

Pioneer Park Reserve Master Plan

Final Report



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Client: Shire of Kalamunda

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Executive Summary

Pioneer Park is located at Dawson Ave, Forrestfield comprising a total of 57 hectares of land. Prior to Pioneer Park being used for recreation and sporting pursuits the land was formally used as a landfill site.

The northern part of Pioneer Park is known as Dawson Park which includes two lots either side of Dawson Avenue which has principally been used for recreational purposes. The area which is the subject of this master plan contains a subsiding and cracking car park, playing fields and play equipment situated in the northern section of the broader Pioneer Park Reserve. Crumpet Creek follows the north-west corner of the reserve, intersecting the site from Roe Highway, near the car park in the northern section, and running north then east, parallel with the reserve's boundary to intersect with Dawson Avenue. South of the Site lies Dawson Park Primary School and a lot owned by the Agriculture Protection Board and Conservation.

Current Use

The history of Pioneer Park has seen a limited amount of sport capable of being played, due to its degradation and the risks to the sporting community. Pioneer Park has been used for Softball, Tee Ball and Rugby League. The reserve was established originally for softball (home of the Perth Hills Softball Association), collocated with tee ball. Due to the subsiding playing pitches, uneven and unsafe playing surface the softball and tee ball clubs and associations were relocated (softball association subsequently left the competition due to the inability to provide the clubs with a home).

The rugby league club, the Kalamunda Bulldogs, continue to use the reserve for training and home and away games. They currently field 5 senior teams a week and up to 70 juniors at the Sunday competition. The club has a strong team of volunteers which is testament to their commitment and dedication given they operate the club and competitions within substandard playing and ancillary supporting infrastructure.

Consultation

The following stakeholders and user groups were consulted during the preparation of the Master Plan:

- Shire of Kalamunda Officers
- Kalamunda Canning Rugby League Club – Bulldogs
- Perth Hills Softball Association
- Tee Ball Club
- Land Gas Company
- Department of Education.

Overall the consultation highlighted the current state of Pioneer Park as being substandard and not fit for sporting club use. A decision therefore needs to be made immediately on the viability of the continued and future use of the reserve. The clubs have also indicated that they would like to see improved communication and support to reduce the risks to their members and the community with the continued use of Pioneer Park.

The outputs from the consultation process revealed that there is a need to provide rectangular and diamond playing fields for training and competition for the Kalamunda community. It also highlighted that the cost benefit of redeveloping the reserve would need to be fully explored to warrant substantial financial and resource commitment. The potential problems highlighted by various groups indicated that significant investment would be required to merely remediate the reserve to enable viable playing pitch surfaces to be developed. The Master Plan must therefore consider and detail the cost benefit and risks associated within its recommendations.

Site Analysis

The document review revealed the following considerations which shaped the preparation of the Master Plan:

- The recommendations in past reports to consider redeveloping Pioneer Park have been remiss of environmental considerations and limitations and the true cost benefit of redeveloping the site. The reports did not fully investigate and identify the amount of further detailed investigations and monitoring required to substantiate the implementation of recommendations for the site.
- There has been a significant amount of data collected and reviewed about the environmental conditions of the site which recommend further studies and investigations to obtain a clearer understanding of costs and timeframes to redevelop Pioneer Park.
- To date there is no one report which brings all the history, constraints, limitations and opportunities for Pioneer Park. This has meant that there is an absence of achievable and identified priorities; associated costs and timeframes required to ensure a redeveloped Pioneer Park would meet current standards and manages associated risks for the Shire, users and the community.
- The Shire is encouraged to conduct a review of recommendations identified within the documents reviewed (within Appendix A), to ascertain its current position on POS and sporting provision and to strategically plan and implement the remaining recommendations.

Facility requirements

The following sporting facilities emerged as justified facility developments during the analysis:

- Playing fields
 - 2 floodlit rectangular playing field suitable for senior rugby competition
 - 1 shared open space/playing field for training and junior competition
- Built Infrastructure
 - 1 collocated multipurpose sporting pavilion of approximately 1149m²
- Lighting
 - 4 light towers capable and located centrally to maximise light spill for all playing fields to Australian Standard Floodlighting requirements for rugby and softball
- Associated Infrastructure
 - Shaded Area
 - Playground
 - Bin and Storage Area

Redevelopment of Pioneer Park Concept Development and Cost

Following a detailed analysis of the site condition's and environmental constraints, it became evident that a number of options needed to be considered:

- a) Option 1: Redevelop Pioneer Park within known constraints and considerations
- b) Option 2: Redevelop Pioneer Park with optimal layout within the existing site considerations and constraints
- c) Option 3: Consider alternative location and don't redevelop Pioneer Park

The construction costs of options 1 and 2 are identified as \$9.4m and \$9.8m respectively. However a cost estimate of \$30 – 50 million for remediation works in advance of any construction works (and the extensive time implications associated with such work) renders the redevelopment of Pioneer Park as unsustainable and cost prohibitive.

Recommendations:

The recommended actions in redeveloping Pioneer Park are identified in table 1. The recommendations have been broken down into the following timeframes.

Immediately: as soon as practically possible

Short Term: 12 months to 2 years

Medium Term: 3 to 5 years

Long Term 6 to 10 years

Table 1 Recommendations of the Master Plan

No	Recommendation	Timeframe
1	The Shire invites the rugby and softball clubs to a forum to report on the outcomes of the master plan. This ideally should be in the form of a risk assessment workshop and subsequently to collaborate on an ongoing basis with the clubs to provide ongoing transparent and open lines of communication.	Immediately
2	To mitigate the risks to the users of Pioneer Park and to the Shire, it is recommended that as soon as practically possible work towards relocating the rugby club for the start of the season to Morrison Oval within Hartfield Park Reserve. This would be an interim solution pending the identification and securing of suitable land for playing field development to provide a new home for the rugby club and diamond pitch sport.	Immediately
3	Undertake a feasibility study to identify potential options for the redevelopment of Maida Vale Reserve from netball courts into rectangular and diamond playing fields, with the principle outcome being to relocate the clubs on a prominent fit for purpose facility.	Immediately to Short term
4	Investigate the possibilities and availability of purchasing or other such arrangements of freehold land within the Forrestfield area as development occurs, which is centrally located within the urban growth areas to the east of Roe Highway.	Medium to Long term
5	Consider the possibility of other land use for Pioneer Park such as: <ul style="list-style-type: none"> - Flora and fauna offset area for developments within Perth - Other land uses (car park, transport depot) - Rationalisation of the reserve - Extreme Sports park - Super Golf and Foot Golf Course 	Long term

1.0 Introduction

The Shire of Kalamunda (Shire) is undergoing a Master Planning process for the redevelopment of Pioneer Park located at Dawson Ave, Forrestfield. Prior to Pioneer Park being used for recreation and sporting pursuits the land was formally used as the Shire’s landfill site.

Pioneer Park (Lots 300 and 12588) is located on approximately 57 ha of land, 25 km south-east of the Perth CBD. The site is separated into four lots, supporting different land uses which comprise an area of approximately 52 ha. It is mostly cleared surface area, traversed with tracks and boarded with native vegetation on the east and western portion of the reserve.

Two lots either side of Dawson Avenue make up what is known as Dawson Park, with a subsiding and cracking car park and play equipment (needing replacement) situated in the northern section of the reserve. Crumpet Creek follows the north-west corner the reserve, intersecting the site from Roe Highway, near the car park in the northern section, and running north then east, parallel with the reserve’s boundary to intersect with Dawson Avenue. South of the Site lies Dawson Park Primary School and a lot owned by the Agriculture Protection Board and Conservation.

Numerous reports have been conducted identifying potential containments, significant differential settlement across the playing fields and limitations to developing the site. This document review and site analysis report explores the previous documents, history and simply identifies opportunities and constraints to the redevelopment of Pioneer Park.

1.1 History of Pioneer Park

The following information was identified within the *Dawson Avenue Former Landfill 19 Preliminary Site Investigation May 2010*, and subsequently confirmed by other reports and Shire officers. It identifies and highlights the limitations of the former land use of Pioneer Park:

Figure 1 Dawson Avenue Former Landfill



Motor Racing Circuit

- The southern section of the site was used historically as Forrestfield Motor Racing Circuit speedway, operated by the Hot Rod Association from 1962 to 1982.

Landfill

- Dawson Avenue landfill operations began in 1975 within the northern section of the site. It was operated by Western Excavating from 1975-1979 before being superseded by Cleanaway in 1982.
- The landfill accepted household/domestic waste, liquid waste, grease, oil, industrial/building rubble and industrial sludge. Other accepted wastes reported include disposal of scrap metal, lithium batteries and septic solution.
- The landfill accepted waste from the Shire of Kalamunda, City of South Perth as well as City of Belmont. The landfill's capacity increased from 51,033 tonnes in 1992 to 93,853 tonnes in 1995.
- The Shire of Kalamunda received frequent complaints regarding the landfill, and subsequent audits reported problems with:
 - excessive, strong and persistent odours
 - noise, dust control
 - the clay capping being insufficient
 - fencing around the landfill being damaged
 - leachate problems
 - flies and mosquitoes breeding in ponds
 - great numbers of seagulls present and transport of rubbish wind and water pathways (e.g. blown into fence, verge litter etc.).
- The Shire maintained the landfill by spraying for flies/mosquitoes, pumping and liming leachate, clearing litter near the perimeter fences, repairing the fence, mulching the green waste and culling seagulls.
- The drainage of the site was found to be inadequate; causing rainfall to pond on the surface and this resulted in leachate problems.
- Dawson Avenue landfill was closed in July 1997 and rehabilitated for recreational use as Pioneer and Dawson Avenue Parks.
- The landfill was compacted to a density of at least 1 tonne/m³ and levelled.
- The Site was capped with clay, to a uniform thickness of 500 mm, and covered in top soil, to a minimum depth of 300 mm (Shire of Kalamunda, 1995).

Gas

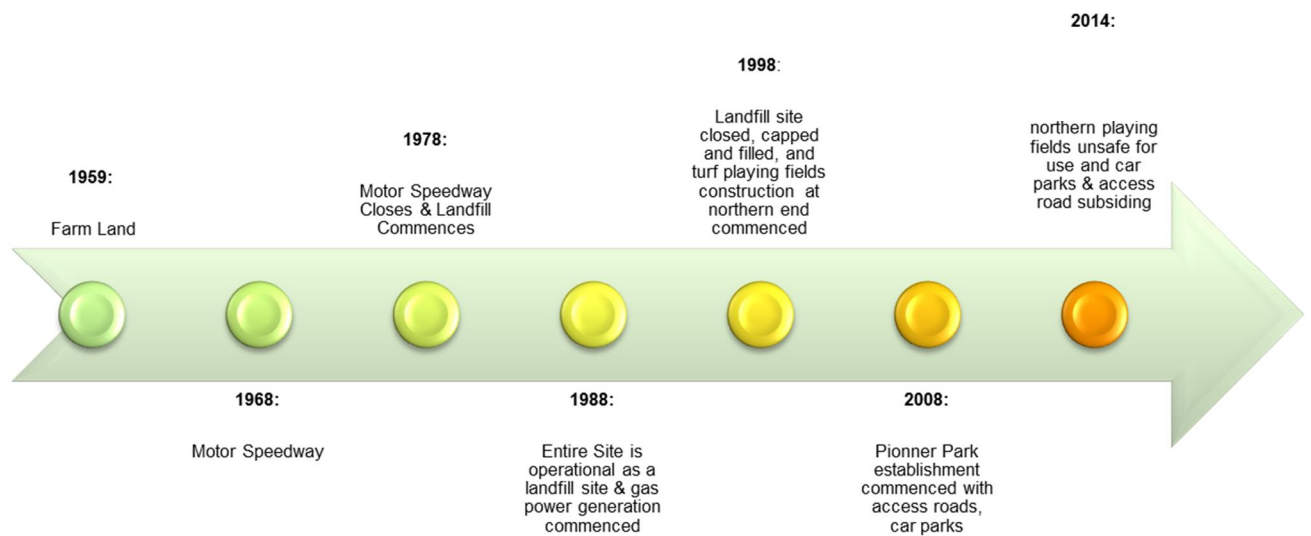
- Landfill Gas and Power Pty Ltd began extracting gas in 1996 following closure of the Site. The flow from Dawson Avenue landfill was incorporated with gas drawn from the Brand Road landfill to the power generators.
- Landfill Gas and Power Pty Ltd initially installed a 1.1 MW of generation, increasing to 2 MW in 1997 at the combined sites (Tony Leahy, LGP).
- Gas generation steadily declined to the point where only part time operation of a 600 kW generator was possible. Presently, it has become uneconomic to pursue this line of works and so this is being replaced with a gas flaring facility.

Recreation

- This site has historically been used as a motor racing circuit and landfill. Landfill operations began in 1975 and ceased in 1997, at which point the site was rehabilitated for recreational use.

- The landfill was capped and turf established within the northern section of the site for the use of diamond and rectangular eastern playing fields. Once the landfill was covered and capped the northern section of the site was used for such sports as softball and rugby.
- Pioneer Park is currently used for public recreation, which encompasses 7.5 ha of irrigated turf. However, subsiding ground levels and condition resulted in the playing fields being considered unsafe for playing sports and the original softball pitches have been abandoned. Trench subsistence and the pooling of water in low points of the ground have rendered the facility unusable (Shire of Kalamunda minutes, 26/10/09).
- There is a small club house (change rooms) facility on the north-western corner of Pioneer Park, constructed in 1997, which is no longer fit for purpose.

Figure 2 Timeline of the evolution of Pioneer Park



As highlighted above Pioneer Park has a chequered history relating to previous land use and subsequent remediation. This has resulted in the development of a reserve which contains significant environmental, health, construction considerations and limitations which need to be assessed in greater detail to inform the future use and redevelopment of the site.

1.2 The Approach to Developing the Master Plan

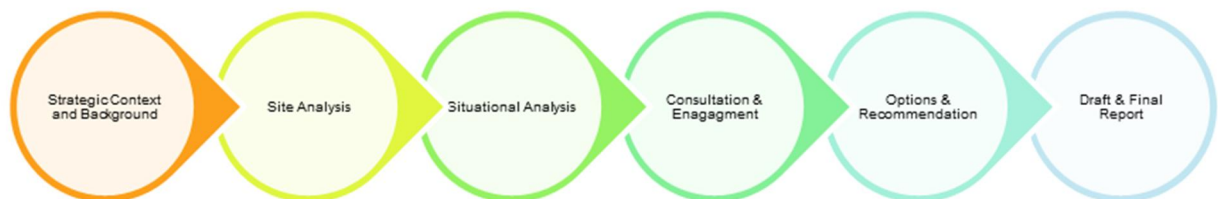
The Master Planning exercise intended to provide a comprehensive analysis and planning options to guide the redevelopment of the Pioneer Park in the future. A significant amount of research and investigation has been completed to develop this Master Plan and to provide the Shire of Kalamunda (Shire) with certainty over the potential long term economic, social and environmental impacts of the redevelopment. The resulting Master Plan provides clarity on the future redevelopment of sport and recreation infrastructure at Pioneer Park.

With the changing demographics within the Shire there will be a requirement to strategically plan and develop greater efficiencies in the provision of community sport and recreation infrastructure. This will necessitate the rationalisation of existing infrastructure and provision of high quality flexible facilities where opportunities arise.

The development of the Master Plan has focused on:

- The long term strategic planning and desired outcomes.
- A comprehensive investigation of current and future needs of the Shire and the local community sporting groups and competition.
- The development of concepts of the potential facilities to be developed together with a full understanding of capital; cost broken down by component elements and anticipated lifecycle costs.
- The staging of development based on anticipated sport and recreation requirements and site operational sustainability.
- Universal design and environmental sustainability principles.

The Master Plan has been developed with the end users in mind having regard to the Shire's endeavour to consider where appropriate sustainable design principles, operational constraints, and financial viability. The following identifies the methodology used to develop the Master Plan:



2.0 Situational Analysis

2.1 Strategic Context

A number of core legislative and planning policies have been considered in the redevelopment of Pioneer Park. The guidelines and identified best practice highlighted the emerging issues and appropriate mechanisms to be adopted in adhering to legislative and policy framework.

Strategic Planning Influences: Western Australia

Current guidance and trends in the planning of Public Open Space (POS) is contained within a number of strategic planning documents produced within WA. The State is particularly well advanced when compared with states across Australia. Key documents include:

- *Public Open Space in Western Australia New Residential Developments* by Parks and Leisure Australia which highlights the need for strategies to have consistent use of terminology; enhance design of POS; provide clarity of policy interpretation; stipulate roles and responsibilities in the planning process and encourage flexible, creative, adaptive, ecologically sustainable public open spaces.
- *Active Open Space - Playing Fields* Centre for Sport and Recreation published by Curtin University references the need to change State Planning Policy: Liveable Neighbourhoods and incorporate more effective shared use of school sites in future planning.
- *The Public Parkland Planning & Design Guide* by the Department of Sport and Recreation states: "It is important that parkland specific planning and design are considered in conjunction with the allocation of water resources at each stage of the planning and development process. Neighbourhood and local parklands need to be adequately located to give all residents walkable access". It further endorses the classification framework referenced in the introduction to the POS Strategy.

National Public Open Space Guidelines and Best Practice

Appendix A includes a selection of POS documents which have established benchmarks in the provision of POS. In particular the following consistent themes are relevant:

- **Accessibility:** Recommendations include distance thresholds for the location of open space in residential areas, the importance of safety in location and design and the value of needs based assessments which should include public input.
- **Health:** Parks and other natural environments are a fundamental health resource, particularly in terms of disease prevention.
- **Sustainability:** Protecting natural resources for future generations is a key outcome desired in all supporting documentation.
- **Enhancing Liveability:** The Green Star Communities - Guide for Local Government provides a rating system for the planning, design and construction of community development projects to achieve better economic, social and environmental outcomes across the built environment.

In addition the emerging role of POS planning highlights the need to take into account local biodiversity conservation as a mechanism to offset issues in relation to climate change, water management and to ensure that a rich diversity of native trees and bushland is retained within and adjacent to urban environments for the benefit of future generations.

International Public Open Space and Best Practice

Appendix A includes a selection of international POS documents which have established benchmarks and case studies in the provision of and development of POS from both a prime function and as a contributor to broader natural environmental issues. In particular the following consistent themes are relevant:

- The importance of well-designed open space which is part of an interconnected network to promote pedestrian and bicycle trips between open space destinations is important and future planning should be cognisant of this desire.
- Design guidance recommendations throughout the world include distance thresholds for the location of open space in residential areas, the importance of safety in location and design and the value of needs based assessments to include public input.
- A full range of spaces should be provided that are significant in promoting physical activity, that balance sporting with recreational pursuits and the value of natural areas.
- Water management both now and into the future is recognised as a critical component of future planning.
- The increase in tree canopy levels should be considered as a core initiative to offset the heat island effect and offset degradation from climate change
- The application of hierarchical standards needs to be recognised and accepted across local and state government to ensure that there is consistency in language and interpretation. A failing of many planning processes is the lack of benchmarking which can be applied across neighbouring metropolitan boundaries. This highlights the value in using a recognised POS definition such as that advocated by Department of Sport and Recreation with minor modifications to take into account local circumstances.
- Solutions are required to be driven from the community first with community engagement, capacity building and ownership critical to the use, protection and delivery of all POS.
- Community groups must have ready access to funding sources to enable those groups to facilitate active participation in the volunteer sector.
- Partnerships with schools and other service providers are critical in ensuring that there are sustainable outcomes as a result of any intervention.
- The need to establish a suitable policy framework to guide development in a sustainable manner is critical to ensure all aspects of POS development can be appropriately planned for and delivered.

State Government - Directions 2031

Over the past 30 years the metropolitan Perth and Peel region has experienced sustained growth and is now home to a population of approximately 1.65 million. There are a number of growth projections for Western Australia - including the Western Australian Planning Commission's WA Tomorrow planning forecasts and those produced by the Australian Bureau of Statistics. Based on the WA Tomorrow (WAPC 2012) report, it is expected that by 2031 the estimated population will have reached 2.2 million, adding more than half a million new residents to the city. Planning for these extra residents, along with the housing, infrastructure, services and jobs they will require presents a significant challenge to Government.

Directions 2031 is a high level spatial framework and strategic plan that establishes a vision for future growth of the metropolitan Perth and Peel region; and it provides a framework to guide the detailed planning and delivery of housing, infrastructure and services necessary to accommodate a range of growth scenarios. *Directions 2031* builds upon many of the aspirational themes of previous metropolitan plans which sought to guide the future structure and form of the city. It encompasses all land within the metropolitan Perth and Peel region schemes, an area that is also referred to as the city or metropolitan region in this report.

Department of Sport and Recreation

The Department of Sport and Recreation *State Sporting Facilities Plans and Strategic Direction 5* documents provide strategic direction for the development of specific sports and more broadly the development of healthy and active communities through physical activity and participation. This is generally facilitated through quality and sustainable sports facilities and open space.

All the documents prepared by the Department of Sport & Recreation provide guidance and targets to consider achieving quality sporting infrastructure. It should be noted that the documents all promote

development and participation of sport and recreation from grass roots through to elite sporting competition, including infrastructure required for spectators.

Shire of Kalamunda

The Master Plan has recognised the need for integrated planning and the need to align with Shire’s Strategic Priority Areas that provides the framework for the delivery of services to the community. Table 2 references the relevant Community Plan priorities the Pioneer Park Master Plan aligns with.

Table 2 Shire of Kalamunda Strategic Community Plan Strategic Priority Areas

<p>SP 1 - Kalamunda Cares</p> <ul style="list-style-type: none"> Looking after our people 	<p>SP 1</p> <ul style="list-style-type: none"> Community needs and aspirations are listened to and considered Due diligence deployed throughout the Master Plan Social, economic and environmental value is explore and considered
<p>SP 2 - Kalamunda Interacts</p> <ul style="list-style-type: none"> Providing our people with social and cultural enjoyment 	<p>SP 2</p> <ul style="list-style-type: none"> Ensure that the health and wellbeing of the community is paramount Providing safe and increased social connection through sport and recreation opoportunities
<p>SP 3 - Kalamunda Clean and Green</p> <ul style="list-style-type: none"> Ensuring the sustainability and the integrity of the natural environment 	<p>SP 3</p> <ul style="list-style-type: none"> Explore all sustainable options for the redevelopment of Pioneer Park At all stages of the Master Plan the environmental value and role was considered
<p>SP 4 - Kalamunda Develops</p> <ul style="list-style-type: none"> Using our land and assets diversely and effectively 	<p>SP 4</p> <ul style="list-style-type: none"> Ensure that the master considered highest and best use of the land and provide thereby investigated recommendations
<p>SP 5 - Kalamunda Employs</p> <ul style="list-style-type: none"> Supporting our industries and businesses to facilitate local employment for our people 	<p>SP 5</p> <ul style="list-style-type: none"> Consider urban development and the economic environment now and into the future
<p>SP 6 - Kalamunda Leads</p> <ul style="list-style-type: none"> Providing good government 	<p>SP 6</p> <ul style="list-style-type: none"> Acknowledge local government reform and work together to ensure the most appropriate regional outcome.

The Pioneer Park Master Plan illustrates the strategic alignment within the integrated planning framework which influences the decision making process. There have been many documents and studies on Pioneer Park which were considered within the development of the Master Plan.

2.2 Planning Documents Review

The following represents some of the key planning documentation relevant to development of the Pioneer Park Master Plan. A full analysis of all relevant documents is presented in Appendix A.

It is not the intention to reproduce all of these documents here, but to highlight those of particular significance in the areas of planning policy and strategies; public open space development and resilience policies and principles; and all of the relevant site investigation studies and reports.

The following key themes and considerations were highlighted during the document review:

- The recommendations in past reports to consider redeveloping Pioneer Park have been remiss of environmental considerations and limitations and the true cost benefit of redeveloping the site. The reports did not fully investigate and identify the amount of further detailed investigations and monitoring required to substantiate the implementation of recommendations for the site.
- There has been a significant amount of data collected and reviewed about the environmental conditions of the site which recommend further studies and investigations to obtain a clearer understanding of costs and timeframes to redevelop Pioneer Park.



- To date there is no one report which brings all the history, constraints, limitations and opportunities for Pioneer Park. This has meant that there is an absence of achievable and identified priorities; associated costs and timeframes required to ensure a redeveloped Pioneer Park would meet current standards and manages associated risks for the Shire, users and the community.
- The Shire is encouraged to conduct a review of recommendations identified within the documents reviewed (within Appendix A), to ascertain its current position on POS and sporting provision and to strategically plan and implement the remaining recommendations.

Figure 3 provides an overview of the findings and considerations from the document review which have been used to inform the evolution of the Master Plan.

Figure 3 Current and proposed uses of northern portion of Pioneer Park highlighting conditions and considerations



2.3 Industry Trends Assessment

A trend is defined as an important pattern of social, economic or environmental activity that will play out in the future. Trends usually occur when there is a major shift in environmental, social and economic conditions that alter the way people live. The following section provides an overview of selected sporting and recreation industry and participation trends which have an influence the Pioneer Park Master Plan:

General Industry Trends

Sport is a major part of the Australian lifestyle and will continue to be part of our cultural identity, the majority of Australians play, watch and enjoy sport. The sports played, how and why we play them in WA is changing over time. As indicated in the *Future of Australian Sport, Australian Sports Commission* report, current trends will play an important role in shaping long-term policy, investment and strategic planning within government, the sports sector and broader community.

There is growing recognition of the health benefits of regular participation in physical activities within the community, including acceptance of the individual and community wellbeing benefits of belonging to sport and recreation based organisations. There is also growing demand for access to casual and informal participation opportunities in preference to organised sports. This trend has increased demand for greater diversity in sporting and recreation participation opportunities, both in activities diversification and time allocations available. It has also led to an increase in commercial use of public facilities and open space for health and fitness participation (e.g. personal trainers and boot camps).

The emerging trend and preference for participation in informal activities is increasing the need for local, low cost participation opportunities, including increased use of the open space as a setting for informal recreational activities / pursuits.

The following trends will impact on the development of Pioneer Park:

- A greater demand for weekday, evening and weekend time-slots to accommodate changing working patterns.
- Higher expectations regarding the standard of facility provision; programming and management. More well defined and specific facility standards and requirements are also being imposed by peak sporting bodies and to accommodate Australian Standards.
- The need for sports lighting provision to facilitate extended use and financial viability.
- Improved playing surfaces which can accommodate a higher capacity of play and surfaces that can sustain intense usage by a variety of sports i.e. synthetic and other hard surfaces.
- New sporting and recreation initiatives reflect emerging changes in sports products and programming. For example 20:20 cricket, mid-week night competitions, veterans / master's competitions. These all impact on size, function and capacity of facilities. These changes reflect growth in social sports participation, often combining skill levels in recognition of preferences for social outcomes.
- Throughout Australia and WA National and State Sporting Bodies are increasing the importance and grass roots and modified participation programs aimed at junior development and recruitment (e.g. Auskick, 5 a side / small sided soccer, tag footy etc.).
- Declining numbers of volunteers and increasing professionalism (brought about by need to have a competitive advantage and meet regulatory requirements).
- The rise of lifestyle, adventure, extreme and alternative sports which are particularly popular with younger generations. These sports typically involve complex, advanced skills and have some element of inherent danger and / or thrill-seeking. These are likely to attract participants through generational change and greater awareness via online content.



Facility Trends

The general trends are influencing contemporary sporting and recreation facility design and development. It is now more common to design facilities that can be configured to meet a variety of different needs and uses (i.e. flexible design for adaptive reuse over time). The following are facility provision trends which will influence the Master Plan outputs:

- The provision of facilities with a high level of social interaction and engagement is seen as important. Examples include under-cover external viewing areas attached to sports pavilions and the design of meeting and social spaces within sports and recreation facilities.
- Local governments are increasingly adopting a hierarchical approach to facility and infrastructure provision which reflects different service levels, usage and standards of provision. This includes the establishment of major regional sport / recreation facility hubs that offer a wide variety of activities / sports and ancillary services.
- The co-location of recreation, leisure and sports facilities close to other community assets such as retail precincts, arts precincts, libraries and other facilities designed to maximise the visibility, traffic and throughput.
- Growing evidence of effective public-private partnerships between developers, government and sports clubs to develop sports facilities.
- Increasing preference for the design of joint-use facilities at school and other educational institutions which allow educational use during daytime periods (weekdays) and community use during the peak evening and weekend periods.
- Increasing consideration and use of energy efficiency and environmentally sustainable features within the design of sport and recreation facilities as well as greater consideration of resilience, water use and flexibility.
- An emergence of new playing surface technologies which maximise the use of existing assets (e.g. synthetic playing surfaces). These facilities are capable of high use (3 to 4 times the level that natural turf can sustain) with comparable ongoing maintenance costs and programs to natural turf.

