

Supply & Demand -Winter Sports Fields

FINAL REPORT

Prepared for Rotorua Lakes Council



November 2018

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1 Introduction

Study Objectives

This study has been undertaken to identify the supply and demand for sports fields in the Rotorua Lakes area. This review is being conducted to help to identify future priorities for investment into sports fields to address the changing needs of sports codes and the impact of population growth. The focus of the study is community use of winter sports fields for football, rugby and league. In addition to identifying the supply and demand for sports field the study is also considering a high-level cost benefit analysis of different sports surfaces, in particularly artificial turf.

Project scope

Included in demand	Excluded from demand
Regular competition games on community fields	Pre-season training and games
Regular training on community fields	Shoulder season training and games
Regular use by Talent Centres, Academies and other introductory or skills development programmes	Booked and unbooked activities, events and tournaments occurring on an irregular or one-off basis throughout the season (i.e., this is additional demand that has not been quantified)
Regular use by representative squads or teams during the winter season	
Regular use by social teams	
Regular College Sport use of community fields	
Regular booked use of winter fields for other activities and identified through Council's sports field booking system	
Regular unbooked use of winter fields for other activities and identified through club feedback	

Demand for regular competition and training is based on the number of teams and the amount of space they need for games and training.

The demand hours for **home and away competition** is calculated by adding all the teams in the grade and applying a 'game time' requirement based on:

- the length of each half
- the length of half time period
- time to get on and off the field
- injury time – senior teams only
- rounding the total to the nearest quarter hour.

The hours are based on an analysis of the way the games are being played. It assumes that 2 teams are competing against each other and will require 1 field at any one time.

Demand for teams playing in **centralised modules** is included as the total field hours required to run the module each week.

The demand for **training** is based on information provided through a club based survey and from the RSOs.

The demand model considers the peak time regular use throughout the main season. It is acknowledged that the pre and shoulder season period create additional pressure due to the overlap of seasons with both winter and summer codes looking to expand the playing season. While this creates a pressure on the fields it is not considered appropriate to model / base field supply on this

short term peak demand. Should the shoulder season demand be considered as the overall measure of demand it would result in significant oversupply of fields throughout the main season.

The Rotorua Lakes Council area has been considered as 2 main geographical area. These are Ngongotaha and Central. These areas are based on New Zealand Statistics Census Unit area to enable an analysis of the local population. These are:

Ngongotaha

Census Unit Areas: Ngongotaha North, Ngongotaha South

Central

Census Area Units: Selwyn Heights, Western Heights, Fairy Springs, Pukehangi North, Pukehangi South, Mangakakahi, Sunnybrook, Fordlands, Ultuhina, Pomare, Hillcrest, Springfield, Kawaha Point, Koutu, Ohinemutu, Kuirau, Victoria, Glenholme East, Glenholme West, Fenton, Owhata East, Owhata West, Owhata South, Poets Corner, Lynmore, Ngapuna, Whaka

2 Overview of Winter Codes

The senior winter season of the three codes usually runs from early April to mid/late September. Demand usually peaks between May and August as junior competition is timed to fit the school term and senior competition tapers when teams who have not qualified for the competition play offs drop out.

Rugby Background

- There are 6 rugby clubs regularly playing in the Rotorua Lakes area.
- The 6 clubs field 76 teams.
- All regular club rugby is played on Saturdays.

Football Background

- There are 5 football clubs and 4 schools regularly playing in the Rotorua Lakes area.
- The 9 clubs field 101 teams between them.
- Football is played on a Saturday with mid-week training.

Rugby League Background

- There are 4 league clubs playing in the Rotorua Lakes area.
- The 4 clubs field 34 teams between them.
- League is played on a Saturday with mid-week training.

3 Current Demand

Demand for winter fields is predominantly made up of regular competition games and regular training by teams involved in winter competitions. Additional demand includes:

1. 'one off' sports events / tournaments – winter or summer code
2. regular non-sport community use
3. 'one off' non-sport community use

The 211 rugby, football and league teams require 263.6 hours of full field equivalent hours per week (93.7 at the weekend, mainly for competition and 169.9 during the week, mainly for training).

