

Northern Sydney Regional Organisation of Councils

Regional Plan for Synthetic Sportsfields



Prepared by SGL Consulting Group



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1 EXECUTIVE SUMMARY

Background

The Northern Sydney Regional Organisation of Councils (NSROC) has seven members - Hornsby, Hunter's Hill, Ku-ring-gai, Lane Cove, North Sydney, Ryde and Willoughby. NSROC's role is to coordinate policy advice and facilitate shared knowledge and linkages between its members.

NSROC's Regional Sportsground Management Strategy outlines a co-operative approach to the development of synthetic sports fields. It identifies key challenges in developing synthetic sports fields are:

- funding for feasibility, planning and construction,
- managing neighbourhood concerns about loss of amenity arising from higher use of existing sports fields, and
- competing demands from sporting codes.

This plan outlines a strategic and efficient approach to the regional provision of synthetic sports fields which maximises community benefits.

The Case For Synthetics

Strategies for sports facilities have been prepared at a regional level and by each Council in the region. These studies found a shortage of sportsgrounds. Most grounds are overused in winter, and playing surfaces are sometimes poor, particularly in wet weather. To meet existing and projected demand more sports fields are required and/or existing fields must be developed with substantially increased usage capacity. Substantially increasing use can only be achieved by constructing synthetic turf surfaces.

The NSROC region currently has a population of over 589,000, which is forecast to increase to 647,000 in 2021, a 13% increase. Demand for sports facilities is expected to increase significantly across the region. It will particularly impact Ryde, Ku-ring-gai and Hornsby. These three Councils will also have increased difficulty meeting demand generated by junior (12 – 17 year old) sports.

The implication for each Council is that greater pressure will be placed on a range of community facilities including sports fields. Given that all Councils are experiencing a shortage of sports fields, if the forecasts are accurate, the current shortfall is likely to increase.

Football, rugby union, rugby league, Australian football, cricket and hockey all support the development of synthetic turf sports fields. All sports report that adequate sports fields do not exist in the region to accommodate current demand for playing field space and time.

Meeting the Challenge

Whilst the region does not have adequate sports field, it also does not have large greenfield areas for new sports fields. Consequently, increased use of existing sports fields needs to occur. A mix of strategies is required to increase the supply of sports fields such as:

- Develop sports fields on greenfield sites.
- Increase community use of existing natural turf, school sports fields.

- Community access to synthetic sports fields on schools, including private schools.
- Increasing the maintenance regime on natural turf sports fields will allow increased use for training and competitions.
- Improving floodlighting to spread the load on natural turf surfaces.
- Convert natural turf to synthetic turf surfaces.

The main reasons for installing a synthetic sports fields are:

- ✓ Climatic
- ✓ Increases use
- ✓ Maintenance costs are lower
- ✓ Consistency and quality of play
- ✓ Health
- ✓ Mandated by some sports (ie hockey)

Given the existing deficiency in sports fields across the region, and the potential increase in demand, it is unlikely that demand and supply will be in balance without the construction of more synthetic sports fields.

Synthetics in Northern Sydney

12 synthetic sports fields currently exist in the NSROC region:

- Six council owned and operated dry multipurpose synthetic sports fields providing six football pitches and one futsal pitch
- Two council owned wet synthetic sports fields, operated and primarily used by hockey, providing four hockey pitches
- Four school synthetic sports fields

Fourteen synthetic sports fields are proposed to be developed in the region by 2017/18. All the pitches are planned to be dry multipurpose sports fields, except for the hockey pitch proposed for Ku-ring-gai nursery site.

If all current plans for synthetic sports fields are implemented, a total of 26 sports fields (one with two pitches) will have synthetic surfaces, including:

- 20 council owned and operated dry multipurpose synthetic sports fields providing five football pitches and one futsal pitch
- 3 council owned wet synthetic sports fields, operated and primarily used by hockey, providing four hockey pitches
- 4 school synthetic sports fields

Projections indicate increased demand for sports fields and construction of the synthetic sports fields proposed, will significantly increase the supply of sports field time and space availability. The level of unmet demand will have to be reassessed when all these facilities are constructed.

Subsequently, NSROC Councils intend to work together to select sites that make sense of existing and likely demand from different sports, so that Councils acting individually do not inadvertently create problems for the operational and financial viability of each other's fields.

Planning Issues and Approaches

- 1 When determining whether to install a synthetic surface, a suite of considerations must be addressed:

- ✓ Demand and capacity.
- ✓ Local climatic and environmental factors.
- ✓ Sport specific requirements.
- ✓ Environmental issues.
- ✓ Social impacts.
- ✓ Health impacts.
- ✓ Lifecycle costing.
- ✓ Asset management.

As each situation is unique, the decision will specifically relate to the individual site. A generic solution to all situations is not appropriate.

- 2 Synthetic sports fields have increased use capacity over natural turf fields. However, this increased use requires additional infrastructure and can negatively impact on the local community. Consequently, their concerns need to be addressed.
- 3 A detailed feasibility study and business case is required prior to developing a synthetic sports field. Some sports fields are intensively used, creating problems in maintaining the quality of the surface. Hence, these sports fields may be prime targets for conversion to synthetic surfaces. They are currently in high demand, and can sustain increased use if converted to synthetic turf.
- 4 The “One Turf” program has produced a specification which suit most field sports – this ‘one turf standard’ is an agreed standard for turf field construction that meets the needs of a wide range of user groups – soccer/football, rugby union, rugby league, touch, Australian football and junior or lower grade hockey. Fields constructed to this standard will meet the requirements of this wide range of user groups – removing the previous issues of differing sporting codes having different required standards for construction. Very few natural turf surfaces are capable of such a diverse range of sports.
- 5 Synthetic sports fields require maintenance at two levels. On a day to day basis they require sweeping and replenishing the infill. On a periodic basis high use areas may require replacement. A regional approach to maintenance may result in efficiencies and hence cost savings to Councils.
- 6 Establishing a synthetic sports field will impact on multiple stakeholders – local and regional sporting clubs and associations, other user groups, local residents, advocacy and lobby groups. It is imperative that all stakeholders, particularly residents, are engaged and protocols are established which minimise or eliminate negative impacts.
- 7 Constructing additional synthetic sports fields will satisfy some of the demand pressures. However, by constructing a large number within a short time frame does not provide the opportunity to assess the regional impact when a facility is opened. Currently, demand far outstrips supply of sports fields, therefore the few synthetic surfaces are extensively used, and generate substantial incomes. There is a risk that a point will be reached if too many synthetic surfaces are established, that revenue will be inadequate to cover operating and replacement costs. It may be prudent to build the synthetic sports fields already in the planning phase, and then individually and collectively evaluate these facilities from a usage, financial, environmental and community perspective.

Conclusion

Councils within NSROC have identified a shortage of sportsgrounds, most grounds are overused in winter, and playing surfaces are sometimes poor, particularly in wet weather. To meet existing and projected demand more sports fields are required and/or existing fields must be developed with substantially increased usage capacity.