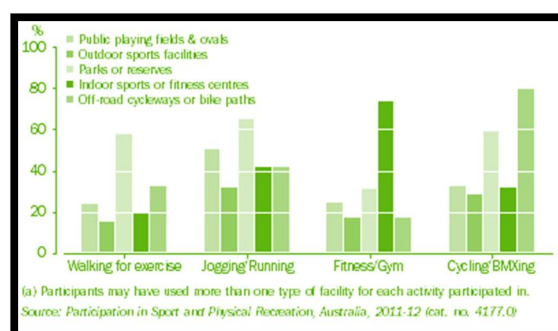
Participation Trends

People can choose to take part in sport and physical recreation either through organised or non-organised activities. Organised activities can be arranged through recreation clubs, sporting or non-sporting associations, through health & fitness centres or through a wide variety of other sporting and non-sporting arrangements. The *Exercise, Recreation and Sports Surveys (ERASS)* from 2000 to 2010; *2010 Children's Report and Sport, Fitness & Recreation Environmental Scan 2014* all highlight such trends.

In 2014 around a quarter of the population (27%) reported participating in organised sport and physical recreation while almost double that (53%) took part in non-organised activity.

Participation in organised sport and physical recreation was highest amongst persons aged 15–17 years (58%). Participation rates in organised activities were similar for males and females (28% and 27% respectively) but were higher for males (54%) than females (51%) in non-organised activities.

Figure 4 Australia's Population participation in physical activity (Source: The Future of Australian Sport 2013)



The *Future of Australian Sport* data highlights:

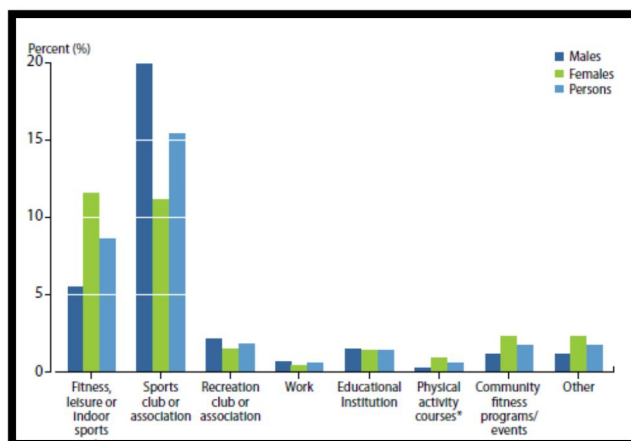
- Of the 11.7 million people who participated in sport and physical recreation, more than half (52%) participated 105 times or more (i.e. on average at least two times each week). This included the number of times spent training and practising for an activity.
- A larger percentage of female than male participants took part 105 times or more (55% compared with 49% respectively).
- Comparing the top 25 most frequently participated in sports and physical activities, persons walking for exercise were more likely to participate 105 times or more (58%). This was followed by fitness and gym activities, where 40% of participants participated 105 times or more.
- Parks and reserves were used by the most people (40%), followed by indoor sports and fitness centres (37%). Beaches and walking trails also often used for exercise and physical activity.

A 'Participation in Sport and Physical Recreation Survey' was also conducted in 2005–06 and 2009–10.

The following are the key outcomes of participation trends in sport and recreation:

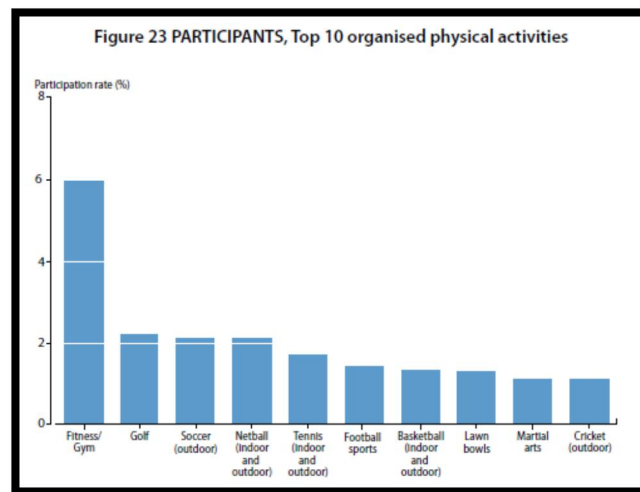
- There was no significant change in the participation rate between 2005–06 and 2009–10 (64% and 65% respectively). However, as the population increased so too did the number participating, which grew from 11.1 million to 11.7 million between the two reference periods.

Figure 5 Participation in Organised sports and physical recreation by type and sex (Source: The Future of Australian Sport 2013)



- Rates of participation by age remained similar over the two periods with the exception of those aged 35–44 where participation increased from 65% in 2009–10 to 69% in 2011–12.
- There were significant increases in participation rates between 2009–10 and 2011–12 for people who were born overseas (56% to 59%), people living in capital cities (64% to 66%), and those who were not in the labour force (53% to 55%).
- Walking for exercise remained the most popular activity over the period with a similar participation rate from 2009–10 to 2011–12 (23% and 24% respectively). The participation rate for cycling or BMX increased from 6.5% to 7.6%. Similarly, the rate of people participating in jogging or running increased from 4.3% in 2005–06, to 6.5% in 2009–10, to 7.5% in 2011–12.

Figure 6 Participation in the Top 10 organised physical activity (Source: The Future of Australian Sport 2013)



The redevelopment of community infrastructure should consider:

- Emphasise healthier lifestyles and seek a balance between work and leisure is a key outcome. This should lead to opportunities for sports to develop services and facilities that make accessing healthier lifestyles easier and more enjoyable.
- Maximise opportunities for informal, casual and non-organised participation in a range of sport, recreation or fitness pursuits which will optimise opportunities for physical activity participation by the community.
- Respond to specific growth opportunities in emerging markets where large and growing populations whose average disposable incomes and standards of living are expected to increase. In developed markets, average life expectancy is rising. As they enjoy a good standard of living, people in developed markets are more likely to stay active longer and invest in high-quality sporting goods and increase the financial viability of extensive sporting infrastructure.
- Ensure management of sporting reserves maximises opportunities to support the operational and financial sustainability of individual sporting clubs. This should include proactive support and assistance for club volunteers. This would include assistance to clubs through training, recruitment and retention initiatives to support its volunteers. In addition a fundamental review of the capacity of individual clubs to maintain facilities should be undertaken.
- Ensure any new sporting or community facilities maximise opportunities for shared use, long-term flexibility and mixed gender use.
- Integrate opportunities for social gathering spaces in design and infrastructure provision.
- Ensure that asset management planning for open space infrastructure (including facilities) continues to be reviewed, monitored and where appropriate apply best practice.
- Ensure proactive plans for asset maintenance, renewal and replacement are developed for all classes of assets including buildings, lighting, paths and trails, park furniture, playing.
- Consider opportunities to establish a defined walking / running loop throughout the reserve, including lighting of a primary path network.
- Provide for sports with known facility demands and consistent participation increases which include rugby / touch and diamond sports.
- Respond to the popularity of outdoor activities and experiences enjoyed by participants of all ages regardless of gender (including integration with the natural environment).

2.4 Demographic and Regional Context

Kalamunda Population Profile - 2011

The Shire of Kalamunda is located in Perth's south-eastern suburbs, about 24 kilometres from the Perth CBD and is bounded by the City of Swan in the north, the Shire of Mundaring in the east, the Cities of Armadale and Gosnells in the south, and the Cities of Canning and Belmont in the west. The Shire contains a mixture of urban and rural areas encompassing a total land area of 349 square kilometres. The first figure is current demographic information and the second reflects forecast population.

The Shire of Kalamunda current community profile is based on 2011 statistical information from *id forecast* which is informed by the 2011 national census. The Shire includes rapidly growing urban areas in the foothills, such as High Wycombe, Maida Vale and Wattle Grove. Rural land is used mainly for orchards, horticulture, grazing, animal agistment, sawmills and poultry farming.

The broad statistical data is highlighted in figure 7 below

Figure 7 Shire of Kalamunda baseline statistics (Source: Forecast id)



From 2006 to 2011, Shire's population increased by 4,041 people (8.2%). This represents an average annual population change of 1.58% per year over the period.

The largest changes in the age structure in this area between 2006 and 2011 were in the age groups:

- Empty nesters and retirees (60 to 69) (+1,380 people)
- Seniors (70 to 84) (+820 people)
- Young workforce (25 to 34) (+500 people)
- Babies and pre-schoolers (0 to 4) (+492 people)

Kalamunda Population Forecast Profile – 2014-2036

The Shire's population and household forecasts highlights population change in the community and how the population, age structure and household types will change each year between 2011 and 2036. These forecasts were last updated in November 2013 by *forecast.id*, forecasts are available for each year from 2011 to 2036.

Figure 8 Shire of Kalamunda Population Forecast Profile

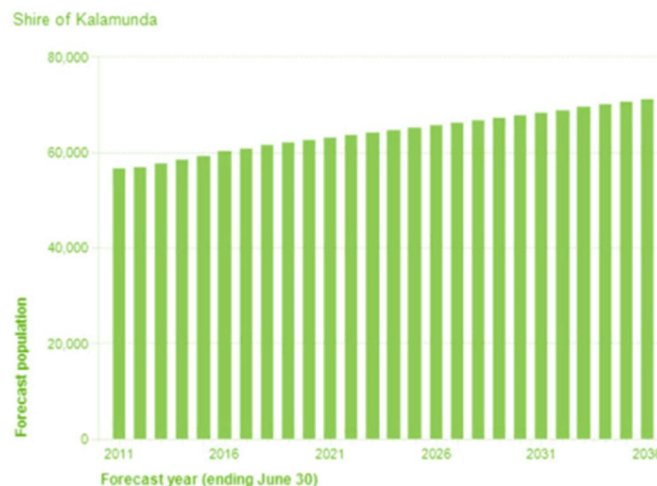


Figure 9 Population Forecast Growth (Source: Forecast id)



The Shire is no different than most of the urban development areas in Perth and the Eastern Metropolitan Regional Council (EMRC) region. The majority of the community is characterised by older families, retirees or people ageing in place and the trend is likely to continue into the future.

However due to urban development and policy change (such as the Shire's Housing Strategy & Local Government Reform) the population change will see in contrast, younger families with children under 12 being the greatest change in the community.

The most significant development within the Shire occurred during the post-war years, particularly during the 1960s and 1970s. The population was relatively stable during the 1990s but increase significantly during the early 2000's. Since 2001, population growth has primarily been focused around Wattle Grove and High Wycombe with lesser gains experienced in Maida Vale and Forrestfield.

Pioneer Park Location

Pioneer Park is located on Dawson Ave, Forrestfield, 25 km south-east of the Perth CBD. The reserve is separated into four lots, and currently used for recreation and sporting pursuits and is more particularly shown in figures 10 and 11.

Figure 10 Shire of Kalamunda Regional Context, local government boundaries, council electrets and land uses.

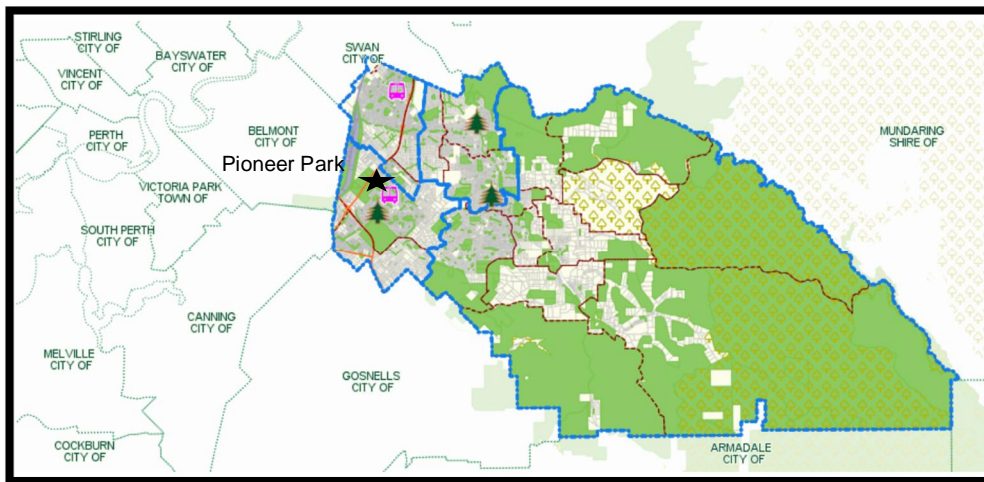
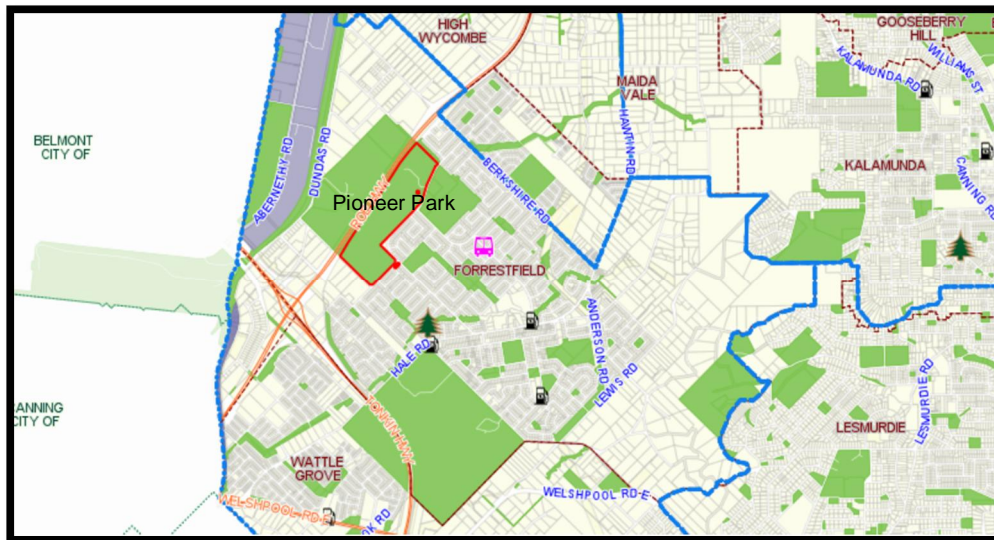


Figure 11 Parks and Reserves within a 10km radius from Pioneer Park



Figures 10 and 11 show that Pioneer Park is situated along the eastern edge of Roe Hwy and on the most western edge of the Shire's urban development. Pioneer Park's strategic location to service the community is limited due to the highway and surrounding land uses. It is also situated in close proximity to other district level sporting and recreation open spaces. Overall the Shire appears well serviced by a variety of public open spaces although in some instances the quality and accessibility to the open spaces would not meet the normative need of the community. This is re-affirmed in previous open space assessments and community planning processes.

3.0 Consultation

The following section represents the comments and feedback from the consultation that was conducted during the development of the Master Plan, refer to Appendix D. The following comments or statements have been considered in developing the recommendations within the report:

Table 3 Consultation Undertaken with Risk Associated with the Implications to the Master Plan

Organisation	Comments/Issue	Implications to the Master Plan	Risk Associated to the implications
Tee Ball Club	<ul style="list-style-type: none"> The club has requested that they are not contacted again as they felt any discussion would jeopardise the good working relationship forged at another reserve with a cricket club. 	<ul style="list-style-type: none"> The Shire's desire to potentially create a diamond playing field home at Pioneer Park is not released 	<p>The following is to be considered a Low Risk to the shire as this will not create additional pressure on the reserve.</p>
Kalamunda Canning Rugby League Club' – Bulldogs	<ul style="list-style-type: none"> The club operates in an inefficient manner (competition and training) due to the poor site conditions and ability for average playing field use The change rooms and associated infrastructure are not fit for purpose and or meet any current equity, building codes and modern community facility standards Inability to grow the club due to the perception or facilities, risk to users and safe site conditions The club is willing to collocate with any other club, if a full rugby season and competition can be fulfilled. Currently have a set of 4 poles at 200lux being within time limited storage at present. These need to be stored elsewhere as a matter of urgency or they will be required to sell them. Affiliated with the new National Rugby League (NRL) and competitions will be undertaken under a different in structure in future. The club aspire to be a community hub, able to operate a holiday program, clinics and after school programs A need for a fully fenced senior playing field. Loss of team spirit/morale as they get little support and or value from the Shire (as reflected by their facilities). The club is financially viable and has a strong committee who have expressed concerns relating to their ability to 	<ul style="list-style-type: none"> Ascertain if Pioneer Park is capable now and into the future to meet the needs of user groups The risks associated with the redevelopment the site are too great consider continuing with the Master Plan process on the current site The Master Plan will need to consider the club's requirements in regard to all competition, facility and lighting requirements Consider all environmental, social and economic benefits of redeveloping Pioneer Park and or give consideration to alternative sites to achieve the objectives of the Master Plan 	<p>The following are consider to be a High to Extreme High Risk to the Shire which need immediate addition:</p> <ul style="list-style-type: none"> public liability, governance/auditing, injuries, harm to children, exposure to the elements Inability to attract new members and keep volunteers health and wellbeing as the amount of time being spent moving equipment and driving to other grounds for all elements of the club. Duty of Care is a concern to all involved in the club and visitors. Storage of Lighting poles Lack of support and assistance from the Shire to the club Playing surface and general site and associated infrastructure quality. The impact of Berkshire Rd works and gateway project on the safety and security of the site

Organisation	Comments/Issue	Implications to the Master Plan	Risk Associated to the implications
	<p>sustain this into the future due to the lack of appropriate facilities.</p> <ul style="list-style-type: none"> - This is likely to impact on the current commitment of volunteers to continue facilitating and operating competitions (particularly where there is a lack of shelter and shade). - The club have identified they require 2 senior playing fields with an additional open space shared for training and junior games (floodlight). 		
Perth Hills Softball Association	<ul style="list-style-type: none"> - The association wants to continue at Pioneer Park - The association members have all gone to other associations though are willing to return. - The HDS contributed a \$30,000 investment into the establishment of Pioneer Park. - The council has not communicated what is happening with Pioneer Park or offered alternatives for a lengthy period. - The association has a strong committee and does have a desire to reactivate the association if a sustainable home could be found. - The association is realistic in appreciating that Pioneer Park may not be the most suitable location for growth - The association require a 12 month operational diamond playing fields (2 diamonds floodlit to Australian standards). - To operate effectively 2 diamonds would be required (although ideally 3) and / or shared open space for training (floodlight). 	<ul style="list-style-type: none"> - Due to the perception and reality of not being able to promote sustainable playing surface and lighting conditions into the future. - The Master Plan will need to ascertain if lighting is a feasible option and the quality of the playing fields can be assured into the future - Pioneer Parks ability to cater for 12 months a year playing fields and use. 	
Shire of Kalamunda Officers	<ul style="list-style-type: none"> - A workshop was held with many Shire officers and managers to review the findings of the Situational and Site Analysis. - Identified gaps were discussed and information truth checked. Additional information was sourced and supplied by officers. - History and environmental information was clarified and the cost benefit of redeveloping the site was discussed. 	<ul style="list-style-type: none"> - All of the information received needs to be toughly analysed to ascertain Pioneer Parks' ability to be redeveloped and to meet the Shire's objectives in the Master Plan 	<ul style="list-style-type: none"> - There is a number of high to extreme risks associated with the redevelopment of Pioneer Park of which the Shire is responsible. - It is recommended that the Shire considers all the risks, mitigations and take appropriate action

Organisation	Comments/Issue	Implications to the Master Plan	Risk Associated to the implications
Gas Company	<ul style="list-style-type: none"> - Could not source maps or diagrams that indicate the location, depth and pattern of the pits, pipes and plans for the infrastructure of the site. - Indicated the north section pits ran laterally north to south (this is visible with the land subsiding) approximately 15m deep. - The middle section was the deepest section with put up to 25m in depth due to the vegetated areas on the west and eastern boundaries. - The south section was approximately 15-17m deep with horizontal pits and pipes. - The manifold (main gas pipeline) runs from the northern edge of the reserve, under the rugby playing field to the burn off area and generator. In the past two months (Oct / Nov 2014) the main pipeline was severed and capped at Roe Hwy, this will allow for concentrated monitoring of landfill gas levels within Pioneer Park to occur in the next 5 years. - The gas company requested that their responsibility under the agreement be reduced to the monitoring of the newly installed landfill monitors installed along the northern Roe Highway edge of the reserve, and the generator area. This would mean that the above ground pipeline and other pipe underground within the reserve would now be the responsibility of the Shire to maintain. 	<ul style="list-style-type: none"> - As information cannot be confirmed via maps and reports identifying location of pipes, depths and condition of gapping and land fill. The Master Plan will be required to make numerous recommendations and broad bands of costs associated with the redevelopment requirements and costs 	<ul style="list-style-type: none"> - There is a High risk to the Shire if there is no due consideration given to the unknowns and requirements to redevelop the site to achieve a sustainable community facility.
City of Belmont	<ul style="list-style-type: none"> - The City officers detailed the findings and progress of the Belmont Housing Strategy, Local Planning Scheme, Public Open Space Strategy and other policies and documents that needed to be considered during the development of the Master Plan - The City reinforced its strategic direction with water efficiencies principles in regard to POS and the need to strategically position any future district and regional sporting and recreational open space. - The City indicated the only sporting code normative need 	<ul style="list-style-type: none"> - The Master Plan will need to consider the regional requirements and position of the sports and community outcomes - The redevelopment of Pioneer Park, given the site constraints would not be seen as a high priority for the City. - The City would like to work with the Shire to achieve socially, 	<ul style="list-style-type: none"> - There is an high risk associated with the Shire pursuing the redevelopment of Pioneer Park without having regard to the City of Belmont's needs and regional approach to the development of public open space

Organisation	Comments/Issue	Implications to the Master Plan	Risk Associated to the implications
	<ul style="list-style-type: none"> not currently being met within the City was soccer. Confirmed that the position of Pioneer Park was not in keeping with their strategic direction and the City would not support the redevelopment of Pioneer Park and expressed the concern that the potential cost benefit to the community would likely be low. 	environmentally and economic sustainable outcomes for the user groups of Pioneer Park	
Department of Education	<ul style="list-style-type: none"> The Darling Range College is an independent school which has the responsibility to manage and negotiate the development and shared use of the school and its grounds. DoE therefore have limited influence over the extent of community use which could be secured. The Department of Education (strategic planning unit) would be willing to liaise and would promote the shared use of the school and would be willing to arrange further discussion if the matter was to be pursued. 	<ul style="list-style-type: none"> There is a possibility to revisit the shared use of Darling Range school. However the school were consulted during the development of the Darling Range Master Plan and it has been resolved that pursuing this option further would not be viable. 	<ul style="list-style-type: none"> Opportunities in previous reports have identified this was not an option. However if the Shire wishes to reconsider this as an option the Department of Education would consider the possibility.

Overall the consultation highlighted the current state of Pioneer Park as being substandard and not fit for sporting club use. As identified within the Risk Associated with each implication, a decision therefore needs to be made immediately on the viability of the continued and future use of the reserve. The clubs have also indicated that they would like to see improved communication and support to reduce the risks to their members and the community with the continued use of Pioneer Park.

The outputs from the consultation process revealed that there is a need to provide rectangular and diamond playing fields for training and competition for the Kalamunda community. It also highlighted that the cost benefit of redeveloping the reserve would need to be fully explored to warrant substantial financial and resource commitment. The potential problems highlighted by various groups indicated that significant investment would be required to merely remediate the reserve to enable viable playing pitch surfaces to be developed. The Master Plan must therefore consider and detail the cost benefit and risks associated within its recommendations.

It is recommended based on the above information and risk associated that the Shire does not continue to use Pioneer Park in its current condition, find alternative location for the rugby club, with due regard to improved communication and the need to complete a full (competition) season. It is also further recommended that the Shire gives assistance to the Rugby club with regard to lighting poles and work in conjunction with the City of Belmont to determine whether a joint regional approach could be developed to facilitate the requirements for softball and rugby for both communities.

4.0 Case Studies

The following information was collated to support the situational analysis and site assessment of Pioneer Park. The two case studies referenced are examples of the investigation and development on former landfill and contaminated sites.

Brockway was deemed to be low cost benefit / high risk and was not pursued for development. However the Blackman Park development in New South Wales was considered to be highly beneficial to the community and the redevelopment and validation of the site was completed.

The decision to develop Blackman Park was considered necessary due to no alternative options being available to create an open space to meet the needs of rapid urban growth and high density within the area. The cost benefit undertaken including the extensive method of construction (and its associated cost) was deemed critical to develop facilities to meet the need of the community and ultimately secure funding to provide open space capable of high use.

Table 4 Case Studies Explored

Case Study	Similarities	Outcomes (Costs)	Actions Taken
Brockway – UWA Playing Fields WA - Investigated as part of the site selection for the development of the State Rugby facility and 4 years of investigation was conducted by the State Government.	<ul style="list-style-type: none"> - Groundwater quality and availability was limited. - Risk Assessment of the site highlighted numerous “extreme” risks which would require lengthy and costly mitigation measures. - Ongoing sustainability of the site was considered extremely low and the asset management of the site would create a burden to the state. 	<ul style="list-style-type: none"> - The state would have had to invest in the vicinity of \$30 million dollars to remediate the site to acceptable playing field standard. There was no further analysis done on the cost of developing infrastructure on the site as it was deemed unfeasible to pursue the development. 	<ul style="list-style-type: none"> - Risk Assessment considered the development a high risk and financially not viable to produce a high quality state playing field with necessary floodlighting requirements.
Blackman Park – NSW - A reserve located within a development of NSW – Lane Cove 7km from Sydney CBD.	<ul style="list-style-type: none"> - The development of an existing reserve (previously a tip site) for 2 additional synthetic rectangular pitches. - The high population and housing targets from the State Government and Local Government Planning Scheme indicated a desperate need to identify an appropriate site for sport and recreational use which could meet current and anticipated need. 	<ul style="list-style-type: none"> - There is a lack of open space and no other large lots space available for purchase. - Truck Movements in a residential area – nearly 1,000 trucks for fill alone in 1 month period was required. Approximately 800 concrete truck movements for slab and piers were required. - Location and impacts of old stormwater system – there was a need to construct a new creek and wetland at a cost of nearly 	<ul style="list-style-type: none"> - 5 years of investigation to develop the site was conducted. - Cost benefit of developing the site for playing fields (synthetic playing field) to cater for built infrastructure and intense use to cater for population and housing densities was high as there were no alternative options available. - Over 20,000m³ of fill was brought to site to provide levels required for slab construction.

Case Study	Similarities	Outcomes (Costs)	Actions Taken
		<p>\$500,000.</p> <ul style="list-style-type: none"> - Dust on a large site - difficult to provide adequate dust management. - Increased use (wear & tear) of Council's other sports fields for cricket, soccer, & AFL – playing & training whilst site preparation works and construction was being undertaken. - Lights for training on adjacent fields are now currently inadequate as old light poles were removed temporarily whilst works underway. - Weather - Over 40 days were lost to rain between January and May - Cost – Close to \$7.5 million. However, similar size fields on established housing blocks would require purchase of at least 18 dwellings (at over \$1M per property). 	<ul style="list-style-type: none"> - Piling required between 8 and 28 metres in depth x 246 piles = 800m³ of concrete - Piling Rig – 70 tonne, maximum drilling depth 30 metres - Slab construction – 4,000m³
<p>Hong Kong</p> <ul style="list-style-type: none"> - Suen Wan Landfill - Sai Tso Wan Recreation Ground <p>North Brabant Holland</p> <ul style="list-style-type: none"> - Gulbergen landfill - Eindhoven Waste Precinct - The Fold (Office Complex) <p>United Kingdom</p> <ul style="list-style-type: none"> - Cross Lane Landfill – Wirral, Liverpool, - Mostenvale Landfill - Manchester, UK - Kenmuir Site, Glasgow, UK - Summerston Landfill, Glasgow - Giants Park, Belfast, UK 28. 	<ul style="list-style-type: none"> - Other case studies were assessed as part of the analysis, particularly in relation to the development of sporting infrastructure on tipped / unstable land. Predominantly however, these related to motorsport and golf. 	<ul style="list-style-type: none"> - Cost – Varied from \$3 to \$15 million. 	<ul style="list-style-type: none"> - All determined that there was no alternative parcels of land and the location and cost associated with each development was considered appropriate to the benefit to the community

Figure 12 Blackman Park Information

PROJECT REPORT

Blackman Park Lane Cove

Location: Lane Cove, NSW
 Client: Lane Cove Municipal Council
 Contractor: Australian Prestressing Services Pty Ltd

To provide a more serviceable sporting field in the area, Lane Cove Council is undertaking the installation of a synthetic sports surface on an old landfill dump site. Until recently this area had a sports field operating on top of a soil layer placed above a decomposing rubbish dump.




Generally, landfill sites are continually sinking and produce a very uneven playing area that requires continuous maintenance to be fully utilised. To overcome this problem, Lane Cove Council is placing a synthetic field on a concrete slab. This provides a surface with a long term solution, almost maintenance free, and with correct establishment and lighting it can provide many extra hours of use in all weather, year round. The concrete slab on piles down through the landfill allows the fill material to settle further over time and not disrupt the playing fields.

Many suburban Councils are finding it increasingly difficult and expensive to provide good quality playing surfaces. Where landfill sites or other areas are available but unsuitable for a high standard of playing finish, the concrete slab and synthetic surface provides a very efficient solution. A concrete slab with a built in gas collection system also provides a great seal against unwanted toxic leakage and allow gas collection if necessary.

In January of this year, Lane Cove Council awarded Australian Prestressing Services (APS) a design and construct contract to complete an 18,750 m² (150 m x 125 m) sealed slab over an old landfill site at Blackman Park adjacent to the Lane Cove River.