Summary Table: Number of Hours Demand Generated within the study area

	Competition (Weekend)	Training (Weekday)	Full week
<i>Ngongotaha</i>	14.9	28.4	43.3
<i>Central</i>	78.8	141.5	220.3
Total	93.7	169.9	263.6

Current Field Hours Demand by Code

The table below shows the weekend, weekday afternoon and weekday floodlit evening demand by each of the three Codes:

Summary Table: Current Field Demand by Code - FFE¹ hours per week

Analysis area	Football		Rugby		League	
	Week end	Week day	Week end	Week day	Week end	Week day
<i>Ngongotaha</i>	5.1	9.1	5.3	10.5	4.5	8.8
<i>Central</i>	30.6	37.5	34.9	68.8	13.3	35.3
Total	35.8	46.4	40.1	79.3	17.8	44.0

¹ Full Field Equivalent

4 Supply of Fields

Number of fields

There are 36 winter fields secured for community use which equate to 27.5 full size fields.

In addition, 3 College fields were identified as being used by clubs for training during the week.

The current allocation of fields to each code is detailed in the table below.

Summary Table - Current Field allocation

	Ngongotaha	Central	Total Fields Region	Total FFE
Football full size	2	9	11	11
Football junior (1/2)	1	5	6	3
Football junior (1/8)	0	20	20	2.5
Rugby full	2	15	17	17
Rugby junior (1/2)	0	0	0	0
League full	0	10	10	10
League (1/2)	0	0	0	0
Total number of fields 2018	5	59	64	43.5

In addition, 2 school fields were identified as being used by rugby for training include:

- Rotorua Intermediate School
- Wharewarewa Primary School.

The clubs survey identified that a number of school fields were being used for training however did not provide details of the individual schools.

Assessed playing capacity

In considering the total playing capacity of the fields, information has been provided by the Council through the SSDM Sports Fields Assessments, 2018. No account is taken for field closures or bad weather.

SSDM provided an assessment of the total weekly capacity of the individual sports fields. For the purposes of analyzing the weekly supply and demand it has been assumed that 3 hours field capacity is available for weekend competition and that any additional capacity identified is allocated for mid-week training. If a field was assessed with a capacity of under 3 hours a week, all available capacity was allocated to weekend competition and it was assumed that there was no capacity for mid-week training.

Impact of Events

The projected playing field capacity assumes that all available field capacity is used by local sporting clubs for competition and training. While this is the case for a large proportion of the season it is important to consider the impact of events. Where events are held on sports fields the available capacity for community sport is reduced. As more events are held and the fields not available for community based sport any projected surpluses are reduced, and shortfalls increased.

The fields have a total assessed playing capacity of 184.7 full size equivalent hours, comprising 91.4 hours for weekend play and 93.3 hours for weekday play.

Summary Table: Field Capacity – All Codes – FFE hours per week

Analysis area	Total Hours in Weekend	Total Hours on Weekdays
<i>Ngongotaha</i>	10.5	19.5
<i>Central</i>	80.9	73.8
Total	91.4	93.3

Current Playing Capacity by Code

The table below shows the current weekend, weekday and weekday capacity for each of the three codes.

Analysis area	Football		Rugby		League	
	Weekend	Week day	Weekend	Week day	Weekend	Week day
<i>Ngongotaha</i>	6.0	12.5	4.5	7.0	0.0	0.0
<i>Central</i>	19.9	11.5	40.0	28.3	21.0	34.0
Total	25.9	24.0	44.5	35.3	21.0	34.0

5 Current Capacity Surplus / Shortfall

As the field size requirements are fairly similar for the three codes it is feasible to reallocate fields should there be a supply surplus in one code and a shortfall in another. This analysis therefore considers not just surpluses and shortfalls within each code but across the codes as a whole as well.

Currently most competition games are played at the weekend with mid-week training. If this pattern is to continue the weekend and weekday capacity will need to meet demand at those times.

