces include an additional 9,000 sf would be for four team rooms, public washrooms, a control counter and staff office, a meeting room, first aid room, referees change room, storage and mechanical rooms (some mechanical rooftop or suspended internally). There is also a large lobby space with banks of day-lockers. Some storage could be accommodated in the void spaces between structural columns in the Fieldhouse.

3.5 Annual Operating Costs

In summary, annual operating costs are estimated to range between $386,000 to $482,000 per year. The least costly to build (air supported bubble) is the most costly to operate, and the most expensive to build (pre-engineered metal building) is the least expensive to operate. Rationale for this and other details are discussed in Building Type Options section of this report (section 4.0).

Detailed annual operating estimates for this option are included in **Appendix C** of this Study.

4 Building Type Options

Four main types of construction were identified that were analyzed and evaluated included:

- Air-support fabric structure (ASFS)
- Rigid-frame fabric structure (RFFS or Sprung-type)
- Fabric with pre-engineered structure (Legacy-type)
- Pre-engineered metal buildings (PEMB)

Due to the prohibitive project cost, institutional quality (i.e. Meadow Park Sports Centre) was not examined in detail for this study.

4.1 Air-Support Fabric Structure

The air-supported structures promote themselves as the most economical solution, which is true on the capital side. But ASFS tend to be the costliest to operate because of the constant pressurization required and the low insulation properties designed to keep the shell light and easier to keep aloft. ASFS can be removed seasonally, but the annual cost (approximately $15,000 to $20,000) often outweighs the benefit.

The capital costs identified by the manufacturers tend to only be about half of the actual project cost as elements are excluded including foundations, life safety requirements, the artificial turf and support rooms which tend to be out-buildings built (ATCO-type portables) or inside the bubble. In the most current iteration of the BC Building Code, air-supported structures are no longer considered temporary buildings and so must meet all fire and life safety requirements.

Energy costs for pressurization is higher than normal building code air-change requirements in order to keep the roof up, but the significant premium comes in heating, as heat rises and is lost through the skin with only an R-2 (glass) to R7 equivalent rating.

Manufacturers claim the outer skin can last over twenty years, but in most cases partial or whole re-skinning in required between 10-15 years. ASFS are fabric skin to the ground line and are highly susceptible to vandalism, usually requiring a perimeter chain-link fence. Lifecycle replacement costs are higher for fabric structures than a metal building.

Other issues include UV and weather damage resulting in delamination of seams, fabric tears and discolouration or staining. What is saved in initial capital outlay, occurs in capital replacement due to shortened building life-expectancies.

ASFS can span incredible distances and feature significant interior clear height as a function of creating a steep profile for shedding snow and rain. Heat loss also aids in melting snow before it accumulates. Interior lighting can be suspended from the fabric shell or with light standards at floor level.

The greatest unknown with ASFS in Whistler is whether the structure could survive the significant snowfalls. The closest precedent in terms of snow loads (Colorado and Maine) were only in the order of 50% of Whistler's over 200 inches (508cm) of snow per season. As such, there is a significant risk of building failure for this type of structure in the Whistler context.

Typical air supported bubble

Collapsed bubble due to snow load in Cape Breton

4.2 Rigid-Frame Fabric Structure

The rigid-frame fabric structures, sometimes referred to by the proprietary 'Sprung-structures' are a series of repeated bays with pointed-peak hollow-tube trusses, usually 20-feet (6 metres) on centre. Manufacturers claim the product is capable of clear-spanning up to 200-feet, (60 metres) though 80-120-feet (24 to 36 metres) are most common. The ends can be flat gables, but manufacturers prefer rounded ends to laterally stabilize the structure. These half-circles ends tend to be less efficient space and often difficult to use.

Owing to the truss depth and frame design, RFFS can support up to the equivalent of R-20 insulation between the double-skin section. The more insulation reduces translucency and increases dependency on artificial lighting, though some products now feature 'skylights' of uninsulated almost-clear panels. As with ASFS, manufacturers claim the outer skin can last over twenty years, but in most cases partial or whole re-skinning in required between 10-15 years.

The RFFS project will also include foundation work, life safety requirements, artificial turf as well as team rooms and support spaces either outside the building or within. And like ASFS, the RFFS are fabric skin to the ground line and are highly susceptible to vandalism, usually requiring a perimeter chain-link fence.

The same issue for RFFS as with the bubbles, Whistler snow loads are prohibitively high and there are no precedents for these structures with significant clear spans in these conditions (at best only in the order of 100-125 inches (254 to 317 cm) of annual snowfall). If these buildings fail however, it tends to be localized to single bays unless the frame buckles resulting in a serious failure.

Rigid-frame fabric structure (Sprung-type)

Pre-engineered fabric structure (Legacy-type)

4.3 Fabric with Pre-Engineered Structure

A relatively new hybrid solution has emerged between the RFFS and the metal pre-engineered buildings, a fabric covering on a pre-engineered structural skeleton. The most prominent manufacturer, Legacy Buildings (USA), has been producing structures mostly for industrial use worldwide. The product can be insulated like the Sprung structures and features superior structural strength with the solid steel I-beams instead of hollow-tubing web trusses. The product can span 200-feet (60 metres) and roofs can be steeply peaked to shed snow. If there is a building failure, it should be localized to fabric tears between metal columns.

Like the air-supported structures, there are no Canadian manufacturers of scale of this product, so the exchange rate will add a significant premium to cost. In spite of this, the product prices between the Canadian-made Sprung or alternative structures and the metal-clad pre-engineered buildings.

As with all fabric buildings, manufacturers claim the outer skin can last over twenty years, but in most cases partial or whole re-skinning in required between 10-15 years.

4.4 Pre-Engineered Metal Buildings

Pre-engineered buildings are metal I-beam structure with corrugated metal building envelope. One of the largest producers of pre-engineered metal buildings for recreation purposes is Butler Buildings (USA) whose name has become almost generic - though there are also numerous Canadian steel-building manufacturers of equal quality, including some based on the Lower-Mainland.

