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SYNTHETIC TURF
Luxury item or management tool?

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SHOULD CONSTRUCTION COSTS ALONE BE CONSIDERED WHEN CONTEMPLATING THE CONSTRUCTION OF A SYNTHETIC SPORTS SURFACE?

With the generalised rise in the popularity of soccer, users are becoming more and more sophisticated and their expectations increase proportionally. Players and fans are no longer content with worn out and rutted surfaces. They demand quality facilities and they also demand an ever increasing access to these surfaces. Playing seasons start earlier and end later. League schedules are so tight that games are played rain or shine, whatever the consequences on the grass surface. And these consequences are often dramatic.

Municipalities have difficulty keeping up with this trend. Their resources are not infinite, neither is their capacity for adding playing fields of increasing maintenance budgets. Anyway, when playing hours surpass a surface's capacity, maintenance can no longer compensate for extreme overuse.

In the past, synthetic surfaces were considered by many an unacceptable alternative to natural turf. But this situation is rapidly changing. In the 1990's, a new technology called "Infilled synthetic Turf" was introduced by a Montreal based company. This new technology is now revolutionising the way municipalities are building and managing sports fields.

While the old "Astroturf-like" synthetic grass systems were generally shunned by players and considered dangerous at best, this new infilled turf technology so faithfully mimics the properties of real grass that it has now started to impose itself as a serious alternative to natural surfaces. The growing demand for these installations has spawned a multitude of companies which now offer alternatives to the original infilled turf product.

Faced with this new phenomenon, international turfgrass sport governing bodies have come to officially endorse its use for officially certified installations. The FIFA has even produced its own set of performance standards for such surfaces.

The advantages of these surfaces seem irresistible. Seemingly unlimited playing hours, very little maintenance, consistently high playing surface quality make these installations very attractive to municipalities faced with otherwise unsolvable sportsturf management problems such as overuse and skyrocketing maintenance costs.

But the high price of these installations seems an insurmountable obstacle to many. How can one justify spending over one million dollars for a soccer field? The numbers make such projects difficult to justify.

CONSTRUCTION AND OPERATION COSTS.

While considering the installation of such a playing surface, a municipality must look beyond the installation costs alone. The high prices of these installations can convey a misleading picture. They can easily be perceived as mere luxury items destined solely for the rich and frivolous.

In order to fully appreciate the opportunity of such investments, it's important to consider this technology's particular properties, which set it apart from traditional natural surfaces. Installation cost is but one of the many factors to consider, not the only one. And once a municipality has decided to install such a system, optimising the returns on its investment will require adopting new management and programming approaches.

The few numbers presented here will give a quick glance at a different approach to the evaluation of the feasibility of synthetic turf projects.

Construction and usage costs associated with different construction techniques are compared and compiled over a ten (10) year time period, which constitutes a realistic life expectancy for an infilled synthetic turf surface. Once the construction and operation budgets are set, realistic usage schedules are devised which are meant to simulate the actual number of playing hours which will be obtained from each surface type. By dividing construction and operation costs by actual playing hours, we get a better idea of usage costs.

For each construction type, we examined and compiled the following costs over the study's ten year time frame.

- Construction costs, including :
  - Lighting system, when appropriate
  - Consulting fees, with or without lighting
- Operation costs, including:
  - Lighting costs
  - Irrigation costs
  - Maintenance and renovation costs.

Construction costs

The following three natural sports turf construction types were examined and compared with a sample infilled synthetic turf project.

- Conventional construction with agricultural drainage
- Technical construction, including slit drainage and automatic irrigation
- Technical construction, as described above, but with manufactured soil

We provided lighting systems for the higher end technical construction with manufactured soil and for the synthetic surface. Due to the lower usage potential of the more traditional natural construction systems, we considered that lighting was not appropriate for these types.

The consulting fees were calculated by applying the Quebec Landscape Architect Association's pricing schedule.