Across the study area there is a current shortfall in capacity of 87.1 hours per week made up of a shortfall of 0.8 hours for competition at the weekend and a shortfall of 86.3 hours for training during the week

Summary Table: Surplus Shortfall in Capacity – All Codes – FFE hours per week

Analysis area	Surplus Shortfall Weekend	Surplus Shortfall Weekdays	Overall Surplus Shortfall
<i>Ngongotaha</i>	-4.4	-8.9	-13.3
<i>Central</i>	2.1	-67.8	-65.7
Total	-2.3	-76.6	-78.9

2018 Surplus / shortfall in capacity in FFE hours per week by sports code

	Area	Weekend surplus / shortfall	Weekday surplus / shortfall	Overall surplus / shortfall
Football	<i>Ngongotaha</i>	0.9	3.4	4.3
	<i>Central</i>	-10.8	-26.0	-36.8
	Total	-9.9	-22.6	-32.5
Rugby	<i>Ngongotaha</i>	-0.8	-3.5	-4.3
	<i>Central</i>	5.1	-40.5	-35.4
	Total	4.4	-44.0	-39.6
League	<i>Ngongotaha</i>	-4.5	-8.8	-13.3
	<i>Central</i>	7.7	-1.3	6.4
	Total	3.2	-10.0	-6.8

The analysis identifies that all codes have an overall shortfall in terms of field capacity to meet the identified demand. In considering these estimates a number of important factors should be considered:

- The shortfall for mid-week training is currently being managed by a combination of measures including:
 - Clubs using fields areas above their capacity.
 - Clubs using smaller field areas and shorter training times than identified as desirable in other studies as required for effective training.
- The balance between weekend and mid-week is based on the assumed split of field capacity to allow 3 hours on a weekend.

6 Future Demand

Information Used to Project Future Demand

Demand for future years is based on the number of teams produced by the current population factored up by population growth and any sport development growth.

A Team Generation Rate (TGR) is calculated by dividing the total active population in each grade by the current number of teams, i.e., the TGR is the size of the active population at that particular level that is required to produce 1 team.

This Team Generation Rate, together with population projections, is used to project the likely number of teams in the future and hence future demand (assuming game lengths, field sizes and training requirements remain constant) based on projected population growth.

There is a change occurring in the way people wish to participate in sport with growth in non-club participation such as 'pay for play' shortened game formats and competition durations. This trend was first noted by Sport NZ's 2013/14 Active NZ Survey, which gathered the views of 6,448 people aged 16 and over on how, why and where they take part in sport and recreation. The report notes *'Traditional sports club membership is down slightly, while gym membership is up. Pay to play is now the most common way people pay to participate rather than a traditional subscription. What people want is changing'*.

We consider it highly unlikely that participation rates in formal club based winter codes will increase above natural population growth and have therefore not included any additional allowance for code growth in this study.

Population Growth and Trends

The region's population is projected to increase from 71,700 in 2018 to 85,247 (18.9%) by 2038. While this is significant growth it is not uniform across all age groups. The active age population (5 to 49 years) within the study area is projected to decrease by 10,648 by 2028, from 58,820 to 48,172.

The projected population growth in the active age group is not evenly distributed across the region with some areas growing at a much faster rate than others and others seeing a decline in the active age group as the ageing effect outweighs any population growth.

Current and 2028 Projected Population in Active Age Groups – 5 to 19 years, 20 to 49%

Area	Estimated 2018 Population		Projected 2028 Population		% change in population 2017 to 2028	
	5 to 19 years	20 to 49 years	5 to 19 years	20 to 49 years	5 to 19 years	20 to 49 years
<i>Ngongotaha</i>	990	1,660	1077	1743	9%	5%
<i>Central</i>	12080	20410	11843	21458	-2%	5%
Sub Total	13,070	22,070	12920	23201	-1%	5%

Current and 2038 Projected Population in Active Age Groups – 5 to 19 years, 20 to 49%

Area	Estimated 2018 Population		Projected 2038 Population		% change in population 2017 to 2038	
	5 to 19 years	20 to 49 years	5 to 19 years	20 to 49 years	5 to 19 years	20 to 49 years
<i>Ngongotaha</i>	990	1,660	1,123	1,888	13%	14%
<i>Central</i>	9,410	16,165	12,263	22,691	2%	11%
Sub Total	13,070	22,070	13,386	24,579	2%	11%

Projections of Future Demand 2028

Demand is projected to increase within the study area as a result of the increasing population. It is important to recognise the high level of participation within the under 18 age group as an increase in this age group has the potential to significantly reduce the number of teams.