The site, when completed with its synthetic surface will provide for a cricket pitch, and two soccer or rugby fields or AFL field. The site will be secured and served with an excellent lighting system. Because of the very high level of concrete finish the surface will drain in a way that it provides all weather playing.

This particular site had landfill placed in depths from 2 metres to 29 metres deep. Originally, the site was a valley that had a stream running through it to the river. Bedrock is generally sandstone with a steep profile down to the original creek bed, up to 30m below.



APS chose a design using a post-tensioned slab on piles to support the synthetic surface.

Work on site commenced in January with the placing of approx. 23,000 m³ of fill obtained from nearby excavation sites.

Piling commenced with bored piers at 9m centres down to approx. 10m then CFA piles for all others down to 30m total depth. All piles were 400 mm diameter reinforced concrete with pre-welded reinforcing cages. Piles were completed with a 2m x 2m x 400mm pile cap, poured integrally with the pile. The post-tensioned slab was designed to float on these pile caps initially, to be later fixed with dowels after all stressing and initial shrinkage.

Because of its large size the slab was poured in eight large pours with smaller perimeter and infill pours. Smaller infill pours completed the cricket pitch areas and perimeter paths. A drainage system was cast around the perimeter to control surface run off and taken into the existing drainage system.

The synthetic turf is made up of a series of layers. First is a conventional solid drainage cell mat. On top of this is placed a rubber base, with the turf then laid in wide mats over the rubber. When placed, the turf is filled partially with a synthetic backfill and then a loose sand fill to give a more realistic feel to the playing surface.

The field when finished should have a surface that has the characteristics of a lawn with significantly more durability.

Some of the statistics for the project are listed below:

PROJECT STATISTICS

Slab Area:	18,750 m ² (150 m x 125 m)
Synthetic Pitch Area:	16900 m ² (116 m x 116 m)
Supporting Fill:	22,000 m ³ compacted backfill
Piles:	256 bored and CFA to 30 m depth each 400 mm diameter
Total Length of Piles:	4,970 LM
Slab Concrete:	5,000 m ³ approximately
Reinforcement & Mesh:	160 T and 20,000 m ² approximately
Post-tensioning:	120 T
Gas release pipes:	650 LM
Drainage:	270 m of 375 mm diameter with suitable pits
Electrical:	6 x high mast lights
Playing Field:	1 x cricket pitch that can be lowered when not in use, allowing play over the top 1 x AFL playing field or 2 rugby fields or 2 soccer fields

There are a number of examples where sites have been abandoned as a result of underground subsidence resulting from mine workings / tipped sites and where clubhouse buildings have been constructed on unstable land. No other sites were identified with similar circumstances to that which exist at Pioneer Park.

5.0 Opportunities & Constraints

5.1 Core Influences

A review of documents, site and situational analysis has reinforced the need to fully explore and understand the implications and costs associated with a sustainable long term redevelopment of Pioneer Park. There is a normative need for rugby playing fields and for a regional level (association) provision for diamond sports. However the most important consideration is the need to provide flexibility in any new / enhanced development and ensure the opportunity for multiple uses of open space is available to cater for demographic changes and emerging trends as a site evolves.

The development of large open areas for training and competition allows for numerous rectangular and diamond sports to be played as trends and demands change over time. This section of the Master Plan report summarises the key issues and opportunities that have arisen from the research and analysis.

Planning

- The site is currently zoned Parks/Reserve and Bush forever.
- There are environmentally significant issues and land use implications which will need to be considered in the development of the site.
- A Contaminated Site and Environmental Management Plan(s) associated with the development of the site would need to be approved by the Department of Environment.
- The development of the site must adhere to numerous state and local policies and strategies.

Sporting Uses

- Projected population growth and increases in junior sports participation indicate that better quality playing fields that can sustain additional use are required on this site. The need for additional infrastructure is consistent with demand which will emerge from the population growth characteristics of the Perth Hills region.
- The anecdotal gap of the lack of playing fields within previous reports was not substantiated, though the investigation and research defined the need for more flexible and fit for purpose open space. The demand for sustainable playing fields is likely to increase even with the provision of district level infrastructure at surrounding reserves.
- Sporting facilities at Pioneer Park will need to complement other opportunities that exist or are planned across the Shire and surrounding local government areas to avoid a duplication of projects / facilities. This should include proposed opportunities within the City of Swan (proposed Regional Open Space), City of Belmont and the City of Armadale to the south.
- The use of flexible solutions will be important for maximising multi-use and changing use as community demands and the demographic profile vary over time.

Open Space Uses

- Previous planning studies have identified gaps in quality sporting open spaces.
- Passive recreation parkland is well catered for within the Shire and surrounding area.
- Public facilities such as, park infrastructure, public artworks, pathways and amenities are needed to cater for casual / informal reserve users.
- The residential developments (current and projected) within the vicinity of the Pioneer Park have created a demand for a family and children services community hub. The greater number of people in an area inevitably results in increased participation across a variety of sport and recreational activities and in particular the growth in young families creates a high interest in play and leisure pursuits.

Schools

- There is an opportunity to develop better and more effective joint school / community facilities for sport, recreation and other activities. To undertake this, it is important to develop and realise good partnerships.

Built form

- Built facilities such as sporting pavilions will be required to support sporting uses and other community activities. Such facilities will need to be well positioned and have the capacity to cater for multiple playing fields / sports simultaneously.
- Sporting Pavilions will need to be flexible and wherever possible (and practical) include multi-use community spaces and provide meeting rooms for local clubs and community groups needing a home.

Access and linkages

- It is recognised that Pioneer Park is relatively isolated from the extended Kalamunda community and the Roe Highway provides a significant barrier to use from the west. Any future redevelopment of the reserve will need to ensure safe and efficient pedestrian and cycle links are provided across Roe Highway.
- Access roads, car parking and pathways through the site will need to consider land stability within the site. Additional traffic volumes into the area will require careful planning to provide safe entry, parking and exit for vehicles, cyclists and pedestrians.

Infrastructure

- The layout of facilities needs to be flexible in design. Sustainable principles of design, operation and management have been considered throughout the Master Plan.

Consultation

- The Master Plan has engaged and consulted with all primary stakeholders and established their needs and considered their facility requirements and potential to contribute and manage facilities. Whilst the wider community is yet to be consulted, their potential use of Pioneer Park has been considered and incorporated in the development. This however will need to be reviewed following a public advertisement period and subsequently on an ongoing basis.

Capital Contribution

- Best and highest benefit to the Shire and the community has been considered in the financial implications for the redevelopment of the reserve.

Quality

- Increasingly, the community is looking for and willing to pay for quality sporting and recreation services. If what they want to use is not of a sufficient standard, they will go elsewhere. The Master Plan has considered quality and sustainable principles for all opportunities presented.

Hours of Operation

- The Master Plan has considered that the WA community has changed the way it uses its time. Flexible working arrangements; the impact on the mining industry; changes to shopping hours; changes to national sporting leagues and championships and changing family relationships have all meant that the tradition of weekend sports has been redefined to be spread across the week at extended time periods.
- Many activity structures have changed which, amongst others, includes playing on week nights rather than on weekends and shorter but higher intensity games (i.e. 20 / 20 cricket, 3 on 3 basketball, small sided soccer etc.).

Master Planning

Specific issues that have been addressed through the preparation of this Master Plan are:

- Understanding the entire sub surface and surface environmental constraints and considerations and their impact (environmental, social and economic) on the preparation of the Master Plan and any future development of Pioneer Park.
- Providing quality and sustainable sporting infrastructure to relieve the pressure on clubs and competitions as well as responding to projected population growth, particularly providing for increased junior participation and changes to demographics within Kalamunda and the broader region.
- The need to plan and construct facilities using environmentally sensitive design principles, including use of better urban water sensitive design principles that make the site as self-sufficient as possible for irrigation purposes.
- Ensuring construction of quality buildings that are multi-use, provide for all users and sited to consolidate storage, change, clubroom, public toilet and social meeting facilities in a minimum number of built structures
- Providing good traffic and pedestrian management both into and throughout the reserve, ensuring safety and good access.

Mitigating Risks

The following sites within the Shire have been considered in response to the risks identified within the risk assessment:

- Consider relocating the rugby club in the short term to Morrison Oval sharing with cricket club, with the intention to provide an additional playing field (1.78ha) by mid-2016.
- Consider currently a feasibility to upgrade and repurpose Maida Vale Reserve in light of the folding of the netball club to relocate rugby for the future.

5.2 The Design Approach

This section highlights the design principles which have underpinned the preparation of the Master Plan. It needs to be noted; due to the former land uses and environmental considerations within the reserve the following approaches were considered imperative to the redevelopment of Pioneer Park:

- Provide for current and future sports demands within the Shire;
- Provide built infrastructure to support relevant sporting activity;
- Encourage informal recreation activity by the general community;
- Create safe access and integrated movement through the site; and
- Promote the natural environment and sustainable development.

Water / Climate / Environmental Considerations

Through discussions with the majority of local government partners and key state government agencies the relevance of global warming, water shortages, energy costs and other environmental issues were emphasised. These aspects are having a significant impact on the service provision and access to good quality, well maintained facilities. The following is provided as a checklist for considering Environmentally Sustainable Design (ESD) initiatives as part of any redevelopment proposal. It should be noted that a number of these aspects relate to detailed design, but are nevertheless important considerations for the Master Plan and its associated cost assessment.

Energy Conservation

The features to be considered in developing upgrading existing built infrastructure in relation to energy conservation include:

- Control systems which may include energy smart lighting control and localised light switches;

- Smart Meters to monitor energy consumption;
- Solar boosted hot water system;
- Generous use of natural daylight by a combination of glazing, skylights and appropriate shading to reduce the reliance on artificial lighting;
- Increased levels of insulation;
- High performance glazing;
- High level roof and natural ventilation;
- Movement sensor light switches; and
- Energy efficient air conditioning.

Water Conservation

The features being considered as part of the design process in developing new facilities and upgrading existing infrastructure in relation to water conservation include:

- Rainwater collection and reuse for irrigation;
- Water efficient hydraulic services;
- Waterless urinals;
- Bio Swale;
- Landscaping design to consider sun and wind protection, native vegetation and low water use; and
- Stormwater harvesting and wastewater treatment and use.

Enhancement of the Indoor Environmental Quality

Main features should include:

- Passive natural ventilation through operable windows;
- Natural lighting.

6.0 Recommendations and Capital Expenditure Plan

6.1 Recommendations

The following section is a Strength Weakness Opportunities and Threat (SWOT) Analysis on the options identified:

- a) Option 1: Redevelop Pioneer Park within known constraints and considerations
- b) Option 2: Redevelop Pioneer Park with optimal layout within the existing site considerations and constraints
- c) Option 3: Consider alternative location and don't redevelop Pioneer Park
 - 3.1: A feasibility of the redevelopment of Maida Vale Reserve (formerly the home of the Maida Vale Netball Association) to cater for Rugby and Softball.
 - 3.2: Investigate the development of freehold land, strategically located to meet the needs of the community into the now and into the future.
 - 3.3: Explore alternative land uses and possible rationalisation for Pioneer Park in the long term.

Concept plans were provided for the two options for the redevelopment of Pioneer Park:

- Option 1: Redevelop Pioneer Park within known constraints and considerations
- Option 2: Redevelop Pioneer Park with optimal layout within the existing site considerations and constraints

It is estimated that the total cost associated with environmental approval and remediation is approximately \$30-50million. This would need to be undertaken prior to any construction and pitch development works are commenced.

The capital costs associated redevelopment of Pioneer Park for Option 1 and 2 has been based on current day cost benchmarks and are shown in table 5.

Table 5 Capital Costs per option

Option 1		Option 2	
Works	Costs	Works	Costs
Building Works	\$2,160,637.50	Building Works	\$2,160,637.50
Site Works and External Services (including playing fields and lighting)	\$3,547,316.25	Site Works and External Services (including playing fields and lighting)	\$3,766,691.25
Contingencies & Professional fees	\$3,905,310.63	Contingencies & Professional fees	\$4,055,404.27
Total Cost	\$9,613,264.38	Total Cost	\$9,982,733.02

The total cost of the redevelopment of Pioneer Park with environmental approval, remediation, associated pitch infrastructure, and servicing is approximately \$40-60million. No account was taken in this assessment of the escalation costs which could, based on present day assessment be between 2% and 3% annually.

The Lifecycle cost associated with the full development indicates that over a 30 year period this would amount to approximately \$6-12 million including CPI. The full analysis of the lifecycle costing will be determined once the Shire has made a decision on the option they wish to pursue.

Table 6 SWOT Analysis of all Options

Option	Strength	Weakness	Opportunity	Threat
Option 1: Redevelop Pioneer Park within known constraints and considerations	<ul style="list-style-type: none"> - Known constraints can give guidance to options available - The community continues to have access to open space - Improved efficiencies 	<ul style="list-style-type: none"> - Financial commitment - Does not achieve a sustainable opportunities - High to extreme risks associated with this option - Sustainability of the site - Does not meet the needs of the community and the region into the future - Inability to meet strategic objectives and state government requirements (funding opportunities) 	<ul style="list-style-type: none"> - History of clubs within the location continues - To improve service and infrastructure to the site 	<ul style="list-style-type: none"> - Risks to finances, social aspirations, health, holistic resilience and environment - Seriously and critical incident occurs
Option 2: Redevelop Pioneer Park with optimal layout within the existing site considerations and constraints	<ul style="list-style-type: none"> - Known constraints can give guidance to options available - The community continues to have access to open space - Improved efficiencies - Club have access to modern community facilities and the ability to grow clubs - Softball Association is reactivated and contributes to community health and wellbeing 	<ul style="list-style-type: none"> - Unknown constraints effect the time, quality, scope and cost of the project - Financial commitment and burden is great - Does not achieve sustainable opportunities - High to extreme risks associated with this option - Ongoing sustainability of the site not achieved - Does not meet the needs of the community and the region into the future - Inability to meet strategic objectives and state government requirements (funding opportunities) 	<ul style="list-style-type: none"> - History of clubs within the location continues and is improved - Improved performance of services and irrigation - Create a community hub with additional services offered to the community 	<ul style="list-style-type: none"> - Risks to finances, social aspirations, health, holistic resilience and environment - Seriously and critical incident occurs
Option 3a: A feasibility of the redevelopment of Maida Vale Reserve (formerly the home of the Maida Vale	<ul style="list-style-type: none"> - Improved efficiencies - Club have access to modern community facilities and the ability to grow clubs - Softball Association is reactivated and contributes to community health and wellbeing - Ability to obtain funding to conduct the feasibility 	<ul style="list-style-type: none"> - Does not meet the needs of the community and the region into the future - Financial considerations - Ongoing sustainability of the site not achieved - Apply for funding to conduct the feasibility 	<ul style="list-style-type: none"> - To improve service and infrastructure to the site - Create a community hub with additional services offered to the community - Create a home for diamond sports - Continue to provide improved opportunities 	<ul style="list-style-type: none"> - Site is not capable of meeting the requirements of rugby and softball - Clubs aspirations are not met - The Shire needs to allocate substantial funds to redevelop the

Option	Strength	Weakness	Opportunity	Threat
Netball Association) to cater for Rugby and Softball.	<ul style="list-style-type: none"> - Improved and increase participation within the sports - Reuse of an existing community asset 		<ul style="list-style-type: none"> - within an existing sporting catchment - Mitigates the risks associated with Pioneer Park 	<ul style="list-style-type: none"> - site - Site is unable to sustain the ongoing management, operation and sustainability of the community - Strategic and regional needs are not realised.
3b: Investigate the development of freehold land, strategically located to meet the needs of the community into the now and into the future.	<ul style="list-style-type: none"> - Improved efficiencies - Ability to obtain funding to conduct the feasibility - Improved and increase participation within the sports - Better meet the needs of the future 	<ul style="list-style-type: none"> - Conduct a detailed investigation of the most appropriate location - Assumptions and projections need to be relied on to achieve the best outcome for the community 	<ul style="list-style-type: none"> - Create effective and efficient modern community facilities - Create a community hub with additional services offered to the community - Continue to provide improved opportunities within an existing sporting catchment - Mitigates the risks associated with Pioneer Park 	<ul style="list-style-type: none"> - Site is not capable of meeting the requirements of rugby and softball - Clubs aspirations are not met - The Shire needs to allocate substantial funds to redevelop the site - Site is unable to sustain the ongoing management, operation and sustainability for the community - Strategic and regional needs are not realised.
3c: Explore alternative land uses and possible rationalisation for Pioneer Park in the long term.	<ul style="list-style-type: none"> - Reuse of an existing community asset - Create financial opportunities to offset other options - Alternative source of revenue and or environmental outcomes 	<ul style="list-style-type: none"> - Changing environment within the area and within Pioneer Park - Environmental considerations may limit opportunities 	<ul style="list-style-type: none"> - Mitigates the risks associated with Pioneer Park - Create effective and efficient management of the site - Reinvestment of a community asset 	<ul style="list-style-type: none"> - Strategic and regional needs are not realised. - Potential loss of useable open space to the community - Damage to the Shire's reputation, environment and risks realised

The SWOT Analysis has identified that Option 1 and 2 weakness and threats are considerable with little strengths and opportunities. It further demonstrates that Option 3a has the greatest strengths and opportunities (short and long term) for the sustainability of the rugby club. It also creates opportunities for the reactivation of the softball association within the Shire.

The information within the SWAT Analysis was considered along with the following implication and approaches required to implement Options 1 and 2. The section below further details the requirements to implement Option 1 and 2, which has been given considerable weight in the development of the recommendations.

Environmental Investigations

The following highlights the indicative approach within an Environmental Investigation which will be required for the redevelopment of Pioneer Park. The scope of work needs to consist of a review of previous investigations including identification of data gaps; development of a Sampling and Analysis Plan (SAP) for the investigation; the implementation of the approved SAP an assessment of the risk to adjacent receptors and reporting of the investigation findings.

The following requirements will need to be undertaken within a 2-3 year time period and will cost approximately \$300,000 to \$725,000 depending on the amount of wells/monitors/surveys and pits and time required.

Table 7 Overview of Environmental Investigation Approach

Project Stage	Task
Project Preliminaries	<ul style="list-style-type: none"> - Project establishment and administration - Project kick off meeting - Development of Health and Safety Plan (HSP) and Safe Work Method Statements (SWMS)
Preliminary Site Investigation	<ul style="list-style-type: none"> - Review of previously completed site investigations and site history information - Data gap analysis - Development of a Conceptual Site Model - Preparation and provision of a Preliminary Site Investigation Report
Sampling and Analysis Plan (SAP)	<ul style="list-style-type: none"> - Development of detailed Sampling and Analysis Plan outlining requirements for site investigation
Ground Gas Investigation	<ul style="list-style-type: none"> - Installation (where required) of ground gas wells - Monitoring at ground gas wells
Detailed Site Investigation	<ul style="list-style-type: none"> - Groundwater well installation (where required) and groundwater sampling - Limited soil sampling within surface capping materials - Laboratory analysis of soil and groundwater samples
Site Investigation Reporting	<ul style="list-style-type: none"> - Review of results and risk assessment - Preparation and provision of a Landfill Gas Investigation Report - Preparation and provision of a Detailed Site Investigation Report
Fauna Investigation	<ul style="list-style-type: none"> - Review of previously completed site investigations and site history information - Data gap analysis - Development of a Conceptual Site Model - Preparation and provision of a Preliminary Site Investigation Report
Vegetation survey	<ul style="list-style-type: none"> - Vegetation and flora surveys would need to be undertaken between September and the end of November (spring) - Reports for survey
Geotechnical Report	<ul style="list-style-type: none"> - Review of previously completed site investigations and site history information

Project Stage	Task
	<ul style="list-style-type: none"> - Data gap analysis - Development of a Conceptual Site Model - Preparation and provision of a Preliminary Site Investigation Report - Development of detailed Sampling and Analysis Plan outlining requirements for site investigation

Planning

The following requirements will need to be undertaken within a 1-2 year time period and will cost approximately \$200,000 to \$1million depending on the amount time, resources and information required.

Table 8 Approvals and Clearances

Project Stage	Task
Various environmental Approvals and Clearances from numerous State Government Departments	- Prepared and Submitted
Development Application	- Prepared and Submitted
Building Permit	- Prepared and Submitted

Remediation Works

The following requirements will need to be undertaken within a 1-2 year period and will cost approximately \$20 million to \$30million depending on the amount of remediation and time required.

Table 9 Overview of Approach

Project Stage	Task
Project Preliminaries	<ul style="list-style-type: none"> - Project establishment and administration - Project kick off meeting - Development of Health and Safety Plan (HSP) and Safe Work Method Statements (SWMS)
Preliminary Site Investigation	<ul style="list-style-type: none"> - Review of previously completed site investigations and site history information - Preparation of Environmental Management Plan for the remediation of the site
Removal of top soil to expose capping	<ul style="list-style-type: none"> - Mobilisation of earth moving equipment - Disposal of excavated material
Remediation of failed capping	- Installation (where required)
Installation of web stabilisation material	- Installation
Clean fill laid	- Mobilisation of earth moving equipment
Service and sewer conduit installed	- Installation
Irrigation Installed	<ul style="list-style-type: none"> - Installation - Testing
Lighting installed	<ul style="list-style-type: none"> - Installation - Testing
Turf installed	<ul style="list-style-type: none"> - Installation - Establishment time

Detailed Design

The following requirements will need to be undertaken within a 12 month period and will cost approximately \$350,000 to \$1million depending on the amount of time and resources required.

Table 10 Detailed Design of Built Urban form

Project Stage	Task
15% Design	- Concept and schematic design - Development Application
85% Design	- Amendments and Council Approval - Quantity Survey completed
100% Design and tender documentation	- Documentation and procurement - Contract Administration

Construction

The following requirements will need to be undertaken within a 1-2 year period and will cost approximately \$1 million to \$3 million depending on the amount of time and resources required.

Table 11 Construction

Project Stage	Task
Preliminary Works	- Mobilisation and handover to construction contractor
Construction of built form	- Construction
Landscaping and associated infrastructure	- Installation
Fit out & opening	- Practical Completion - Certificate of Building and Occupancy - Grand Opening

Option 3a: A feasibility of the redevelopment of Maida Vale Reserve (formerly the home of the Maida Vale Netball Association) to cater for Rugby and Softball.

It is recommended that the Shire prepare a Business Plan and Scope of Works for a Request for Quote to go out to market for a feasibility study for the redevelopment of Maida Vale Reserve. This would provide a current fit for purpose facility for the community and in line with forecast population increases within the suburb.

Option 3b: Investigate the development of freehold land, strategically located to meet the needs of the community into the now and into the future.

A number of urban investigation areas have been identified as part of the Master Planning of the foothills area, these include Maida Vale South and East, Forrestfield North and Wattle Grove. Future planning of these areas will require consideration of suitable locations for sporting fields as part of the public open space provision.

Using the following criteria, forecast id, and direction from the Shire Officers (suggested areas to pursue: Maida Vale South and East, Forrestfield North and Wattle Grove), an alternative site has been explored; high level spatial analysis of an alternative location (recommended suburb) within the Shire of Kalamunda.

Criteria:

- Location
- Capability (i.e. size of land relative to the needs of the sport and topography)
- Servicing (direct access to water, power)
- Accessibility
- Access to public transport

- Ownership
- Zoning – current
- Known environmental constraints.

Figure 13 indicates that the Maida Vale South and East, and Wattle Grove have the highest forecast development growth.

Figure 13 Forecast dwellings and development map

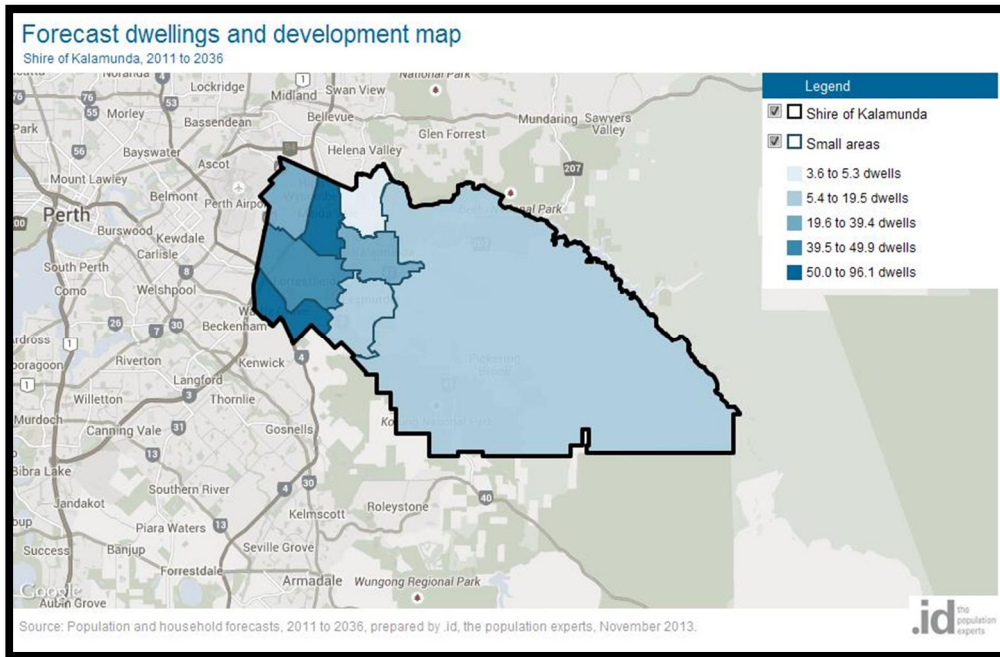
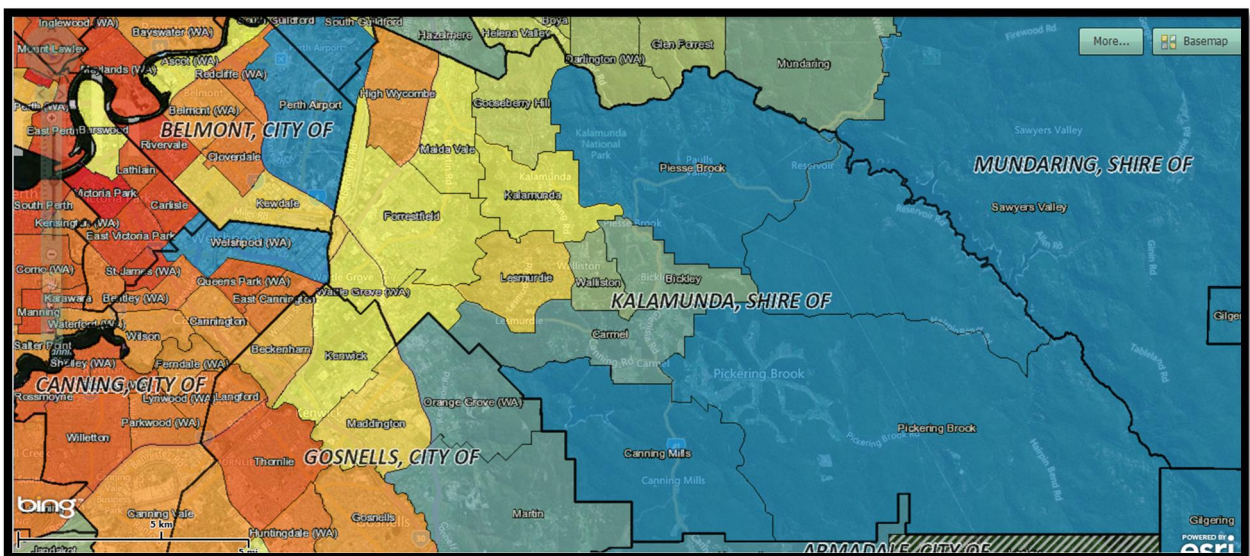


Figure 14 references the 2011 Census Population density in the Shire of Kalamunda. Wattle Grove and Maida Vale South currently have the highest densities, with Wattle Grove not having any current district playing fields.

Figure 14 Shire of Kalamunda Population Densities



It is recommended from the high level analysis that land options within Wattle Grove be pursued and investigated further to meet the needs of the community into the future.

7.0 Concept & Costings

7.1 Concept

Following a detailed analysis of the site condition's and environmental constraints, it became evident that a number of options needed to be considered to provide the Shire with sufficient clarity on the future direction for the site, existing user groups and the financial implications.

The following options are recommended to be considered as a result of the Master Plan investigations:

- 1) Option 1: Redevelop Pioneer Park within known constraints and considerations
- 2) Option 2: Redevelop Pioneer Park with optimal layout within the existing site considerations and constraints
- 3) Option 3: Consider alternative location and don't redevelop Pioneer Park. In order to develop this option 3 additional matters need to be considered
 - a) A feasibility of the redevelopment of Maida Vale Reserve (formerly the home of the Maida Vale Netball Association) to cater for Rugby and Softball.
 - b) Investigate the development of freehold land, strategically located to meet the needs of the community into the now and into the future.
 - c) Explore alternative land uses and possible rationalisation for Pioneer Park in the long term.