All costs were calculated on the basis of a 7000 m2 surface, with no accessories or peripheral constructions. The construction costs were estimated using actual construction costs in the Montreal region. These costs may be different from one region to another and can even vary significantly during a given construction season. But they help draw a realistic picture using actual construction costs. Slight

variations of the unit costs used in these calculations shouldn't have a significant effect in the final long term usage costs.

The different construction systems and their total estimated construction costs are as follows:

✓ **Conventional construction with agricultural drainage**

- Total base construction cost (7000 m2):..... 99 000.00 $
  Unit base construction cost..... 14.15 $ / m2
- Consulting fees ..... 15 900.00 $

Total construction cost: ..... 114 900.00 $

✓ **Technical Construction, Including Slit Drainage And Automatic Irrigation**

- Total base construction cost (7000 m2):..... **149 000.00 $**
  Unit base construction cost ..... 21.30 $ / m2
- Consulting fees ..... 22 910.00 $

Total construction cost: ..... 171 910.00 $

✓ **Technical Construction With Manufactured Soil**

- Total base construction cost, without lighting (7000 m2):..... 173 500.00 $
  Unit base construction cost..... 25 $ / m2

- Base construction cost, with lighting (7000 m2): ..... 333 500.00 $
  Unit base construction cost..... 48 $ / m2

- Consulting fees, without lighting ..... 26 340.00 $
- Consulting fees, with lighting ..... 48 740.00 $

Total construction cost, without lighting ..... 199 840.00 $

Total construction cost, with lighting ..... 382 240.00 $

✓ **Infilled Synthetic Construction**

- Total base construction cost, without lighting (7000 m2):..... 992 500.00 $
  Unit base construction cost..... ± 140 $ / m2

- Total base construction cost, with lighting (7000 m2):..... 1 192 500.00 $
  Unit base construction cost..... ± 170 $ / m2

- Consulting fees, without lighting ..... 121 725.00 $
- Consulting fees, with lighting ..... 143 725.00 $

Total construction cost, without lighting ..... 1 114 225.00 $

Total construction cost, with lighting ..... 1 336 225.00 $

Operation costs

Very often, the feasibility evaluation of sportsturf construction projects never goes beyond this the initial construction cost. One reason for this is that construction and operation budgets are often managed by different departments. In fact, this is one of the major problems plaguing sportsturf construction and management. Projects originate in one department, are conceived by another which then turns over the finished product to yet another. In some instances, a fourth department does the actual programming of the activities the sports surface is to accommodate. Sometimes, this fourth link in the chain can be the initial instigator of the project, but in other cases all are distinct. This is why it's important that all the costs be integrated in the equation, and not only those incurred during one phase of the process.

Operation costs are those that go into the daily and seasonal maintenance and management of the facility. We have identified these principal items:

- Lighting costs
- Irrigation costs
- Maintenance and renovation costs.

These vary from one construction type to another and in the case of maintenance, some operations, such as major surface repairs, will occur every few years, so that a fixed annual budget is difficult to establish. Some secondary costs, such as lining, have been omitted. It's important to note that these can take a fairly heavy toll on a maintenance budget but are too difficult to establish clearly.

Lighting costs

Lighting costs are closely related to operation schedules. We defined operation schedules for each construction type. These will be explained in the section devoted to usage.

Construction type	Quantities	KWh	Cost / hour (,07 $ / KWh)
Natural construction			
Projector 1150 W	36	41.4	2.90 $
Synthetic construction			
Projector 1150 W	54	62.1	4.35 $

	Technical construction with manufactured soil	Synthetic construction
Total lighting (hours / year)	350	560
Hourly electrical cost	2.90 $	4.35 $
ANNUAL COST	**1 015.00 $**	**2 436.00 $**

We see that two different lighting systems were considered. We worked with the premise that the higher-end synthetic surface would benefit from a more elaborate, brighter lighting system. If this is not the case, this just brings the operation costs down, as well as the lighting system's initial construction costs.

Irrigation costs

We have considered irrigation systems for the higher end natural turf surfaces. The more basic conventional construction type is usually built with no irrigation system in place. If such a system were put in, the surface's performance would increase (higher usage capacity) and it would be brought up into another bracket.