Summary Table: Future Field Demand by Code (2028) - FFE hours per week

Analysis area	Football		Rugby		League	
	Week end	Week day	Week end	Week day	Week end	Week day
<i>Ngongotaha</i>	5.5	9.7	5.6	11.2	4.8	9.4
<i>Central</i>	30.2	37.1	35.0	70.0	13.3	35.2
Total	35.7	46.8	40.6	81.2	18.1	46.6

¹ Full Field Equivalent

2028 Surplus / shortfall in capacity in FFE hours per week by sports code

	Area	Weekend surplus / shortfall	Weekday surplus / shortfall	Overall surplus / shortfall
Football	<i>Ngongotaha</i>	0.5	2.8	3.4
	<i>Central</i>	-10.3	-25.6	-35.9
	Total	-9.8	-22.8	-32.5
Rugby	<i>Ngongotaha</i>	-1.1	-4.2	-5.3
	<i>Central</i>	5.0	-41.8	-36.8
	Total	3.9	-46.0	-42.1
League	<i>Ngongotaha</i>	-4.8	-9.4	-14.2
	<i>Central</i>	7.7	-1.2	6.5
	Total	3.1	-10.6	-7.8

Projections of Future Demand 2038

Demand is projected to increase within the study area as a result of the increasing population. It is important to recognise the high level of participation within the under 18 age group as an increase in this age group has the potential to significantly reduce the number of teams.

Summary Table: Future Field Demand by Code (2038) - FFE hours per week

Analysis area	Football		Rugby		League	
	Week end	Week day	Week end	Week day	Week end	Week day
<i>Ngongotaha</i>	5.8	10.4	6.0	11.9	5.1	9.9
<i>Central</i>	31.3	38.5	36.5	73.4	13.9	36.7
Total	37.1	48.9	42.5	85.3	19.0	46.6

¹ Full Field Equivalent

2038 Surplus / shortfall in capacity in FFE hours per week by sports code

	Area	Weekend surplus / shortfall	Weekday surplus / shortfall	Overall surplus / shortfall
Football	<i>Ngongotaha</i>	0.2	2.1	2.3
	<i>Central</i>	-11.4	-27.0	-38.4
	Total	-11.2	-24.9	-36.1
Rugby	<i>Ngongotaha</i>	-1.5	-4.9	-6.4
	<i>Central</i>	3.5	-45.1	-41.7
	Total	2.0	-50.0	-48.0
League	<i>Ngongotaha</i>	-5.1	-9.9	-15.0
	<i>Central</i>	7.1	-2.7	4.4
	Total	2.0	-12.6	-10.6

7 Challenges

Stakeholder Feedback

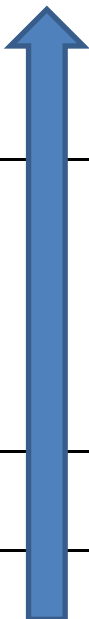
The stakeholders were contacted and asked to identify some of the key concerns regarding access to fields. Analysis of the responses identified 3 key considerations:

- Field quality was considered very poor at a number of fields. This was considered to be a significant factor in restrict training opportunities.
- The poor field quality was considered to lead to poor quality competition fields and contribute to field closure levels due to poor weather
- Training opportunities were further restricted with few fields have access to training lights.

Club comments

The club survey identified a number of concerns the clubs are currently facing.