The regional population is forecast to increase by 13% by 2021. Greater pressure will be placed on sports fields. Football, rugby union, rugby league, Australian football, cricket and hockey report that adequate sports fields do not exist in the region and support the development of synthetic turf sports fields.

Given the existing deficiency in sports fields across the region, and the potential increase in demand, it is unlikely that demand and supply will be in balance without the construction of more synthetic sports fields.

Twelve synthetic sports fields currently exist in the NSROC region and fifteen are proposed to be developed in the region by 2017/18. If all current plans for synthetic sports fields are implemented, a total of 26 sports fields (one with two pitches) will have synthetic surfaces.

Construction of the proposed synthetic sports fields will significantly increase the supply of sports field time and space availability. At this time the level of unmet demand will have to be reassessed when all these facilities are constructed. NSROC Councils propose to work together to select sites that make sense of existing and likely demand from different sports, so that Councils acting individually do not inadvertently create problems for the operational and financial viability of each other's fields.

In assessing future synthetic sports fields:

- A detailed feasibility study and business case is required prior to developing a synthetic sports field.
- The "One Turf" program has produced a specification which suit most field sports – football, rugby union, rugby league, touch, Australian football and junior or lower grade hockey.
- A regional approach to maintenance may result in efficiencies and hence cost savings to Councils.
- It is imperative that during the planning and development stages, all stakeholders, particularly residents, are engaged and protocols are established which minimise or eliminate negative impacts.
- To avoid oversupply of sports fields, once the synthetic sports fields already in the planning phase are constructed, individually and collectively they should be evaluated from a usage, financial, environmental and community perspective.



2 THE CASE FOR SYNTHETICS?

This section reviews the rationale for developing synthetic sports fields.

2.1 Limitations of Natural Turf

Field sports including football, rugby union, rugby league, cricket, Australian football¹ (AF) and touch prefer to train and compete on a flat, well maintained natural turf sports field. Hockey, however, has a preference for synthetic sports fields, ideally a water based surface rather than a “dry” surface.

Strategies for sports facilities have been prepared at a regional level and by each Council in the region. These strategies have some common findings regarding sports fields. For example the Northern Sydney Regional Sportsground Strategy (2011) found a shortage of sportsgrounds in the NSROC region, and that most grounds are overused in winter. Hunters Hill Sport and Recreation Plan (2012) noted the quality of playing surfaces is sometimes poor and playing fields are at, near or over capacity for safe play. Similar findings are found in the plans of other six Councils in the region.

In Northern Sydney, on the basis of evidence provided by Councils and sporting associations and codes, the number of natural turf sports fields does not meet existing demand, even when all fields are playable. The situation is exacerbated during wet weather, when surfaces deteriorate and some sites are closed, which throws scheduling for associations into disarray.

As well, natural turf sports fields, although being an ideal surface for most field sports, have significant disadvantages in high use urban environments, which include:

- a They experience substantial wear in high use spots, such as football goal mouths and under floodlights
- b They can deteriorate rapidly in extreme weather conditions, such as high rainfall or high temperatures
- c They are often closed in wet weather to avoid further deterioration

While a natural turf sports field can sustain a higher level of use if it has efficient and effective drainage and irrigation, and high levels of maintenance. It is apparent from the studies conducted by Councils that existing natural turf fields does not meet existing demand.

Consequently, to meet existing and projected demand more sports fields are required and/or existing fields must be developed with substantially increased usage capacity. Substantially increasing use can only be achieved by constructing synthetic turf surfaces.

2.2 Population Growth

Research conducted by NSROC and its members Council has established that the current

¹ Australian football is the name of the code, which is often referred to as AFL in the same way in which football is used rather than the colloquial “soccer” and touch which is the formal name of the sport referred to as touch football.

supply of sports fields does not satisfy demand. Based on population projections and participation projections by sporting organisations, demand for sports fields will increase.

NSROC commissioned a demographic analysis of the region. Salient factors relevant to demand for sports fields are highlighted.

The NSROC region currently has a population of over 589,000, which is forecast to increase to 647,000 in 2021, a 13% increase. Table 2.1 summarises population growth in each Council. It indicates:

- An increase in 74,199 residents is projected
- The biggest increases are forecast for Ryde, Ku-ring-gai and Hornsby which are expected to account for 75% of the region's growth
- Both Hunters Hill and Lane Cove are forecast to experience a modest increase in population numbers compared with the other Councils.

Table 2.1: NSROC population growth from 2011 to 2021

Council	2011	2021	Increase %	Increase #
Hornsby	163,906	180,218	10%	16,312
Hunters Hill	13,864	15,033	8%	1,169
Ku-ring-gai	114,564	132,242	15%	17,678
Lane Cove	33,186	35,924	8%	2,738
North Sydney	67,022	74,560	11%	7,538
Ryde	108,429	129,771	20%	21,342
Willoughby	71,652	79,075	10%	7,423
Region	572,623	646,822	13%	74,199

Table 2.2 summarises population growth in the 12 – 17 age group. It indicates:

- A 17% increase, or an additional 7,203 young people
- The biggest increases are forecast for Ryde, Ku-ring-gai and Hornsby which are expected to account for 77% of the region's growth
- Ryde and North Sydney are forecast to have the largest proportional increase, while Hunters Hill will experience both a small proportional increase and a small increase in people.

Table 2.2: NSROC 12 – 17 year population growth from 2011 to 2021

Council	2011	2021	Increase %	Increase #
Hornsby	13,720	15,467	13%	1,747
Hunters Hill	1,477	1,576	7%	99
Ku-ring-gai	11,160	13,239	19%	2,079
Lane Cove	2,330	2,655	14%	325
North Sydney	1,941	2,391	23%	450
Ryde	6,545	8,250	26%	1,705
Willoughby	4,197	4,994	19%	797
Region	41,369	48,572	17%	7,203

This data indicates that demand for sports facilities will increase significantly across the region. It will particularly impact Ryde, Ku-ring-gai and Hornsby. These three Councils will also have increased difficulty meeting demand generated by junior (12 – 17 year old) sports.

The implication for each Council is that greater pressure will be placed on a range of

community facilities including sports fields. Given that all Councils are experiencing a shortage of sports fields, the current shortfall is likely to increase, if the forecasts are accurate.

2.3 Sport's Views

Sporting organisations, local clubs, regional associations and state bodies are the primary users of sports fields. They are therefore key stakeholders and informants when determining strategies to meet current and projected demand for sports fields. A representative of each state sporting organisation, plus two regional football associations were interviewed regarding existing participation levels, future demand for facilities and approach to synthetic sports fields. Where they exist, facility strategies have been summarised and implications for a synthetic sports field strategy assessed.