Water consumption is different depending if the soil is natural or manufactured. A manufactured soil requires more water because of its poor water retention capacity. This increased cost is offset by a higher resistance to wear and compaction, which in turn increases the system's usage potential.

We have synthesised the breakdown of the irrigation schedule to concentrate on the total annual irrigation cost.

	Technical construction	Technical construction with manufactured soil
Total volume (m3/7000 m2)	3150	8260
ANNUAL IRRIGATION COST (0.25$/m3):	**787.50$**	**2 065.00 $**

Annual maintenance costs

As mentioned above, maintenance programs and costs vary from one construction type to another and from one year to another.

The costs outlined here were derived from the application of maintenance programs specific to each construction type, and applied over the 10 year time span of this study.

The maintenance operations which were considered were the following:

- Decompaction - Aeration
- Spring overseeding
- Fall overseeding
- Fertilization
- Topdressing
- Resodding
- Annual mowing

Surface repairs were planned at different instances over the 10 year period and their costs were integrated into the overall maintenance budgets. To give an idea of the sums involved, here is a sample of the various annual budgets which were devised.

- Natural construction ..... 16 220.00 $
- Technical construction ..... 19 140.00 $
- Technical construction with manufactured soil ..... 19 840.00 $
- Synthetic construction ..... 5 000.00 $

USAGE

Usage capacity is defined here as the number of hours of use one can get out a given sport surface without causing its deterioration. Typically, municipalities exceed their sportsfield's usage capacity. It's impossible for most municipalities to meet the ever increasing demand for these equipments and many have no choice but to let their surfaces go and see them inexorably deteriorate. This is precisely why synthetic sport surfaces are so attractive, since they can apparently sustain an unlimited number of usage hours.

Natural construction usage limits

The premise behind this study is that we are comparing surfaces of similarly high quality. Since synthetic surfaces can hold up to extreme usage while maintaining a high surface quality, we defined the usage patterns for the natural turf surfaces so they would be in a similar high quality state. This is why the natural surfaces were assigned usage limits compatible with their construction types. We defined the following usage limits for our study:

- Natural construction ..... 12 hours / week
- Technical construction ..... 18 hours / week
- Technical construction with manufactured soil ..... 25 hours / week

These usage limits are specific to each construction type and cannot be exceeded without compromising the surface's quality. The season calendar starts in mid May, after the soil has thawed and drained out, which is a minimal condition for maintaining quality turf surfaces. As well, the season ends beginning of September, so that fall maintenance (decompaction, overseeding, etc.) can be done to prepare the surface for the next year's season.

We know that in many cases municipal sport surfaces must withstand much higher usage levels than those we have set here. But in most cases surface quality is low, a reality municipalities learn to live with over time. But we decided from the onset to compare surfaces of comparable quality, which is why we maintain these strict limits.

Synthetic construction usage limits

Conservative scenario

One could think that by applying such strict usage constraints to the natural construction types we are giving an unfair advantage to the synthetic surface. But being concerned with drawing as precise and fair a picture as possible, we devised a usage calendar specifically for the synthetic surface which follows as closely as possible realistic municipal scheduling practices. In fact, we made out two distinct calendars: one for a non-lit surface and one for a lit surface. These scenarios were devised to closely follow strict usage guidelines, the playing surface being open when the players, mainly school children, are free to play. This is why the number of hours is considerably less in the spring and fall than during the summer.

✓

Non lit conservative scenario

	Schedule	Hours/day	Hours	
Pre season				
Week	16 h. to 18 h.	2	10	
Week-end	10 h. to 18 h.	8	16	26 hours / week
Spring				
Week	16 h. to 20 h.	4	20	
Week-end	9 h. to 20 h.	11	22	42 hours / week
Summer				
Week	9 h. to 21 h.	12	60	
Week-end	9 h. to 21 h.	12	24	84 hours / week
End of season				
Week	16 h. to 18 h.	2	10	
Week-end	10 h. to 18 h.	8	16	26 hours / week