The table below identifies the requirements for each option with associated costs and time required:

Table 12 Capital Expenditure Plan with estimated costs and time requirements

Option	Environmental Investigations	Planning	Remediation Works	Detailed Design	Construction	Total Cost
Time	2-3years	1-2 years	1-2 years	12 months	1-2 years	
1	\$300,000 up to \$725,000	\$200,000 up to \$1million	\$20 million up to \$30million	\$350,000 up to \$1million	\$1million up to \$3million	\$30-50million
2	\$300,000 up to \$725,000	\$200,000 up to \$1million	\$20 million up to \$30million	\$350,000 up to \$1million	\$1million up to \$3million	\$30-50million
3a	12 weeks to complete feasibility study					\$35,000
3b	4 weeks to complete site selection and investigation report					\$10,000 - \$15,000
3c	12 weeks to complete feasibility study					\$25,000

It is estimated that the total cost associated with environmental approval and remediation is approximately \$30-50 million. This is over and above the capital costs identified above and the investment would need to be made prior to any construction and pitch development works are commenced.

Table 13 overleaf identifies the potential redevelopment costs of the site when working within the identified constraints and limitations (Option 1). The capital cost has been based on current day cost benchmarks.

Table 13 Option 1: Redevelop Pioneer Park within known constraints and considerations

Pioneer Park - Option 1				
Order of Cost estimate December 2014	Area	Unit	Rate	Total (\$)
Cost Summary				
Building Works				2,160,637.50
Site works and External Services				3,547,316.25
				5,707,953.75
ESD Allowances			3%	171,238.61
Loose Furniture and Fixtures			5%	293,959.62
Planning Contingency (10%)			10%	617,315.20
Design Contingency (10%)			10%	679,046.72
Construction Contingency (10%)			10%	746,951.39
Professional Fees and Disbursements (12%)			12%	985,975.83
Management Fees (4%)			4%	328,658.61
Public Art (1%)			1%	82,164.65
				9,613,264.38
Total Project Cost				
EXCLUSIONS:				
> Bore for Irrigation				
> Land costs				
> GST				
> Escalation beyond December 2014				



Master Plan Legend - 1:4000 @ A3

- ① PROPOSED SHARED PEDESTRIAN PATH (BY OTHERS)
- ② PROPOSED CROSS PARK PATH
- ③ PROPOSED NEW ENTRANCE
- ④ PROPOSED ROAD
- ⑤ PROPOSED BUILDING
- ⑥ PROPOSED CAR PARK
- ⑦ PROPOSED PLAYGROUND
- ☼ FLOOD LIGHT
- ▶ SPECTATOR VIEWS



The optimal layout is provided on the following page and it meets the requirements of both rugby and softball (Option 2). The capital cost has been based on current day cost benchmarks.

Table 14 Option 2: Redevelop Pioneer Park with optimal layout within the existing site considerations and constraints

Pioneer Park - Option 2				
Order of Cost estimate December 2014				
	Area	Unit	Rate	Total (\$)
Cost Summary				
Building Works				2,160,637.50
Site works and External Services				3,766,691.25
				5,927,328.75
ESD Allowances			3%	177,819.86
Loose Furniture vand Fixtures			5%	305,257.43
Planning Contingency (10%)			10%	641,040.60
Design Contingency (10%)			10%	705,144.66
Construction Contingency (10%)			10%	775,659.13
Professional Fees and Disbursements (12%)			12%	1,023,870.05
Management Fees (4%)			4%	341,290.02
Public Art (1%)			1%	85,322.50
				9,982,733.02
Total Project Cost				
EXCLUSIONS:				
> Bore for Irrigation				
> Land costs				
> GST				
> Escalation beyond December 2014				



Master Plan Legend - 1:4000 @ A3

- ① PROPOSED SHARED PEDESTRIAN PATH (BY OTHERS)
- ② PROPOSED CROSS PARK PATH
- ③ PROPOSED NEW ENTRANCE
- ④ PROPOSED ROAD
- ⑤ PROPOSED BUILDING
- ⑥ PROPOSED CAR PARK
- ⑦ PROPOSED PLAYGROUND
- ⑧ FLOOD LIGHT
- SPECTATOR VIEWS



7.2 Risk Assessment

During the investigation and situational analysis it became evident that a Risk Assessment on possible scenarios needed to be conducted to inform the recommendations and ascertain the Shire's risk with the current operation and use of Pioneer Park as highlighted within Appendix E.

The context of this risk assessment comprised the identification of risks and associated treatments relating to the redevelopment of Pioneer Park and the Shire of Kalamunda in providing for community use; rectangular and diamond pitches and associated club support infrastructure.

The Risk Assessment highlighted which option has the greatest risk and makes recommendations on the option that should be pursued given the risk rating score:

- Option 1 has the highest risk
- Option 2 is the second highest risk
- Option 3a has the lowest risk with the most known constraints and the ability to further mitigate those.
- Option 3b and 3c have medium risk as a result of many unknown constraints.

8.0 Funding Opportunities

Department of Sport and Recreation manages the Community Sporting and Recreation Facilities Fund (CSRFF). CSRFF contributes toward the development of community level facilities in partnership with project proponents and local government. (Approximately \$7 million is available annually).

As there are no specific funding programs to contribute to the redevelopment of former landfill sites for recreational purposes there has been a need to explore all potential funding programs from community, state and national level having regard to the infrastructure providing a unique community resource.

All funding opportunities potentially available for the redevelopment of Pioneer Park are listed below in accordance with the various types of funding per category of administration:

- Local Funding
- State Government
- Commonwealth Government
- Other Possible Funding Options

Table 15 Funding Opportunities for the redevelopment of Pioneer Park

Potential Funding Source	Sporting Infrastructure
Federal Government Funding (various)	Potential
State Government Funding (various)	Potential
PPP / Private sector	Unlikely
CSRFF	Potential
Rate Levy	Unlikely
Other possible funding options	Potential

The above table provides a high level analysis of potential funding options. Whilst Public Private Partnerships (PPP) are referenced, it is recognised that for a PPP to be a viable proposition the overall development cost (not including additional remediation cost) is generally considered to be in excess of \$50m. It is highly unlikely that this project would attract any commercial investor on that basis.

9.0 Cost Benefit Analysis

The degree to which open space, sports and recreation contribute to the economic and social wellbeing of the community should be elevated due to the strong return on investment. One strong argument is that it attracts and retains residents and businesses to the local government and provides residents with the best possible quality of life. The theme of creating a high quality of life is echoed in the Shire of Kalamunda Strategic Community Plan.

There are three overarching benefits from open space, sports and recreation amenities to a community and local governments:

- 1) economic
- 2) social and
- 3) environmental.

The advantages of economic prosperity, environmental sustainability, alleviation of social problems can be divided into specific benefits, though many of these benefits are intrinsic or difficult to provide measurable observations. The attributes are:

- Increased property value (direct),
- Tourism (direct),
- Cost of recreation opportunities (savings),
- Health benefits (savings),
- Community cohesion (savings),
- Healthy waterways and ecosystems (environmental savings)

Parks and recreation systems provide an intrinsic value and benefit to the community. Economists call these activities “direct uses”. The value of activities such as team sports, individual exercise, nature watching, extreme sports and passive activities all hold value to the community.

Open Space and recreation facilities have been called the social fabric of the community. The wide variety of opportunities that are offered by local governments for residents to interact with each other through a common interest weaves the thread of relationships that build community.

These relationships and subsequent sense of community promotes cohesion that supports stronger, safer and better Shires / Cities. Any organisation that promotes this kind of community cohesion, whether a club, a school, religious institution, homeowners or advocacy groups adds value to a neighbourhood and, by extension the whole Shire / City.

There are many environmental benefits that contribute to the health and wellbeing of the community which result in increased recreation and leisure activity. The benefit of urban forest provide critical community infrastructure, alongside built infrastructure such as roads, paths and buildings.

The value of urban forests is demonstrated through: providing shade that reduces the urban heat effect and improves liveability and comfort, reducing energy costs by shading buildings reducing the need for heating and cooling, and improve air and waterways quality.

Open space and urban forests provide places for social and community interaction, improve visual amenity of neighbourhoods which increase the real estate value of homes and commercial properties and enhance the local economy.

These above benefits can be measured through the decrease in local government services provided, increased rates base, increase in workforce, tourism based spend within the region, decrease in requirement of health services, and decrease in motor vehicular infrastructure.

The intent of this information is to identify how parks and sporting recreation facilities contribute directly to the economic and social fabric of the community. The information provides a high level appreciation of the benefits of developing parks and open spaces. It is however difficult to quantify the results on every aspect as many outputs are perceived and do not have a direct monetary value.

In respect of Pioneer Park there is undoubtedly significant community benefit in developing a facility which provides for a defined community and sporting need. There is also significant potential value in protecting and enhancing the environmental assets associated with the site and remediating the land in order that current contaminants can be contained and water run-off controlled. Investment in developing the site would likely to marginally increase surrounding property values; provide for recreational needs; enhance community cohesion; provide an opportunity to increase health benefits and provide healthier waterways and systems. It would however have limited tourism value. The most significant issue however is the cost of remediating the site before any community infrastructure can be developed - approximately \$30-50 million based on current known constraints.

The cost benefit analysis in relation to Pioneer Park must therefore consider the overall cost of the development and the likely output which will be achieved from the community use of the facility. Where a similar level of sporting infrastructure may be provided elsewhere at a lower cost, but still performs a similar function, the value in developing Pioneer Park, given the investment required to remediate the site, is at best questionable. Alternative options should therefore be considered.

The Pioneer Park Master Plan in considering all the implications as outlined throughout the report has been developed taking into account both the needs of the sport and community groups, together with the likely cost implications to the Shire of its development. Whilst it is clear that the site can be developed, this will be at a significant cost and should not be undertaken without first exploring alternative and potentially more cost effective site options.

The recommended actions the Shire of Kalamunda needs to take to meet the needs of the community and understanding the cost benefit of redeveloping Pioneer Park are identified in table 16.

The recommendations have been broken down into the following timeframes.

Immediately: as soon as practically possible Short Term: 12 months to 2 years
 Medium Term: 3 to 5 years Long Term: 6 to 10 years

Table 16 Recommendations of the Master Plan

No	Recommendation	Timeframe
1	The Shire invites the rugby and softball clubs to a forum to report on the outcomes of the master plan. This ideally should be in the form of a risk assessment workshop and subsequently to collaborate on an ongoing basis with the clubs to provide ongoing transparent and open lines of communication.	Immediately
2	To mitigate the risks to the users of Pioneer Park and to the Shire, it is recommended that as soon as practically possible work towards relocating the rugby club for the start of the season to Morrison Oval within Hartfield Park Reserve. This would be an interim solution pending the identification and securing of suitable land for playing field development to provide a new home for the rugby club and diamond pitch sport.	Immediately
3	Undertake a feasibility study to identify potential options for the redevelopment of Maida Vale Reserve from netball courts into rectangular and diamond playing fields, with the principle outcome being to relocate the clubs on a prominent fit for purpose facility.	Immediately to Short term
4	Investigate the possibilities and availability of purchasing or other such arrangements of freehold land within the Forrestfield area as development occurs, which is centrally located within the urban growth areas to the east of Roe Highway.	Medium to Long term
5	Consider the possibility of other land use for Pioneer Park such as: <ul style="list-style-type: none"> - Flora and Fauna Offset area for developments within Perth - Other land uses (car park, transport depot) - Rationalisation of the reserve - Extreme Sports park - Super Golf and Foot Golf Course 	Long term


Appendix A



Document Review


It is important that the Pioneer Park Master Plan has a context which is consistent with current and previous studies outcomes and other planning directions and initiatives supported by the Shire of Kalamunda, therefore a review of relevant strategic planning documents and previous research was completed to identify key issues and recommendations that may impact on this plan.


The key document which provides the direction for the reserve is the *Dawson Avenue Former Landfill Preliminary Site Investigation May 2010*. In addition the Shire of Kalamunda's *Community Facilities Plan 2011 – 2031, May 2011*. These documents are referenced below with a summary of other key information ascertained from the review of previous research:



Table 17 Document Review for the development of Pioneer Park Master Plan

Document	Key themes/outputs	Implications for the Master Plan
<p>Darling Range Master Plan July 2013</p> 	<ul style="list-style-type: none"> - Commissioned to determine the future sporting needs of the Foothills community and to consider the options to meet these needs and prepare a Master Plan for the development of additional facilities for community use at the Darling Range Sports College. - It revealed that the development of the sporting fields and amenities at the College is not the most desirable solution to community need, or best use of Shire funds. - It also recommended alternative accommodation options which were considered to have superior outcomes. - The assessment of playing fields and their level of use and capacity suggested that a number of the reserves are already operating at or above capacity. - The most critical is overuse of the soccer fields at Hartfield Park. Pioneer Park is in a poor state and currently unfit for use. It needs to be returned to service to meet known need. - It projected the need for as little as 9.5ha to as much as 26ha by 2031. Combined with current constraints these two factors alone indicated the need for an additional playing field space. - The needs assessment identified the following key issues: <ul style="list-style-type: none"> • Darling Range Sports College would welcome new facilities but are unable to make any financial contribution or provide a long term tenure • The College's preferred facilities (AFL field, turf cricket wicket, baseball diamond, athletics track, tennis courts and a synthetic multi-use turf) do not coincide with currently identified community need • Hills District Softball Club has had to relocate to grounds outside of the Shire due to the poor condition of the playing fields, lighting and general amenities at Pioneer Park • It recommends that the Shire immediately plans for the remediation of Pioneer Park and for its return to service, supported by playing fields at the adjacent Dawson Park and potentially the Dawson Park Primary School. Clubrooms and lighting would be required to make Pioneer Park most effective. 	<ul style="list-style-type: none"> - Review the conclusions and recommendations from the report and ascertain if the findings and recommendations are applicable to the current and future community - This review will guide the investigation and recommendations for the Master Plan

Document	Key themes/outputs	Implications for the Master Plan
<p>Community Facilities Plan 2011 – 2031, May 2011</p> 	<ul style="list-style-type: none"> - The study was to establish the current needs of community facility and the future population of Kalamunda. - The Community Facilities Plan was intended to provide the strategic framework to guide community facility requirements, over the next twenty years or the following infrastructure. <ul style="list-style-type: none"> • Parks • Sports Grounds and Sporting Facilities • Recreation Centres • Aquatic Centres • Community Centres • Performing Arts Centres • Libraries - The Plan also focused on addressing the following key issues and challenges which emerged from the outcomes and findings, it suggests to adequately cater for the community facilities requirements of the current and future population Kalamunda needs to address the following issues <ul style="list-style-type: none"> • Low standard and quality of facilities • Existing backlog and growing new demand • Changing community needs and facility trends • Some facilities are residual to requirements • Uneven distribution and access to facilities 	<ul style="list-style-type: none"> - Consider the findings and recommendations which are imperious to the investigation and recommendations for the Master Plan
<p>Shire of Kalamunda Sporting Reserve Development Plan</p> 	<ul style="list-style-type: none"> - The aim of the plan as outlined by the Shire of Kalamunda is to, “identify specific issues and implications for the Shire, improvements needed and rationalisation of usage amongst the Reserves. - It covered short term (0 yrs-5 yrs) issues as a priority but also include provisions for the longer term (5 yrs-10 yrs) - From consultation trends in developments in the area of sporting reserve and facilities needs and the individual clubs were obtained. - Findings from the research showed that a number of the Shire of Kalamunda’s sporting reserves were being overused and could not sustain the current levels of usage whilst maintaining an appropriate level of sporting surfaces and facilities. - Increasing demands from users were also being experienced as they participated in higher levels of competition. - Over use is likely to be compounded with projected population growth and continued 	<ul style="list-style-type: none"> - Consider the findings and recommendations which are key to the investigation and recommendations for the Master Plan - Ascertain what recommendations have been undertaken and ensure these are taken into consideration within the Master Plan



Document	Key themes/outputs	Implications for the Master Plan
	<p>emphasis on increasing physical activity levels of the community.</p> <ul style="list-style-type: none"> - Strategies to employ to accommodate increased usage and improved quality of sporting reserves, that should be considered by the Shire of Kalamunda include; <ul style="list-style-type: none"> • Review sports delivery i.e., programming by sports • Review grounds maintenance strategies to ensure sound elements for quality and durable surfaces such as water supply, irrigation /reticulation, soil base and drainage capabilities. • Individual business plans for each reserve to guide and direct development and management of the sporting reserves. • Review sporting reserve infrastructure needs including policy development on standards of provision, minimising duplication, provision of multiuse facilities and the introduction of sound asset management and risk management practices. 	
<p>Dawson Landfill Site Post Management Plan</p>	<ul style="list-style-type: none"> - Management Plan of the site at the closure of the landfill site - Management of the gas generated from the land fill - Outlines staged development required for the revegetation and rehabilitation of the landfill site by section and by date period. - 1995 - beyond: period of works required under the agreement with the Land Fill Gas Operators and what is required by Council 	<ul style="list-style-type: none"> - Ascertain what was been completed and what was planned for the site. - It clearly outlines dates and responsibility of what was required to rehabilitate the site and its end use for diamond sport and rectangular playing fields.
<p>WA Gateway Project Proposed Bike Path</p>		<ul style="list-style-type: none"> - Acknowledge this may alter the concept and positioning of playing fields and infrastructure.



Document	Key themes/outputs	Implications for the Master Plan
<p>SERRAG Regional Sporting and Recreation Facilities Plan</p> 	<ul style="list-style-type: none"> - The aim of this Regional Sport and Recreation Facilities Strategy aims to build on the foundations of the 2004 strategy and identify priorities for provision of regional facilities over the next 5-10 year period. - It identified the level of need and demand that is currently experienced in the region, as well as the potential future levels of need and demand. The major findings from the stakeholder consultation included: <ul style="list-style-type: none"> • There is a general lack of active sporting space and active reserves, with the existing spaces suffering from issues associated with over-play • Sustainability and water management issues • There is a lack of alignment, partnerships and consultation of State Sport Associations with Local Governments. • The regeneration and redevelopment of existing infrastructure - key findings for the report include the following recommendations: <ul style="list-style-type: none"> • Coordinated Cross LGA Boundary Developments • Alignment with State Sporting Associations Strategic Facility reports and strategies. • Enhancement, Regeneration & Redevelopment or Rationalisation of Current Facilities • Active Sporting Reserves Ongoing research and analysis is required on the capability of reserves to meet the growing demand for formal pitch sport provision. • Rationalise and Regenerate Community Recreation Centres • Equine Provision Research should be carried out for the feasibility of a regional level Equestrian centre to be built within the SERRAG region, as a joint initiative between LGAs. • Provision of trails SERRAG should have a regional trails plan that links in with the Perth metropolitan trails plan. • Role of Curtin University • Asset Management. • Development of Relationships with strategic Partners • Cost & Access to Facilities • LGAs / SSA Relationship & Communication • Sports Development and Volunteer Development • Policy Intervention / Guidance • Water / Climate / Environmental Considerations • Ongoing Monitoring, Evaluation & Review 	<ul style="list-style-type: none"> - Ensure that the regional contents is acknowledged, especially during local government reform - Explore opportunities regional with neighbouring local governments - Ensure that sustainability and water management opportunities are explored - Shared use and partnerships with SSA and community organisations need to be explored to improve efficiencies - Asset Management and regeneration is a priority within the Master Plan.


Document	Key themes/outputs	Implications for the Master Plan
<p>Gas Monitoring Dawson Ave 14-12-12</p> 	<ul style="list-style-type: none"> - The report was to assess the risk to human health associated with the potential off site migration of landfill gases and vapours from the former Dawson Ave Landfill site - Conclusions based on the findings of this investigation and subsequent risk assessment are as follows for the proposed future use of the site: <ul style="list-style-type: none"> • There were minimal risk associated with landfill gas generation and transport to surrounding areas to the northeast, east and southeast of the site via services infrastructure • Very low concentrations of gases and vapours detected are not indicative of gas or vapour migration from the former landfill site • Not considered capable of significant impact to relevant receptors or require additional management • Additional investigations are not required 	<ul style="list-style-type: none"> - Gas vapours and concentration are not considered a risk to human health - No further investigation is required.
<p>Report for Dawson Avenue Former Landfill Preliminary Site Investigation May 2010</p> 	<ul style="list-style-type: none"> - Preliminary Site Investigation (PSI), the primary objective of was to investigate the land use history of the site and adjoining properties in order to identify existing or past practices that have the potential to contribute to contamination of soil and/or groundwater at the site, it also aimed to establish the nature of probable contaminants and the possible locations of contamination for the purpose of identifying areas of the site that require further investigation, remediation and/or management. - The following conclusions were made: <ul style="list-style-type: none"> • The southern section of the Site was used historically used as a Forrestfield Motor Racing Circuit speedway, operated by the Hot Rod Association from 1962 to 1982. • Dawson Avenue landfill operations began in 1975. It was operated by Western Excavating from 1975-1979 before being superseded by Cleanaway in 1982. • The Shire of Kalamunda was first registered as the owner of Lot 9685 on 30 June 1988, Lot 12588 on 1 January 1996 and Lot 300 on 2 June 2006. • The Shire of Kalamunda currently occupies Lot 10295 owned by the State of Western Australia. • Waste management activities formerly included the acceptance of municipal and industrial wastes; however on the 31/07/1997 Dawson Avenue Landfill ceased operation and was rehabilitated for recreational use as Pioneer and Dawson Avenue Parks. • A review of historical aerial photographs shows that the southern portion of Lot 300 was cleared by 1959, including a small patch of land in the north of the Lot. The 	<ul style="list-style-type: none"> - The history of the site and years of remediation are imperative to the recommendations and proposed development of the site - Consider all the recommendations and ascertain what investigations have occurred since this report has been written. - Acknowledge that more investigations and information of the site needs to be completed that directly impact on the recommendations within the Master Plan.



Document	Key themes/outputs	Implications for the Master Plan
	<p>central portion of Lot 300 remained vegetated until 1978.</p> <ul style="list-style-type: none"> • The aerial photographs indicate that the land uses appear to correlate with the land filling activities on Lots 300 and 12588 and the speedway in the southern portion of Lot 300. • In 1996 Landfill Gas and Power commenced extraction of landfill gas as a means of reducing emissions and to provide an energy supply. • A review of previous groundwater investigations at the site and in the immediate vicinity indicated the presence of contaminants in groundwater. • The contaminants identified are consistent with landfill operations that accepted municipal and industrial wastes • Groundwater is reported to flow in a south westerly direction beneath the Site. There are various surface water receptors within 5 km of the Site, including several surface water bodies, such as Crumpet Creek and Woodlupine Brook. • The current groundwater monitoring well network allows an evaluation of groundwater quality, though there is no information regarding the quality of groundwater entering the site from the north and south-easterly directions, which includes possible offsite sources within the industrial zone to the north. <p>- Potential sources of contamination in the area:</p> <ul style="list-style-type: none"> • Landfill; • Compost Storage; • Up-gradient industrial operations (including hardware stores, garden centres, automotive and tyre repair centres, panel beaters and warehouses, amongst others). <p>- Potential contamination migration pathways include:</p> <ul style="list-style-type: none"> • Lateral and vertical migration via permeable strata and service lines; • Surface water runoff; • Groundwater flow; • Vapour migration; and • Dermal contact, inhalation and ingestion. <p>• Potential receptors include:</p> <ul style="list-style-type: none"> • Humans Onsite: Current/future workers; • Humans Offsite: Down-gradient residential groundwater bore users and adjacent residents; • Ecosystems Onsite: Flora and fauna and groundwater; and 	


Document	Key themes/outputs	Implications for the Master Plan
	<ul style="list-style-type: none"> • Ecosystems Offsite: Adjacent bushland and down-gradient water bodies. - Based on these conclusions, the following recommendations can be made: <ul style="list-style-type: none"> • Consideration could be given to incorporating any such bores into the groundwater monitoring well network to assist in providing further information regarding the quality of groundwater passing beneath the northern and eastern boundaries • Additional wells should be installed along the eastern boundary to determine the status of groundwater moving onsite and allow a more accurate assessment of groundwater flow direction beneath the site • Should groundwater impacts be identified offsite then an environmental and/or human health risk assessment should be undertaken to quantify risk to identified receptors. • Undertake surface water sampling from Crumpet Creek during the next round of monitoring to assess whether groundwater impacts are migrating to this nearby surface water. • Analyses of the current inorganic suite are maintained. Given the wide variety of wastes accepted at the landfill, it is recommended the organic suite is increased to include a broader range of volatile and semi volatile organic compounds for the next two monitoring rounds. Following the results of these monitoring events, the organic suite should be reviewed to determine if the analytical program can be reduced by removing analysts that have never been recorded onsite. • As municipal wastes including putrescibles were reportedly deposited onsite, a landfill gas investigation should be undertaken to assess methane gas levels at the site. • The Shire of Kalamunda should maintain fences around the Site to exclude illegal dumping of materials and restrict public access. • Geotechnical and soil cap contamination investigations, including a geophysical survey, should be undertaken. 	
Strategic Community Plan to 2023	<ul style="list-style-type: none"> - Kalamunda Advancing: Strategic Community Plan to 2023 is designed to move the Shire from the present state to its desired future state. It describes how the Shire collectively hope Kalamunda will look and feel in 2023 and will guide strategic decision making to our desired future. - Kalamunda's history is immersed with the pioneers which has left a very clear imprint on the landscape. The foothills and the hills over the past 40 years to a large extent have been overlooked by development but this era is about to change. The vision for 	<ul style="list-style-type: none"> - Ensure that the Shire's and residents vision and aspirations are reflected in the Master Plan - Key issues and concerns identified within the plan are considered within the Master


Document	Key themes/outputs	Implications for the Master Plan
	<p>Kalamunda is by the Year 2022:-</p> <ul style="list-style-type: none"> • The community will live in harmony in diverse, healthy and connected communities. • Celebrate the rich cultural creativity and the heritage. • Town centres are revitalised, distinctive and inviting. • The residential areas are safe and built with quality. • Protected and enhanced the remnant bushland responsibly for future generations to enjoy. • The local economy is strong and offers a wide range of employment choice and access to education opportunities for all those wishing to acquire skills. • the Shire A deeply engrained progressive attitude to all the Shire do and the Shire will build infrastructure that is state of the art. • Be a sought after eco-tourism destination and our small businesses are thriving. • All are proud to be citizens of Kalamunda. • The Shire are living sustainably. 	<p>Plan</p>
<p>Pioneer Park Bi Annual Water Monitoring Report August 2014</p> 	<p>Based on the information contained within this report, the following recommendations are made:</p> <ul style="list-style-type: none"> - Heavy metal, nutrient and TPH/TRH concentrations across the sample sites require continued monitoring to identify trends; - Halogenated aliphatic compounds should continue to be analysed and trends closely monitored; and - Historical groundwater data should continue to be compiled and tabulated to allow for increased transparency to DER. <p>The limitations of this sampling round are:</p> <ul style="list-style-type: none"> - Historical results have not been graphed for all detected parameters if they were detected at less than the LOR for the majority of sites; - A graphical error is evident in the display of historical electrical conductivity. This is likely due to a lack of uniformity in the units used in the past data produced by GHD; and - There are no historical data and sample collection location details for surface water sites. 	<ul style="list-style-type: none"> - Key issues and concerns identified within the report must considered within the Master Plan - Acknowledge that more investigations and information of the site needs to be completed that directly impact on the recommendations within the Master Plan.
<p>Kalamunda Landfill - Test Pits Pioneer Park Dawson Avenue, Forestville WA</p>	<ul style="list-style-type: none"> - The purpose of the investigations was to determine the type of materials within the landfill; the vertical extent of the landfill; what type of landfill cap is present; and if the landfill is lined. The following tasks were performed to accomplish this purpose: <ul style="list-style-type: none"> • Ten test pits were advanced on site by an OTEK approved contractor; • The test pits were approximately 5m long, 1m wide and 3.5m deep; and 	<ul style="list-style-type: none"> - Important information on the northern end of the site identifying the exact levels and failing of the capping of the former landfill, the types

Document	Key themes/outputs	Implications for the Master Plan
	<ul style="list-style-type: none"> • Field screening was conducted using olfactory techniques during the excavation activities. - The test pits (TP1 through TP10) were excavated on May 15th and 16th 2012 using a backhoe. Waste was identified in each of the test pits and consisted primarily of household wastes. However, construction waste (bricks, tyres, concrete, etc) was also identified in seven of the pits (TP1 thru TP7). Waste was initially encountered at depths vary from 0.6mBGS (TP2) to 3.3mBGS (TP10). The vertical extent of the waste was determined in only 2 of the 10 pits (TP4 and TP7). Waste was identified to the base of the other test pits (maximum depth 3.8mBGS). - A cap, varying in thickness and composition, was identified during excavation at each pit location. Generally the cap consists of clayey sand to sandy clay varying in thickness from 0.6 metres (TP2) to 3.3 metres (TP10). A proper liner (i.e. clay) was not identified in any of the pits. - OTEK is of the opinion that for safety reasons the playing fields should not be utilised until the potential health issues associated with the landfill (e.g. landfill gas emissions, subsidence, etc.) are addressed. 	<ul style="list-style-type: none"> - of contaminants and the levels and depths of soil. - There is no information on the capping for the middle and southern end of the reserve, which would require further information if development is suggested within the middle and southern portions of the land.
<p>Ray Owen Reserve December 2008</p> 	<ul style="list-style-type: none"> - The purpose of this management plan is to provide a structured management approach for Ray Owen Reserve to protect the natural values of the reserve, whilst recognising the importance of the area for active and passive recreation. This is achieved through the formulation of strategies and actions with responsibilities and time frames for implementation. - The main issues in relation to the management of Ray Owen Reserve fall under environmental and recreation considerations and include the following: <ul style="list-style-type: none"> • Environmental Issues • Recreation Issues - The broad management objectives for Ray Owen Reserve are: <ul style="list-style-type: none"> • The protection and enhancement of the biodiversity within Ray Owen Reserve; • The maintenance and improvement of the recreational aspects of Ray Owen Reserve. 	<ul style="list-style-type: none"> - Review the approach that was taken and acknowledge the key considerations that are similar for the development of the Master Plan.
<p>Landfill Gas Investigation and Assessment Phase 2</p>	<ul style="list-style-type: none"> - The study was to assess the risk to human health associated with potential off-site migration of landfill gases and vapours from the former Dawson Avenue Landfill, Forrestfield WA - Based on the levels of methane detected and Gas Screening Value calculated, the results 	<ul style="list-style-type: none"> - There is a moderate risks to public health in relation to the gas generation, though further monitoring is required