The PEMB are far more durable than any fabric building, but the price leap upward is significant. That said, the PEMB can be expected to last 2-3 times longer than a fabric building in total building life, with lower and fewer capital upgrades during the years of operation. The building should not have to be re-clad, though leaks at joints can occur and the thin metal siding can be susceptible to damage particularly near ground level.

Structurally, the PEMB presents the least risk of building failure with the snow loads expected in Whistler. The primary structural trusses and columns are supported by secondary structure perpendicular purlin trusses to which the metal decking is applied. The building can be significantly insulated to the equivalent of R-20 to R30, retaining heat and resulting in operating savings in the long-term that will recoup some of the capital premium.

Pre-engineered metal structure

Institutional quality building

4.5 Institutional Quality Buildings (not in scope)

A local example of this type of building would be the Meadow Park Sport Centre. This 'institutional quality' tends to have a 50-to 100% longer building service life than a pre-engineered metal building. Most institutional buildings are masonry and concrete to the eight-foot height with structural steel above. Mechanical systems are also usually of a higher quality standard with an expected service life of over 30-35 years. Building envelope and cladding systems are more architectural and would also have a longer expected service life. Cost as would be expected would be in the order of 30-80% more than pre-engineered metal structures.

4.6 Estimated Capital Costs

Large Facility Option
The capital costs for the large facility option defined in section 2.0 of this Study range between $5,900,000 for the air supported bubble to $11,100,000 for the pre-engineered building.

Small Facility Option
The capital costs for the small facility option defined in section 3.0 of this Study range between $3,800,000 for the air supported bubble and $8,000,000 for the pre-engineered building.

Detailed capital cost estimates are included in **Appendices B** (large facility) **and D** (small facility) of this Study.

The air supported is the least costly as there is no building structure. In reality the cost of air-supported structures doubles when accounting for all the foundation, life safety and mechanical costs. Pre-engineered structures are the most durable with the longest expected building life of the structures considered, but are the most costly of the four options being analyzed.

Each option carries the same value and quality of interior lighting and artificial turf. Lighting would be practice level not competition level, though lighting could be augmented with additional portable lighting if hosting special events. The turf is assumed to be long-strand with granular infill and applied directly on the ground and not on a slab (precluding dry floor rentals if the turf is removed).

The capital estimates are construction plus soft costs and a contingency allowance for the building only – site costs will differ dramatically from one site to the next and therefore have been excluded from this study and should be analyzed separately.

5 Potential Locations

As part of the municipality's recent Recreation and Leisure Master Plan (RLMP) process a study was conducted to identify potential park or recreation sites of one-hectare size or more. A site of this general size is necessary to accommodate the large facility option described in the section 2.0.

A number of constraints were used as filter to identify potential sites; lands were excluded if they possessed existing development and/or had slopes greater than 10%, and if they were located:

- within 30 metres of a watercourse;
- within a protected area network designation of 1 or 2;
- within a designated provincial park or recreation site;
- within Whistler/Blackcomb's Controlled Recreation Area; and
- were greater than 500 metres from an existing provincial, municipal, or Forest Service road;

The net result is that there are few locations for a facility this size within municipal boundaries. The exceptions are existing school, park, golf course and parking lot sites, as well as sites located south of Function Junction and in the Callaghan Valley – the latter two are outside of the Whistler Urban Development Containment Area (WUDCA).

Consequently the client identified four potential locations within the WUDCA for a facility:

- Spruce Grove Park;
- Cheakamus Crossing;
- Whistler Secondary Community School; and
- Myrtle Philip Community School.

These locations were initially selected based upon the RLMP process described above and then further refined based upon available area, ownership, zoning, existing developed condition, partnership potential, proximity to Village, and proximity to existing services.

What is key to note is that each site has its own unique characteristics, and with that comes different opportunities, constraints, and development costs.

The following pages provide a diagram of each potential site overlain with the larger facility option. Similar diagrams are included for the smaller facility option at the end of this section.

5.1 Spruce Grove Park

Description
The diagram above illustrates the multi-use facility shown to scale on the Spruce Grove Park site located approximately 2.5 km north of Whistler Village. A portion of the site is currently housing portable buildings for the Waldorf School. The municipally-owned athletic park features three ball diamonds and a Fieldhouse as shown. The proposed new facility is shown placed adjacent to the existing Fieldhouse building and in close proximity to parking. The new facility would function well in the park making the site a year-round use.