2.3.1 Future Participation

An estimate of potential participation numbers in field sports has been forecast in the NSROC Regional Sportsground Management Strategy. Table 2.3 summarises the projections, which clearly demonstrates that football has the largest number of participants in the region. It also projects the greatest numerical increase will occur in football.

Table 2.3. Potential number of organised participants by the main sports in NSROC, 2011-2036

Sport	2011 Potential Number	2016 Potential Number	2021 Potential Number	2026 Potential Number	2031 Potential Number	2036 Potential Number
Aust. Rules football	4,120	4,274	4,413	4,534	4,678	4,837
Cricket Outdoor	9,971	10,347	10,689	10,984	11,333	11,719
Hockey	7,657	7,970	8,257	8,495	8,768	9,072
Rugby League	10,023	10,370	10,683	10,966	11,309	11,690
Rugby Union	6,535	6,823	7,088	7,300	7,538	7,802
Football	33,618	34,851	35,967	36,946	38,114	39,408

2.3.2 Football

The Northern Suburbs Football Association – Strategic Facilities Plan 2014 – 2016 includes an audit of all sports fields used by Northern Suburbs Football Association (NSFA), the quality of playing surface and amenities. It does not include future demand estimates either in terms of participation or required facilities. Football NSW (FNSW) and Gladesville-Hornsby Football Association (GHFA) do not have a sports field strategy. However, FNSW is currently compiling a sports field strategy, based on a facilities audit from the clubs and associations.

FNSW consider elite level teams (National and State Premier League) are well catered for, however local club teams suffer from a lack of available facilities.

NSFA believes its member clubs have inadequate access to football grounds. To address the issues requires:

- increased availability of grounds for training,
- increased quality of existing grounds,
- synthetic pitches,
- improved amenities,
- floodlights.

NSFA has approximately 15,000 players, across five LGA's. The Association uses 161 Council fields and 13 school fields and consider that current demand for turf and synthetic fields is not being met. Some clubs are unable to conduct competition on Saturdays due to a lack of field availability. Training hours are heavily restricted by most Councils (ie one hour per team per week). If ovals are located in high-transit or CBD areas ie North Sydney fields, these are more heavily used for training.

GHFA has 34 member clubs, with approximately 13,500 members and uses facilities in Ryde, Hornsby, The Hills, Parramatta and Hunters Hill local government areas. Lack of availability of fields has meant that senior fixtures are now played on Sundays.

Participation is growing each year. FNSW believes that metropolitan areas will continue to experience high growth in participation. Due to lack of availability, associations are not able to claim ownership of 'home grounds'. If this was an option, it may entice clubs to better manage facilities on behalf of Councils as well as generate some revenue. Overlapping seasons and shifts in competition structure of both football and other sports cause inequitable use.

Population density, land scarcity and cost are significant constraints to development of additional fields, however the NSFA's opinion is that synthetic fields are not the solution to lack of grounds. A mix of synthetic and grass facilities suitable to the location and situation is needed.

Estimates by Football NSW indicate that synthetic surfaces can accommodate up to 60 hours per week of use as opposed to 25 hours per week on grass. Calculations show that synthetic is 56% more cost efficient depending on availability of lights. Lack of a synthetic facility in Hornsby is significant for the NSFA, given that 25% player base resides in that area.

2.3.3 Rugby Union

While NSW Rugby Union has not prepared a facility strategy for the state or any region, the Australian Rugby Union has prepared a National Community Rugby Facilities Strategy (2011) which highlights the need for better support to clubs to meet facility needs. It found that nationally, almost half of all clubs train and play on one field, 56% have one field with lights and lack of field space and capacity are in some cases hindering growth of associations. The immediate priorities is for flood lighting, club house and playing fields improvements.

There is a lack of facilities available to clubs. Junior numbers in NSW are continuing to grow, with 2,500 school and junior registered players in the Northern Region.

2.3.4 Hockey

Hockey NSW has a 20 year Facility Plan. The NSROC area has three synthetic hockey pitches which are used for both training and competition. Two of these pitches are now due for renovation, at a cost of up to \$500,000 each.

According to the Hockey NSW, the North Sydney region has approximately 4,000 players. [Note: this figure differs from the estimate in Table 2.3, which may be due to different definitions of the north Sydney region.] Turf is used for association level fixtures and training, though more so in regional areas than in metropolitan Sydney. Competition level fixtures can still be run on grass facilities.

Hockey NSW states that there is constant demand for space on synthetic pitches, particularly in the metropolitan area, which results in substantial travel being required to facilities. Associations report that they have to schedule fixtures on both days of weekend to complete competition rounds.

During the hockey season each synthetic turf has approximately 45 hours of use every week. To preserve the surfaces, NDHA ensures that training is moved around each pitch, avoiding wear on the main circle. Every six months both pitches are vacuumed by ABC Sports Clean to help preserve longevity.

2.3.5 Australian Football

NSW/ACT AFL reported that Australian football (AF) is very popular in NSROC area with a 14% increase in participation in past 12 months.

Phase one game development starts with juniors usually on level grassed areas but as more people take up the sport and more teams formed then higher use of areas justifies more hard wearing ground surfaces. Normally this can see up to seven teams sharing use of a playing field. Lack of available sports fields in NSROC area is limiting growth of the sport. This is particularly so for junior development where the game is attracting significant take up and interest.

Phase two game development is to access approved synthetic surface playing areas. NSW/ACT AFL estimate that up to 23 teams can use one synthetic field as it allows for much high capacity use. The AFL does not estimate the number of teams which use a natural turf oval, but estimates that synthetic surfaces allow up to three times more use than natural turf ovals. Currently, the main synthetic surface playing area in the northern areas is Narrabeen State High School used by the Pittwater Tigers (Juniors)/Manly Giants (Seniors). Lane Cove Cats will use the new synthetic area at Blackman Park.

Lack of sports fields in the NSROC area is hindering development and participation in the sport. Established codes of football and rugby union occupy the majority of fields and it is difficult for new or emerging sports to gain access. As the population increases and more people want to participate in AF it will be critical for the sport to have access to more sports fields or have high use/high capacity synthetic sports fields in key locations.

NSW/ACT AFL has a partnership with Cricket NSW to share grounds seasonally and make available small amounts of capital funding for synthetic playing, training and skill sessions.

2.3.6 Cricket

Cricket NSW strongly support synthetic surfaces for playing areas, pitches and training pitches. Lower level standard cricket is mainly played on synthetic covered wickets across the region. A large number of clubs have a range of synthetic covered training wickets.

Cricket is a very high participation sport but limited potential for growth due to lack of playing fields in the NSROC area. Synthetic surfaces allow more wear and tear and can be used quickly after rain and poor weather so support continued increase in these facilities. As the area population increases and more people want to participate in cricket it will be critical for the sport to have access to more sports fields or have high use/high capacity synthetic sports fields and practice wickets in key locations.