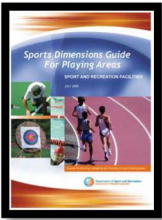
Document	Key themes/outputs	Implications for the Master Plan
	<p>indicate that there is some minor gas generation associated with waste materials historically disposed onsite. The maximum level of Carbon Dioxide recorded within BH6 at 1m bgl (9.5%v/v) and 2m bgl (9.5%v/v) are above the guideline threshold value of 5%v/v. Therefore results indicate that there may be a moderate risk to human health with regards to the inhalation of hazardous landfill gasses.</p> <ul style="list-style-type: none"> - It should be noted however that as per CIRIA C665 guidelines, to fully quantify the risk to human health with regards to landfill gases long term monitoring should be implemented to allow modelling of long term landfill gas concentrations. This monitoring is considered important as gas generation can occur in different climatic and atmospheric pressure conditions. 	<p>as levels can vary according to climate and other conditions.</p> <ul style="list-style-type: none"> - Consideration must be given to any disruption/ redevelopment of the site with regard to public health and increased gas concentrations.
Environmental Management Plan and Off Set Requirements for Gateway Project	<ul style="list-style-type: none"> - Assesses the flora and fauna of the Gateway Project Area and its impact and requirements under the Environmental Protection Act. - Highlights Pioneer Park (eastern vegetated area) as the site to be upgraded as the off set for the Gateway Project - It also highlights and identifies some of the trees within Pioneer Park as being significant for the Carnaby Cockatoo breeding and foraging. 	<ul style="list-style-type: none"> - Key considerations and constraints will be acknowledged and considered within the development of the Master Plan.
Ray Owen Reserve Strategic Development Plan	<ul style="list-style-type: none"> - Strategic Development Plan was conducted to guide future decision making and produce a plan which recognises the importance of the valuable reserve to the wellbeing of its users, to those who love adjustment and to the wider community. - It provides clear actions and recommendations to improving the use of the reserve now and into the future 	<ul style="list-style-type: none"> - Ensure that the Master Plan considers the recommendations within this report, to ensure no duplication occurs and the community need is considered within the region.
City of Belmont Community Infrastructure Plan	<ul style="list-style-type: none"> - The Community Infrastructure Plan is considered a high-level analysis based on desktop research, analysis, and consultation with stakeholders and the community. - Provides direction for the provision of community infrastructure needs for the City both now and into the future. - It is essential that any arrangements put in place are flexible and that future populations can have their say in tailoring the rates and quality of provision of community infrastructure to ensure that their needs are best met. 	<ul style="list-style-type: none"> - From a regional context the information and recommendation with this report will be considered for the Master Plan
City of Belmont Local Planning Scheme No. 15	<ul style="list-style-type: none"> - Council has incorporated consideration of open space into its Strategic Plan in both the Natural and Built Belmont key result areas. This is to ensure sustainable outcomes for the natural environment and for the community are achieved whilst positively contributing to 	<ul style="list-style-type: none"> - From a regional context the information and recommendation with this

Document	Key themes/outputs	Implications for the Master Plan
<p>Public Open Space</p> 	<p>the quality of life of residents, the image of the City and the amenity of the City.</p> <ul style="list-style-type: none"> - The key principles and elements relevant to planning for a liveable city include protecting and enhancing the natural environment, open spaces and heritage by: <ul style="list-style-type: none"> • protecting the beauty and accessibility of the City’s beaches, parks and rivers; • protecting and enhancing waterways and air quality; • protecting water supplies, both surface and in aquifers; and • protecting and enhancing City’s natural, cultural and built heritage, including Indigenous heritage. 	<p>report will be considered for the Master Plan</p>
<p>Public Open Space in Western Australia New Residential Developments (Parks and Leisure Australia).2012</p> 	<ul style="list-style-type: none"> - The purpose of this document is to identify key issues associated with the planning and management of public open space within new residential developments in Western Australia. While many of the issues raised within this paper may also apply to planning and management of public open space within established residential areas, it is recognised that provision of public open space within new developments presents immediate and more pressing concerns. - Most international standards of allocation of public open space are associated with population density and calculated per 1000 population. However, the level of allocation varies across nations. In the United Kingdom, a standard of 6 acres (2.43 hectares) per 1000 population is now promoted. Within the United States, POS allocations in new developments vary across the country and calculation of required POS may vary from 2.5 to 4.25 hectares per 1000 population. In some US states, POS allocation is not governed by statutory requirements and may be determined by perceived resident demand and accepted (profitable) models of residential development [2]. In many ways Western Australia has been fortunate to have a recognised standard of provision, and now is an opportune time to question the quantum and nature of that standard. - The current accepted standard of 10% allocation of sub divisible land (refer WAPC Policy DC 2.3) is derived from recommendations found in the Stephen-son-Hepburn Plan and is based on an assumption of an average of 10 dwellings per hectare (R10), with each having three occupants. As such 333 dwellings (with 1000 occupants) would require approximately 33 hectares of land which roughly equates to the stated requirements of 3.36ha per 1000 population (excluding school playing fields). - Unlike required assessments associated with environmental impact or urban water management, there is currently no explicit requirement under statutory planning 	<p>The Master Plan must consider:</p> <ul style="list-style-type: none"> - enhance functionality, usability and diversity of POS design; - Improving clarity of interpretation and implementation of current planning policy; - Establish objectives around effective management and maintenance of public open spaces; - Have consistent use of terminology within existing state and local government policy documents; - Stipulate roles and responsibilities in planning processes including buy in from leisure, recreation and park management officers; and - Encourage flexible, creative, adaptive, ecologically

Document	Key themes/outputs	Implications for the Master Plan
	<p>frameworks to assess public open space function, design or long-term management as part of new residential development proposals. In practice, many new residential estates contain numerous small pocket parks distributed throughout each neighbourhood. While many of these parks are highly valued by residents, current emphasis on inclusion of neighbourhood spaces little opportunity to develop larger multi-purpose areas suitable for sport, active recreation, relaxation and social interaction.</p> <ul style="list-style-type: none"> - The fragmented nature and the lack of connectivity between areas of public open space, and a corresponding lack of large areas of well-designed, multi-functional POS are emerging as major concerns for local communities. Apart from community concerns regarding limited functionality, having to distribute management and maintenance resources over a greater number of smaller parks is becoming increasingly problematic for some local governments. 	<p>sustainable public open spaces meet current and future community needs.</p>
<p>Active Open Space - Playing Fields Centre for Sport and Recreation – Curtin and Department of Sport and Recreation) 2013</p> 	<ul style="list-style-type: none"> - Open space is an inherent part of the Australian culture, helping to define Perth and contribute to the physical and mental health of our community. Public open space (POS) comprises the freely accessible areas that support the functions of recreation, relaxation, socialisation, organised sporting activities, informal play and environmental protection. - The past two decades has seen POS used for a greater range of applications, notably environmental protection, water management and walkable catchments. The introduction of Bush Forever, which aims to protect important bushland in Perth and the move to better urban stormwater management through Water Sensitive Urban Design (WSUD) has seen more open space being set aside for these purposes. Both of these policies have led to significant benefits by delivering positive environmental and social outcomes for the community. The Western Australian Planning Commission's (WAPC) Liveable Neighbourhoods (LN) policy, which offers reduced POS provision incentives to developers, has also had implications for open space. When combined, these initiatives have resulted in the perception that there are now insufficient active reserves (active open space) to accommodate organised sport. - In summary the research found: In delivering significant environmental and social benefits, the unintended consequence of implementing Bush Forever, Water Sensitive Urban Design and Liveable Neighbourhoods planning policies has been a reduction in the amount of open space able to accommodate organised sport. - With a high degree of certainty, the new suburbs in each of the fringe growth subregions of Perth already have a shortage of active playing fields. - The research concluded: If the provision of the support facilities is taken into account, the 	<ul style="list-style-type: none"> - Consider changes to LN are likely to provide the best opportunities for gains in the future. Both Bush Forever and WSUD design have led to significant environmental benefits, which should not be significantly changed. - An additional consideration to work with the Education Department so that school ovals are available for joint use (school and community), are large enough and fit for purpose to accommodate senior sport.

Document	Key themes/outputs	Implications for the Master Plan
	<p>total shortfall of open space required for active sport by 2031 is around 495 hectares.</p> <ul style="list-style-type: none"> - Without a change to the relevant planning policies and without the State Government stepping in to provide additional active open space as Regional Open Space, this shortage can only get worse. 	
<p>Public Parkland Planning & Design Guide (Department of Sport and Recreation, WAPC and Department of Water) 2014</p> 	<ul style="list-style-type: none"> - Public parklands are wonderful places for social interaction, recreation, leisure, sporting activity, exercise, rest and relaxation. It's important that all communities have equal access to good quality parkland that creates a sense of place and enhances feelings of social attachment and cohesion, identity and belonging. - Good quality parklands are valuable community assets that require well-considered planning, design and management to achieve optimal levels of amenity and functional performance. While initial establishment costs may be high, the long-term return to today and tomorrow's communities is beyond measure. - To achieve this it's important to: Plan and design more diverse, well-distributed, well-connected parkland that meets different community needs, provides spaces suited for different purposes and functions and encourages higher levels of usage and positive social interaction for people of all ages and abilities. - Adopt planning and design practices that recognise the value of local biodiversity, including existing bushland and wetlands and enhance and protect natural ecosystems. Adopt sustainability principles within parkland planning and design to ensure efficient use and protection of water resources. - In Western Australia, a growing population is increasing demand for access to good quality parklands. At the same time, climatic trends are resulting in lower allocations of water resources being made available to irrigate new and existing public parklands. - This guide is presented in three sections: <ul style="list-style-type: none"> • Land and water use planning in Western Australia outlines the different stages of land and water use planning and how this relates to parkland planning. Parkland planning outlines objectives, guiding principles and critical considerations in land allocation and water planning to meet community needs and ensure best use of water resources. • Parkland design outlines objectives, guiding principles and critical considerations to enhance parkland usability and function and create sustainable, water-efficient sport, recreation and nature spaces. • Case studies are included in planning and design sections and provide examples of how key aspects described within this document have been applied effectively in 	<ul style="list-style-type: none"> - These guidelines consider challenges and opportunities unique to Western Australia and offer good practice planning and design principles and case studies to assist in the creation and care of our parkland assets. - Different aspects of parkland planning and design occur at different stages of the land planning and development process. Reference must be made to key documents such as the Structure Plan Preparation Guidelines, Liveable Neighbourhoods and Better Urban Water Management (BUWM). - It is important that parkland specific planning and design are considered in conjunction with the allocation of water resources at each stage of the planning and development process. <p>Local planning</p> <ul style="list-style-type: none"> - Determine parkland type, connectivity, sizing and general landscaping

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	<p>Western Australia.</p> <ul style="list-style-type: none"> - Objectives and principles: <ul style="list-style-type: none"> Planning objective <ul style="list-style-type: none"> • To ensure optimal allocation of land and water resources to provide a well-distributed and connected suite of parklands that can be adapted to meet changes in social and environmental conditions. Guiding principles <ul style="list-style-type: none"> • Determine range of potential functions and allocate appropriate parkland area. • Plan parklands as a suite of multi-functional open spaces accommodating sport, recreation and nature spaces. • Plan for conservation, protection and enhancement of local landforms, ecological systems, cultural assets and heritage sites. • Plan for water allocation and access to fit-for-purpose water sources. • Apply collaborative, integrated, multi-disciplinary planning processes to inform decision making. • Challenge planning frameworks as necessary to ensure optimal provision of parkland types and functions. Design objective <ul style="list-style-type: none"> • To ensure access to high quality, well-activated, sustainable parkland systems that meet diverse community needs and expectations. - Guiding principles <ul style="list-style-type: none"> • Start with consideration of parkland function and end-user needs. • Develop multiple-use parklands and balance provision of sport, recreation and nature spaces. • Integrate and enhance existing landscape and geographic features in site design. • Ensure human activity interacts positively with natural processes. • Ensure storm water management infrastructure and other utility areas are well-placed. • Ensure maintenance requirements are considered and integrated into the initial design process. • Make efficient use of local resources and materials 	<ul style="list-style-type: none"> requirements - Determine likely water budget - Apply for parkland groundwater allocation or seek approval for alternate water supply - Integrate BUWM principles into parkland design - Within Local Structure Plans, determinations are made regarding parkland purpose, typology, connectivity and size (in alignment with regional and district spaces already allocated at the regional or sub-regional stage). It is recommended that a public open space or landscape Master Plan is created at this time to support parkland development. The physical condition of the land selected for parkland will determine its capability to provide for sport and recreational purposes. - At this stage, a Local Water Management Strategy (LWMS) should outline how development of parkland landscaping plans will be balanced with available

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		<p>water strategies that fit the requirements of the local area. If water resources are limited, relevant approvals to access required water may be necessary.</p>
<p>Sports Dimension Guide for Playing Areas (2008)</p> 	<p>This guide has been prepared with the assistance of national and State sporting associations responsible for the administration of their respective rules. The Department of Sport and Recreation wishes to acknowledge and thank all the sporting associations that have assisted in the preparation of this guide.</p> <p><u>Sports surfaces</u> From a playing perspective, the sports surface is probably the most important item of equipment in any sport facility.</p> <p><u>Line court marking</u> In many cases of facility provision, it is not possible to accommodate individual courts for separate activities because of cost and space factors.</p> <p><u>Orientation of outdoor playing areas</u> Provides the orientation of outdoor playing areas is an important planning consideration. The time of day (early morning or late afternoon) as well as the time of year (winter or summer) has a bearing on optimum orientation.</p>	<ul style="list-style-type: none"> - To be referenced during the design of sporting playing fields
<p>Western Australian Planning Commission: www.planning.wa.gov.au</p> <p>Directions 2031 and Beyond: Metropolitan planning beyond the horizon</p> <p>Liveable Neighbourhoods Operational Policy</p>	<ul style="list-style-type: none"> - Directions 2031 is a high level spatial framework and strategic plan that establishes a vision for future growth of the metropolitan Perth and Peel region; and it provides a framework to guide the detailed planning and delivery of housing, infrastructure and services necessary to accommodate a range of growth scenarios. - Directions 2031 builds on many of the aspirational themes of previous metropolitan plans which sought to guide the future structure and form of the City. It encompasses all land within the metropolitan Perth and Peel region schemes, an area that is also referred to as the City or metropolitan region in this report. Directions 2031 responds directly to several of the tasks identified in the WAPC Statement of Planning - Policy No. 1 State Planning Framework Policy (Variation No. 2), including detailing the metropolitan structure, determining local population housing and job targets, managing growth and developing the activity centre concept. It is not a final blueprint, but the latest in an evolving series of plans that have shaped the City over the past 55 years. Each successive plan is based on an understanding of contemporary factors that influence the 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications from each of the Policy, Codes and Strategies listed.

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<p>Structure Plan Preparation Guidelines (August 2012)</p> <p>Policy No DC 2.4: School Sites: Co-location of parkland and playing fields with schools</p> <p>Policy No. DC 2.3: Public Open Space in Residential Areas</p> <p>Better Urban Water Management (2008)</p> <p>Planning Bulletin 92: Urban Water Management</p> <p>State Planning Policy 2.9: Water Resources</p>	<p>shape and growth of the City, and includes assumptions about how the City will change into the future.</p> <ul style="list-style-type: none"> - Directions 2031 replaces all previous metropolitan strategic plans for the metropolitan Perth and Peel region and supersedes the draft Network City policy. - Liveable Neighbourhoods has been adopted by the WAPC as operational policy, and is to be followed in the design and approval of urban development. Liveable Neighbourhoods applies to structure planning and subdivision for greenfield sites and for the redevelopment of large brownfield and urban infill sites. - In general, Liveable Neighbourhoods replaces the current WAPC development control policies. Where there is conflict with existing policies, Liveable Neighbourhoods will prevail unless an applicant can demonstrate why the relevant Liveable Neighbourhoods policies cannot or should not apply. - Overlaps between development control policies and Liveable Neighbourhoods will be progressively removed through a mixture of incorporation into Liveable Neighbourhoods and rescission of redundant policies. Development control policies will of course be retained for those matters not covered by Liveable Neighbourhoods. - The Structure Plan Preparation Guidelines (Guidelines) have been prepared by the Department and its consultants and facilitated by a project reference group comprising members from State and local governments, consultants and the land development industry. Existing structure plans and local planning schemes, policies and other documents relevant to the format and content of structure plans were referenced as part of the preparation of these guidelines - The objectives of the Guidelines are to: <ul style="list-style-type: none"> • 1 Standardise the scope, format and content of structure plans; • 2 Define the statutory and non-statutory elements of structure plans; • 3 Detail the information required to be provided for each type of structure plan; and • 4 Encourage pre-lodgement consultation. - This Policy Statement sets out general criteria and design standards for the provision of school sites in residential districts. It also contains the requirements for TAFE colleges (technical colleges) and recognises the need to consider any requirements for higher education facilities. - The policy is intended to overcome problems of conflict that may arise in residential areas between schools and their surroundings particularly in respect of traffic and noise generating activities. The Commission believes future problems can largely be eliminated 	

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	<p>by judicious subdivision design.</p> <ul style="list-style-type: none"> - The site selection criteria and design standards in this statement are intended to apply to new residential subdivisions. They may not necessarily be applied to situations where changes of use or rezoning are proposed in already developed residential areas. - In order to preserve amenity and contribute to the quality of life in urban areas, including country towns, the Commission has resolved, as a general policy, to require suitable provision of public open spaces which can be used by people living and/or working in those areas. - The Commission's policy is to ensure that the provision of public open space allows for reasonable distribution of land for active and passive recreation in each locality. The Commission accepts that this may be secured by providing larger areas for active recreation and smaller areas for passive recreation within residential cells, but treats each case on its merits. - This policy sets out the requirements of the Commission for public open space and the provision of land for community facilities in residential areas. Requirements for industrial areas are incorporated in the policy on Industrial Subdivision (DC 4.1). - Better Urban Water Management has been designed to facilitate better management of our urban water resources by ensuring an appropriate level of consideration is given to the total water cycle at each stage of the planning system. It also provides guidance on the implementation of State Planning Policy 2.9 Water Resources. - The development of Better Urban Water Management is a partnership between the Department for Planning and Infrastructure, the Department of Water, the Western Australian Local Government Association and the Australian Government Department of Environment, Water, Heritage and the Arts. - This planning bulletin provides guidance on urban water management matters to be taken into account by the WAPC, local governments and applicants in considering planning proposals and applications for new residential, rural-residential and commercial. - The purpose is to ensure planning decision-making, where water issues are a consideration, is informed via relevant and appropriate information. - This policy is directly related to the overarching sector policy SPP 2 Environment and Natural Resources policy and provides clarification and additional guidance to planning decision-makers for consideration of water resources in land use planning strategy. The objectives of this policy are to: <ul style="list-style-type: none"> • protect, conserve and enhance water resources that are identified as having 	

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	<p>significant economic, social, cultural and/or environmental values;</p> <ul style="list-style-type: none"> • assist in ensuring the availability of suitable water resources to maintain essential requirements for human and all other biological life with attention to maintaining or improving the quality and quantity of water resources; and • promote and assist in the management and sustainable use of water resources 	
<p>WA Department of Water: www.water.wa.gov.au</p> <p>Guideline for the approval of non-drinking water systems in Western Australia - Urban Developments (December 2013)</p> <p>Guidelines for water meter installation (2009)</p> <p>Operational Policy 1.01: Managed Aquifer Recharge in WA (2011)</p> <p>Operational Policy 5.13: Water entitlement transactions for Western Australia (previously State-wide policy 6: Transferable (tradeable) water entitlements for Western Australia)</p> <p>Stormwater</p>	<ul style="list-style-type: none"> - The objective of the Guideline for the approval of non-drinking water systems in Western Australia is to provide for the delivery of non-drinking water systems that meet regulatory requirements by promoting: <ul style="list-style-type: none"> • protection of public health and the environment • optimal management of water resources timeliness – eliminating duplication of reporting • regulatory certainty – conforming to known and uniform standards • auditable standards – monitoring and reporting to ensure compliance • public confidence – providing reliable service financially viable projects delivered at an acceptable cost to consumers. • A non-drinking water system provides water that can have lower quality standards than potable water but is still suitable for many uses such as irrigating parks, public and private gardens, and toilet flushing. - The Department of Water supports managed aquifer recharge (MAR) activities that have environmental, social or economic benefits and maximise the use of the state's water resources. - The department will approve MAR schemes, provided that recharge and recovery operations will not adversely affect the groundwater system, the environment, existing groundwater users (e.g. through changes in water quality or quantity) or aquifer integrity. - The position on MAR activities is outlined below. MAR is considered to mean: <ul style="list-style-type: none"> • The infiltration or injection and later recovery of treated wastewater will be considered MAR, and the department will allow banking (storage) and recovery of the recharge water. • Re-injection of dewatering excess will be considered MAR, and the department will allow banking (storage) and abstraction of the recharge water. • Infiltration or injection of stormwater in developments where a demonstrable excess exists will be considered MAR (demonstrable excess refers to only that portion of stormwater that cannot be infiltrated at source). 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications from each of the Policy, Codes and Strategies listed.


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<p>management manual for Western Australia (undated)</p> <p>Water monitoring guidelines for better urban water management strategies/plans, WA (2011)</p> <p>Water recycling and efficiency note: Community bore (December 2013)</p> <p>Water quality protection note 33: Nutrient and irrigation management plans (June 2010)</p>	<ul style="list-style-type: none"> • Infiltration or injection of stormwater from existing drainage systems that normally discharge to the ocean or surface waters (commonly known as 'retrofitting') will be considered MAR. <p>- The Department of Water will support the voluntary redistribution of licensed water entitlements through opportunities to trade, transfer or through agreements allowing another person to take water, with the aim of:</p> <ul style="list-style-type: none"> • encouraging the efficient use of water resources (within allocation limits) by providing the opportunity to capitalise on water savings • enabling the migration of water to uses of higher economic value • appropriately valuing water resources enabling the re-allocation of water resources, including opportunities for new water users to access limited water resources. • When assessing applications to trade, transfer or through agreements allowing another person to take water, the Minister will ensure that these transactions will no compromise: <ul style="list-style-type: none"> • sustainability for the needs of current and future users • sustainability of the local environment and ecosystems of the water resources that are being managed the promotion of the orderly, equitable and efficient use of these water resources. <p>- This chapter explains why stormwater management is important and the issues that face stormwater managers. Stormwater management requires careful design, planning and implementation to avoid a number of potential problems in the quality of the receiving natural and built environment. It is also important that stormwater management is considered in the context of the catchment and sub-catchment, rather than focusing on the site level. This manual focuses on best management practice techniques that address these issues. An understanding of the following potential issues will help in the decision making for appropriate policy and planning, source controls and in system management measures:</p> <ul style="list-style-type: none"> • water quality in the receiving environment • water quantity in the receiving environment • healthy ecological communities • flood management • total water cycle management, and • quality of life. <p>- Considering this wide range of issues, a holistic approach to stormwater management is</p>	


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	<p>needed. The water cycle has complex interactions between surface flows, groundwater hydrology, water quality, channel form, aquatic habitat and riparian vegetation characteristics of a watercourse. The impact that the hydrological relationships in turn have on human health, recreation and quality of life are all factors to consider when determining what the community wants to achieve when managing stormwater. Effective management of stormwater means managing social, economic and environmental values in built environments (ARMCANZ/ANZECC, 2000). This chapter also discusses the key roles and responsibilities for stormwater management in Western Australia.</p> <ul style="list-style-type: none"> - The Department of Water has prepared these monitoring guidelines for surface water and groundwater systems to help the land-development industry establish the necessary monitoring programs associated with urban development. Integrated land and water planning is based on the principle of total water cycle management as outlined in the State planning policy 2.9: Water resources (Government of WA 2006) and Better Urban Water Management (WAPC 2008). These guidelines support the urban land-development process and define what hydrological information needs to be collected and reported both before and after urbanisation. Addressing the requirements of these guidelines and incorporating them into the planning process is part of an integrated approach to land use and water management. - In the same way as the Better Urban Water Management document, these guidelines acknowledge the need for a flexible approach to monitoring and its implementation. The scale of monitoring required will depend on the availability of existing data, the planned development's scale, local water values and the risk to local water resources. Implementation of these guidelines will promote a more consistent approach to monitoring programs both pre- and post-development across Western Australia. The Department of Water will periodically review and update this document to reflect current issues. - This note provides information on using community bores to irrigate public open space and domestic gardens, particularly in new residential areas. The information is for developers, water service providers and regulatory agencies. - Nutrient and irrigation management plans (NIMPs) provide detailed guidelines for minimising water wastage and fertiliser losses when establishing or growing crops, gardens, trees or turf. NIMPs demonstrate that inputs such as water and fertiliser are well-matched to the plant growth cycle resulting in healthy plants and minimal contaminant leaching into the surrounding environment. Good planning and operational practice is vital for irrigated and fertilised plants so that water is used effectively and plants flourish with a 	

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	<p>maximum uptake of essential nutrients (principally nitrogen and phosphorus). Well-prepared NIMPs offer potential economic benefits as they promote cost savings through the efficient use of water and agricultural chemicals, while offering protection to the quality of local water resources. Social benefits also arise if the community perceives that farmers and landscape managers operate with minimal environmental impact. For our water resources to retain their value (that is, quality suited to sustaining aquatic ecosystems, people and animals) they need protection so that negligible amounts of contaminants from chemicals applied to land leach through or across the soil into water resources.</p>	
<p>WA Department of Health: www.public.health.wa.gov.au</p> <p>Code of Practice for the Design, Manufacture, Installation and Operation of Aerobic Treatment Units (ATUs) (2001) and additional guidelines for water recycling in unsewered areas</p> <p>Draft Alternate Water Supply Guidelines – Stormwater and Rainwater (April 2009)</p> <p>Guidelines for the Non-potable Uses of Recycled Water in Western Australia (August 2011)</p>	<ul style="list-style-type: none"> - The Code of Practice for the Design, Manufacture, Installation and Operation of Aerobic Treatment Units (ATUs) Serving Single Dwellings [the Code] has been primarily developed as a set of minimum standards for the design, manufacture, installation and operation of ATUs, and provides guidance to local government as to how to assess the installation and ongoing operation of ATUs. - The Code is based on the following documents: <ul style="list-style-type: none"> • “Specification for Aerobic Treatment Units (ATUs) Serving Single Dwellings”(1992) published by the Department of Health • “Standard for the Installation and Operation of Aerobic Treatment Units (ATUs) Serving Single Dwellings” (1992) published by the Department of Health. • “Standard for Dripper Irrigation Effluent Disposal System” (1994) published by the Department of Health. • “Standard for the Installation and Operation of Septic Tank Systems in South Australia, Supplement B - Aerobic Wastewater Treatment Systems” (1990) published by the South Australian Health Commission. • The Code, which was prepared by the Environmental Health Service of the Department of Health, is published by the Executive Director, Public Health under the provisions of section 344A(2) of the Health Act 1911, and is to be read in conjunction with the Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974. - In Western Australia (WA), the use of alternative water sources is becoming more prevalent to ease the demand on potable water supplies. Therefore, it is crucial to implement management practices to ensure that the use of such water sources will not pose any harm to health. The objectives of these guidelines are: <ul style="list-style-type: none"> • To assist in defining approvals needed for an alternative water scheme; • To provide guidance on the drafting of Water Quality Management Plans (WQMP); 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications from each of the Policy, Codes and Strategies listed.