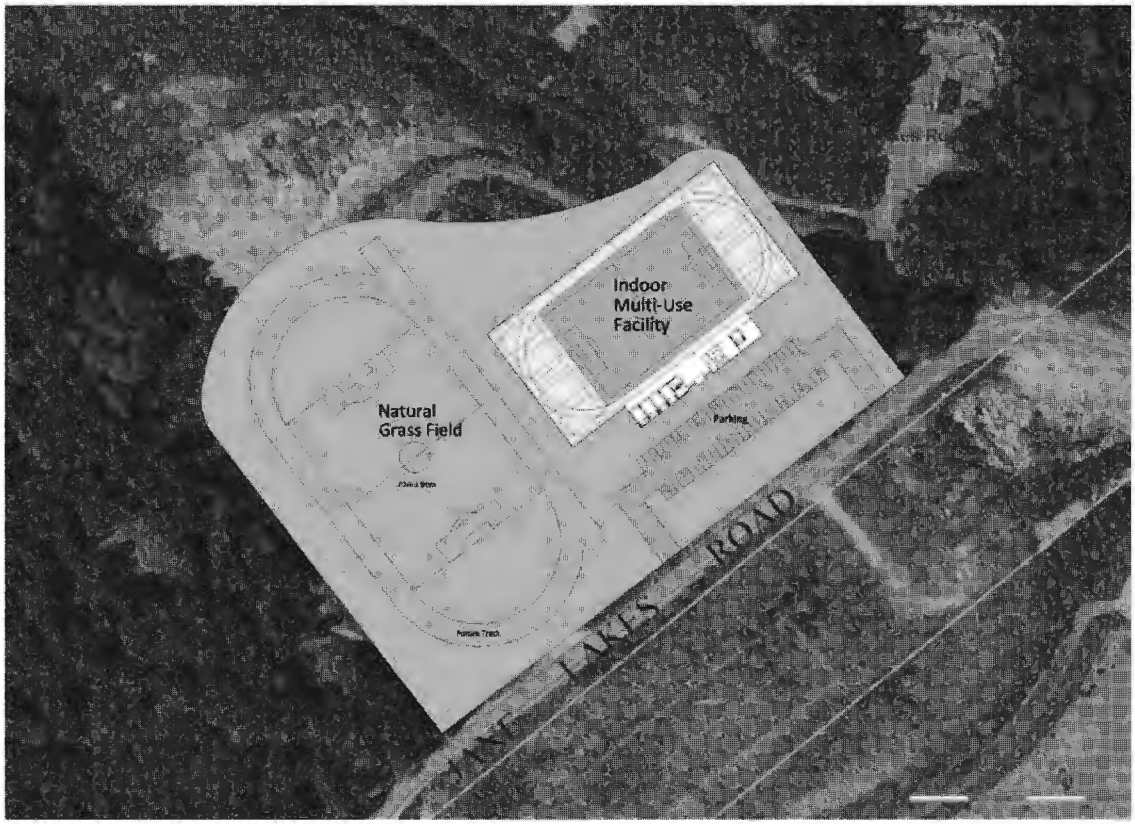
Advantages
The new facility fits reasonably well into the existing available brownfield footprint with only a few trees lost in the back corners. The overall project is 10% smaller and therefore about 10% less expensive because the team rooms and support spaces could be accommodated in the existing adjacent Fieldhouse. The project would also be less expensive as existing parking is not removed and no additional parking is required (other uses are seasonal and non-conflicting). The large building massing would be concealed in the park and generally not visible from the road or surrounding uses.

Disadvantages
The park site is located within a floodplain and extensive on and off-site flood mitigation work will be necessary to protect the building. The scope and cost of this can be determined by a flood way study, which is outside the scope of this study.

The Whistler Waldorf School would be required to be relocated off site.

Some trees may have to be removed to accommodate the 2-acre building footprint and a fire-lane perimeter. There may be environmental considerations with vegetation lost in this area.

5.2 Cheakamus Crossing



Description
The space below and adjacent to Bayly Park is a vacant brownfield site property currently about 10 kilometers southwest of the Village. It is in the Cheakamus Crossing neighbourhood and is 400-metres from the Whistler Athletes Centre operated by Whistler Sport Legacies. The relatively level site sits on a terrace about 4-5 metres above the road grade. The site would also be large enough to accommodate potential future facilities as well as parking.

Advantages
The site is large and within 400-metres of the infrastructure of the Whistler Athletes Centre that could compliment athlete training while supporting the new facility's need for accommodations for special events and tournaments. The site could support any building orientation and could also support future amenities.

Disadvantages
While the land is public, it is not owned by the Municipality - it was provided to the municipality by the Province for employee housing and not sports infrastructure. The site is not serviced - services would need to be brought approximately 450 metres to the site. The site was an industrial use at one point, and some of the site may require engineered fill. The site is 10 kilometres from the Village, a potential impediment for some users.