2.3.7 Rugby League

NSW Rugby League (NSWRL) and the National Rugby League (NRL) have prepared development standards for synthetic surfaces. No NSWRL and NRL standard pitches exist.

Rugby league believes it is under represented in the NSROC area with very few facilities available to the sport. Most rugby league facilities are located at schools. Current options for new participants and clubs are in the Kur-ring-gai, Hornsby and Ryde areas.

Rugby League has a strategic alliance with Touch and needs large open space areas for "Touch and Tag" programs. Large school participation program in the region is not widely known and this forms a good development base for more community clubs and leagues.

Synthetic surfaces allow more wear and tear and used quickly after rain and poor weather so support increase in facilities.



3 LOCAL GOVERNMENT PERSPECTIVES

The Northern Sydney Region and each Council has prepared a strategy which includes sports fields. Salient points relating to synthetic sports fields are summarised.

Northern Sydney Regional Sportsground Strategy (2011)

Commissioned by NSROC in 2010, the Strategy identified a shortage of sportsgrounds in the region. It was evident by the poor condition of grounds. Most grounds are overused in winter and cannot provide for the desired level of training use, or accommodate expressed demand or future projected demand for outdoor sports.

The shortage of grounds was expected to be exacerbated as the region's population grows and the numbers of people wanting to play sport increase. The overriding advantage of synthetic surfaces is the increased capacity of up to 1200 hours of use more per field per year than grass surfaces.

Hunters Hill Sport and Recreation Plan (2012)

Consultation for the plan identified a regional shortage and lack of quality sports fields for competition and training. Generally, the quality of playing surfaces was reported to sometimes be poor, facilities had basic amenities and limited opportunities for multi-use venues.

Playing fields were at, near or over capacity for safe play. High levels of participation in field-based sports – cricket, football and rugby - with high levels projected to continue into the future. Football (soccer) was the highest participation sport in Hunter's Hill - two to three times NSW average.

A new synthetic turf playing field was identified as a medium to long term goal.

Hornsby Sport Facility Strategy (2006)

Cricket and football were identified as being under-provided for, in terms of availability of facilities and most urgent need in the short term.

Facilities were overused, particularly football and cricket. Cricket and football needed an additional 6 and 11 fields, respectively to meet current demand. Finding a solutions for football training and competition was identified as urgent.

Recreation Potential Study for Hornsby Quarry and OMV Land

This study compared data regarding the football participation rate and number of players per field in the GHFA and NSFA areas. It found:

	Players per Field	Population per player
GHFA area	198.29	17.99
NSFA area	128.45	22.69

This data suggest greater demand for sports fields in the GHFA than the NSFA area.

Ryde Open Space Plan (2012)

Sportsgrounds are heavily used and such use is projected to grow with increased demand, particularly for night time, Sunday use and pre-season for winter sports. Main issues for Ryde were a lack of grounds, inadequate lighting, poor quality of fields and amenities.

29% of winter sportsgrounds were used for more than 20 hours per week, 31% were used for more than 30 hours per week - these levels resulted in major surface deterioration. Demand for football, rugby union, cricket and hockey exceeded supply. In winter it was estimated that sports fields had approximately 40 hours of use and in total 28,000 players per week. In summer the total was 10,000 players. Increased numbers were particularly evident in Gladesville Hornsby Football Association and the Northern District Hockey Association.

Synthetic turf facilities were projected to alleviate capacity issues and manage surface condition.

Ryde is currently preparing a revised Draft Sport & Recreation Strategy 2016 – 2016. This document is likely to be placed on public exhibition in early 2017.

North Sydney Recreation Needs Study Discussion Paper (2013)

Current sporting infrastructure in North Sydney is good quality though at or near capacity. Demand exists for hockey and football facilities. All sports fields exceed capacity in winter, however the summer load is not quite as high. Feedback from sports clubs indicated that obtaining access was difficult due to limited hours available for use, quality of playing surfaces vary across grounds, and lack of a synthetic turf pitch for hockey was a concern.

Synthetic surfaces and lights were identified as two initiatives likely to relieve demand, for hockey in particular, where synthetic turf is a competition requirement.

Sport in Ku-ring-gai Strategy (2006)

Council had insufficient facilities, to meet current and future demands. Previous studies concerning open space provision and planning methods demonstrated a need for additional sports facilities in Ku-ring-gai.

Key issues impacting upon demand were availability, suitability and sustainability of sports fields. Demand for sport in Ku-ring-gai was growing - football was the highest participation sport (14,731 players in winter season 2005).

Lane Cove Recreation Action Plan (2008)

Heavy use of fields, especially in the winter season for contact ball sports, resulted in deterioration in quality of the grassed playing surfaces. A shortage of playing fields to meet demands of local clubs and regional associations was exacerbated by the constraint of available land to develop new sporting fields and an increase in participation, especially in soccer.

Willoughby Open Space and Recreation Plan (2013)

The usual Winter demand for the 28 grass sports fields in the City results in a usage rate of 276 hours per week. However, the sustainability usage rate for the grass fields is only 226 hours per week. Consequently the grass fields are being over-used by approximately 50 hours per week in Winter, resulting in dead wear patches, higher maintenance costs with returfing and fields unavailable for use. The Sports Action Plan includes strategies and actions to address demand, such as the use of synthetic grass for playing surfaces, and off-field sites for mid-week training.



4 MEETING THE CHALLENGE

An overview of demand for sports fields, by sporting codes and in the assessments of the region's local governments, strongly indicates that demand for access to consistently available playing areas for field sports outstrips supply of available facilities and that the gap will widen as population in Northern Sydney continues to grow.

It has been confirmed by the major field sport – football, rugby union, rugby league, cricket, Australian football and hockey. Each of the NSROC member Councils has noted a lack of sports field, which was reinforced by the regional sports field strategic plan. Compounding the deficiency is a forecast population growth in the region which is likely to further increase demand for training and competition spaces.

Whilst the region does not have adequate sports field, it also does not have large greenfield areas to be applied to developing new sports fields. Consequently, increased use of existing resources is one of the important responses that needs to occur. A mix of strategies is required to increase the supply of sports fields. The specific mix used across the region, within each Council and for each field sport will vary depending upon circumstances. A detailed feasibility assessment will be necessary to address specific deficiencies in demand.