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	<ul style="list-style-type: none"> • To provide guidance on how alternative water sources could be utilised without negatively impacting on public health; and • To provide guidance on monitoring and reporting requirements. <p>- The Guidelines for the Non-potable Uses of Recycled Water in Western Australia 2011, brings WA into line with the nationally recognised risk management approach. The Guidelines assist planners, designers, developers and engineers in the areas of development, construction, installation, approval, operation, monitoring and auditing with the ultimate aim of establishing safe and sustainable reuse of waste water.</p>	
Shared Use Agreements: DoE Policy Document	<p>- The document has been developed following extensive consultation with a variety of service deliverers, education, planning, sport and recreation professionals. It is intended to provide a series of templates which may be used in a variety of circumstances by schools, sports clubs, local government and community groups. It is not intended to be prescriptive, but provide advice and assistance to those parties who are seeking to enter into shared use agreements.</p> <p>- Highlights the strategic principles that will guide the application of all shared use agreements with education providers within local governments. The principles the LG will work towards include:</p> <ul style="list-style-type: none"> - An equitable sharing of costs and benefits between the parties. - Buildings are to comply with the Building Codes of Australia and other relevant standards. - All parties who benefit from its provision are to contribute to the costs of any building, structure, or feature. - Shared use facilities are to be designed to the LG policies and guidelines - Agreements are to be flexible and respond to changing needs. 	<p>- The development of shared use should be one of the first considerations in the development of new infrastructure on the understanding that the principles identified within the policy are considered within the Master Plan.</p>
Disability Access: WA Disability Commission Disability Access and Inclusion Plan Requirements (2008)	<p>- To ensure that people with disabilities have access to all City facilities, functions and services. This includes access to build infrastructure, programs and services.</p>	<p>- Establishes the principle of access to all Shire developed and managed facilities and is incorporated within recommendations contained in the Master Plan</p>
Creating Active Communities: How Can Open and Public Spaces in Urban and	<p>- Open space is an important component of urban areas and may be a key factor in promoting active living.</p> <p>- Identifies the evidence in respect of evaluating the importance of open and public space in supporting active living through a review of the academic and policy evidence.</p>	<p>- The Master Plan needs to consider all the implications from each of the report</p>

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<p>Suburban Environments Support Active Living? A Literature Review (University of New South Wales 2008)</p>	<ul style="list-style-type: none"> - The report addresses the academic literature under four main headings namely, types of open space, uses of space, location of spaces and design of space. It is clear that open space covers a broad range of sizes and types of area from small pocket parks, children's play areas and urban squares to sports fields and extensive green areas. - The evidence indicates that these fulfil a range of functions in respect of physical activity, from active sports to passive sitting, picnicking and as a venue for socialising for a range of age groups. Open space also needs to be viewed as fulfilling multiple urban functions such as amenity, biodiversity enhancement, flood mitigation and carbon sequestration. - The evolution of open space policy is charted and common aspects such as open space hierarchies and open space standards are identified. It is clear that there is a long legacy of standards and approaches to the provision and design of open space, which is increasingly open to question and are beginning to change. - The research addresses the issue of open space provision in different densities of urban development. It identifies a paucity of evidence in respect of the appropriate provision or design of open space in higher density and transit oriented developments. 	
<p>Healthy Parks, Healthy people - The health benefits of contact with nature in a park context (May Carter for Parks Victoria and PLA 2010)</p>	<ul style="list-style-type: none"> - In many disciplines, there have been concerted attempts to understand the human relationship with nature and how humans might benefit from nature in terms of health and wellbeing. Although still in the relatively early stages, research indicates that contrary to popular thinking, humans may be dependent on nature for psychological, emotional, and spiritual needs that are difficult to satisfy by other means. Findings so far demonstrate that access to nature plays a vital role in human health, wellbeing, and development that has not been fully recognised. - City living involves an extraordinary disengagement of humans from the natural environment that is likely to be detrimental to health and wellbeing. Parks may be one of the only means of accessing nature for the majority of people in urban areas, yet most people are unaware of their full range of potential health benefits. - Humans have forgotten how much the natural world means to them. Yet, signals abound that the loss of life's diversity endangers not just the body but also the spirit. It has been reported that modern people are experiencing a spiritual famine and that alcohol, food, and drug addictions are futile attempts to fill the spiritual emptiness that has arisen from loss of contact with nature. - In terms of health, parks and other natural environments have been viewed almost exclusively as venues for leisure and sport. Yet recent research shows that 'green nature', such as parks, can reduce crime, foster psychological wellbeing, reduce stress, boost 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report

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	<p>immunity, enhance productivity, and promote healing. In fact, the positive effects on human health, particularly in urban environments, cannot be over-stated.</p> <ul style="list-style-type: none"> - Evidence in the literature shows that among other benefits viewing nature is positive for health in terms of recovering from stress, improving concentration and productivity, and improving psychological state, particularly of people in confined circumstances such as prisons and hospitals. Furthermore, wilderness and related studies clearly demonstrate that being in a natural environment affects people positively, particularly in terms of mental health. There are also multiple benefits from brief encounters with nature, or experiencing nature on a smaller scale, such as in urban parks. 	
<p>Open Space Planning and Design Guide (Parks and Leisure Australia 2013)</p> 	<ul style="list-style-type: none"> - This document sits in a broader industry context to achieve quality non-contested outcomes for open space provision in changing communities. Local Government plays a critical role in setting policy and considering planning applications that determine the future of public space for the benefit of all residents within their communities. - This Open Space Planning and Design Guide advocates on behalf of the industry that: - Open space is vitally important in the development and sustainability of communities; - Sufficient quantity and quality of open space is critical in the planning of communities to ensure that long term social needs can be addressed and environmental values can be preserved; and - A no 'net loss' policy for the provision of open space is a sound policy position for local government to consider so that open space is preserved for future generations. - This document guides: - Development of sound and consistent policy across all local governments to inform open space contributions through planning provisions at a local level; - Assessment of planning applications that statutory planners will consider as new communities are planned and existing communities are regenerated; - Strategies to assist local government prepare planning scheme amendments and defend local planning decisions for open space contributions at Council and at the Victorian Civil and Administrative Tribunal; - Approaches that can be applied to the numerous settlement types that exist in Victoria that are determined by government policy and the urban, regional and rural nature of the state; and - Planning processes that Councils will undertake to plan and develop open space and achieve the best outcomes from land that is available. 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report
<p>Green Star</p>	<ul style="list-style-type: none"> - The way our cities and towns are planned, designed and built has an enormous impact on 	<ul style="list-style-type: none"> - The Master Plan needs to




Document	Key themes/outputs	Implications for the Master Plan
<p>Communities - Guide for Local Government (Green Building Council of Australia 2014)</p> 	<p>our economy, our wellbeing and our environment.</p> <ul style="list-style-type: none"> - Local governments across Australia will play an integral role in implementing and administering the planning controls, policies and programs that will ensure we 'get it right' for existing and future communities. - The Green Star – Communities Guide for Local Government is a resource for local governments to encourage community development projects in their local government areas (LGAs) that will enhance liveability, contribute to local economic prosperity and deliver sustainable outcomes. - This guide explains how councils can use the Green Star – Communities national framework and the Green Star – Communities rating tool to support and achieve better economic, social and environmental outcomes across the built environment. - Developed by the Green Building Council of Australia in consultation with industry stakeholders, the framework consists of five principles that define a sustainable community in Australia and the rating tool sets benchmarks that enable community development projects to be assessed and rated against the framework's five principles. - The framework can be used on its own to guide local government planning or in conjunction with the rating tool to indicate and measure success in delivering sustainable development. - Local governments can use the national framework and the rating tool to: Demonstrate a commitment to long-term sustainability <ul style="list-style-type: none"> • Deliver more liveable, prosperous and sustainable communities • Achieve more effective planning outcomes through the plan-making process • Reduce infrastructure delivery and asset maintenance costs • Foster community engagement and participation • Work collaboratively with private sector developers to ensure the best possible community outcomes • Ensure credibility through independent, third party verification of best practice outcomes or above. 	<p>consider all the implications within the report</p>
<p>Park planning and design – ULDA Guideline no.12 (2013)</p>	<ul style="list-style-type: none"> - This guideline sets out the Urban Land Development Authority (ULDA) objectives, planning principles and standards for the provision and design of parks in Urban Development Areas (UDAs) in Queensland. - The ULDA's objective for parks is to achieve a network of diverse, accessible, high quality parks and recreation facilities that are sustainable, contribute to the attractiveness and vitality of communities, and enhance people's health and wellbeing by meeting their needs 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report

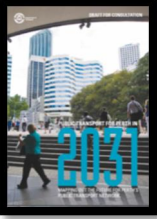


Document	Key themes/outputs	Implications for the Master Plan
	<p>for outdoor recreation in urban settings now and into the future. The principles include:</p> <ul style="list-style-type: none"> • Diverse: The parks network should provide a diverse range of settings and opportunities that cater for the varied recreational needs of residents and visitors of all ages and abilities. • Accessible and connected: Parks should be distributed and located to provide high levels of accessibility, and form part of an integrated parks network. • Sense of place: Parks should respond positively to the natural environment and to local community values and needs. • Safe and healthy: Parks should be located and designed to provide a safe environment and encourage healthy activities. • Cost effective: Parks should be planned and designed to balance capital costs with ongoing maintenance and operational costs. • Fit for purpose: Parks should be fit for purpose and capable of adaption to cater for changing recreational demands. <ul style="list-style-type: none"> - Reference is made to a number of different park types: <ul style="list-style-type: none"> • Recreation parks: Including Linear park; Local recreation park; Neighbourhood recreation park; District recreation park; Major recreation park and Civic park • Sports parks including: District sports park and Regional sports park. - The planning and design standards differ from the DSR definitions in both area and accessibility. It does however advocate that 90% of dwellings should be within a 400m catchment of a neighbourhood recreation park or other park providing equivalent informal recreation opportunities. - For a District recreation park 90% of dwellings within 2.5 km, must comply with locational criteria (which includes direct access from trunk connector or higher order road, and by frequent public transport). Whilst 90% of dwellings within 4km must comply with the locational criteria (which includes direct access from trunk connector or higher order road, and by frequent public transport). - Designing parks as places for people highlights some simple activation synergies: <ul style="list-style-type: none"> • Locating park shelters to overlook a playground or other active recreation space • Designing pathways to travel between activity nodes and lookouts to destination • Situating a large grassed area for active recreation next to areas of natural bushland and associated trails. - Park areas can have varied topography provided: <ul style="list-style-type: none"> • The areas are accessible and functional for the intended recreation purposes 	


Document	Key themes/outputs	Implications for the Master Plan
	<ul style="list-style-type: none"> • The area of any park with a gradient of 1:10 or more should not exceed 20 per cent of the total park area. - Wherever possible natural topography should be retained. - Retaining walls should only be used in limited circumstances where other solutions are impractical. - The ULDA encourages the integration of flood and stormwater management practices into parks. - Park design is required to achieve: <ul style="list-style-type: none"> • Relevant performance criteria in the Framework for the Integration of Flood and Stormwater Management into Open Space, Water by Design, Healthy Waterways Limited. (Note: for design purposes a "minor storm event" is defined as a storm event with an Average Recurrence Interval (ARI) of 2 years), and • The minimum flood immunity - At its discretion the ULDA may approve lakes and other permanent water bodies in parks provided they: <ul style="list-style-type: none"> • Form part of an overall integrated stormwater management system • Are located in district or major recreation parks • Are highly visible • Have safe and active edge treatments • Are designed to maintain the required levels of water quality and minimise ongoing maintenance costs • Are provided with suitable access for maintenance purposes including by small boats • Comply with all relevant local government standards and the applicable standards in ULDA Guideline No. 13: Engineering Standards. - All parks should be provided with at least one controlled access point for maintenance, service and emergency vehicles at strategic locations along the road frontages or from internal roads or car parks. - Parks should be provided with shade cover in accordance with: <ul style="list-style-type: none"> • 50% shading of walking and cycling paths and 50% shading of formal seating in Recreation parks and • Shaded spectator viewing areas provided for at least one-third of one boundary of all formal sports fields in Sports parks. <p>Parks should be provided with appropriate facilities and embellishments to suit their intended roles and functions.</p>	

Document	Key themes/outputs	Implications for the Master Plan
<p>Planning Policy Guidance note 17: Sport, Recreation and Open Space (now replaced) Dept of Deputy Prime Minister (UK) 2002</p>	<ul style="list-style-type: none"> - PPG17 states that local authorities should undertake robust assessments of the existing and future needs of their communities for open space, sports and recreational facilities. The document also states that local authorities should: <ul style="list-style-type: none"> • When assessing needs and opportunities – undertaking audits of open space, sport and recreational facilities. • Set local standards. • Maintain an adequate supply of open space. • Plan for new open space. - National standards are no longer considered to meet local needs as they do not take into account the demographics of an area, the specific needs of residents and the extent of built development. The document was accompanied by a companion guide into assessing needs and opportunities which promoted a consistent approach across varying types of open space. 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report
<p>Accessible Natural Green Spaces - Standards in Towns and Cities (ANGST): A Review and Toolkit for the Implementation English Nature (now Natural England)</p>	<ul style="list-style-type: none"> - A review of A Space for Nature standard which was introduced in 1996, aimed at determining whether its validity could still be supported, how local authorities were managing green space policy and how the standards might be promoted effectively in a new and changing policy environment. - The standard was primarily an accessibility standard (using distance thresholds), with quantitative hierarchy of open spaces. The standard applies to natural / semi-natural spaces. - The Angst Model specified: <ul style="list-style-type: none"> • That no person should live more than 300m from their nearest area of natural green space of at least 2ha in size. • Provision of at least 1ha of Local Nature Reserve per 1,000 population. • That there should be at least one accessible 20ha site within 2km from home. • That there should be one accessible 100ha site within 5km. • That there should be one accessible 500ha site within 10km. 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report
<p>ICLEI – Case Studies:</p>	<ul style="list-style-type: none"> - ICLEI promotes local action for global sustainability and supports towns and cities to be: <ul style="list-style-type: none"> • Sustainable • Resilient • Resource-efficient • Biodiverse • Low-carbon 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report

Document	Key themes/outputs	Implications for the Master Plan
	<ul style="list-style-type: none"> • Smart infrastructure • Green urban economy • Achieve healthy and happy communities. <ul style="list-style-type: none"> - Of the case studies undertaken by the organisation the following are of relevance to the Shire of Kalamunda: - Chiang Rai, Thailand - Urban biodiversity for a sustainable City and climate change resilience: In 2008, Chiang Rai municipality established the Urban Biodiversity towards Sustainable City and Climate Change Resilience project (UBD-SCCCR). The main goal was to develop the City in a sustainable way by conserving its natural areas while using them as a carbon sink. The project has already revived flora and fauna within the City, provided exhibitions, a natural study area, and a local biodiversity curriculum for students, as well as contributed to establishing a nursery greenhouse for local plants. The project aims to understand the role biodiversity plays in the community by collecting local knowledge and working with stakeholders from government, private and educational institutions, as well as community organizations to better utilize and conserve public green spaces within the City. - Toronto, Canada: Live Green Toronto: Community action to reduce emissions. designed to help neighbourhoods and citizens reduce climate change impacts at the local level. Active participation, through a series of networking, educational, and funding opportunities for social and infrastructural projects, provide the means to achieve the program's objectives. The foundation of Live Green Toronto is built on the range of institutional partnerships and person-to-person support offered by a group of what the City of Toronto calls 'community animators,' and the Live Green Toronto volunteers. - Baguio City, Philippines: Community driven initiatives on urban biodiversity: the environment has suffered from urban and economic development. In response community-driven initiatives have emerged where local residents have been empowered by participatory decision making and local capacity building; Community control has been enabled over project resources through accountability and transparency. 	
Our Future World	<ul style="list-style-type: none"> - There are 6 major trends that will affect Australia in the future and this document mentions them and talks about projections 10, 20, 50 years from now. Declining resources, an ageing population, development and advancement in technology, animal extinction, global warming and changing consumer expectations were all major considerations and trends that would affect Australia well into the future. - The document talks briefly on how to combat these changes and the planning that is 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report

Document	Key themes/outputs	Implications for the Master Plan
	<p>required to be prepared for these changes over time.</p>	
<p>Directions 2013 and Beyond</p> 	<ul style="list-style-type: none"> - The Directions 2031 document sets out projections to assist with planning infrastructure and developing the Perth metropolitan and outer metropolitan areas into the future and how to cope with an increasing population and their needs. - The Whiteman Park ROS falls into the North East sub-region, which is forecasted to have an increase in population by nearly 40% and an increase in jobs by 40,000. - Midland is seen as the Strategic Metro Area with Ellenbrook being the Secondary Metro Centre in the North East region. 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report
<p>Strategic Direction 5</p> 	<ul style="list-style-type: none"> - Key challenges faced by the Department of Sport and Recreation are Participation, People Development (volunteers), Industry Development, Organisational Development, Places and Spaces and High Performance. - Increasing participation and making it more accessible to everyone is a key priority for DSR. Many low socio-economic families cannot afford to participate in sport. - Retaining volunteers and attracting them to work opportunities in a tight market is a difficult challenge. Many volunteers are time poor, so attracting and retaining good volunteers is critical to sporting success. - Organisations need to be sustainable and financially viable if they wish to succeed and should be able to adapt and evolve with the market that it is in. - Sporting and recreation facilities should be pushed to be included in existing and new planning frameworks for local government to ensure that there are sporting and recreation facilities provided to new areas. 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report
<p>Public Transport 2031</p>	<ul style="list-style-type: none"> - This document was made using the Directions 2031, and is seen as a solution or guide to work through the challenges described in Directions 2031 from a transportation point of view. 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report

Document	Key themes/outputs	Implications for the Master Plan
	<ul style="list-style-type: none"> - The biggest challenge faced is the increasing population, meaning that there will be a greater emphasis on public transport. - To combat the increasing population, more rail cars and buses will be purchased and projects such as the Light Rail Project will be considered as an option to service the community - With a larger population, increasing the size of the metropolitan area, more bus routes and transportation services are needed in areas that aren't being serviced adequately now. An example is creating light rail route from the City to the Airport and the Gateway Project to service those two communities. This service would also travel past a train station, allowing for people to disperse onto the train system. 	
<p>Outer Metropolitan Perth and Peel sub-regional strategy (August 2010)</p> 	<ul style="list-style-type: none"> - This document was made using Directions 2031. This provides a framework to work towards objectives set in Directions 2031. This document focuses on the outer regional areas of metropolitan Perth. The North Eastern sub region includes the Shire of Kalamunda, Shire of Mundaring and the City of Swan. - It estimates the region's population forecast and regional considerations within the planning context 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report
<p>Sport, Recreation and Play</p> 	<ul style="list-style-type: none"> - Using sport and recreation as a tool to reach and target under privileged children is important to send strong messages of tolerance, acceptance, and awareness. - UNICEF's recreation kit contains supplies up to 40 children and contains many activities, games, several types of balls etc. - Sport and recreation is used as a tool to educate children about disease and the importance of health and vaccinating. 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report
<p>Guide to Social Infrastructure Planning (October 2009)</p>	<ul style="list-style-type: none"> - This document serves as a guide to describe the steps used in growth area community infrastructure planning. <ul style="list-style-type: none"> • Growth areas are sufficiently supplied with community infrastructure; 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report

Document	Key themes/outputs	Implications for the Master Plan
	<ul style="list-style-type: none"> • community infrastructure is distributed as equitably as possible; and • Community infrastructure is effectively and efficiently configured so that service providers can respond to changing local community needs flexibly over a long time period. <p>- Some steps involved include:</p> <ul style="list-style-type: none"> • Planning a timeframe, defining a study area and subject land, preparing a community facility audit. Identifying stakeholders, literature review, developing a demographic profile using population forecasts, use Planning standards, calculating community infrastructure requirements, timing of infrastructure provision, and preparing a draft and final report. 	
<p>Dr Nanette Murtrie, with 'It is hard to persuade some people to walk – or is it?' (Be Active 2012)</p> <p>http://sma.org.au/2012/11/presentations-from-be-active-2012/</p>	<ul style="list-style-type: none"> - Levels of cycling and walking extremely low and declining over the world. Netherlands maintains high record of walking and cycling. - There are multiple levels that influence health: <ul style="list-style-type: none"> • Individual • Interpersonal • Organisational • Community • Public Policy - Self-monitoring is a powerful tool to engage people in walking and being active. A pedometer is used as a self-monitoring tool for individuals - Testing showed increases in physical activity. - Used Scottish football clubs to entice males to increase their walking. After completion of the program it was seen that men had begun to walk more, nearly 4000 more steps at the end of the 12 week program. 	<p>- The Master Plan needs to consider all the implications within the report</p>
<p>26 July 2012 - Sport for Development — the UNICEF approach</p> <p>https://secure.ausport.gov.au/clearinghouse/Library/videos/smart_talk_seminar_series/2012_smart_talk_seminar_series/sport_for_development</p>	<ul style="list-style-type: none"> - UNICEF works with high profile athletes to promote health and inclusivity messages to their country members. E.g. Australian World Champion Cricket players were promoting HIV research and awareness in the Caribbean where cricket is very popular. - UNICEF works with 74 major cities in the Caribbean and Latin America to help service over 200 million people. These are capital cities and cities with 1 million people or more, - Golombiao is an inclusive game of football created in South America; it is a mixed game that promotes inclusivity and a sport for all approach. In this version of football, a female player must score first followed by a male player and going back and forth. This promotes teamwork between males and females and encourages everyone to play. There are no 	<p>- The Master Plan needs to consider all the implications within the report</p>

Document	Key themes/outputs	Implications for the Master Plan
nt - the unicef approach	referees and each game promotes principles that are important in modern society, no violence, no discrimination, looking out for one another, equality, active participation and freedom of expression	
Research - Sport for development in the Pacific	<ul style="list-style-type: none"> - Use of sporting stars in advertising campaigns in Tonga were very effective with 90% of women surveyed recalling the ad campaign. - Social inclusion campaign brought island of 450 together. Sport helped unite 9 different religious groups of people with 40% the population under 15. 	<ul style="list-style-type: none"> - The Master Plan needs to consider all the implications within the report

The following key themes and considerations were highlighted during the document review:

- The recommendations to redevelop Pioneer Park in past reports have been remiss of factual and environmental considerations and limitations. They have not investigated the “real” cost benefit of redeveloping the site and the amount of investigations and monitoring required to make a realistic recommendation for the site.
- There has been a significant amount of data collected and reviewed about the environmental conditions of the site which recommend further studies and investigations required to obtain a clear understanding of costs and timeframes to consider the redevelopment of Pioneer Park.
- To date there is no one report which brings all the history, constraints, limitations and opportunities for Pioneer Park, which identifies priorities, costs and timeframes required to bring Pioneer Park to current standards with reduced risks to the users and community.
- The Shire of Kalamunda are encouraged to review the recommendations identified within the documents reviewed, to ascertain its current position and to strategically plan and implement the remaining recommendations.

Appendix B

Site Analysis

Environmental Considerations

Northern portion of the site

- Diamond (unsafe) and Rectangular (failing) playing fields has the following characteristics
 - Playing fields/turf areas: Not fit for purpose, unlevelled, subsiding, contaminated soils and ponding of surface water. Capping of the entire area has or is failing and rubbish is rising to the surface.
 - Change room and Playground: building is structurally sound though is not fit for purpose and does not meet any current building codes or equity principles. The playground is not considered suitable for use, shading has failed and been removed.
 - Generally the use of the site is considered unsafe, potential high risks to the users and the Shire exists and safety concerns have been validated throughout consultation and inspection of the site.

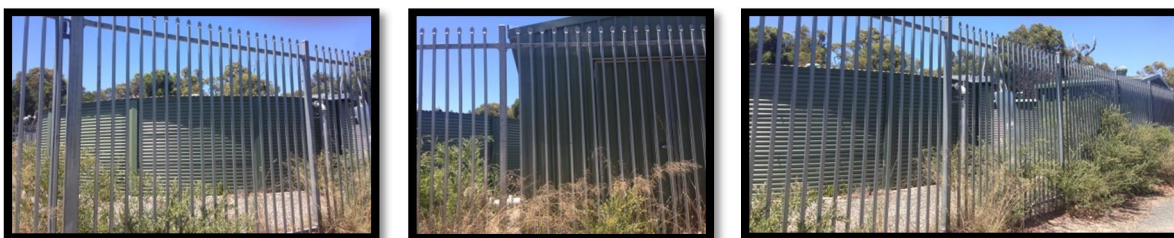
Figure 15 Photos of northern section of Pioneer Park



Middle portion of the site

- Bush forever vegetated sites that has the following characteristics
 - Eastern: contains a generator for the gas company, gas burn off unit, water tanks and vegetated area with mature trees and fauna and flora habitat
 - Western: contains fenced, steep banking with high levels and degraded native flora and fauna that is boarded by Roe Hwy and Gateway Project.

Figure 16 Photos of middle section of Pioneer Park



Southern Site (formally Perth Speedway Site)

- Shire Soil yard in southern portion of the site, which has experienced illegal dumping of waste, compounding the leaching of contaminants and nutrients into the ground water. This however has now been secured through the installation of fencing.
- Gas Pipeline is visually visible above the ground level that runs north to south along the site, linking into the eastern section of the site
- Land is completely unlevelled; remnant vegetation has established, lack of any mature trees, with the site being used by off road vehicles. There are risks associated with the informal use of the site and lack of any surveillance which could result in further surface water containments entering the creek running along the site and entering the ground water.

Figure 17 Photos of southern section of Pioneer Park



The following figures highlight the findings of the site assessment and analysis. The following information will need to be considered and or noted within the development of the Master Plan.

Figure 18 Soil type for the immediate site and area surrounding Pioneer Park

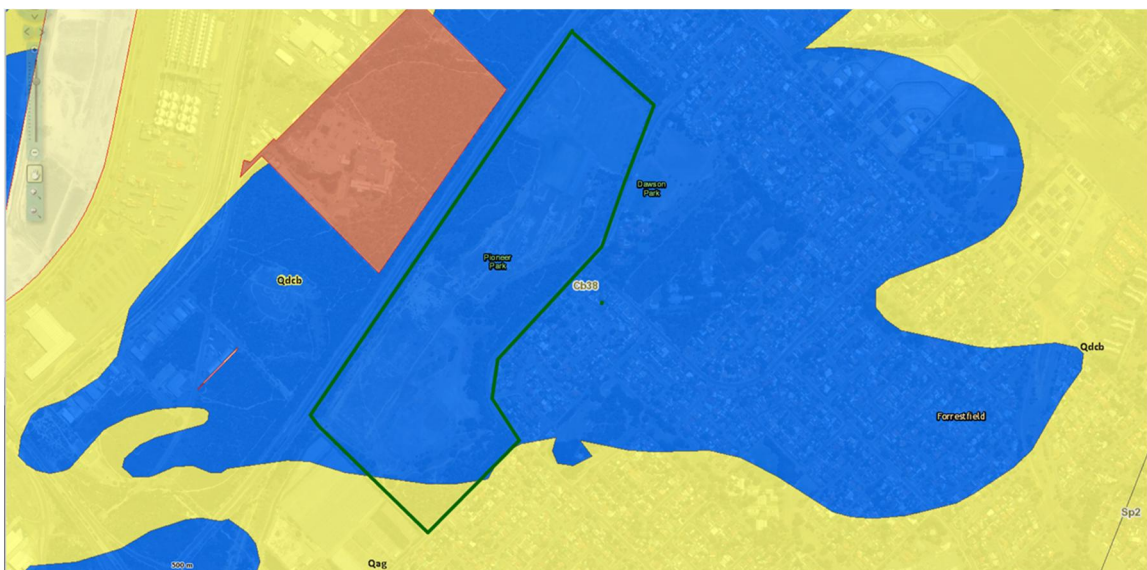


Figure 18 maps the soil types which is dune and swale: The figure references dunes of leached sands (Uc2.3) and (Uc2.2) which increases in area in the northern portion of the unit, shallow red-brown sandy soils (Uc6.13), and exposed limestone; swales of sandy alkaline yellow mottled soils (Dy5.43(2) and Dy5.83(2)) and lesser areas of hard alkaline red soils (Dr2.23) and hard alkaline yellow soils (Dy2.23). Swamps in low-lying situations. This unit gradually merges into Cb4.

The undulating land is leached sands (Uc2.3 including Uc2.33) in association with hard acidic yellow mottled soils (Dy3.61), some of which contain ironstone gravel, and sandy neutral yellow mottled soils (Dy5.82); small areas of shallow sand soils (Uc4.11) and shallow grey-brown sandy soils (Uc6.11) on ridge and hilltops.

Figure 19 Water and Hydrology for the immediate site and area surrounding Pioneer Park



Figure 19 above highlights that Pioneer Park is surrounded by water course, the water catchment areas intersect at the northern portion of the reserve. It is unclear from previous reports and in communication with the City officers; it is assumed (by groundwater table levels) that the ground water flows southerly through the site.

Figure 20 Environmental sensitive and Bush Forever for the immediate site and area surrounding Pioneer Park



Figure 20 demonstrates that the entire site of Pioneer Park is registered as an Environmentally Sensitive Area and Bush forever. The bush and vegetation area will need to be retained and has been identified as being enhanced through the WA Gateway Project as an offset area. Any redevelopment of the site would need to be authorised and approved through the Department of Environment Regulation and the Environmental Protection Authority.

Figure 21 Black Cockatoo area for the immediate site and area surrounding Pioneer Park



Figure 21 shows that Pioneer Park is located within a known foraging area for the Black Cockatoo, this will need to be recognised and considered within any proposed redevelopment and removal of any vegetation within the reserve.

Figure 22 Carnaby Black Cockatoo area for the immediate site and area surrounding Pioneer Park



Figure 22 shows Pioneer Park to be located within a known breeding range for the Carnaby Black Cockatoo. This will need to be recognised and considered within any proposed redevelopment and removal of any vegetation within the reserve.

Figure 23 Vegetation classification for the immediate site and area surrounding Pioneer Park



Figure 23 above indicates that Pioneer Park is located within a Hedde Vegetation classification area e2Mb cbLi, Veg Assoc: 1001 Bassendean. This will need to be noted within any proposed redevelopment and removal of any vegetation within the reserve noted and approved.