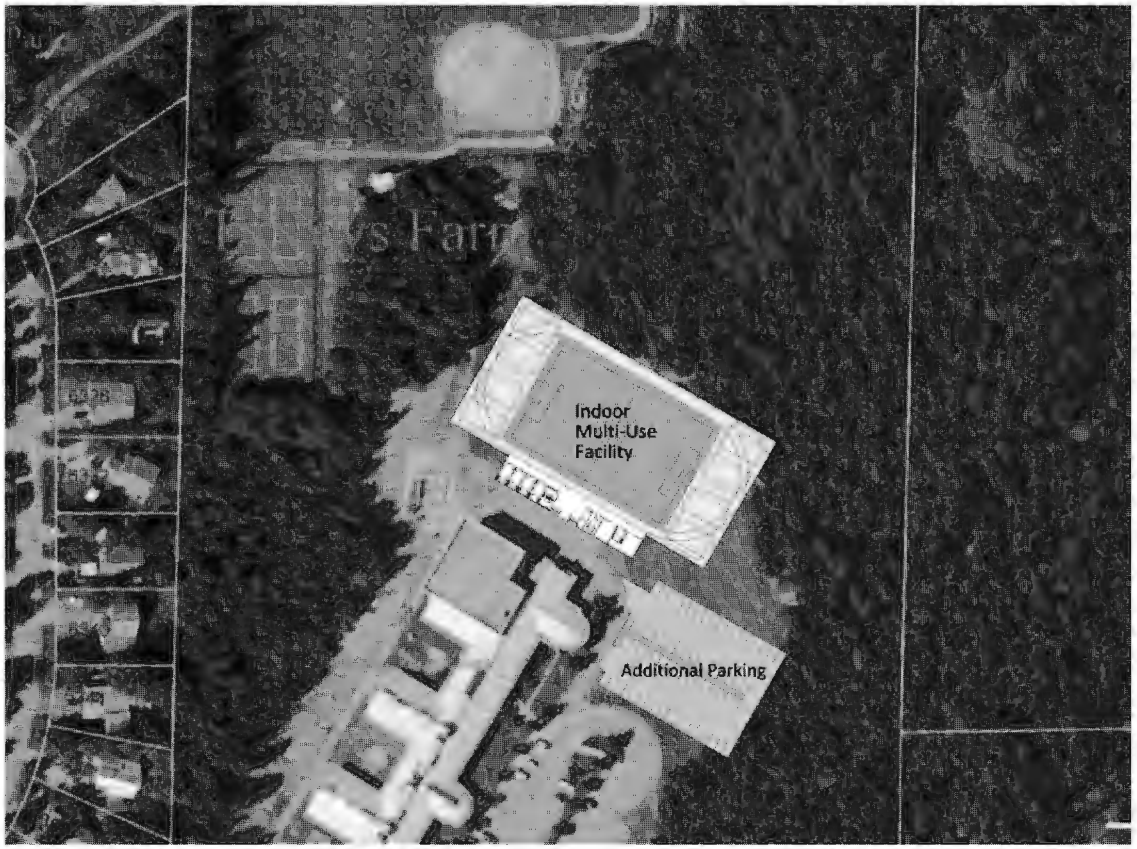
5.3 Whistler Secondary Community School

Description
The community's secondary school is located about 4.4 kilometres north of the Village. The new facility would be on the footprint of the existing soccer / football field.

Advantages
The facility could enjoy extensive daytime use by the secondary school and it would be near the Meadow Park Sports Centre with some opportunity for cross-programming. The site is adjacent to an outdoor open area which could offer support space. The existing Fire Hall at the north end of the site may offer some access or servicing opportunities.

Disadvantages
The multi-use facility could only be built on the site of the existing full-sized soccer / football field, potentially conflicting with school requirements and removing one full-sized grass field from the community's inventory. The adjacent smaller field has various fill and environmental issues. The field is somewhat remote from the school building. Existing vehicle parking is oversubscribed with school activities. Additional parking would need to be built on the site, however expansion opportunities are limited. A service road / fire lane would have to be extended across the existing creek that separates the school from the fields, requiring some form of creek crossing. The risk is small, but introducing transient users to the school property may pose a security concern for the school.

5.4 Myrtle Philip Community School Option A – Upper Field



Description
The site is located about 1.6-kilometres away from Village. The school is a partnership between the school district and the municipality, and contains a large elementary school with a community centre. The existing school facility is in use daytime and evening, complimenting the likely operating model for the new facility.

Advantages
This option would be closest to the Village and most central to the community. The facility could be operated by community centre staff and or school staff. Proximity to the school ensures the facility will be heavily used by students during the daytime school months.

Disadvantages
Additional parking would be required; the likely location would eliminate most of the close-to-school usable grass space. Students would have to trek about 150-metres to the soccer fields / ball diamond to the north to access green space. The risk is small, but introducing transient users to the school property may pose a security concern for the school.

5.5 Myrtle Philip Community School Option B – Lower Field

Description
Two soccer fields / ball diamond and tennis courts exist to the north of the existing elementary school. The fields are extensively used by minor soccer. As an alternative location to the upper field, the open fields' area would be adequate for the multi-use facility, though service access and parking would be too remote unless a road and parking lot were provided on the current ball diamond site.

Advantages
The site is large and unencumbered and the large building massing does not crowd the existing school. The facility would be adjacent to an existing outdoor field, sharing the team rooms and washrooms.

Disadvantages
The new facility would be farther away from the community school and the ball diamond would be lost as the remaining area to too small for baseball or softball. Extending building services to the site would be more expensive given the relative remoteness of the location. Vehicle traffic would be introduced further into the school grounds. No additional field space would be created. The risk is small, but introducing transient users to the school property may pose a security concern for the school.

5.6 Small Facility Locations

The small facility option described in Section 3.0 could also be located at each of the four sites. In general terms the advantages and disadvantages listed above for the larger facility option also apply to the small facility options.

At the Whistler Secondary Community School site the smaller facility footprint permits it to be located in the smaller field site, as well as upon the larger field site. There may be environmental or geotechnical issues with this smaller site noted here.

6 Outdoor Artificial Turf

An alternative to the enclosed building options is the construction of a full-sized FIFA outdoor artificial turf soccer pitch with lighting. While the cost of an artificial field can be six-fold the cost of a grass field and it only adds one field, an artificial turf field can be used all hours of the day and in most weather conditions.

6.1 Annual Operating Estimates

Annual operating costs for an outdoor artificial turf are relatively low, and typically less than that of a natural grass field. However as the turf has an expected 7-10 year lifespan, operating costs should include a lifecycle replacement line item of about 60% of the annual operating cost. The intention is to create a sinking fund to replace the turf. Service life for an outdoor turf is impacted by amount of use and UV exposure.

Annual operating costs are estimated to be approximately $33,000 per year. This excludes a $100,000/year contribution to a turf lifecycle replacement fund. The municipality typically funds lifecycle replacement costs through general reserve funds. Figures are in current 2015 dollars.

Detailed annual operating estimates for this option are included in **Appendix E** of this Study.

6.2 Capital Costs

The capital estimates are construction plus soft costs and a contingency allowance. As site development costs will differ dramatically from one site to the next they have been excluded from this study and should be analyzed separately.

The capital costs for this option are in the order of $3,200,000. Figures are in current 2015 dollars.

Detailed capital cost estimates are included in **Appendix F** of this Study.

6.3 User Fees

User fees are typically in place to recoup the operating costs: about $30 / hour for youth and $60 / hour for adults are comparable Lower Mainland examples (see **Appendix G**). In order to break even at these rates, the field would need to be used approximately 800 hours per year in the +/- 8 month playable season. That being said, all existing Whistler fields as well as the Meadow Park Sports Centre are taxpayer subsidized at varying amounts, and the Meadow Park Sports Centre is currently subsidized approximately 45% annually = $1.5m.

6.4 Heated Field

Some consideration was given to heating the playing surface in order to further extend the playing season by preventing the field from freezing and snow accumulation. In-ground heating systems are more commonplace in the United States, especially at NCAA and NFL football stadiums - teams and organizations with sizeable operating budgets.