Potential strategies include:

- 1 **Develop sports fields on greenfield sites.** It is clear limited opportunities exist to implement this strategy. However, where land can be converted to open space, such as former tip or industrial sites, this option should be pursued.
- 2 **Increase community use of existing natural turf, school sports fields.** Local government can be a facilitator of increasing community access. This strategy may also require increased maintenance of the facility, to accommodate increased use.
- 3 **Community access to synthetic sports fields on schools, including private schools.** The NSROC region includes many private schools, some of which have natural and synthetic sports fields. Whilst it is understood that many private schools are “protective” of their facilities, an opportunity exists to negotiate community access. It is likely that in return, schools will expect payment and/or a financial contribution to capital and/or maintenance of the sports fields.
- 4 **Increasing the maintenance regime on natural turf sports fields will allow increased use for training and competitions.** However, significant capital and operational costs are likely to be required to upgrade drainage and irrigation infrastructure and to expand the maintenance regime. Advice from turf managers suggests that the increased expenditure will not result in a commensurate increase in use. In other words an increase in costs of, say 50%, is unlikely to result in an increase use of 50%.
- 5 **Improving floodlighting to spread the load on natural turf surfaces** will spread the wear over a larger area on a sports field. Fully floodlighting all sports fields to a training standard can increase use capacity.
- 6 **Convert natural turf to synthetic turf surfaces.** It has been demonstrated that conversion significantly increases capacity. At Northbridge the synthetic sports field accommodates approximately 1,200 more hours of use annually than a natural turf sports field.

When determining whether to install a synthetic surface, a suite of considerations must be

addressed:

- Demand and capacity.
- Local climatic and environmental factors.
- Sport specific requirements.
- Environmental issues.
- Social impacts.
- Health impacts.
- Lifecycle costing.
- Asset management.

As each situation is unique, the decision will specifically relate to the individual site and local and regional sporting requirements. A generic solution to all situations is not appropriate.

The main reasons for installing a synthetic sports fields are:

- 1 **Climatic:** Under drought and water restrictions or excessive rain conditions, it can be difficult to provide a safe and suitable natural grass surface. Synthetic sports surfaces in general are not affected by the reduced or increased rainfall.
- 2 **Use:** There is a limit to the hours natural turf can be used before there is a significant impact on surface condition. A high quality turf surface may only be able to be used for up to 20 hours per week before it starts to deteriorate. Synthetic surfaces can sustain significantly higher use than natural grass with 60 hours plus per week as an acceptable expectation.
- 3 **Maintenance:** Maintaining a turf surface can be time consuming, expensive and generally requires a qualified person. Synthetic surfaces require lower ongoing maintenance than a natural turf surface.
- 4 **Consistency and quality of play:** Synthetic surfaces provide a consistent and safe surface all year round for all sports to play on, thus improving the quality of performance for each sport, when comparing to natural playing surfaces.
- 5 **Health:** By allowing play on the surface more often and under safer conditions, it enhances physical health of participants.
- 6 **Mandated:** some sports governing bodies insist that if a particular level of game is to be played, it has to be played on a particular level of synthetic surface (e.g. Federation of International Hockey with Hockey fields etc.).

In addition to these reasons, synthetic turf is often promoted as being a "green" alternative to natural grass. The main ecological benefits of synthetic turf that are promoted are:

- Conserves water (research in the US has shown that each full sized rectangular field saves between 1.8 million to 3.7 million litres of water each year).
- No mowing. Mowing, especially large areas of natural grass, use fossil fuels and contribute carbon dioxide into the atmosphere.
- No pesticides or herbicides for pest and disease management are required (reducing harmful chemical inputs).
- Recycled materials are often used. (Rubber granules are often used in the base of synthetic turf as infill. These rubber granules are usually made from recycled tyres, keeping them out of landfill and reused sandshoe cushioning can be used for the shock pad.)

Each Council should compare the cost and benefits of each strategy in the context of their facilities, requirements and financial capacity. However, given the existing deficiency in sports fields across the region, and the potential increase in demand, it is unlikely that demand and supply will be in balance without the construction of more synthetic sports fields.



5 SYNTHETICS IN NORTHERN SYDNEY

This chapter identifies the location of existing synthetic sports fields, those planned to be developed and proposes a regional perspective.

5.1 Existing and Planned Synthetics

Map 5.1 identifies the location of existing and proposed synthetic sports fields in the NSROC area.

5.1.1 Existing Synthetic Sports fields

Eleven synthetic sports fields currently exist in the NSROC region:

- Five council owned and operated dry multipurpose synthetic sports fields providing five football pitches and one futsal pitch
- Two council owned wet synthetic sports fields, operated and primarily used by hockey, providing four hockey pitches
- Four school synthetic sports fields

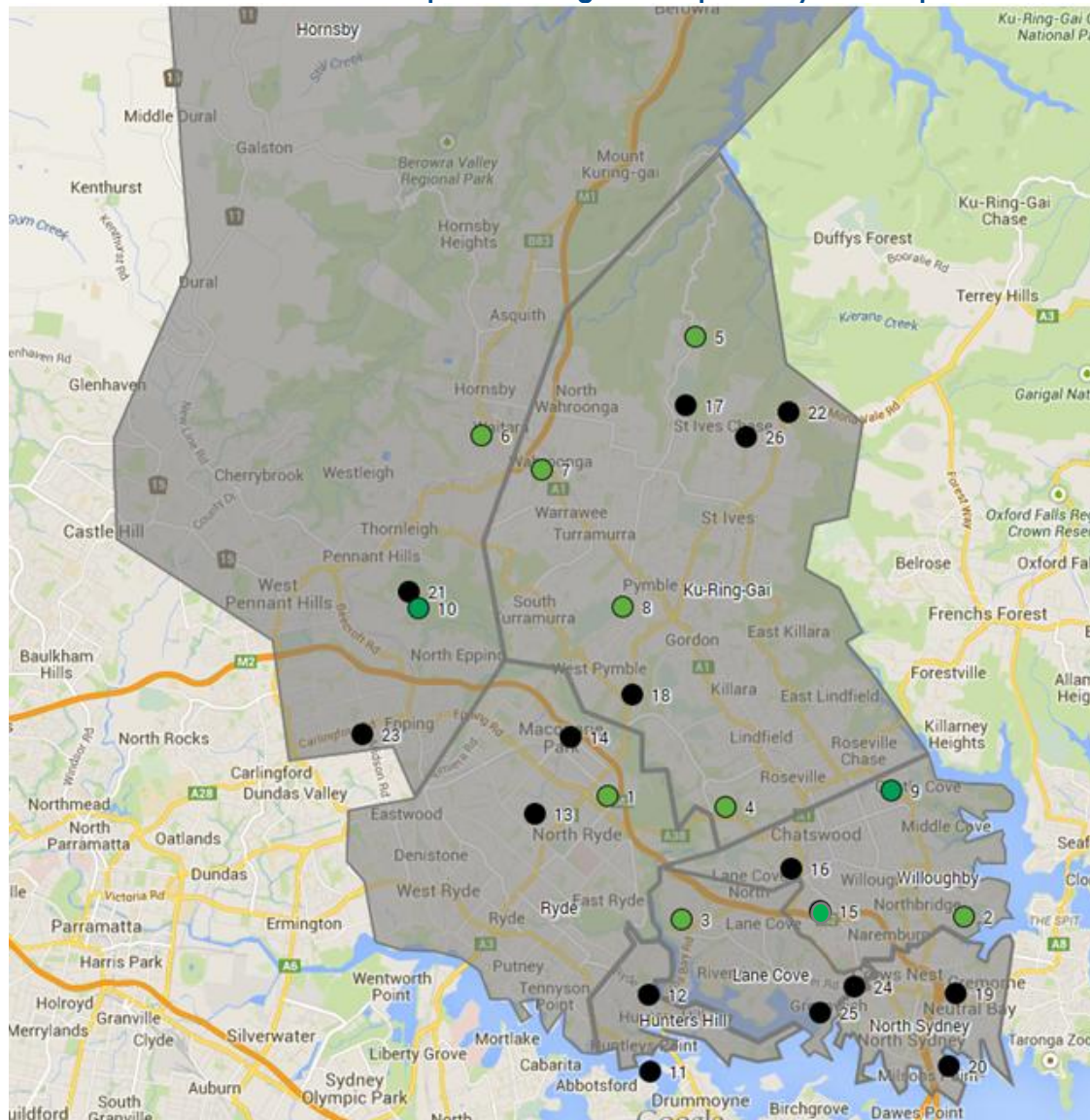
Council	Location	Details
Dry Surfaces		
Ku-ring-gai	Charles Bean Sportsfield	one field
North Sydney	Cammeray Park	one football/rugby pitch
Willoughby	Northbridge Oval	- one sports field with two football pitches and cricket oval with cricket wicket on a hydraulic platform
Willoughby	Willis Centre	futsal pitch created by the conversion of two tennis courts
Lane Cove	Thomson Oval Blackman Park	One football (multi-purpose) pitch one sports field with two rectangular fields incorporating an AF and cricket oval, with the cricket wicket installed on a hydraulic platform
Wet Surfaces		
Ryde	Keith Thompson Hockey Centre	two hockey fields
Hornsby	Pennant Hills Park	two hockey fields
Schools		
Ku-ring-gai	Creative Arts High School	one hockey field
Ku-ring-gai	Abbotsleigh School for Girls	currently constructing a hockey field
Ku-ring-gai	Pymble Ladies College	currently constructing a synthetic pitch
Hornsby	Barker College	one sports field