✓ **Lit conservative scenario**

	SCHEDULE	HOURS/DAY	HOURS	TOTAL
Pre season				
Week	16 h. to 20 h.	4	20	
Week-end	10 h. to 20 h.	10	20	40 hours / week
Spring				
Week	16 h. to 22 h.	6	30	
Week-end	9 h. to 22 h.	13	26	56 hours / week
Summer				
Week	10 h. to 22 h.	12	60	
Week-end	9 h. to 22 h.	13	26	86 hours / week
End of season				
Week	16 h. to 21 h.	5	25	
Week-end	10 h. to 21 h.	11	22	47 hours / week

These scenarios are called conservative because they so closely follow the usage patterns of the traditional users of sports surfaces that they don't take full advantage of the synthetic surface's full usage potential. If this potential was exploited to its full extent, a municipality could reduce its usage costs, as we will see in the next section.

Optimal scenario

We examined the repercussions on usage costs of taking full advantage of the synthetic surface's full usage potential. To do this, we devised a usage schedule which goes beyond the school schedule and presupposes that it's possible to attract new categories of users. This will be discussed further in this text.

	SCHEDULE	HOURS/DAY	TOTAL
Non lit optimal scenario			
Pre-season	10 h to 18 h	8	56 hours / week
Spring	9 h to 20 h	11	77 hours / week
Summer	9 h to 21 h	12	84 hours / week
End of season	10 h to 18 h	8	56 hours / week
Lit optimal scenario			
Pre-season	10 h. to 20 h.	10	70 hours / week
Spring	9 h. to 22 h.	13	91 hours / week
Summer	9 h. to 22 h.	13	91 hours / week
End of season	10 h. to 21 h	11	77 hours / week

Reduction of estimated synthetic turf usage

In order to further tighten the numbers defining the projected usage of a synthetic turf field, we chose to unilaterally reduce by 25% the estimated usage defined in the above detailed schedules. This is done to better reflect actual management conditions where a sports facility is occasionally unavailable to play due to weather conditions, maintenance operations or other contingencies.

Usage schedule

		Conven-tional	Technical	Manufac-tured soil	Synthetic non-lit	Synthetic lit	Synthetic non-lit	Synthetic lit
					Conventional scenario		Optimal scenario	
April	Week 3				26	40	56	70
	Week 4				26	40	56	70
May	Week 1				26	40	56	70
	Week 2				26	40	56	70
	Week 3	12	18	25	42	56	77	91
	Week 4	12	18	25	42	56	77	91
	Week 5	12	18	25	42	56	77	91
June	Week 1	12	18	25	42	56	77	91
	Week 2	12	18	25	42	56	77	91
	Week 3	12	18	25	84	86	84	91
	Week 4	12	18	25	84	86	84	91
July	Week 1	12	18	25	84	86	84	91
	Week 2	12	18	25	84	86	84	91
	Week 3	12	18	25	84	86	84	91
	Week 4	12	18	25	84	86	84	91
	Week 5	12	18	25	84	86	84	91
August	Week 1	12	18	25	84	86	84	91
	Week 2	12	18	25	84	86	84	91
	Week 3	12	18	25	84	86	84	91
	Week 4	12	18	25	84	86	84	91
Septembre	Week 1	12	18	25	84	86	84	91
	Week 2				26	47	56	77
	Week 3				26	47	56	77
	Week 4				26	47	56	77
	Week 5				26	47	56	77
-25%					**(357)**	**(415)**	**(460)**	**(534)**
TOTAL / YEAR :		**204**	**306**	**425**	**1069**	**1245**	**1381**	**1601**

USAGE COSTS OVER 10 YEARS

Total usage costs include initial construction costs as well as yearly operation costs. Once they have been detailed and compiled in budgets spanning a 10 year period, Each construction type's total usage costs are divided by its estimated total usage capacity. This gives us the hourly usage cost for each construction type.