Factors limiting field use would be heavy snowfall or air temperatures being too cold for participants to play. An in-field heating system may not be able to keep pace with accumulating snowfall. In effect, this solution would make the field fully playable 7-8 months of the year instead of the 3-4 months grass fields are limited to.

Typical in-ground heating would add significantly to the capital and operating costs. Entry level systems start around $750,000. The outdoor field with an in-ground heating system would cost about the same to construct as a half-sized Fieldhouse, but less to operate. This could make the outdoor project almost as costly as the least expensive building project.

Consideration was also given to using the existing Cheakamus Crossing District Energy System to heat the field if the facility were located in this neighbourhood. However, the quantity of the heat this system provides is insufficient to be able to provide any effective outdoor snow melt capabilities.

Given the high cost, risks and anticipated minimal success in achieving desired outcomes of an extended playing season, in field heating is not considered further in the cost estimates or this study.

6.5 Potential Locations

A full size pitch is capable of fitting on all four of the potential sites.

6.5.1 Artificial Turf at Spruce Grove Park – Option 1

Description
The diagram above illustrates a full-sized FIFA soccer pitch shown to scale on the Spruce Grove Park site in the preferred north-south orientation.

Advantages
The artificial turf field would fit on the available footprint without the removal of any trees. The field orientation would be the more desirable north-south configuration (sun angle high in the sky at noon). Field lighting would have less impact on surrounding uses including the neighbourhood as field lights already exist for the adjacent ball diamonds.

Disadvantages
The field orientation necessitates the displacement of some existing parking that would have to be replaced. Relocation of the Whistler Waldorf School would be required.

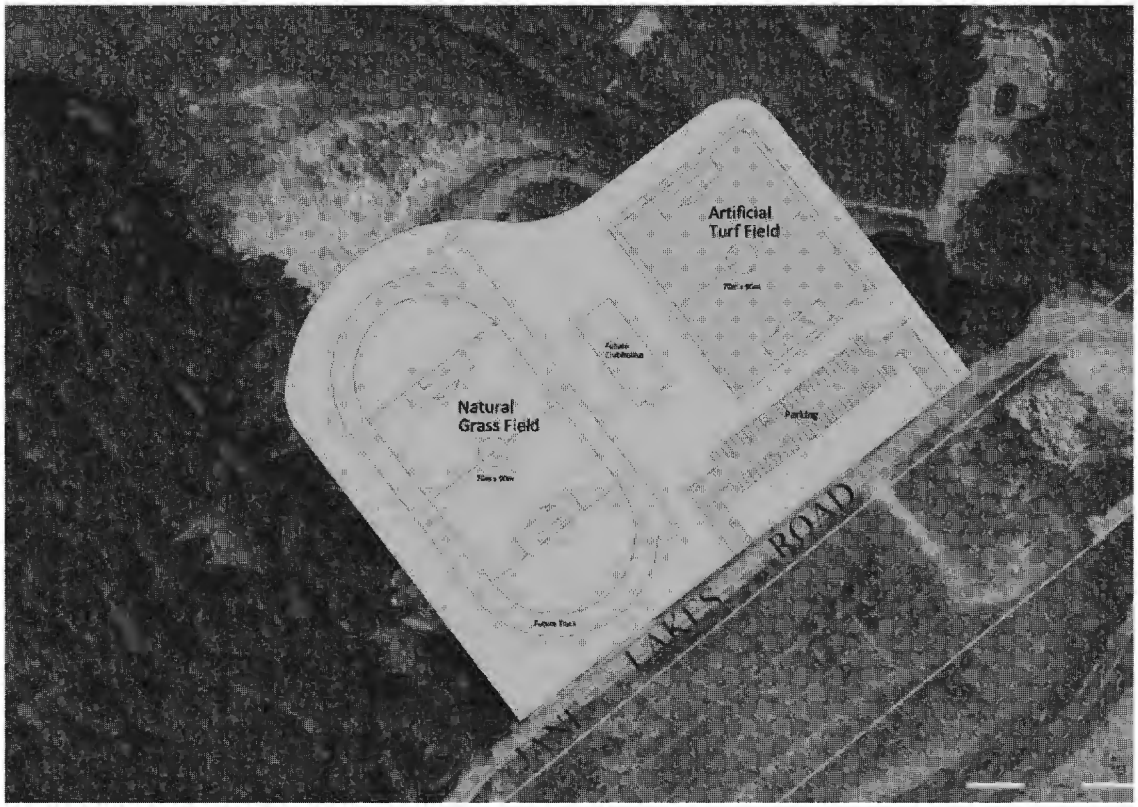
6.5.2 Artificial Turf at Spruce Grove Park – Option 2

Description
The diagram above illustrates a full-sized FIFA soccer pitch shown to scale on the Spruce Grove Park site with a less desirable east-west orientation.

Advantages
The artificial turf field would fit on the available footprint although the removal of some trees will likely be necessary. No existing parking would be displaced therefore no new or additional parking would be required. Field lighting would have less impact on surrounding uses including the neighbourhood as field lights already exist for the adjacent ball diamonds.

Disadvantages
The field orientation is an undesirable east-west, limiting its use during late afternoons when the sun angle is low in the sky. Trees would need to be removed and there may be environmental concerns with this. Relocation of the Whistler Waldorf School would be required.

6.5.3 Artificial Turf at Cheakamus Crossing



Description
A full-sized FIFA regulation soccer pitch is shown on the brownfield site adjacent to Bayly Park. The site would also be large enough to accommodate a future adjacent grass or artificial turf field and a 400-metre running track as well as all parking required.

Advantages
The site is vacant and relatively easy to build on and would be in relatively close proximity to the other athlete training facilities. Correct field orientation would not be a problem given site size. Of the potential sites, this one receives the least amount of annual snowfall and has the highest solar exposure – meaning that it will be playable considerably earlier and later in the season than all of the other sites.