Figure 24 Aboriginal Heritage Areas for the immediate site and area surrounding Pioneer Park

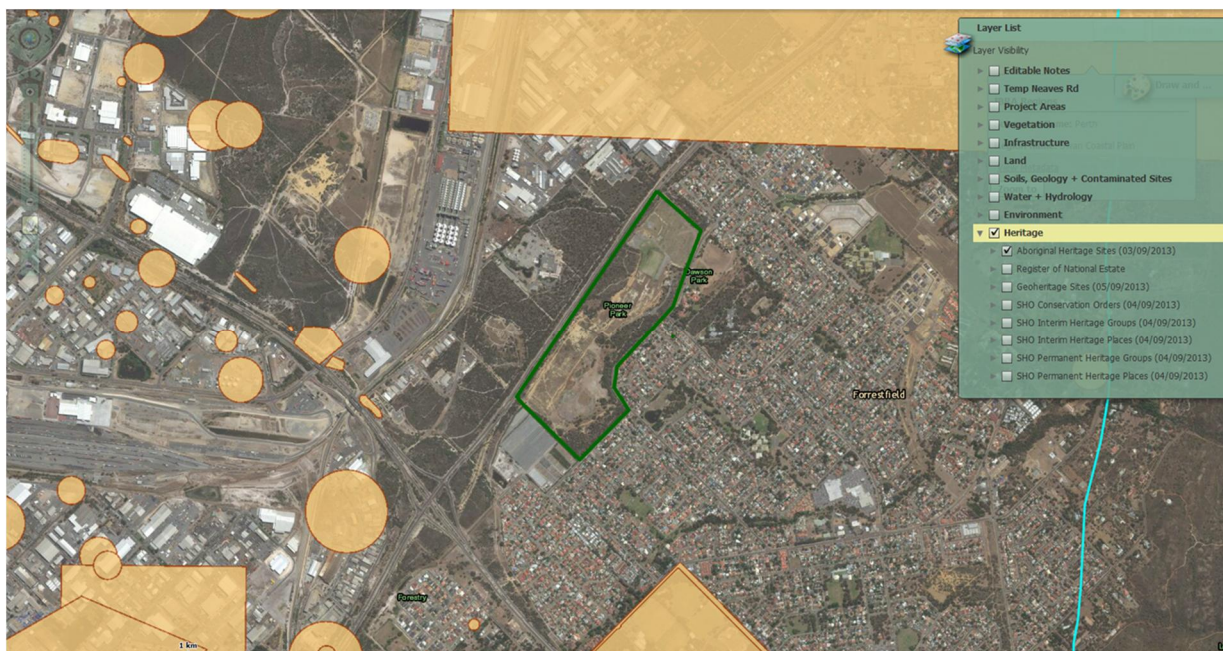


Figure 24 indicates that Pioneer Park does not have any Aboriginal heritage considerations and constraints.

Figure 25 Transport Services for the immediate site and area surrounding Pioneer Park

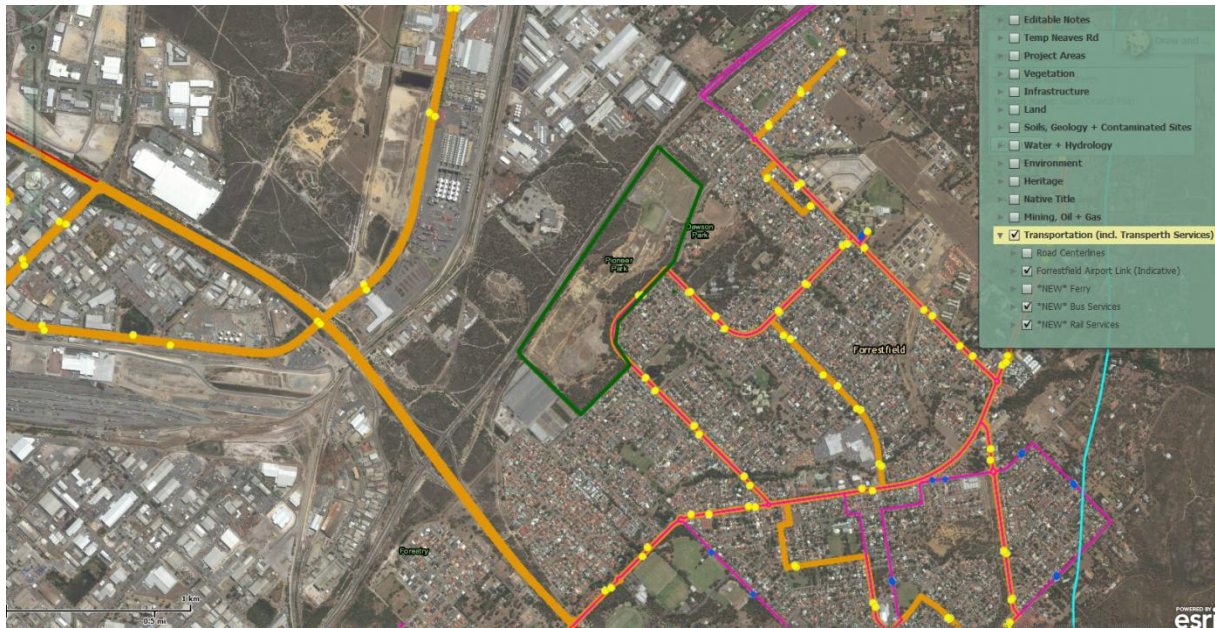


Figure 25 highlights the surrounding transport linkage and services to Pioneer Park. It illustrates there is limited public transport to the reserve. The reliance of the car to access is the reserve is evident and needs to be considered within the Master Plan.

Appendix C

Industry Trends

Appendix C Industry Trends

Industry Trends Assessment

The identification and assessment of sport, health & fitness, aquatic and recreation industry trends, is important to ensure that the proposed development meets the needs of the community. The Regional Open Space needs to consider the current and future facility and operational requirements.

The assessment of industry trends and benchmarking of the sports industry has been broken into the following:

Trends

- Participation
- Precinct Development
- Global Sports Market
- Sport Specific
- Emerging Issues
- Playing Pitch Development – Grass and Synthetic Turf Provision

Industry Trends Assessment

A trend is defined as an important pattern of social, economic or environmental activity that will play out in the future. Trends usually occur when there is a major shift in environmental, social and economic conditions that alter the way people live. The following section provides an overview of selected sporting and recreation industry and participation trends:

General industry trends

Sport is a major part of the Australian lifestyle and will continue to be part of our cultural identity, the majority of Australians play, watch and enjoy sport. The sports played, how and why we play them in WA is changing over time. As indicated in the *Future of Australian Sport* report current trends will play an important role in shaping long-term policy, investment and strategic planning within government, the sport sector and broader community.

There is growing recognition of the health benefits of regular participation in physical activities within the community, including acceptance of the individual and community wellbeing benefits of belonging to sport and recreation based organisations. Though there is also growing demand for access to informal participation opportunities that can be participated in on a casual basis in preference to organised sports or paying club fees.

This trend has increased demand for greater diversity in sporting and recreation participation opportunities, both in activities diversification and times allocations available. It has also led to an increase in commercial use of public facilities and open space for health and fitness participation (e.g. personal trainers).

The emerging trend and preference for participation in informal activities is an increasing need on local, low cost participation opportunities, including increased use of the open space as a setting for informal recreational activities/pursuits. (eg. outdoor boot camps)

The above trends also impact:

- opening hours for health & fitness facilities and programming
- greater reliance on weekday, evening and weekend time-slots.
- higher expectations: regarding the standard of facility provision, programming and management, associated to more well defined and specific facility standards and requirements (imposed by peak sporting bodies and Australian Standards)
- need for sports lighting provision
- improved playing surfaces and surfaces that can sustain intense usage by a variety of sports

Sporting and recreation trend also reflect emerging changes in sports products and programming, for example 20:20 cricket, mid-week night tennis competitions, veterans/masters competitions. These changes reflect growth in social sports participation, often combining skill levels in recognition of preferences for social outcomes.

Throughout Australia and WA National and State Sporting Bodies are increasing the importance and grass roots and modified participation programs aimed at junior development and recruitment (e.g. Auskick, Cardio Tennis, 5 a side soccer, tag footy etc).

One of the most significant trend impacting on formal sport/recreation and community organisations is the declining numbers of volunteers and increasing professionalism (brought about by need to have a competitive advantages and regulatory requirements). Both of these factors impact on the ability of organisations to provide participation opportunities for the community.

One significant trend is the rise of lifestyle, adventure and alternative sports which are particularly popular with younger generations. These sports typically involve complex, advanced skills and have some element of inherent danger and/or thrill-seeking.

These sports are characterised by a lifestyle element and associated with strong cultural self-identity and self-expression, likely to attract participants through generational change and greater awareness via online content.

There is strong viewer demand for extreme sports videos on the internet and television. These sports are also finding their way into world tours and Commonwealth and Olympic Games. International associations for skateboarding and rock climbing are making substantial efforts to have these included as Olympic sports in the future.

Facility trends

The general trends noted above are influencing contemporary sporting and recreation facility design and development. It is now more common to design facilities that can be configured to meet a variety of different needs and uses (i.e. flexible design for adaptive reuse over time).

The importance of providing facilities that facilitate a high level of social interaction and engagement are also increasingly being recognised. Examples include under-cover external viewing areas attached to sports pavilions and the design of meeting and social spaces within sports and recreation facilities.

Facility developments are increasingly adopting a hierarchal approach to facility and infrastructure provision which reflects different service levels, usage and standards of provision. This includes the establishment of major regional sport/recreation facility hubs that offer a wide variety of activities/sports and ancillary services.

This may involve co-locating recreation, leisure and sports facilities close to other community assets such as retail precincts, arts precincts, libraries and other facilities designed to maximise the visibility, traffic and throughput.

There is also growing evidence of effective public-private partnerships between developers, government and sports clubs to develop sports facilities, including the design of joint-use facilities at school and other educational institutions which allow educational use during daytime periods (weekdays) and community use during the peak evening and weekend periods.

Facility developments and renewal are increasingly considering energy efficiency and environmentally sustainable features within the design of sport and recreation facilities as well as greater consideration of resilience, water use and flexibility.

Finally, there is an emergence of new playing surface technologies which allow the Shire to maximise the use of existing assets (e.g. synthetic playing surfaces). These facilities are capable of high use (sometimes up to 3 times the level that natural turf can sustain) and ongoing maintenance costs and programs are comparable to natural turf.

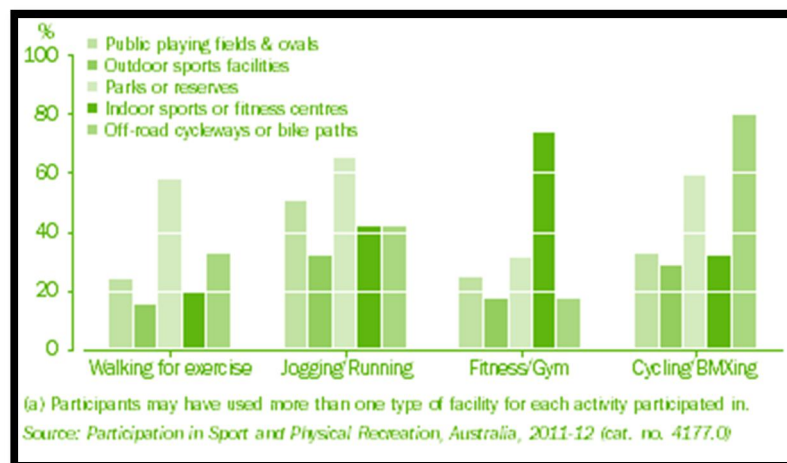
Participation trends

People can choose to take part in sport and physical recreation either through organised or non-organised activities. Organised activities can be arranged through recreation clubs, sporting or non-sporting associations, through health & fitness centres or through a wide variety of other sporting and non-sporting arrangements.

Around a quarter of the population (27%) reported participating in organised sport and physical recreation while almost double that (53%) took part in non-organised activity.

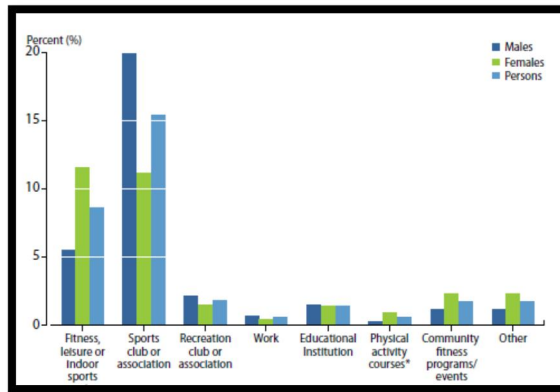
Participation in organised sport and physical recreation was highest amongst persons aged 15–17 years (58%). Participation rates in organised activities were similar for males and females (28% and 27% respectively) but were higher for males (54%) than females (51%) in non-organised activities.

Figure 26 Australia's Population participation in physical activity



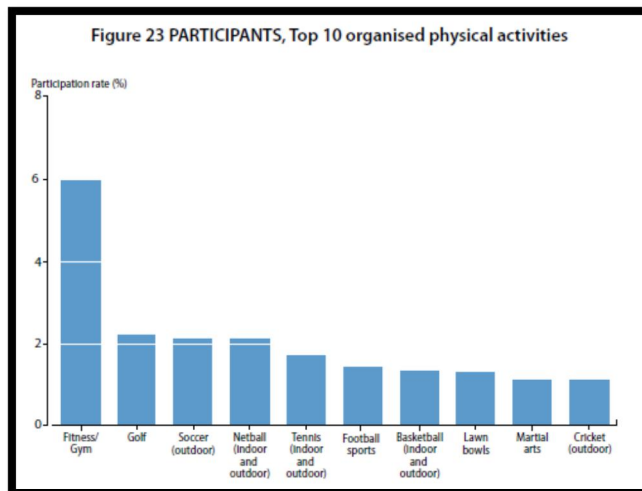
- Of the 11.7 million people who participated in sport and physical recreation, more than half (52%) participated 105 times or more (i.e. on average at least two times each week). This included the number of times spent training and practising for an activity.
- A larger percentage of female than male participants took part 105 times or more (55% compared with 49% respectively).
- Comparing the top 25 most frequently participated in sports and physical activities, persons walking for exercise were more likely to participate 105 times or more (58%). This was followed by fitness and gym activities, where 40% of participants participated 105 times or more.
- Not all are purpose built such as ovals, tennis courts and health & fitness centres with parks, beaches and walking trails also often used for exercise and physical activity. Parks and reserves were used by the most people (40%), followed by indoor sports and fitness centres (37%).
- Participation in Sport and Physical Recreation Survey was also conducted in 2005–06 and 2009–10. The following are the key outcomes of participation trends in sport and recreation:
- There was no significant change in the participation rate between 2009–10 and 2011–12 (64% and 65% respectively). However, as the population increased so too did the number participating, which grew from 11.1 million to 11.7 million between the two reference periods.

Figure 27 Participation in Organised sports and physical recreation by type and sex



- Rates by age remained the same over the two periods with the exception of those aged 35–44 where participation increased from 65% in 2009–10 to 69% in 2011–12
- There were significant increases in participation rates between 2009–10 and 2011–12 for people who were born overseas (56% to 59%), people living in capital cities (64% to 66%), and those who were not in the labour force (53% to 55%).
- Walking for exercise remained the most popular activity over time with a similar participation rate from 2009–10 to 2011–12 (23% and 24% respectively). The participation rate for cycling or BMXing increased from 6.5% to 7.6%. Similarly, the rate of people participating in jogging or running increased from 4.3% in 2005–06, to 6.5% in 2009–10, to 7.5% in 2011–12.

Figure 28 Participation in the Top 10 organised physical activity



Participation Trends: Sport and Recreation: Adults

Table 18 indicates the 2010 participation trends for sports in Australia, compared to Western Australia (the last Participation in Exercise, Recreation and Sports Study produced by the Australian Sports Commission). Participation relates to persons aged 15 years and over who participated over a 12 month period prior to interview in 2010.

All sport, exercise and recreation activities are ranked in accordance those most popular activities Australia wide. Activities within WA for which participation rates are greater than the national average are highlighted in green, whilst those below the national average are highlighted in red. The figures do not take into account the growth in the junior activities, which are referenced separately. The red indicates WA participation below the national percentile and the green above.

Table 18 Australian and Western Australian total participation in specific activities 2010 (ERASS 2010: Australian Sports Commission)

National Rank 2010	Activity	National 2010	Western Australia 2010	National Rank 2001	National 2001	Western Australia 2001
1	Walking (other)	35.9%	38.4%	1	28.8%	32.5%
2	Aerobics/Fitness	23.5%	25.4%	2	13.0%	14.0%
3	Swimming	13.0%	15.5%	3	16.0%	17.0%
4	Cycling	11.9%	14.2%	4	9.5%	10.7%
5	Running	10.6%	10.4%	7	7.2%	8.0%
6	Golf	6.7%	5.6%	6	8.2%	7.8%
7	Tennis	6.0%	4.9%	5	9.2%	7.2%
8	Football - outdoor	4.8%	4.6%	10	3.7%	3.5%
8=	Walking (bush)	4.8%	3.6%	8	5.3%	5.1%
10	Netball	3.7%	4.1%	9	4.1%	3.6%
11	Basketball	3.5%	4.8%	11	3.5%	4.6%
11	Yoga	3.5%	4.0%	20	1.5%	1.5%
13	Australian Rules	3.3%	5.4%	16	2.3%	3.6%
14	Cricket (outdoor)	3.2%	2.2%	12=	2.7%	2.9%
15	Weight Lifting	2.9%	3.1%	11	2.9%	2.5%
16	Touch Football	2.8%	1.8%	12=	2.7%	1.3%
17	Dancing	2.6%	3.8%	18	2.0%	2.1%
18	Fishing	2.2%	2.3%	14=	2.4%	2.4%
19	Martial Arts	2.1%	1.9%	17	2.1%	2.2%
19	Lawn Bowls	2.1%	2.3%	19	1.9%	2.0%
21	Surf Sports	1.9%	2.9%	14=	2.4%	3.8%
21	Football (indoor)	1.9%	1.3%	21	1.2%	1.4%

- General trends in sports participation across Western Australia during the past 5 years. Swimming, aerobic/fitness, swimming, cycling, running and golf activities have consistently remained high.
- This emphasises the importance of non-club based activities as being a key driver in sustaining high levels of participation in sport and recreation. It also highlights the fact that team sports, individually are not necessarily the main participatory drivers. However this assumption tends to undermine the value of team sports, which collectively demonstrates a high participation rate. If sports were not competing for the same users and opportunities were more constrained it is likely that participation rates would be higher
- Of the main team sports, tennis, netball, Australian Rules Football, football (outdoor), cricket (outdoor), basketball and volleyball consistently rank in the top 20 of participatory sport and

recreation activities. This indicates that such sports are likely to be a focus for most communities across metropolitan and regional Western Australia.

- The level of participation in basketball and netball has fluctuated but both sports are consistently within the top ten participation sports within the state. Indoor participation for football, cricket and volleyball are generally low and infrequently appear amongst the top 20 sports by participation.

Figure 29 identifies the trends associated with club based sports in WA. The data highlight that within a 10 year period the most significant growth in Western Australia is in football (soccer) with a significant decline associated with martial arts. Tennis has seen a decline although from 2006 to 2009 it had started to gradually increase participation levels until a drop in 2010.

One of the concerning trends demonstrated by the graph is that whilst there has been significant population growth within Western Australia, participation in a number of team based sports has not consistently increased in line with that growth. This indicates that, with the exception of Soccer and Australian Rules Football and more recently Netball, participation in team sports is generally in decline as a percentage of population participating in such activities. The population growth has tended to enable the traditional club based sports to potentially maintain participation levels.

Participation trends are only one element in understanding local needs and demands and need to be underpinned by knowledge of club growth and participation in a specific region / local area.

Figure 29 WA Sports Participation in Western Australia (Source ERASS 2011)

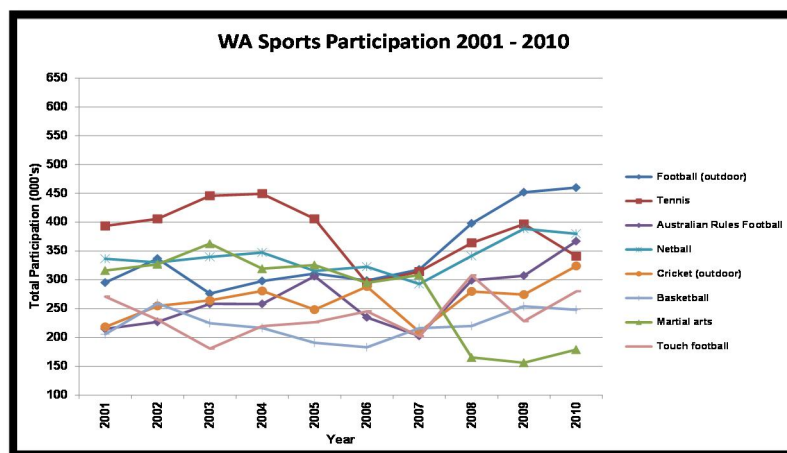


Table 19 WA Participants - percentage of total participants in specified activities (Source: ERASS 2006-2010)

Rank	Activity/Participation 2006	Activity/Participation 2007	Activity/Participation 2008	Activity/Participation 2009	Activity/Participation 2010
1	Walking (other) 37.8%	Walking (other) 33.1%	Walking (other) 40.1%	Walking (other) 37.2%	Walking (other) 38.4%
2	Aerobics/fitness 22.0%	Aerobics/fitness 20.4%	Aerobics/fitness 23.3%	Aerobics/fitness 26.2%	Aerobics/fitness 25.4%
3	Swimming 16.0%	Swimming 14.0%	Swimming 16.9%	Swimming 17.6%	Swimming 15.5%
4	Cycling 12.3%	Cycling 10.7%	Cycling 13.6%	Cycling 14.5%	Cycling 14.2%
5	Running 9.4%	Running 8.4%	Running 9.3%	Running 11.3%	Running 10.4%
6	Golf 7.0%	Golf 5.7%	Golf 6.7%	Golf 6.3%	Golf 5.6%
7	Tennis 6.0%	Walking (bush) 5.2%	Basketball 5.6%	Tennis 5.4%	Australian rules football 5.4%
8	Netball 5.3%	Tennis 4.5%	Tennis 5.5%	Basketball 4.2%	Tennis 4.9%
9	Australian rules football 5.0%	Basketball 4.1%	Australian rules football 5.2%	Netball 4.2%	Basketball 4.8%
10	Walking (bush) 3.9%	Netball 3.5%	Walking (bush) 4.6%	Football (outdoor) 4.1%	Football (outdoor) 4.6%
11	Football (outdoor) 3.6%	Yoga 3.1%	Football (outdoor) 4.4%	Walking (bush) 4.0%	Netball 4.1%
12	Surf sports 3.4%	Australian rules football 3.0%	Netball 4.2%	Australian rules football 3.9%	Yoga 4.0%
13	Weight training 3.2%	Football (outdoor) 3.0%	Cricket (outdoor) 3.5%	Surf sports 2.9%	Dancing 3.8%
14	Cricket (outdoor) 3.1%	Dancing 2.7%	Yoga 3.4%	Cricket (outdoor) 2.8%	Walking (bush) 3.6%
15	Basketball 3.0%	Surf sports 2.5%	Weight training 3.4%	Weight training 2.8%	Weight training 3.1%
16	Yoga 2.9%	Weight training 2.3%	Surf sports 3.1%	Fishing 2.5%	Surf sports 2.9%
17	Dancing 2.5%	Cricket (outdoor) 2.2%	Squash/racquetball 2.8%	Hockey (outdoor) 2.4%	Fishing 2.3%
18	Volleyball 2.5%	Lawn bowls 2.1%	Dancing 2.6%	Yoga 2.3%	Lawn bowls 2.3%
19	Squash/racquetball 2.2%	Fishing 1.9%	Football (indoor) 2.4%	Lawn bowls 2.3%	Squash/racquetball 2.3%
20	Fishing 2.1%	Football (indoor) 1.9%	Hockey (outdoor) 2.3%	Canoeing/kayaking 2.3%	Cricket (outdoor) 2.2%

The following conclusions can be drawn from the data referenced in table 19:

- Overall participation indicates growth has varied. Aerobics/Fitness has increased significantly over the 10 year period from 14.0% to 25.4% in Western Australia. In addition walking, swimming and cycling have consistently been above the national average.
- Australian Rules Football in Western Australia is consistently significantly higher than national participation rates as is basketball, dancing, fishing, lawn bowls, surf sports and badminton. It is noticeable that rugby league, rugby union and hockey are not recognised within the top 20 sport and recreation pursuits within the ERASS data. This however should not under-value the contribution such sports make in providing diverse opportunities for residents. In particular, participation in such sports is generally aligned to the demographic and cultural composition of an area.
- Netball has demonstrated a more gradual increase in population and annual increments since 2001 indicate that the sport has remained relatively consistent over the period with marginal increases and falls, year on year.
- Basketball has remained relatively static with a participation rate between 4% and 5%.
- The level of participation in Indoor participation for football, cricket and volleyball are generally low and infrequently appear amongst the top 20 sports by participation. However in respect of outdoor provision, these sports maintain a good user base, albeit significantly below the non-organised sports activities
- Golf– although still in the top 10 physical activities in terms of participation rate, is has declined by 10% since 2001.
- The decline in Tennis and Golf over the past 10 years indicates that current provision is sufficient and that the “leisure / sport” offer needs to change to be more conducive with current day time restricted requirements.
- Swimming, Aerobics / Fitness, Walking, Running and Cycling (non-organised fitness / social activities) have seen a growth in participation when compared to more structured activities. Therefore there is an inference that existing or new sport & recreation developments need to cater for these requirements.
- The total participation rate in non-organised physical activity was 72.5%, regular participation in non-organised physical activity gradually increasing with age for both men and women.
- Golf activity is slightly lower in Western Australia when compared with national figures and there has been a slight decrease in participation in WA however it still ranks as the 6th most participated activity, and with the aging population and demographic of the SW it is likely to be a significant activity into the future.
- Soccer has increased participation both nationally and throughout the state over the past ten years, this is a trend that is likely to continue, and need to be provisioned.
- Surf Sports have a higher rate of participation in WA when compared with National figures, with the history of the sport in the SW and the establishment of the world class event, provision and amenity needs to be factored.

Other statistical information confirmed that:

- In 2012 national participation in AFL for male children was 14.9% whereas for females it was 1.0%. This compared to soccer which highlights 21.7% for male soccer and 6.5% for female soccer participation. Tennis showed a more equal gender split with 8.4% males and 6.3% female participation. Cricket identified a gender participation split of 8.6% (males) and 0.6% (females).
- In Western Australia the main participation sport for females other than swimming and netball was outdoor soccer, although participation is in decline as a percentage of the child population. The same is true of cricket, although tennis has shown a slight increase.

- An estimated 1.7 million (60%) children participated in at least one organised sport outside of school hours, in the 12 months to April 2012. This is the same number of participants than in 2009 (which was 63% of the child population).
- Participation rates were higher for boys across all age groups compared with girls, with the greatest difference being between 12 to 14 year olds (boys 74% compared with girls 55%).
- One of the main concerns is that whilst actual participation numbers for sports has remained relatively stable over the research period, the actual participation rates have fallen as a percentage of child population across many organised sports activities.

Male and female children's participation in selected recreational activities highlights the trend towards watching TV and videos and other screen based activities. Bike riding and skate boarding are relatively high participatory recreational activities with numbers amongst boys significantly higher than girls. Nevertheless both recreational pursuits rank highly amongst both sexes. For females, reading for pleasure is a significantly higher recreational activity than for males, but nevertheless ranks highly for both sexes. Data on the frequency of participation relates to the 12 months before interview.

With regard to sports participation trends the most common activities are identified as being:

For boys:-

- Outdoor soccer (21.7%);
- Swimming (16.5%); and
- Australian Rules football (14.9%).

For girls:

- Swimming (18.9%);
- Netball (16.2%); and
- Gymnastics (8.1% -figures only available for 2012).

Of particular note is:

- The level of male children's participation in soccer has growing significantly as a percentage over the 6 year period. Martial arts, basketball and athletics have similarly shown a gradual increase in participation. Other sports have either shown a decrease or have remained relatively stable participation rates. Netball shows a low level of participation amongst male children.
- Swimming, Soccer and Australian Rules Football participation amongst male children is significantly higher than all other organised sports
- The level of female children's participation in sports has either shown a decrease or has remained relatively stable over the six year period of study. Rugby union, rugby league, cricket and Australian Rules Football shows a low level of participation amongst female children.
- Swimming and netball participation amongst female children is significantly higher than all other organised sports.
- From further analysis of individual sports it can be seen that the overall growth in organised children's sport in Western Australia has generally been driven through population growth areas. This has generally been supported by highly developed programs associated with each sport.
- A comparison of the data from 2003 to 2012 shows that the participation rate in organised sport shows a slight decline (62% in 2003 to 60% in 2009).
- Approximately two thirds (66%) of all children aged between 9 and 11 years participated in organised sport, higher than the participation rates of those aged 5 to 8 years and 12 to 14 years (56% and 60% respectively).