CONSTRUCTION TYPE		TOTAL COSTS	Total usage hours	Hourly cost
Natural	**Non lit**	295 600.00 $	2 040	144.90 $
Technical	**Non lit**	370 935.00 $	3 060	121.22 $
Technical with manufactured soil	**Non lit**	418 890.00 $	4 250	98.56 $
	Lit	616 805.00 $	4 250	145.13 $
Synthétic / Conservative scenario	**Non lit**	1 195 075.00 $	10 690	111.79 $
	Lit	1 452 235.00 $	12 450	116.65 $
Synthetic / Optimal scenario	**Non lit**	1 195 075.00 $	13 810	86.54 $
	Lit	1 452 235.00 $	16 010	90.71 $

The first thing that strikes us when we look at these figures is that in absolute numbers, despite its high construction cost, the synthetic field costs less to use per hour than the natural fields, with the exception of the non-lit technical field built with manufactured soil.

In all cases, the addition of a lighting system increases the hourly usage cost. In the synthetic scenarios, the increase in usage hours provided by the lighting system cannot fully absorb the installation cost if this equipment. But total usage is increased by 12 to 16 %. On the other hand, adding lighting to the natural grass field has no impact on the usage since the 25 hours per week can be easily attained without lighting. In this case, the only advantage provided by the lighting system is more flexibility in the programming of activities on the surface.

These numbers can be interpreted in many ways. One can use them to illustrate the high long term cost of a synthetic turf field. They can also be used to estimate the relative usage cost of different construction types in order to determine user fees, if this is the objective. One thing they certainly do is demolish the popular misconception that soccer is a sport activity that costs little to provide to a population.

But, faced with choosing between the different options presented here, it appears most interesting to look at a combination of usage costs and potential usage hours. This combination, which we call *relative usage costs,* can be a useful tool in trying to make sense of all these numbers.

RELATIVE USAGE COSTS.

It's impossible to compare natural turf surfaces with synthetic surfaces by simply comparing their usage costs, just as it's too simple to only consider the construction costs. The cost differences don't reflect the relative advantages some construction types present over other less sophisticated types. The synthetic surface is particularly disadvantaged by such simplistic approaches.

The relative usage costs integrate usage potential and costs to draw a more pertinent picture. By so doing, the different construction types can be compared between each other in a more systematic way.

The relative usage costs were derived by using the performance data calculated for the lit synthetic surface.

Relative usage costs / Conservative scenario

CONSTRUCTION TYPE		Hourly cost	# hours / 10 years	"Potential usage hours" coefficient	Relative cost coefficient	Relative usage cost
		(A)	(B)	(C / B)	(A/D) * (C/B)	(C / B) * A
Natural construction		144.90 $	2 040	6.10	7.6	884.33 $
Technical construction		121.22 $	3 060	4.07	4.2	493.20 $
Technical construction with manufactured soil	Non lit	98.56 $	4 250	2.93	2.5	288.73 $
	Lit	145.13 $	4 250	2.93	3.6	425.15 $
Synthétic construction / Conservative scenario	Non lit	111.79 $	10 690	1.16	1.1	130.20 $
	Lit	**116.65 $**	**12 450 (C)**	**1.00**	**1.0**	**116.65 $**

Relative usage costs / optimal scenario

CONSTRUCTION TYPE		Hourly cost	# hours / 10 years	"Potential usage hours" coefficient	Relative cost coefficient	Relative usage cost
		(A)	(B)	(C / B)	(A/D) * (C/B)	(C / B) * A
Natural construction		144.90 $	2 040	7.85	12.5	1 137.18 $
Technical construction		121.22 $	3 060	5.23	7.0	634.23 $
Technical construction with manufactured soil	Non lit	98.56 $	4 250	3.77	4.1	371.28 $
	Lit	145.13 $	4 250	3.77	6.0	546.71 $
Synthétic construction / Optimal scenario	Non lit	86.54 $	13810	1.13	1.11	100.33 $
	Lit	**90.71 $ (D)**	**16 010 (C)**	**1.00**	**1.0**	**90.71 $**

Relative usage cost

The potential usage coefficient is calculated by dividing the total number of usage hours of the reference construction type, in this case the lit synthetic surface , by the number of total usage hours of each other construction type. If we refer to the table illustrating the relative usage costs / Conservative scenario, we see that the lit synthetic field will provide 6.1 times more usage hours than a " Natural construction type" field. This is what we call the *"Potential usage hours coefficient"*. The tables presented above provide the numbers for each construction type of this study.