Disadvantages
While the land is public, it is not owned by the Municipality - it was provided to the municipality by the Province for employee housing and not sports infrastructure. The site is not serviced - services would need to be brought approximately 450 metres to the site. The site was an industrial use at one point, and some of the site may require engineered fill. The site is 10 kilometres from the Village, a potential impediment for some users.

6.5.4 Artificial Turf at Whistler Secondary Community School

Description
The artificial turf site would be on the footprint of the existing soccer / football field and would be sufficiently large enough for the 2-acre full-sized FIFA soccer pitch footprint plus a future 400-metre track. The artificial turf field has to be constructed on the site of the larger field because the smaller would necessitate removal of trees and may encroach on ecological areas.

Advantages
The field could be intensively used by the school during the day without reducing its play-ability for community use evenings and weekends. The site is already a sports field and is easily adapted into an artificial turf. While the turf does not add to the number of fields locally, it does increase its play-ability, as artificial turf fields can support 6-8 times as much use as a grass field. The site is sufficiently large enough to accommodate a track as well without impacting the football configuration. It may be possible to add secondary vehicle access from the Fire Hall to the north of the site.

Disadvantages
Use of the field may occur during school programming, further impacting a generally oversubscribed parking area. It is likely that additional parking will be required and there are few opportunities to provide such. This area of the Valley receives considerably more snowfall than Cheakamus Crossing and this site has the least solar exposure due to relative narrowness of the Valley and the surrounding trees. Illumination may have negative impacts on adjacent neighbourhoods and nearby resort amenities. The risk is small, but introducing transient users to the school property may pose a security concern for the school.

6.5.5 Artificial Turf at Myrtle Philips Community School Lower Fields

Description
One of the two soccer fields in a clearing to the north of the existing elementary school could be converted into artificial turf. The fields are already extensively used by minor soccer. There are no washrooms or parking nearer to the fields or than what is existing in the school.

Advantages
The site is already a sports field and is easily adapted into an artificial turf. While the turf does not add to the number of fields locally, it does increase its play-ability, as artificial turf fields can support 6-8 times as much use as a grass field.

Disadvantages
The artificial turf field would be remote from washrooms (in the school) and parking. Most artificial turf fields are fenced to protect the valuable turf, which would conflict with the diamond forcing its removal. Field lighting should not impact neighbouring residential. The site could not support a track as well without the loss of some trees. The risk is small, but introducing transient users to the school property may pose a security concern for the school.

7 Summary

The purpose of this Investigative Study has been to:

- Examine the construction and operating costs of a hypothetical multi-sport indoor recreation facility;
- Consider how the facility would fit on each of four potential sites; and
- Identify high level challenges and opportunities with each of the four sites.

Costs to operate an indoor facility are inversely proportional to the amount spent on capital – the lesser cost to build facilities are the most expensive to operate and have the shortest lifespan. As a point of reference, the most expensive to build option is of a lesser build quality than that of the existing Meadow Park Sports Centre.

Capital and operating costs were informed by professional knowledge, local expertise, and industry standards. These costs are not insignificant nor without risk, and raise concerns about ongoing operating costs as well as user fees and how they may impact participant affordability. All costs are provided in current dollars.

As the Study progressed it became apparent that similar considerations should be given to a smaller indoor facility as well as an outdoor artificial turf facility. With regard to the latter, the capital and operating costs are considerably less than that of an indoor facility, and the associated user fees, while increased over existing user fees, generally maintain a good degree of participant affordability.

Each of the four potential locations has its own set of unique challenges and opportunities which will impact neighbourhood fit, usability, potential partnerships, and site development, capital and operating costs.

8 Recommended Next Steps

Moving forward the following steps are recommended:

- Investigate order of magnitude site development costs and issues for each of the four sites; and
- Undertake a needs assessment and business case study to confirm assumptions around immediate resort community needs while considering longer term opportunities. This should consider the playing field itself as well as the need and scope for support facilities.

If the steps above prove acceptable costs and confirm needs, it is further recommended to undertake a site selection process. This would identify and consider criteria in addition to capital and operating costs to help inform decision making. These criteria should include but not be limited to:

- land ownership;
- partnership potential;
- environmental considerations;
- geographic considerations (proximity to residential population, proximity to Village, field orientations, annual snowfall, solar exposure etc.);
- fit with neighbourhood and or co-facility (parking, illumination, security, noise, available hours etc.),
- future development potential and resort community needs; and
- other sport development opportunities.

The site selection process may need to consider sites other than the four discussed in this Study.

This page intentionally left blank

Appendix A - Large Indoor Facility Option - Estimated Annual Operating Costs

Item		Air-Supported	RFFS 'Sprung'	RFFS 'Legacy'	Pre - Engineer
Building Area Square Feet		88,000	88,000	88,000	88,000
Insulation R-Value (approximate)		R-2 to 7	R-20	R-12 to 20	R-20
Labour (Non-Succession)					
Manager	1 FTE	$62,000	$62,000	$62,000	$62,000
On-Site Staff (4 Part-Time)	2 FTE	$82,000	$82,000	$82,000	$82,000
Marketing/Accounts	0.5 FTE	$22,000	$22,000	$22,000	$22,000
Maintenance	0.5 FTE	$20,000	$20,000	$20,000	$20,000
Custodial seasonal (contract)		$6,000	$6,000	$6,000	$6,000
Security (contract)		$8,000	$8,000	$8,000	$8,000
Seasonal dome labour		$20,000	n/a	n/a	n/a
Sub-Total		**$220,000**	**$200,000**	**$200,000**	**$200,000**
Energy					
Electricity (+/- 375,000 kWH/year)		$80,000	$33,000	$33,000	$33,000
Heating - Natural Gas (6 mo./year)		$122,000	$95,000	$95,000	$83,000
Sub-Total		**$202,000**	**$128,000**	**$128,000**	**$116,000**
Overheads					
Accounting / Legal		$4,000	$4,000	$4,000	$4,000
Communications		$4,000	$4,000	$4,000	$4,000
Credit card charges		$15,000	$15,000	$15,000	$15,000
Insurance		$15,000	$15,000	$15,000	$15,000
Licenses		$1,500	$1,500	$1,500	$1,500
Office Supplies		$1,500	$1,500	$1,500	$1,500
Waste Removal		$1,500	$1,500	$1,500	$1,500
Maintenance Supplies		$12,000	$12,000	$12,000	$12,000
Envelope Repairs		warranty	warranty	warranty	n/a
Mechanical Repairs		$12,000	$6,000	$6,000	$6,000
Parking Lot Maint. / Snow		$6,500	$6,500	$6,500	$6,500
Sub-Total		**$73,000**	**$67,000**	**$67,000**	**$67,000**
Capital Replacement					
Lifecycle Capital /15 Years		$105,000	$120,000	$120,000	$60,000
Lifecycle Turf only / 15 years		$25,000	$25,000	$25,000	$25,000
Sub-Total		**$130,000**	**$145,000**	**$145,000**	**$85,000**
TOTAL ANNUAL OPERATING COSTS		**$625,000**	**$540,000**	**$540,000**	**$468,000**