5.1.2 Proposed Synthetic Sports Fields

Fifteen synthetic sports fields are proposed to be developed in the region by 2015/16. All the pitches are planned to be dry multipurpose sports fields, except for the hockey pitch proposed for Ku-ring-gai nursery site.

Council	Location	Details
Hornsby	Pennant Hills Park	one football pitch
Hornsby	West Epping Park	one football and cricket pitch
Hunters Hill	Gladesville Reserve	one football (multipurpose) pitch
Hunters Hill	Boronia Park	one football pitch to be also used for junior cricket
Ku-ring-gai	North Turramurra Regional Area	one synthetic football (multipurpose) pitch plus two turf pitches and two synthetic cricket pitches
Ku-ring-gai	Norman Griffith Oval	one football (multipurpose) pitch for 2016/17
Ku-ring-gai	KMC Nursery Site	one football pitch and 1 x hockey pitch
Ku-ring-gai	Warrimoo Oval	one football (multipurpose) pitch
North Sydney	Anderson Park	Potential for one football/hockey pitch (currently the subject of recreation space masterplanning to determine future use)
Ryde	ELS Hall Park	one junior AF oval (9,000m ²) in 2016/17
Ryde	Christie Park	Identified as site for regional football pitch for Gladesville Hornsby Football Association (construction 2017)
Willoughby	Chatswood High School	one football (multipurpose) pitch due for completion June 2017
Willoughby	Gore Hill Park	Identified site for synthetic sports field (due June 2018)
Lane Cove	Bob Campbell Oval	Identified as potential site for synthetic sports field

Map 5.1: Existing and Proposed Synthetic Sports Fields in the NSROC Area



Legend

- Existing synthetic sports fields
 - Proposed synthetic sports fields
- 1 Keith Thompson Hockey Centre
 - 2 Northbridge Oval
 - 3 Blackman Park
 - 4 Charles Bean Sportsfield
 - 5 Ku-ring-gai Creative Arts High School
 - 6 Barker College
 - 7 Abbotsleigh School for Girls
 - 8 Pymble Ladies' College
 - 9 The Willis Sport and Recreation Centre
 - 10 Pennant Hills Park – Britannia Park
 - 11 Gladesville Reserve
 - 12 Boronia Park Ovals
 - 13 ELS Hall Park
 - 14 Christie Park
 - 15 Thomson Park
 - 16 Chatswood High School
 - 17 North Turramurra Recreation Area (NTRA)
 - 18 Norman Griffith Oval
 - 19 Cammeray Park
 - 20 Anderson Park
 - 21 Pennant Hills Park – Britannia Park
 - 22 KMC Nursery Site, St Ives
 - 23 West Epping Park
 - 24 Gore Hill Park
 - 25 Bob Campbell Oval
 - 26 Warrimoo Oval

5.2 Regional Perspective

5.2.1 Current plans

If all current plans for synthetic sports fields are implemented, a total of 26 sports fields (one with two pitches) will have synthetic surfaces, including:

- 20 council owned and operated dry multipurpose synthetic sports fields providing five football pitches and one futsal pitch
- 3 council owned wet synthetic sports fields, operated and primarily used by hockey, providing four hockey pitches
- 4 school synthetic sports fields

Most synthetic sports fields have been developed and planned to meet local demand for additional sports field capacity. Indications from both sport and local government is that a substantial undersupply of sports field capacity exists in the NSROC region. Projections of future demand have been made and construction of the synthetic sports fields identified above, will significantly increase the supply of sports field time and space availability. The level of unmet demand will have to be reassessed when all these facilities are constructed.

In moving forward, it is important that resources are not wasted by either duplication unnecessary facilities or creating over supply. When the 26 synthetic sports fields are completed, a detailed business case must be prepared for any future synthetic or natural turf sports fields. The business case will address:

- Existing supply of natural and synthetic sports fields in the local and regional catchment, including details of infrastructure and sports played.
- Existing use of natural and synthetic sports fields, identifying venues which are under used, at capacity and over used.
- Potential use of proposed facility.
- Potential impact on use of other sports fields in the local and regional catchment.
- Finance – capital and operational income and expenditure.

In preparing the business case, it will, of necessity, involve substantial discussions and negotiations with all stakeholders, including local governments in the NSROC region and local governments abutting the region. A key point to appreciate is that sport's participation is not restricted by local government boundaries.

5.2.2 Regional impacts in site selection

As noted in Chapter 4, there is a well-established list of issues to be considered in the determining whether to invest in developing or redeveloping an open space site with a synthetic surface. These include:

- Assessing demand for specific sporting code facilities, taking into account trend data on population growth and participation patterns.
- Identifying community attitudes and any impediments to introducing synthetics to a site.
- Developing a budget estimate and identifying funding sources
- Analysing sites to establish preferred location.