As we have seen previously, if the total number of usage hours varies from one construction type to another, so do the usage costs. In the example given above, the lit synthetic field provides 6.1 times more usage hours. But the natural field's hourly usage cost is 1.24 times higher than that of the synthetic field.

In one given season, if we wanted to obtain the same number of usage hours from natural turf fields as we could from one lit synthetic field, we would need 6.1 natural fields to do so (, each natural field being used to its maximum 12 hours per week. The total cost to run these 6.1 natural fields would come to 884.33$ per hour (*Relative usage cost*), which is 7.6 times the hourly cost of using the synthetic field (*Relative cost coefficient*).

Of course, one could argue that the 6.1 natural fields would allow a greater amount of simultaneous usage hours, but on the other hand, the costs are prohibitive and the money could be better spent building another synthetic field.

This same reasoning applies to the different types of constructions, with varying results. The more sophisticated the natural construction type, the smaller the gap between usage hours and relative usage costs.

These figures can also be used to compare natural construction types with one another.

The same calculations were made, comparing the different natural turf construction types with the synthetic turf's optimal usage scenario.

USAGE COSTS AND SYNTHETIC FIELDS IN SPORTS FIELD MANAGEMENT

When a municipality is faced with deciding between different sportsfield construction types, the numbers presented here can be useful in the project analysis process. Of course, the numbers need to be adjusted to local conditions and be actualised, but we can see strong tendencies which stand out. If immobilisation costs are the main issue, the choices are clear. If long term management flexibility is the priority and the initial investment can be absorbed over a long period, it's clear that the more sophisticated construction types become more interesting.

Finally, if a municipality has no budget, is faced with a high demand for usage hours and has no available space to build additional installations, it can revert to a last resort scenario which is a low cost construction which is constantly rebuilt after having been severely overused. In this scenario, the municipality will do very little maintenance, which would be useless because overuse, and would thus save on these costs. But this scenario hides the true long term costs of constantly renovating or rebuilding and the only advantage it presents is that it shifts the financial burden from the immobilisation budgets to operation budgets, presuming that they exist. In fact, if it's impossible to control usage and extreme overuse can't be avoided, it makes more sense to build cheap low cost natural fields that to constantly renovate more costly technical constructions.

But if a municipality faces high usage levels and it wishes to maintain a high level of quality of its playing fields, the synthetic field offers distinct advantages over natural constructions, namely high usage potential and low hourly usage costs. We think that the figures presented here are eloquent to illustrate this.

One facet of this question remains to be developed. Up to now, we have looked at the characteristics of synthetic fields in opposition to those of natural constructions. But we feel that in reality the synthetic option gains its full potential when it's considered as integrated in the overall management plan of a municipality's total sportsfield inventory.

Conservative versus optimal scenarios

The numbers show that the synthetic sportsfield option gains interest as the number of usage hours increases. The challenge is to find ways to maximise the use of this extremely high usage potential.

In this study, as was explained previously, two scenarios were formulated for the synthetic surface, a conservative and an optimal scenario. This last scenario presents a management framework that is still realistic, although the schedule is so intensive that it extends beyond the playing hours that are commonly practiced in municipalities today. This extreme schedule was devised to illustrate the impacts that increasing the number of usage hours can have on the relative usage costs. Ideally, actual usage should fluctuate between the two scenarios.

Let's compare the *Natural construction* field, which is the cheapest and most basic construction type presented here, with the *synthetic construction*. Between the conservative scenario and the optimal scenario, the synthetic's total number of usage hours is increased by 28 %, and consequently, it's hourly usage cost decreased by 22 %. At the same time, the natural field's relative usage cost increased by 28 %, and consequently, the gap between the relative cost coefficients of the two options grew by 64 %.