Appendix B - **Large Indoor Facility Option – Estimated Capital Costs**

Item	Air-Supported	RFFS 'Sprung'	RFFS 'Legacy'	Pre-Engineer
Field Structure (80,000 SF)	$2,150,000	$3,495,000	$4,750,000	$6,285,000
	$27/SF	*$43/SF*	*$59/SF*	*$78/SF*
Turf with Cushion Substrait and Synthetic Floor	$480,000	$480,000	$480,000	$480,000
Lighting 300lux (Practice Level)	$110,000	$110,000	$110,000	$110,000
Foundations, Civil, Drainage, Fence and Service Connections	$475,000	$475,000	$475,000	Incl. Above
Life Safety Code Requirements	$325,000	$325,000	$325,000	Incl. Above
Team Rooms (Portable Buildings / Pre-Eng, Common Area Circulation / Lobby)	$525,000	$525,000	$525,000	$900,000
	$150/SF	*$150/SF*	*$150/SF*	*$200/SF*
Support Spaces (Office, WCs, Meeting, Storage)	$125,000	$150,000	$150,000	$150,000
	$125/SF	*$150/SF*	*$150/SF*	*$150/SF*
FF&E, Nets, Scoreclocks, Tilt and Roll, Bleachers, Basketball Backstops	$35,000	$35,000	$35,000	$35,000
Construction Sub-Total	**$4,225,000**	**$5,595,000**	**$6,850,000**	**$7,960,000**
Soft Costs 20%	$845,000	$1,119,000	$1,370,000	$1,592,000
Contingency 20%	$845,000	$1,119,000	$1,370,000	$1,592,000
TOTAL	**$5,915,000**	**$7,833,000**	**$9,590,000**	**$11,144,000**

Excludes site development costs, land acquisition and applicable taxes

Appendix C - Small Indoor Facility Option - Estimated Annual Operating Costs

PRELIMINARY OPERATING ESTIMATES		Air-Supported	RFFS 'Sprung'	RFFS 'Legacy'	Pre-Engineer
Building Area Square Feet		54,500	60,000	60,000	60,000
		45,500	51,000	51,000	51,000
Insulation R-Value (approximate)		R-2 to R-7	R-20	R-12 to R-20	R-20
Labour (Non-Succession)					
Manager	1 FTE	$62,000	$62,000	$62,000	$62,000
On-Site Staff (4 Part-Time)	2 FTE	$82,000	$82,000	$82,000	$82,000
Marketing/Accounts	0.5 FTE	$22,000	$22,000	$22,000	$22,000
Maintenance	0.5 FTE	$20,000	$20,000	$20,000	$20,000
Custodial seasonal (contract)		$6,000	$6,000	$6,000	$6,000
Security (contract)		$8,000	$8,000	$8,000	$8,000
Sub-Total		**$200,000**	**$200,000**	**$200,000**	**$200,000**
Energy					
Electricity (+/- 375,000 kWH/year)		$50,000	$25,000	$25,000	$25,000
Heating - Natural Gas (6 mo./year)		$75,000	$70,000	$60,000	$50,000
Sub-Total		**$125,000**	**$95,000**	**$85,000**	**$75,000**
Overheads					
Accounting / Legal		$3,000	$3,000	$3,000	$3,000
Communications		$3,000	$3,000	$3,000	$3,000
Credit card charges		$10,000	$10,000	$10,000	$10,000
Insurance		$12,000	$12,000	$12,000	$12,000
Licenses		$1,000	$1,000	$1,000	$1,000
Office Supplies		$1,000	$1,000	$1,000	$1,000
Waste Removal		$1,000	$1,000	$1,000	$1,000
Maintenance Supplies		$6,000	$6,000	$3,000	$3,000
Envelope Repairs		warranty	warranty	n/a	n/a
Mechanical Repairs		$6,000	$3,000	$3,000	$3,000
Parking Lot Maint. / Snow		$4,000	$4,000	$4,000	$4,000
Sub-Total		**$47,000**	**$44,000**	**$41,000**	**$41,000**
Capital Replacement					
Lifecycle Capital /15 Years		$75,000	$90,000	$90,000	$35,000
Lifecycle Turf only / 15 years		$35,000	$35,000	$35,000	$35,000
Sub-Total		**$110,000**	**$125,000**	**$125,000**	**$70,000**
Total Annual Operating Budget		**$482,000**	**$464,000**	**$451,000**	**$386,000**
Hourly Break-Even Revenue Target		$196	$188	$183	$157
Based on 1,600 prime-time (49 hrs/wk) & 900 off-prime time (28 hrs/wk) hours / year over 32 weeks, 100% booked					
Seasonal biubble set-up and take down labour		$20,000			