It is this latter step in the preliminary feasibility process that should include a parallel process to consider regional impact. NSROC advice on this issue is as follows:

All Councils in northern Sydney share information and data on sports participation and facilities demand directed at them from sports associations. A shared understanding of the drivers of demand for greater access to playing fields of various quality standards is the first step to ensuring that investments made by individual Councils do not overlap or duplicate neighbouring Councils' planned investments in synthetic surfaced playing fields.

This practice should continue and be extended as more fields come on line and usage patterns and issues to be managed become apparent. It is also important that Councils apply a comparable strategic approach to determining sites for synthetics to recommend to their communities.

It is generally agreed that to maximise the impact of resources directed at new types of playing surfaces, a site should meet the following tests:

- Alignment with Council's Integrated Planning framework (Community Strategic and Operational Plans)
- Accessible by road and public transport; adequate parking is or can be provided
- Multiple sports codes support the site and intended surface and markings
- Community issues are manageable through communication strategy
- Site is suitable for upgrading (requires geotechnical and soil testing ahead of selection)
- Site plan fits with existing demand and projections in respect of activities to be pursued on the field
- Site fits with the catchment area of likely participants, to minimise travel times; where relevant site is located to meet regional resident's needs
- Site complements neighbouring synthetics sites; that is, it is not too close to another LGA's synthetic site promoted to the same clubs or associations.

The purpose of capturing this information as a region is to help to ensure that sites are not selected in such a way as they beggar demand for nearby synthetics fields.

NSROC Councils intend to work together to select sites that make sense of existing and likely demand from different sports, so that Councils acting individually do not inadvertently create problems for the operational and financial viability of each other's fields.



6 PLANNING ISSUES AND APPROACHES

This chapter summarises addresses broad planning issues and approaches to developing synthetic sports fields.

6.1 Synthetic Surfaces

Substantial debate has occurred around the decision to install a synthetic sports field or retain/develop a natural turf field. Two documents - The Decision Making Guide Natural Grass v Synthetic Turf produced by the Department of Sport and Recreation (WA) and the Synthetic Sports Surfaces Study prepared for the City of Ryde - includes background material which is summarised below.

When determining whether to install a synthetic surface, a suite of considerations must be addressed:

- Demand and capacity.
- Local climatic and environmental factors.
- Sport specific requirements.
- Environmental issues.
- Social impacts.
- Health impacts.
- Lifecycle costing.
- Asset management.

As each situation is unique, the decision will specifically relate to the individual site. A generic solution to all situations is not appropriate.

Synthetic sports fields have some advantages over natural turf including:

- Synthetic sports surfaces in general are not affected by the reduced or increased rainfall.
- Synthetic surfaces can sustain significantly higher use than natural grass with 60 hours plus per week as an acceptable expectation.
- Synthetic surfaces require lower ongoing maintenance than a natural turf surface.
- Synthetic surfaces provide a consistent and safe surface all year round.

In addition to these reasons, synthetic turf is often promoted as being a “green” alternative to natural grass. The main ecological benefits of synthetic turf that are promoted are:

- Conserves water.
- No mowing.
- No pesticides or herbicides are required.
- Recycled materials are often used.

6.2 When are Synthetic Sports Fields the Best Solution?

The main strategic issue confronting Council in the NSROC region is lack of greenfield sites for new sports fields to meet forecast demand as the population grows.

Six options for increasing available sports fields are summarised in Chapter 4. In practice, each solution will have a positive impact. However, the biggest increase in capacity will occur with opening up new sites, such as schools or by converting natural to synthetic turf. The advantage of synthetic surfaces is the increased capacity of up to 1200 hours of use more per field per year than grass surfaces. In theory, each new synthetic turf sports field can accommodate approximately 6 - 12 extra teams based on 1 - 3 hours training and 1 hour competition per week. This simple analysis does not take into account that in some circumstances multiple teams can train on one pitch simultaneously, particularly junior teams.

Synthetic sports fields will obviously increase capacity, and are a potential solution in any situation where supply is not adequate to meet demand. The other major advantage of synthetic surfaces is they are playable in all weather conditions. If adequate drainage is installed, they will drain quickly and will be payable in periods of high rainfall. In addition, if adequate and even floodlighting is installed, all areas of the sports field can be used, increasing the opportunity for shared and multiple use.

As noted above, synthetic sports fields also have environmental benefits, particularly use of less water and potential to capture water for recycling. They also provide a flat and consistent playing condition year round.

The "One Turf" program has produced a specification which suit most field sports – football, rugby union, rugby league, touch, Australian football and junior or lower grade hockey. Very few natural turf surfaces are capable of such a diverse range of sports.

Synthetic sports fields have increased use capacity over natural turf fields. However, this increased use requires additional infrastructure and can negatively impact on the local community. Community concerns need to be taken into account in the development stage of a project to introduce synthetic surfaces to existing playing fields. In this regard, the Northbridge Oval Management Plan is an example of working with the local community to both shape and manage expectations relating to increased usage of a site.

6.3 Moving Forward

6.3.1 What type of surfaces are best

One type of synthetic surface will not meet the needs of all types of sports. The intended use and users must be clearly identified before a surface is selected. As a basic rule three types of surfaces are available:

- 1 One Turf surfaces has been designed to be multipurpose, and is suitable for most community level field sports. It is a highly versatile surface, which will accommodate junior and lower level community sport. Based on discussions with Councils it is likely that this type of surface will be the dominant surface in the NSROC region.
- 2 FIFA 2 Star surfaces are intended to be used for elite football. Whilst they are excellent surfaces, it is unlikely they will be used in any significant numbers in the NSROC region. They are likely to be established on venues which are for the exclusive or priority use of football and host elite level teams for training or competition.
- 3 Water based pitches are primarily used for hockey. Most elite and higher grade hockey is now played on water based pitches. They tend to be for the exclusive or priority use of hockey clubs.

To ensure that dry synthetic sports fields are multifunctional, they should be designed to meet the "One Turf" specifications. If this does not occur, the region may find that not all synthetic sports fields will be fully used.

6.3.2 Priority Sites

A detailed feasibility study and business case is required prior to developing a synthetic sports field. It will address the location, demand, financial viability, use and capital development cost. A number of sites are generally considered, before a site is selected. Site selection will take into account many variables, such as access, size, topography, available services and existing use.

It is recognised that some existing sports fields are intensively used, creating problems in maintaining the quality of the surface. Consequently, these sports fields may be prime targets for conversion to synthetic surfaces. They are obviously in high demand, and can sustain increased use if converted to synthetic turf.

6.3.3 What fees are to be charged

NSROC has established a standard fee structure for sports fields in 2015/16. Initially a standard fee structure was introduced (2014/15) for synthetic pitches only. However, this fee structure has been expanded to include other recreation facilities in the region. Fees charged for use of synthetic pitches will be in accordance with the regional fee regime.