Although this talk of numbers can be boring at times, it's also instructive and introduces a whole new dimension in the programming of sports surface usage, once the synthetic field is introduced in the equation.

The synthetic field used as a municipality's premier field

Because of the high construction costs involved, and also because of the innovative nature of the new breed of synthetic turf surfaces, municipalities will very often build these equipments in a very high profile, prestigious setting. Lighting systems are most often installed and these installations are usually given a very high status in a municipality's sport equipment inventory. The first synthetic fields built in a municipality are very often installed in its main municipal park, where it will host the most important games in its season schedule. These games will thus always be held on an impeccable surface that should reflect well on the municipality's image, which is very well.

The synthetic surface as a versatile management tool

A high end, high profile installation can just as well be built with a natural turf surface, providing its usage is closely controlled. We've all seen premier municipal installations that are pampered to a point that they are rarely used and sit unoccupied while the other sports fields of the municipality are ripped to shreds by overuse.

This is where the synthetic surface takes on its full potential. A municipality's premier sportsfield can now be used intensively, taking full advantage of the important investments that go into such an equipment. The more use it's put to, the higher the return on the investment, and all this without compromising the surface's quality.

The trick is to devise strategies to increase this use.

Multi sport surfaces

Many municipalities are faced with a dilemma. They must provide playing surfaces for sports of similar nature that have conflicting schedules. Let's take for example the case of soccer versus football. In northern climates, soccer is traditionally played from the spring to the end of summer, while football is played from mid summer well into fall. Although some municipalities are lucky enough to be able to assign different sportsfields to each sport, most are forced to combine the two sports on the same installations. With natural sportsfields, this makes it virtually impossible to establish viable maintenance programs and multi sport turfgrass surfaces are usually found to be in an appalling state.

A synthetic turf surface is perfectly adapted to multi sport use. By superimposing the lining patterns of different sports, such a surface can be used all season by all sports. The maintenance requirements of such a surface are different from those of natural turf. While natural grass is maintained following a seasonal schedule with certain operations, such as overseeding and decompaction, requiring the shutting down of the facility, a synthetic turf's maintenance regimen is comprised of a series of regularly repeated operations which aren't dictated by seasonal constraints. Maintenance in the spring, summer or fall is pretty much the same all season, and doesn't require shutting down the facility. So, a surface can be programmed to be used from the moment the snow cover has disappeared to the moment snow has again covered the field. Sports can be played consecutively, or movable goals and equipment can allow many sports to be played simultaneously in a same season.

By instituting multi sport surfaces, a municipality broadens the user base which in turn allows to further exploit the surface's usage potential.

The synthetic surface used in natural turf management

In spring, many municipalities have trouble keeping the players off their turfgrass fields while the soil is thawing out. With natural turf, a playing surface can be permanently destroyed before a season even begins if it's used before the soil has drained and regained its resilience.

Also, when municipalities decide to rehabilitate a natural turf surface because it's level of disrepair is no longer acceptable, they are forced to shut it down, often for long periods of time, in order to do the renovation work and then to let the turfgrass grow back in. With no backup installations to take up the usage these renovated installations supported, municipalities must move the players and games onto other, already overused surfaces which in turn suffer additional damage.

Because of their very nature, synthetic turf surfaces are particularly well suited to take up the role of backup facilities in support of a municipality's maintenance and management operations. These can be open for use for practice and play while the natural soil is thawing out. The synthetic surface's usage hours can be increased dramatically in these off season periods. The installation of mini-soccer surfaces can allow multi group practice sessions, which are extremely prejudicial to natural turf surfaces, but have no impact on the synthetic surfaces. When a natural sports field must be shut down, the play can be moved to the synthetic surface which can pick up the slack and relieve the municipality's other natural fields.

Synthetic workhorse fields

Up to now, we have invoked synthetic surfaces as being destined to high profile installations. But synthetic sports surfaces can also be considered in more modest, neighbourhood settings where a high number of local kids exert extreme pressure on local sportsfields. Simple, stripped down installations can accommodate a continuous succession of events, thus relieving the pressure on the other local natural fields, whose state can thus be gradually improved.