A Big Concern	Access to funding Access to fields Finding volunteers for committee Membership recruitment
Of Some Concern	Finding coaches Access difficulties (distance, cost) Maintenance of clubroom Finding team managers Finding coaches before 5.30pm
Not of much concern	
Not a Concern at all	



There were additional comments regarding the poor quality of a number of fields within the existing field network as being a barrier to meeting the current demand and enabling future growth.

Factors impacting on field capacity

Over-use of fields

A number of fields are being used significantly over their potential capacity.

	SSDM Total Capacity	Club Use (Mid week only)
Field 1	10 hours	34 hours
Field 2	10 hours	18 hours

Limited Training

A number of fields are identified as having capacity of under 3 hours a week. To meet the demand for competition all of this capacity is required to be available on a weekend for competition. As a result, these fields effectively have no capacity for mid-week training.

Club training demand

The demands for training vary significantly both between the different codes and between clubs within the same code. Two factors to be considered include:

On average rugby and league require more time and field space for training than football

Many clubs are training more frequently and for longer periods than identified through other studies and National Governing Body guidelines (where available).

Impact of the Challenges

As has been identified, it appears that many fields within the network have a relatively low weekly carrying capacity. However due to the way in which many fields are being over-used to meet the identified demand the pressure on the field network is multiplied as fields do not have sufficient time periods to recover. Should there be a prolonged period of bad weather, the problems of over use are multiplied.

8 Options to Meet Demand

Options for Increasing / Maximising Capacity

There are three main options for increasing / maximising supply capacity:

- more effective use of fields through detailed code allocations and use schedules
- increasing the capacity of existing fields
- expanding the supply of fields

More effective use of existing fields

i. Optimising code allocation and competition / training balance

The data provided in this report will help ensure allocation of fields is optimised across competition and training and across codes. Ensuring that all fields are available for competition and training to maximise the use of the current network.

It was identified that there are a number of fields within the network that have potential capacity however are not currently utilised due to the location / proximity to the main club base. While this is a potential barrier ensuring these fields have appropriate facilities (e.g. lighting) and re-allocating club training has the potential to maximise the existing use of the network and relieve some demand on over utilised fields.

ii. Changing Sports Schedules

Currently most football, rugby and league competition games are played on Saturdays. This leaves many fields unused on Friday evenings. In some parts of New Zealand there is a growing move towards playing some grades, usually young children, on Friday evenings.

Increasing the capacity of existing fields

The SSDM report identified that the soil structure and quality of many of the fields has a negative impact on their ability to withstand high levels of usage. With 53% of fields identified by SSDM report having the capacity to be used for over 5 hours a week, improving the quality of the current field network has the potential to significantly increase capacity.

i. Drainage

Installing drainage in an un-drained soil field is likely to improve the quality of the field and its ability to recover from rain but may not significantly increase its playing capacity.

ii. Irrigation

Irrigation during dry summers is essential to ensure fields go into the winter season with good grass coverage and the ability to maintain a good quality playing surface throughout the winter season.

iii. Lighting existing unlit fields

Without lights, training is limited to daylight hours which in winter means before 5pm to 5.30pm. There is concern within the Accident Compensation Commission about contact

sports codes (rugby) training on poorly lit fields.

Floodlighting extends the time a field is available, particularly for weekday training. With lights teams could train until 8.30 or 9pm, although current trends and feedback from players indicate a preference for training only until 8pm – 8.30pm. An Auckland City study undertaken in 2005 found that players are reluctant to train after 8.30pm due to work the following day.

It is also unrealistic to expect all junior teams to train from 3pm as, whilst players may be available, coaches generally have work commitments meaning any start to training before 3.30pm or later is often difficult to manage. The current pattern for junior teams is for training to generally be between 4.30pm – 6pm to suit coach availability.

In assessing weekday capacity, the use at weekends also needs to be taken into consideration as fields in winter cannot take unlimited play without long term damage to the field surface.