This approach has been in place for a relatively short time. It is expected to support sensible locational choices by sporting clubs, made on the basis of locational convenience rather than on "shopping" for the best price. Problems may arise when sport requests "special consideration" from a local government area or when oversupply occurs and pricing is used by Councils as a marketing tool. Both these situations may result in prices being lowered. It will be necessary to maintain cohesion between councils on the price regime and to review the pricing policy on a regular basis to ensure it is reasonable in terms of the capacity to pay and the need for reliable and quality playing surfaces by communities in the NSROC region.

6.3.4 Maintaining synthetic sports fields

Synthetic sports fields require maintenance at two levels. On a day to day basis they require sweeping and topping up the infill. On a periodic basis high use areas may require replacement. A regional approach to maintenance may result in efficiencies and hence cost savings to Councils.

Experience has shown that Council owned sporting facilities are coming under increasing pressure for use, and some suffer very heavy use year-round. For this reason, Councils will need to be vigilant in ensuring that appropriate fee structures are in place to ensure that capital is available for maintenance over the longer term.

A regional approach may be the purchase of specialist equipment, to enable Council staff to maintain the surfaces. Alternatively, a maintenance contract may be negotiated on a regional basis with a specialist maintenance company.

All synthetic sports fields have a finite life (as does natural turf). Given the level of use that is expected of synthetic fields it is anticipated that carpet and infill have to be replaced after about 5-7 years, depending upon the amount of use and the quality of maintenance. A replacement carpet is likely to cost in the order of \$500,000.

Given the construction of synthetic sportsfields over the past 4-5 years in the NSROC region, it is likely that approximately 10 synthetic carpets will require replacement within a relatively short time frame. At a cost of around \$500,000 each this may place substantial pressure on Councils' resources.

Day to day or routine maintenance may be funded from fees charged to users groups, and from normal Council budgets. Replacement of carpets is an asset replacement issue, which has to be included on each Council's capital works budget. Ideally a sinking fund is established and fees from user groups are used to fund replacement.

6.3.5 Engaging with stakeholders

Establishing a synthetic sports field will impact on multiple stakeholders – local and regional sporting clubs and associations, other user groups, local residents, advocacy and lobby groups. Synthetic sports fields are designed for increased use, compared with natural turf. Hence the potential for conflict with local residents is increased. Residents amenity may be impacted by increased car parking, noise, more frequently used floodlights and floodlights used later into the evening.

It is imperative that residents are engaged and protocols are established which minimise or eliminate impacts on residents.

Sporting clubs will also be affected by incurring a higher rental charge to use the pitch. As with residents, it is important that clubs are engaged and the full implications and ramifications of synthetic surfaces are discussed.

6.3.6 Impact of not increasing supply

Currently demand for use of sports fields is greater than the supply of available time and space. The impact of not addressing increasing demand is likely to have multiple implications:

- Participation rates may decrease, with consequent impacts on the community's health and wellbeing.
- Sports may disregard the direction of Councils and overuse sports fields
- Greater pressure will be placed on government to increase supply.
- Councils will be increasingly required to adjudicate on who can use sports fields.

6.3.7 Building future capacity

Synthetic sports fields alleviate capacity issues and provide consistent playing surfaces. Floodlighting synthetic sports fields for training and competition is imperative to optimise capacity for use.

It is clear that construction of additional synthetic sports fields will satisfy some of the demand pressures. However, by constructing a large number within a short time frame does not provide the opportunity to assess the regional impact when a facility is opened. This creates the dilemma, build quickly to meet demand, or take a slower pace and assess the operational and financial impacts.

Currently, demand far outstrips supply of sports fields, as evidenced by the experience of Council officers responsible for managing local government parks and playing fields. Therefore the few synthetic surfaces are extensively used, and generate substantial incomes. For example at Ku-ring-gai, revenues are adequate to cover routine maintenance as well as supporting a replacement fund.

It is estimated that each new synthetic turf sports field can accommodate approximately 6 - 12 extra teams. Thus converting 10 natural turf to synthetic surfaces, will accommodate

between 60 and 120 extra teams or up to 2,000 players. In practice this number may be significantly higher as multiple teams can train concurrently particularly juniors. Hence this number of pitches may be capable of accommodating up to 5,000 junior and senior players.

A total of 27, local government based, synthetic pitches exist or are planned for the NSROC region. These pitches will accommodate at least 10,000 junior and senior players more than natural turf pitches. Given that approximately 13,000 additional participants are projected to be playing the main field sports by 2036, demand for, and supply of, sports fields may be close to being in balance, given the data is only estimated.

There is a risk that a point will be reached if too many synthetic surfaces are established, that revenue will be inadequate to cover operating and replacement costs. Establishing multiple surfaces in neighbouring localities could result in over supply and lead to some facilities not meeting the financial projections that justified them at individual Council level.

It may be prudent to build the synthetic sports fields already in the planning phase, and then individually and collectively evaluate these facilities from a usage, financial, environmental and community perspective. This evaluation will also assist in identifying when and where the next generation of synthetic sport fields should be constructed, as well as providing an information base on the performance of the fields already built.

6.4 Conclusion

Councils within NSROC have identified a shortage of sportsgrounds, most grounds are overused in winter, and playing surfaces are sometimes poor, particularly in wet weather. To meet existing and projected demand more sports fields are required and/or existing fields must be developed with substantially increased usage capacity.

The regional population is forecast to increase by 13% by 2021. Greater pressure will be placed on sports fields. Football, rugby union, rugby league, Australian football, cricket and hockey report that adequate sports fields do not exist in the region and support the development of synthetic turf sports fields.

Given the existing deficiency in sports fields across the region, and the potential increase in demand, it is unlikely that demand and supply will be in balance without the construction of more synthetic sports fields.

Eleven synthetic sports fields currently exist in the NSROC region and fifteen are proposed to be developed in the region by 2015/16. If all current plans for synthetic sports fields are implemented, a total of 26 sports fields (one with two pitches) will have synthetic surfaces.

Construction of the proposed synthetic sports fields will significantly increase the supply of sports field time and space availability. At this time the level of unmet demand will have to be reassessed when all these facilities are constructed. NSROC Councils propose to work together to select sites that make sense of existing and likely demand from different sports, so that Councils acting individually do not inadvertently create problems for the operational and financial viability of each other's fields.

In assessing future synthetic sports fields:

- A detailed feasibility study and business case is required prior to developing a synthetic sports field.
- The "One Turf" program has produced a specification which suit most field sports – football, rugby union, rugby league, touch, Australian football and junior or lower grade hockey.

- A regional approach to maintenance may result in efficiencies and hence cost savings to Councils.
- It is imperative that during the planning and development stages, all stakeholders, particularly residents, are engaged and protocols are established which minimise or eliminate negative impacts.
- To avoid oversupply of sports fields, once the synthetic sports fields already in the planning phase are constructed, individually and collectively they should be evaluated from a usage, financial, environmental and community perspective.