New partnerships

When they have the budgets and the political will for the construction of new sports facilities, municipalities are sometimes hard pressed to find free space to do so. In municipal settings, free space is a very coveted commodity which is often the object of robust competition between public and private interests.

School districts, for their part, share a common responsibility with municipalities in providing their students with athletic installations which are to be used during school hours. Outside these hours, they close down their facilities while the same students spill into the municipal installations. Many public school districts are plagued with insufficient budgets and their installations are often below grade. Others succeed in building modern facilities which are unused for long periods of time.

In these times of rationalisation of resources, municipalities and school districts are naturally drawn together to find ways to pool their resources in joint use projects. These partnerships are attractive in many ways, but often meet with strong resistance on both sides. The initial mobilisation costs notwithstanding, maintenance and scheduling are issues which often block such projects. Each side fears that the other's users will overstep their usage constraints and cause damage to the common facility. The school wants exclusive access to the surface during the day, while the municipality wants to use it in the afternoons, nights and week-ends. Each is conscious that these combined schedules will result in overuse that will impact the surface but each insists on satisfying its specific user's needs, even if the users are the same on both sides.

With the synthetic turf technology, such partnerships are now easier to consider since overuse is no longer an issue. Both sides have converging interests which would be well served by a pooling of resources. All that needs to be done is to find ways to get things done.

THE NEED FOR INNOVATIVE APPROACHES

With the cooperation of everyone involved, a synthetic field can be used quite effectively to help enhance the overall quality of all the sportsfields in a municipality, thus taking on the enviable role of premier management tool. By doing so, everyone contributes to better sports surfaces for all while rationalising an important investment which could otherwise be difficult to justify.

Municipalities are faced with an ever growing problem. A dramatic rise in the popularity of turfgrass team sports, especially soccer, is putting an intolerable strain on existing municipal sportsturf surfaces. Municipalities must answer to an ever increasing demand on the part of their populations for more playing surfaces. At the same time, evolving technology produces higher quality surfaces and as they realise this, users are becoming increasingly more sophisticated and demanding. All this is happening at a time where municipal financial resources are stretched to their limit and elected officials and public servants are held accountable for every decision they take.

In this context, the new breed of synthetic turf surfaces is extremely attractive for the many advantages it presents over natural turf. But at the same time, municipalities are wary of the high construction costs involved with this technology. While intuitively, they sense that this technology can be an answer to many of their problems, they fear that they will be accused of spending the public's money frivolously.

If synthetic turf surfaces are considered for high end luxury facilities, and aren't to be used to their full potential, they will undeniably be difficult to justify. But if their full potential is exploited, such investments are clearly a rational approach to solving the municipal turfgrass management problems we have described.

But this implies devising new ways of managing sports facilities and scheduling their use. We cannot attain the full potential of this technology by applying to it traditional management strategies.

There will be resistance on the part of users when they are required to respect sportsfield shutdowns for renovation or maintenance purposes and they are asked to go to a synthetic field situated farther than where they are used to playing. There will be even more resistance if these usage restrictions are strictly enforced. But this resistance should subside when the players experience the synthetic surface. They will be further pleased when they return to find their home field in an impeccable state which in addition can be maintained over time.

Associations will be forced to work together in order to negotiate joint usage of the same surfaces. This negotiation should result in a spreading out of the schedule, thus maximising the total number of usage hours and consequently reducing the total hourly usage cost.

One can envision municipalities equipping themselves with a main municipal synthetic field, equipped with all the bells and whistles, and a series of simpler satellite neighbourhood synthetic installations actively used as overflow facilities in the overall municipal maintenance program.

Schools and neighbourhoods will share the same sportsfields, which will be used by the same children during and after school hours.

Synthetic fields, a luxury item?

These are all scenarios which are made possible by the proper use of this new technology. If managed in a rational way, these new sport surfaces can take on the role of management tool which amply justifies the initial investment they require.