Flood lighting is only viable if the field surface can take increased play without sustaining long term damage. This requires appropriate ongoing levels of maintenance and seasonal renovations.

iv. Extending flood lighting on partly floodlit fields

Currently some floodlit fields available for training are only partly lit reducing the level of usable lit space. Extending floodlighting to illuminate the full field will provide additional training capacity after dark.

v. Sand carpeting soil fields

In the northern areas of New Zealand sand carpeting of soil fields often doubles or more the capacity of the field.

vi. Dedicated training areas (DTA)

Dedicated training areas will generally have a much higher training capacity than a field that has to retain a reasonable surface quality for weekend competition. Whilst it is possible to share DTAs between codes, in practice it can result in friction particularly if the field surface deteriorates and compromises training quality. There are successful examples of code sharing of artificial turf fields which can take almost unlimited use. Involvement of the RSO and negotiating formal written agreements between the clubs /codes will help avert potential problems.

vii. Artificial Turf

Capacity of existing fields can be extended to 50 or more hours a week if artificial turf surfaces are used. This is between 3 to 4 times the capacity of most of the region's current fields. Note that whilst turf manufacturers say the fields can be used 24/7, in reality community teams are not 'available' to make use of them right across the day. In addition, manufacturer's warranties tend to be based on limiting use to 2000 hours per year.

The third generation turfs (3G) comprise simulated grass stalks tufted in a weaved rubber backing, with small crumb rubber balls and sand swept into the base of the stalks to hold them upright. They look and play like natural grass and are available in versions approved by all three winter codes.

3G turf can be installed in existing sports parks or on greenfield sites. The cost of installation is dependent on the scope of preparation work needed to level and drain the site, the size of the field, whether a shock pad is installed or not and, to some extent, the brand of turf.

Artificial turf fields have a limited life. At this stage this life is estimated to be between 8 to 12 years depending on the nature and intensity of use and how well the turf has been installed and maintained. The earliest installations are only now reaching this age.

Generally, just the carpet needs to be replaced at the first renewal cycle providing the foundation has been well prepared in the first instance. The capital cost of a turf, including shockpad and floodlights can lie between \$1.8 and \$2.2 million.

Artificial turf fields do require specialised maintenance to ensure the turf fibres remain upright as they are designed to take the wear on the tip of the fibre. If the fibres flatten they will be subject to more wear and can shred. Regular grooming is seen as essential by manufacturers. Maintenance costs, excluding the (generally) required daily inspections are estimated to be in the region of \$25,000+ per year for an artificial turf receiving around 40 hours use per week. The significant capital investment also needs to be protected in some way from unsuitable use, vandalism and fire.

viii. Hybrid Turf

Hybrid turfs represent a 'half way' point between natural grass fields and artificial turf. They are based on a natural grass field reinforced with artificial fibres. The fibres are woven into a backing material through which natural grass grows in the sand infill between the fibres.

Hybrid turfs are thought to extend the playing capacity of a sand based field to around 30 to 35 hours per week, although this has yet to be proven on fields used for community sport in New Zealand.

Auckland Council has conducted several small trials with hybrid turf installed in football goal mouths with very encouraging results. The first hybrid turf fields are now being installed with one on a football field and a second on a rugby field.

The hybrid turf can be installed on site and will typically take the same time to be ready for play as a standard newly stolonised grass turf. It can also be grown off site and then laid, markedly reducing the time the field is out of play.

Hybrid turf offers a number of benefits over artificial turf including:

- cost, currently estimated at around \$500,000 if on an existing sand carpet field with full drainage compared to \$1m for a hybrid
- no requirement for a fully engineered base
- looks and plays like a natural grass field
- meets FIFA 1 star standard (even without natural grass)
- uses sand as infill
- similar temperature to natural grass fields in summer
- does not require fencing for protection
- sections can readily be replaced
- is seen as still being a grass field

There are also some disadvantages compared with artificial turf:

- provides less additional capacity
- is still not proven for community sport use under New Zealand conditions
- will still require between season maintenance, similar to that given to any sand based grass field
- will still be subject to wet weather closures similar to any grass field.

Current Field Improvement Scenario

Should a combination of the above options be implemented and all of the current fields improved to have a usable capacity of 10 hours week (3 hours weekend and 7 hours midweek) it is calculated that there would be sufficient capacity within the existing network of field to meet the demand through to 2028.