Appendix D - Small Indoor Facility Option - Estimated Capital Costs

PRELIMINARY CAPITAL ESTIMATES - BUILDING	Air-Supported	RFFS 'Sprung'	RFFS 'Legacy'	Pre-Engineer
Field Structure (50,000 SF)	$1,250,000 $25/SF	n/a	n/a	n/a
Field Structure (52,500 SF w. walls, columns)	n/a	$2,625,000 $50/SF	$3,225,000 $59/SF	$4,725,000 $90/SF
Turf with Cushion Substrait and Synthetic Floor	$260,000	$260,000	$260,000	$260,000
Lighting 300lux (Practice Level)	$55,000	$55,000	$55,000	$55,000
Foundations, Civil, Drainage, Fence and Service Connections (minimum)	$250,000	$250,000	$250,000	Incl.Above
Life Safety Code Requirements	$250,000	$250,000	$250,000	Incl.Above
Team Rooms (Portable Buildings / Pre-Eng, with Common Area Circulation / Lobby)	$525,000 $150/SF	$525,000 $150/SF	$525,000 $150/SF	$525,000 $150/SF
Support Spaces (Office, WCs, Meeting, Storage)	$125,000 $125/SF	$150,000 $150/SF	$150,000 $150/SF	$150,000 $150/SF
FF&E, Nets, Scoreclocks, Tilt and Roll Bleachers, Basketball Backstops	$25,000	$25,000	$25,000	$25,000
Construction Sub-Total	**$2,740,000**	**$4,140,000**	**$4,740,000**	**$5,740,000**
Soft Costs 20%	$548,000	$828,000	$948,000	$1,148,000
Contingency 20%	$548,000	$828,000	$948,000	$1,148,000
TOTAL PROJECT COST (Current Dollars)	**$3,836,000**	**$5,796,000**	**$6,636,000**	**$8,036,000**
Excluding Site Development Costs, Land Acquisition and Applicable Taxes				
Construction Cost per Square Foot	$50	$69	$79	$96
Project Cost per Square Foot	$70 (blended ASS and portables)	$97 (blended RFSS and portables)	$111 (blended RFSS and portables)	$134

Appendix E - Outdoor Artificial Turf Option - Estimated Annual Operating Costs

ITEM	FULL-FIELD	HALF-FIELD
Staff time - Maintenance 1/4 FTE (municipal staff)	$12,000	$8,000
Security (contracted)	$1000	$800
Lighting (750 hrs / year: 150 days x 5 hrs)	$15,000	$8,000
Maintenance supplies	$4,000	$2,000
Insurance	$1,000	$750
Turf repairs (warranty)	$0	$0
ANNUAL OPERATING BUDGET	**$33,000**	**$19,550**

NOTES:

- **'Staff time' not required if an existing field is upgraded.**
- **Portion of 'lighting' could be transferred to users.**
- **Turf lifecycle replacement ($100,000/year x 10 years) carried in municipal general reserves fund.**

Appendix F - Outdoor Artificial Turf Option – Estimated Capital Costs

ITEM	FULL-FIELD	HALF-FIELD
Artificial turf 9,900 sm (90m x 110m)	$950,000	$475,000
Substraight and drainage	$800,000	$400,000
Field lighting (competition and practice level)	$125,000	$100,000
Fencing (perimeter)	$45,000	$25,000
Soccer bench shelters, goals, misc.	$25,000	$25,000
Portable bleachers (skids)	$60,000	$60,000
Site pedestrian access and circulation	$50,000	$25,000
Site servicing (electrical only)	$90,000	$90,000
Site soils/ grading (allowance)	$250,000	$125,000
Specialty turf maintenance equipment	$50,000	$50,000
Subtotal	**$2,445,000**	**$1,375,000**
Soft costs 10%	$244,500	$137,500
Contingency 20%	$489,000	$275,000
TOTAL	**$3,178,500**	**$1,787,500**

NOTES:

- **Excludes**
  - **site development costs (servicing, parking and driveways, landscaping etc)**
  - **other on-site support facilities (i.e. washroom, change rooms, running track straightaway etc.)**
  - **land acquisition (if required)**
  - **applicable taxes**
- **Assumes scope to be artificial turf field and lighting only. Total costs will increase with provision of other elements.**

Appendix G - Outdoor Artificial Turf Option – Additional Information

Lower Mainland Comparable User Fees

Jurisdiction	Youth Blended Per Hour	Adult Blended Per Hour	Lights Per Hour
Coquitlam	$0	$45	incl.
New Westminster	$22	$45	$8.50
Vancouver	$24	$50	incl.
Surrey	$29	$86	incl.
West Vancouver	$34	$58	incl.
Richmond	$36	$55	incl.
Burnaby	$43	$70	incl.
Port Coquitlam	$45	$56	incl.
Average	**$30**	**$60**	**incl.**

Whistler Break Even Projections

500 annual hours youth prime time x $30 / hour	$15,000
300 annual adult prime time hours x $60 / hour	$18,000
Break-even Revenue Target (Full-Field)	**$33,000**
Annual Subsidy from Municipality	$0
ANNUAL OPERATING BUDGET	**$33,000**

NOTES:

- **2015 Whistler field use equated to 975 hours disbursed between the two fields at lower Myrtle Philip (fields #7 and 8), Bayly Park, and soccer hours shifted from #7 and 8 to Spruce Grove Park as a trial.**
- **This summary includes mainly soccer with some volleyball and ultimate frisbee hours. It excludes baseball hours.**
- **No hours were played at Whistler Secondary Community School in 2015.**

Whistler Available Annual Hours

Assume March 1 to November 30	days	275
Assume 8am to 10pm daily	hours	14
TOTAL AVAILABLE ANNUAL HOURS		**3,850**

NOTES:

- **March 1 to November 30 is an assumed expanded season beyond what is currently available.**
- **Typically, season commences around May 20 and concludes October 15 (weather and field condition dependent). This equates to 148 days or approximately 1850 available hours assuming 8am to sunset as per Environment Canada data.**