Summary Table: 2038 Surplus Shortfall in Capacity – All Codes – FFE hours per week (10 hour capacity)

Analysis area	Surplus Shortfall Weekend	Surplus Shortfall Weekdays	Overall Surplus Shortfall
<i>Ngongotaha</i>	-4.9	0.7	-5.6
<i>Central</i>	18.2	109.6	127.7
Total	14.0	108.8	123.2

ix. Partnerships / Use Agreements with Other Providers

Sport is already using sports fields owned by other providers, in particular schools, sports clubs.

Whilst investigating partnerships is outside the scope of this study these could provide further capacity.

9 Summary and Recommendations

In terms of the overall demand for fields the demand modelling indicates that there is a shortfall of mid-week capacity to meet the demand for training. This is supported by the feedback from the key stakeholders and the sports club surveys.

There are a number of factors that contribute towards this imbalance between the total field availability and the shortfall in mid-week capacity. These include:

- **Overall field capacity**
While a number of fields have restricted capacity due site specific issues such as drainage. For example, a sand carpeted field in the Auckland region has a weekly carrying capacity for competition and training of 14-18 hours. While this may not be achievable SSDM identify that some fields in the region have a capacity of 10 hours a week.
- **Limited access to training lights**
Training lights are restricted to dedicated training areas and a number of other small fields. It is important to recognise that over the winter period that a large proportion of club training does not start until after 6pm. Due to the limited access to training lights, the demand is concentrated into the few areas available increasing the competition for space and wear and tear on the field.

Potential for an artificial turf

The option of an artificial turf field has been identified several times throughout the study. It is recognised that an artificial turf has the potential to provide sustained, high level of use for both training and competition.

There is a case to be made to provide artificial turf to meet the identified training shortfall of football and rugby. Both codes identify the desire to have increased access to high quality all-weather training facilities as has been supported in other regions throughout New Zealand.

Future Options

It is clear that additional sports field capacity is required to meet community demand mid-week, mainly for training. This is estimated to be 54.1 hours a week in 2018. This is however projected to increase to a shortfall of 60.6 hours a week by 2038.

The options to meet current and future demand include:

1. Undertake a field improvement programme to increase field capacity (through drainage and addition of floodlighting).
2. Develop additional dedicated training areas by consolidating competition play on fewer fields and converting the surplus fields to floodlit training (DTAs)
3. Develop an artificial turf field to be used by rugby, football and league for representative and high performance training, freeing up capacity within the community field network.

Given the greatest potential shortfall in capacity is identified for community demand, it is recommended that priority should be given to Options 1.

Overall there is sufficient field area and it is recommended that additional capacity is best

achieved through ground improvements and installing floodlighting at various locations across the region.

However, should Option 3 be considered, carefully planning and management will be required to ensure that the facility meets a wide range of clubs needs and usage is not concentrated around the 'resident' club or code where it is based or focuses on the needs of high performance and the Regional Sports Organisations identified needs. It is recommended that a detailed feasibility study is undertaken to identify utilisation and potential turf occupancy between rugby and football and willingness to pay for use to ensure the on-going financial sustainability for the turf (including maintenance and renewals).

It is further recommended that future investment be targeted in field drainage, irrigation and floodlighting to increase the quality of the existing network and maximise the available capacity.

Appendix 1 Definitions

Active population		Defined as ages 5 to 49 – the age groups most likely to be playing winter code sports.
Capacity	Defined as field hours per week	The number of hours of play per week that a sports field can withstand before sustaining long term damage. Is determined by the type and standard of field surface and presence or absence of flood lighting.
Demand	Defined as field / turf / court hours per week	The number of field / turf / court hours per week needed for play.
FFE	Full field equivalent	There are a number of small sided fields / turfs used by junior players. These fields are defined in terms of full field equivalents, e.g. a half sized field is ½ full field equivalent.
Full field		A full field is one suitable for senior games. Field measurements vary between codes. To be defined as a full field the measurements need to fall within maximum and minimum length and width.
RSO	Regional Sports Organisation	The regional body running the sport in the district. In general, they manage some or all the competitions and act as the link between sports clubs and the National Sports Organisation.
Secure sports fields		Secure fields are those where ongoing use is secured through ownership (e.g. council fields) or a formal agreement (lease, partnership etc) for a period of longer than one year.
Surplus / shortfall		The balance when demand is matched against supply. Defined in terms of field hours per week.
TGR	Team Generation Rate	The TGR is calculated by dividing the number of people in the age group by the number of teams in the area in that age group. For example: if there are 10 mini rugby teams in the 5 to 6 year old age group and 2000 5 to 6 year olds living in the area the TGR is 200 (2000/10). This means there is 1 team generated for every 200 5 and 6 year olds in the area. The figure is used as part of the future projection calculation.
Unsecured fields		Unsecured fields are ones where use could be terminated at very short notice.
Weekend and weekday use		For the three sports field using codes and for netball, weekend demand is predominantly for games and weekday use for training. In contrast, hockey run a number of competitions during week nights, with Sundays mainly set aside for tournaments and representative training

Appendix 2 Technical Assumptions

Model Input Data

a. Competition and Training Demand

Field hours per game include warm up times and are based on appropriate size of field.

Training hours are based on appropriate size of field.

Rugby

Grade	Field hours for game	Training
Adult Male	2.25	3.0
Adult Women	2.25	3.0
Junior u11 to u13	1.50	1.5
Mini u6 to u10	*	0.25
President	2.25	0.5

*Played as centralised module

Football

Grade	Field hours for game	Training
Mini (5 to 7)	*	0.125
8 th grade	1.5	0.125
9 th – 10 th grade	1.5	0.25
Junior 11 th – 13 th grade	2.0	0.75
Youth 14 th to 17 th grade	2.25	1.13
Intermediate Girls	1.25	0.5
Senior Girls	1.75	1.125
Senior Men	2.5	2.25
Senior Women	2.5	2.25

*Played as module

League

Grade	Field hours for game	Training
Mini (u6 to u10)	1.5	0.25
U11- U13	1.5	1.5
Junior	1.50	3
Senior	2.25	3

Appendix 3 Cost per hour of use field comparison

Cost per hour of use

	Soil field	Sand carpet	Fibre reinforced sand	Artificial (no shock pad)	Artificial (shock pad)
Construction	\$120,000	\$260,000	\$790,000	\$1,590,000	\$1,790,000
Floodlighting		\$210,000	\$210,000	\$210,000	\$210,000
Total construction	\$120,000	\$470,000	\$1,000,000	\$1,800,000	\$2,000,000
Maintenance per year	\$12,500	\$25,000	\$25,000	\$25,000	\$25,000
Maintenance for 20 years	\$250,000	\$500,000	\$500,000	\$500,000	\$500,000
Renewal*					
Drainage					
Irrigation		\$40,000	\$40,000		
Sand carpet		\$275,000	\$275,000		
Artificial carpet			\$300,000	\$500,000	\$500,000
Total Renewal over 20 years		\$290,000	\$590,000	\$500,000	\$500,000
Disposal			\$60,000	\$100,000	\$100,000
Total cost for 20 year life span	\$370,000	\$1,260,000	\$2,150,000	\$2,900,000	\$3,100,000

Supply and demand for winter sports fields – Rotorua Lakes Council

Hours use per week based on winter use	8	18	30	40	40
Weeks use per year	48	48	48	52	52
Total hours per 20 years	7680	17280	28800	41600	41600
Cost per hour of use - (not based on discounted cash flow)	\$48	\$73	\$75	\$70	\$75

* Renewal details	Drainage life of 20 years	Carpet life of 10 years	Carpet life of 10 years Shock pad life of 20 years	Carpet life of 10 years Shock pad life of 20 years
	Irrigation 16 years Carpet 8 years			

Alternative capacities

If artificial average 50 hours per week for 52 weeks and fibre 35 hours per week		\$65	\$56	\$60
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