Figure 30 Male Children's Participation in Selected Organised Sports for Western Australia 2006 – 2012 (Source: ABS)

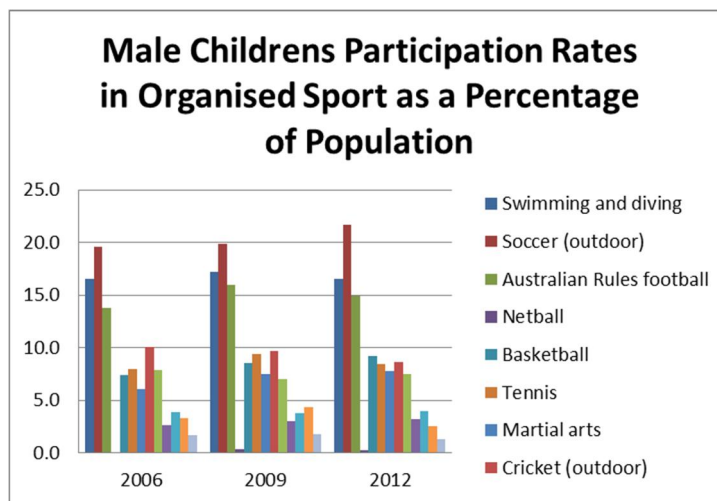
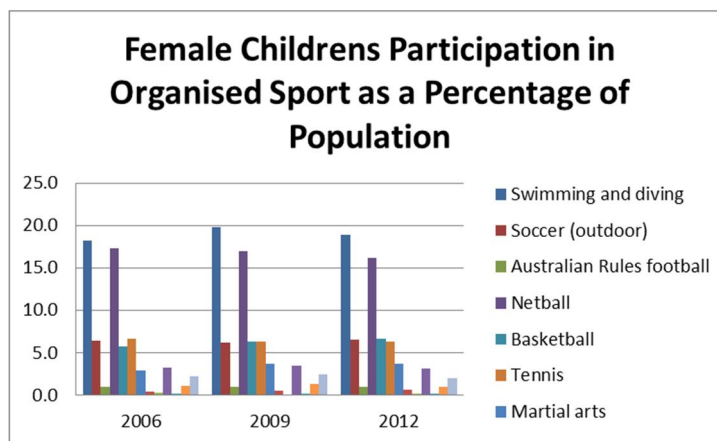


Figure 31 Female Children's Participation in Selected Sports for Western Australia 2006 – 2012 (Source: ABS)



- Participation rates for male children in at least one organised sport did not change significantly over the six year period. After showing an increase of three percentage points from 54% in 2003 to 60% in 2012, female children's participation rates in at least one organised sport did not show any significant change.
- More males (949,000) participated than females (727,000).

Other statistical information confirmed that:

- In 2012 national participation in AFL for male children was 14.9% whereas for females it was 1.0%. This compared to soccer which highlights 21.7% for male soccer and 6.5% for female soccer participation. Tennis showed a more equal gender split with 8.4% males and 6.3% female participation. Cricket identified a gender participation split of 8.6% (males) and 0.6% (females).
- In Western Australia the main participation sport for females other than swimming and netball was outdoor soccer, although participation is in decline as a percentage of the child population. The same is true of cricket, although tennis has shown a slight increase.
- An estimated 1.7 million (60%) children participated in at least one organised sport outside of school hours, in the 12 months to April 2012. This is the same number of participants than in 2009 (which was 63% of the child population).
- Participation rates were higher for boys across all age groups compared with girls, with the greatest difference being between 12 to 14 year olds (boys 74% compared with girls 55%).

- One of the main concerns is that whilst actual participation numbers for sports has remained relatively stable over the research period, the actual participation rates have fallen as a percentage of child population across many organised sports activities.

Male and female children’s participation in selected recreational activities highlights the trend towards watching TV and videos and other screen based activities. Bike riding and skate boarding are relatively high participatory recreational activities with numbers amongst boys significantly higher than girls. Nevertheless both recreational pursuits rank highly amongst both sexes. For females, reading for pleasure is a significantly higher recreational activity than for males, but nevertheless ranks highly for both sexes.

Sport and Recreation Participation Trends: Children

A National survey of children’s participation in Cultural and Leisure Activities is conducted every three years (ABS April 2012 is the latest version, recently published, which is a continuation of a series of surveys on this topic conducted since April 2000). It presents data on a range of cultural and recreational activities, including participation in organised sports and use of the Internet. The study includes children aged from 5 to 14 years inclusive and both state and national data is presented in respect of sport activities: Data was collected on children’s cultural and sporting activities undertaken outside of school hours over a 12 month

Figure 32 Male children’s participation in selected recreational activities (as a percentage of population) – Source ABS

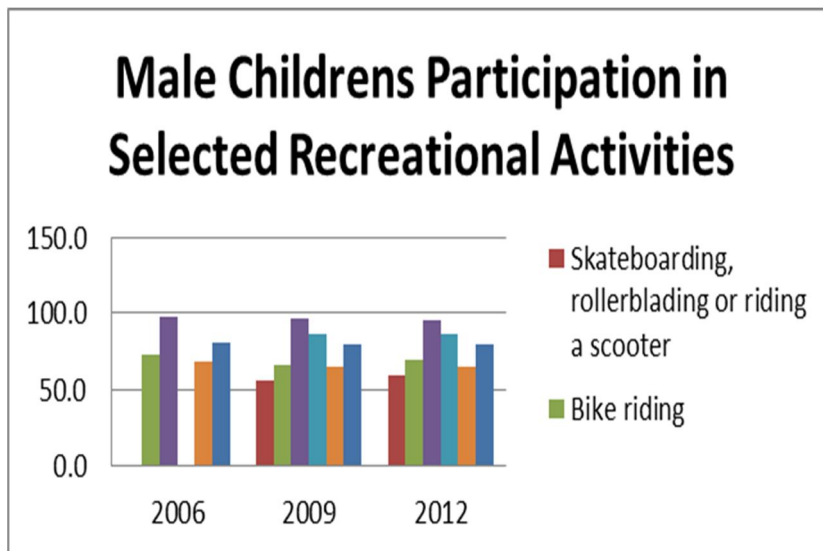
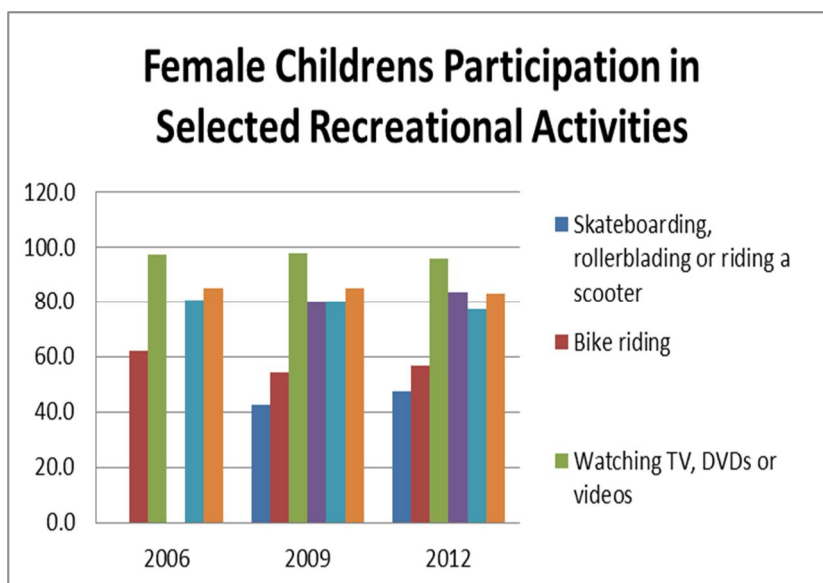


Figure 33 Female children’s participation in selected recreational activities (as a percentage of population – Source ABS)



Design Trends

The following relates to specific design trends which are applicable to the development of buildings and service infrastructure:

- Innovative practices are being developed to maximise natural lighting whilst minimising the vagaries of climactic conditions to develop more sustainable building fabrics.
- Intelligent facility design is required by the majority of facility operators to minimise staffing requirements.
- Flexible facility designs are required to attract a more diverse demographic mix and cater for alternative users with the potential to generate additional income.
- There is a trend of co-locating health and fitness facilities with other leisure based activities to create multi-purpose leisure venues that facilitate improved financial performance.
- The co-location of other community services with sport and recreation infrastructure to minimise administration, maintenance and running costs is becoming more commonplace. Current examples include education institution and community sport and recreation facilities (sharing of ovals, lighting and supporting clubhouse / changing room infrastructure).
- The design of facilities has improved in relation to minimising public risk and possible litigation.
- There is now greater pressure on reducing the environmental impact of facilities (i.e. by incorporating Environmentally Sustainable Design - ESD – initiatives in built infrastructure and using water sensitive solutions in the maintenance of open space and playing fields).
- Management of air temperatures in extreme heat and cold, through innovative design and introduction of building management systems:
- Improving the thermal comfort in indoor spaces and improving the buildings efficiency using passive systems such as shading and insulation to reduce heat gain and by installing modern energy efficient such as air-conditioning and mixed mode systems.
- Reducing the surface area exposed to solar radiations.
- Construction of windows at a high level to block floor radiation.
- Using materials with high reflection.
- Providing natural ventilation wherever possible.
- Environmental and Water Management is seen as a fundamental consideration in developing new community facilities which also seek to minimise cost through energy loss and maximise re-use of materials.
- The need to establish profitable secondary spend where possible (café, crèche, vending machines etc.) is generally considered to assist in securing the financial viability of many facilities.
- The increasing use of facilities by family groups which require appropriate support facilities such as family change rooms, social spaces and baby change facilities. This is critical particularly when considering the development of multi-functional facilities for wider community access.
- There is a need to build core infrastructure, such as vertical circulation, natural lighting, and HVAC (automotive environmental comfort) to support future development and ensure a smoother transition as new needs surface.

Operational Trends

- Increased competition (from other sports and leisure activities) which impact on programming and potentially undermine financial viability.
- Increased costs of energy, staffing and superannuation. Energy costs alone have increased by approximately 20% a year recently.
- Council financial pressures (increased competition for both revenue and capital investment).

- Pressures on local government discretionary spend limiting the flexibility to underpin non-statutory provision.
- Aging stock of facilities and allocation of additional funding to address legacy maintenance and refurbishment (including allocation of sinking funds).
- Increased customer expectations – which may result in the loss of current users and lack of ability to attract new participants.
- State/Federal drivers (funding requirements – monitoring - and the need to plan strategically).
- Increase in planning for the early determination of issues affecting service, (service review, benchmarking, and performance measurement).
- A greater focus on establishing sensible and realistic aspirations/targets (i.e. a realistic acceptance of the costs of operating sports facilities and the recognition of non-direct expenditure in overall income/expenditure financial accounts).
- The need to develop economic, effectiveness and efficiency of the service.
- Greater levels of partnership working (with other agencies, operators learning from best practice and not afraid to innovate). This includes the devolution of control from local government to alternative management arrangements which are held accountable for delivering on agreed objectives.
- Pressure on income generation requiring a greater focus on:
 - Market analysis and demographics
 - Targeted marketing and promotion
 - Member/user attrition, customer loyalty
 - Attracting new customers
 - Competitors' tactics and market intelligence
 - Innovative programming
 - Consistent and recognisable branding
 - Reducing Staff Costs. Invariably these are between 50% and 90% of income typically associated with community infrastructure. This requires ongoing assessment of:
 - Staffing levels (and potential alternative solutions to a staff presence).
 - Shift patterns and adopting innovative solutions
 - Quality training and personal development to ensure staff retention.

Facility Provision Trends

- The majority of community facilities are operated and managed by the relevant local government. In certain circumstances local government have brought in an experienced not-for-profit or commercial management body to bring in specialist expertise and offset asset management costs.
- The need to establish profitable secondary spend where possible in suitable locations to assist in the generation of income to sustain facilities i.e. café, crèche, vending machines etc.
- The increasing use of facilities by family groups which require appropriate support facilities such as family change rooms, social spaces and baby change facilities.
- Due to busier lifestyles there has been a move away from competitive and equipped sport to simpler, fitness orientated activities.
- Home based fitness and non-centre based activities such as cycling, walking and running are gradually increasing.

- Government drives against poor public health and obesity to have accessible facilities to allow a wide range of people to take more exercise.
- Specific Programming is required for Baby Boomers: Baby Boomers want to age well, and they are exercising for more energy and the ability to work and play longer. There is a need now to consider beyond the baby boom generation and anticipate what their needs will be in order to ensure appropriate investment in community infrastructure.
- Recent community planning initiatives across local governments highlight the rationalisation and co-location of facilities as being the preferred option. This is an emerging trend across Australia and overseas.
- The need to allocate land in advance of development to meet emerging community needs.
- Community expectation of a higher quality level of infrastructure and associated support.
- A shifting away from traditional organised sporting activities as the community progressively ages and/or seeks more choice and diversity in individual recreation activities.
- Work patterns are more individualised and less predictable and as a consequence there is less time for more traditionally structured sport and recreation activities.
- These trends are likely to be reflected in the development of sport and recreation facilities over the next 25 years.

Sporting Hubs and Precinct Facilities

Of recent trends in facility planning, the aspiration to develop consolidated sports hubs or precincts has become common place. The rationales for such developments include the following:

- A general acknowledgement that centralised administration and facilities can be of greater benefit to sporting clubs and recreational groups:
- The financial viability of facilities can be improved
- Needs can be more efficiently met through the co-location of facilities
- The increasing demands on open space provision and use particularly in urbanised areas where multifunctional use of a larger area is more easily managed and maintained.
- The need for operators to be responsible and accountable in the provision and management of the asset.
- The pressures facing local sports clubs and recreation groups in declining volunteers and increased risk management requirements which can be better managed by an overarching management body.
- Competition between sport and recreation uses and the need for service providers to be well managed and customer focussed.

When planning or considering the development of sporting hubs and precincts a number of opportunities and constraints are generally considered. These are outlined below:

- The establishment of a realistic vision is critical.
- The importance of acknowledging the needs of potential users including the broader community in the overall use and management of the facilities.
- Potential private interest in the use and/or management of facilities within the site. This could include leased space to compatible businesses such as allied health services, fitness operators, sports stores etc.
- Bringing a range of different uses and users together at one integrated site enables significant cost savings to be achieved and allows a more professional approach to management, maintenance and programming.
- Increasingly, the community is looking for and willing to pay for quality leisure services. If what they want to use is not of a sufficient standard, they will go elsewhere.

- Sporting infrastructure which can provide a diversity of activities will attract and retain community support.
- Facilities will require consistent access, opening times and programs in order to attract community users and satisfy needs
- The design of sporting infrastructure needs to minimise public risk and possible litigation. This would need to be considered in all development options. Increasing legislative requirements placed on providers is adding significant additional costs which need to be addressed or recognised at an early stage.
- Environmental and Water Management is seen as a fundamental consideration in developing community facilities.
- There is a trend of co-locating health and fitness facilities with other leisure based activities to create multipurpose leisure venues that facilitate improved financial performance.

Multi-functional facilities

Generally refers to the design and adaptability of single buildings and/or playing field space. The design incorporates highly flexible, innovative and adaptable approaches to meet the needs of a variety of users and use requirements. It is important within these facilities to incorporate a management approach which is independent of the user groups is fair, equitable and transparent in its decision making process.

Shared Use Facilities

To meet the needs of the community with limited resources, it has become more important to ensure that there is flexibility in the way that facilities are provided. Shared use infrastructure can include:

- The provision of multiuse facilities;
- Co-location of Council services; and
- Co-location or partnerships with other providers (including the not for profit sector).

Shared use (sometimes referenced as dual use) of school facilities is the most common mechanism for delivering shared use sport and recreation provision. This combines the use of facilities required to meet curriculum needs and managed/controlled access for more general community use.

When considering partnerships for the community use of school facilities we should ensure that the sharing of school facilities will:

- Meet an identified need in the local community.
- Offer benefits to both the school and the community.
- Make the most of school and community resources.
- Strengthen Relationships and social networks between schools and communities.

Benchmarking

The choice of playing surface infrastructure is critical in the development of the Regional Open Space. For the development to be viable it is important to choose a surface which is going to be attractive to clubs and support the development of the individual sports.

The ongoing implication of the cost of maintaining both grass and synthetic surfaces is a critical consideration and where possible the surfaces chosen should afford the maximum opportunity to play intensively and replicate the playing conditions commonly associated with high level competition.

Provision of Synthetic Turf

The provision of synthetic surfaces has over the past 5 years become a significant issue worldwide. Provision of full synthetic (3G or 4G) or hybrid (combined synthetic and grass pitches) is seen as the catalyst both to improve skills but also to offer a more intensive play capability.

The importance of dedicated synthetic pitch football hubs / academies / training bases has been further emphasised by more recent developments with the English market. An FA Commission report

highlighted the following key proposals to address the paucity in quality infrastructure when compared to continental Europe.

This included:

1. A 50% increase in the total number of full-size, publicly accessible 3G artificial grass pitches across England, to more than 1,000.
2. More than 150 new football-owned and managed football hubs to support the delivery of FA, county FA and professional club youth development and coach education programmes.
3. More than 50% of all mini-soccer and youth football matches - about 3,750 per week - being played on the best quality artificial grass pitches.

Australia has been developing the technology of providing synthetic surfaces to adapt to current climate change issues and is likely to follow a similar approach to that of the FA based on previous trends. Currently however the number of dedicated football synthetic surfaces is low, with none currently available within Western Australia

At the elite level, and in a controlled and supervised setting, the application of synthetic surfaces has proved successful particularly in Europe and has gradually been introduced in Australia (i.e. Darebin International Sports Centre; Tasmania and the ACT). FIFA's endorsement of synthetic pitches for international competitions has added further credence to the installation of such infrastructure.

Within Western Australia the ongoing maintenance of outdoor sports fields has become a significant issue due to concerns associated with climate change and the lack of available public water licenses to draw from. In the majority of areas across metropolitan Perth water licensees are close to or at capacity and this situation is unlikely to improve with population growth set to double by 2050. The lack of water to undertake basic maintenance regimes on outdoor sports surfaces has led to a number of sports and local governments looking elsewhere at alternative solutions to the traditional grass infrastructure. This has led to improved technology in the provision of synthetic surfaces which replicate the standard of play of grass pitches, whilst minimising water use and maximising play.

The following table provides a summary of benefits and challenges associated with the use of synthetic surfaces for sports

Table 20 Benefits and Challenges associated with the provision of synthetic surfaces

Benefits	Challenges
<ul style="list-style-type: none"> - There is capacity to accommodate high use in all seasons and weather conditions. Current estimations indicate that synthetic surfaces can generally provide between 40 and 60 hours use, (i.e. up to 3,000 hours per year) provided that a suitable maintenance regime is implemented. This has the potential to generate a significant financial return which could offset the costs of provision and provide a sinking fund. For grass pitch infrastructure the maximum use would be 15 hours per week in WA based on the recent Curtin University Public Open Space study for Metropolitan Perth. This provides for an estimated 600 hours of use (to include a 3 month recovery period) on a high quality turf field with an intensive maintenance regime and excellent drainage. - Access and use is not dependent upon climatic conditions. However in certain circumstances water may be required to offset heat issues. - The potential to raise revenue from hiring 	<ul style="list-style-type: none"> - Synthetic facilities have high installation and replacement costs (estimated \$0.6M for a soccer field). - Repair of damaged turf is costly and may result in a full pitch replacement depending on the damage incurred. - Permanent lines (stitched) are not practical for grounds used for multiple sports. - The impact of players in collision sports hitting the ground can cause extensive abrasions on exposed skin. This has been reduced through advances in technology but is still a serious issue. - Where the facility is located on Public Open Space under the control of a local government, use by local residents could be compromised for passive recreational use. This may result in a reduction of publicly available POS and as a consequence could prove difficult to develop in areas where POS is below acceptable standards. - Vandalism from unauthorised access may be difficult to prevent and address resulting

Benefits	Challenges
<ul style="list-style-type: none"> - facilities to various user groups is high. - The relatively low maintenance cost (approximately \$12k pa for an artificial surface, depending on the hours of use compared to an estimated \$35k pa for a turf equivalent). - Consistent and improved playing standards to enhance player skill levels and improve player technique. - Subject to stringent testing which accommodates player safety and bounce which is otherwise not available for grass pitch infrastructure. - Potential to incorporate environmentally sensitive design through trapping and channelling rainfall to catchment/storage areas for re-use. - Potential to significantly decrease water usage and decrease in water costs (dependent on the surface chosen). - In accordance with normal usage, the overall life span of a synthetic surface is between 8 to 12 years. The first replacement requires the initial replacement of the carpet covering whilst the second replacement (20 years would involve the replacement of shocks. (for hybrid surfaces, rejuvenation of the synthetic grass will be required). - Technology now permits multi-use line marking and greater multi-functional use. 	<ul style="list-style-type: none"> - in surfaces being out of commission for lengthy periods. - Carbon foot-print impacts, e.g. manufacture of synthetic material and glues used to install the surface, and the loss of the turf to the process of reducing CO2 from the atmosphere. - Depending on surface type, heat retention can be significant and result in the surface being unplayable during summer months. It is therefore critical to assess the heat generating and retention of each surface to be considered to ensure that it is appropriate to the climactic conditions prevalent.

Environmental Management of Sporting Infrastructure

Environmental concerns associated with climate change and limited water supplies in Western Australia have resulted in water restrictions being imposed during winter months and decisions being taken on Public open space reserves to reduce watering and accept a lower standard of grass cover. This situation is likely to get considerably worse as the population in metropolitan Perth expands further. This will result in greater restrictions on grass pitch irrigation and the need to source alternative solutions to the current water intensive level of grass pitch provision.

The following strategies have been identified to reduce the water demand of sports facilities and improve their sustainability in drier times:

- Install synthetic surfaces.
- Use of appropriate and low water turf species.
- Implement appropriate turf management practices.
- Improve understanding of site and climatic conditions.
- Prepare a water budget.
- Improve irrigation control.
- Review irrigation methods.
- Rationalise provision of facilities.
- Rationalise the area requiring irrigation.
- Reduce water use in clubrooms, toilets and across the whole council.

- Reduce water use at sports facilities managed by clubs.
- Investigate alternative sources of water.
- Improve responses to restrictions.
- Influence decision makers, including communities and sporting clubs.

A number of conclusions were reached from the research and investigations conducted during the project. These include:

- Successful water saving projects frequently requires a holistic range of strategies to achieve successful outcomes.
- Reductions in potable water use at sports facilities in excess of 50% are achievable.
- Consultation with sporting clubs and communities is needed to develop a combined understanding and ownership of the problem and the solutions.
- The required investment to achieve the possible water saving is beyond the financial resources of many councils in the short to medium term.
- Due to the high cost and lack of space for the construction of substantial local storage facilities, drought proofing facilities using storm-water and some other alternative sources needs to be carefully evaluated against other alternatives.
- Although additional resources and funding for responding to the drought and water shortages are likely to be available in the future, the need to continue saving water will still exist. The provision of funding is likely to include the expectation that the water saving effort will continue and associated potential substantial water price increases will maintain the business case for demand reduction and alternative water sources.

Appendix D

Consultation & Engagement

Appendix D Consultation & Engagement

The following section represents the comments and feedback from the consultation that was conducted during the development of the Master Plan. The following comments or statements have been considered in developing the recommendations within the report:

Pioneer Park User Groups

The history of Pioneer Park has seen a limited amount of sport capable of being played, due to its degradation and the risks to the sporting community. Pioneer Park has been used for Softball, Tee Ball and Rugby League. The reserve was established originally for softball (home of the Perth Hills Softball Association), collocated with tee ball. Due to the subsiding playing pitches, uneven and unsafe playing surface the softball and tee ball clubs and associations were relocated (softball association subsequently left the competition due to the inability to provide the clubs with a home).

Tee Ball Club

- Contacted as requested by Shire officers to ascertain if there was a desire to return to Pioneer Park to create a home of diamond sport within the Shire.
- The club has requested that they are not contacted again as they felt any discussion would jeopardise the good working relationship forged at another reserve with a cricket club.

Kalamunda Canning Rugby League Club – Bulldogs

- Currently have over 70 juniors which train at Pioneer Park and compete at other sites due to the condition of the site (including the lack of change rooms and storage). Sunday Competition is 6.30 -4.00pm
- Currently have approximately 130 seniors.
- The club rooms are not fit for purpose or meet any current building codes. They fail to meet fundamental requirements of sporting organisations and competitions, which in turn is limiting growth.
- Senior Training is on Tues-Fri (5pm-8pm), Saturday includes competitions from 9am-5.30pm, where 5 teams are fielded including , C Grade, Reserves, 1st Grade, 18 years and Women's competition.
- The club is willing to share with anyone as long as they can secure access to infrastructure to complete a full rugby season.
- Lighting requirements are 200lux and they currently have a set of 4 poles at 200lux being within time limited storage at present. These need to be stored elsewhere as a matter of urgency or they will be required to sell them.
- Touch and NRL alignment nationally has been finalised. This will mean that all touch and rugby league clubs will be affiliated with the new National Rugby League (NRL) and competitions will be undertaken under a different in structure in future.
- The club aspire to be a community hub, able to operate a holiday program, clinics and after school programs. They aspire to be an integrated community hub with other family services (Including crèche, PCYC, Youth focus, playgrounds and mix uses for family services).
- The following issues were highlighted during the consultation:
 - the building/pavilion is not fit for purpose which is restricting the clubs growth
 - a need for a fully fenced senior playing field
 - lack of lighting
 - loss of team spirit/morale as they get little support and or value from the Shire (as reflected by their facilities)

- They wish to promote themselves as an all-inclusive club. There are however restrictions on women using the same facilities as men (as there is only 2 showers, 2 toilets and 1 change room).
 - Restricted to season games only - no finals can be hosted as don't have the facilities required.
 - Surface quality is declining rapidly especially in the northern western corner, drainage is poor and they are unable to train on it without compromising the surface.
 - Risks: public liability, governance/auditing, injuries, harm to children, exposure to the elements and inability to attract new members and keep volunteers health and wellbeing as the amount of time being spent moving equipment and driving to other grounds for all elements of the club.
 - Duty of Care is a concern to all involved in the club and visitors.
- The club is financially viable and has a strong committee who have expressed concerns relating to their ability to sustain this into the future due to the lack of appropriate facilities. This is likely to impact on the current commitment of volunteers to continue facilitating and operating competitions (particularly where there is a lack of shelter and shade).
 - The club have identified they require 2 senior playing fields with an additional open space shared for training and junior games (floodlight).

Perth Hills Softball Association

- The association has been in operation for the past 25 years and wants to continue.
- All clubs in Kalamunda played under the Hill District Softball (HDS) which is currently an inactive sporting association (the association has no home playing fields).
- The club members have all gone to other associations though are willing to return.
- If there is currently no lighting and therefore they will only be able to play in summer. Training is currently undertaken within another LGA.
- The HDS contributed a \$30,000 investment into the establishment of Pioneer Park.
- The council has not communicated what is happening with Pioneer Park or offered alternatives for a lengthy period.
- The association has a strong committee and does have a desire to reactivate the association if a sustainable home could be found.
- The association has a good governance structure and the current president is committed to the reintroduction of the association and securing its viability into the future.
- The club indicated that they would ideally like to reactivate Pioneer Park as their home. They are however realistic in appreciating that Pioneer Park may not be the most suitable location for growth of the association due to the perception and reality of not being able to promote sustainable playing surface and lighting conditions into the future.
- The association require a 12 month operational diamond playing fields (2 diamonds floodlit to Australian standards). To operate effectively 2 diamonds would be required (although ideally 3) and / or shared open space for training (floodlight).

Shire of Kalamunda Officers

- A workshop was held with many Shire officers and managers to review the findings of the Situational and Site Analysis.
- Identified gaps were discussed and information truth checked. Additional information was sourced and supplied by officers.
- History and environmental information was clarified and the cost benefit of redeveloping the site was discussed.

Gas Company

- Could not source maps or diagrams that indicate the location, depth and pattern of the pits, pipes and plans for the infrastructure of the site.
- Indicated the north section pits ran laterally north to south (this is visible with the land subsiding) approximately 15m deep.
- The middle section was the deepest section with put up to 25m in depth due to the vegetated areas on the west and eastern boundaries.
- The south section was approximately 15-17m deep with horizontal pits and pipes.
- The manifold (main gas pipeline) runs from the northern edge of the reserve, under the rugby playing field to the burn off area and generator. In the past two months (Oct / Nov 2014) the main pipeline was severed and capped at Roe Hwy, this will allow for concentrated monitoring of landfill gas levels within Pioneer Park to occur in the next 5 years.
- The gas company requested that their responsibility under the agreement be reduced to the monitoring of the newly installed landfill monitors installed along the northern Roe Highway edge of the reserve, and the generator area. This would mean that the above ground pipeline and other pipe underground within the reserve would now be the responsibility of the Shire to maintain.

City of Belmont

- Representatives from the Planning, Parks and Environment and Community Development (Recreation and Club Development) discussed the findings of the site and situational analysis.
- The City officers detailed the findings and progress of the Belmont Housing Strategy, Local Planning Scheme, Public Open Space Strategy and other policies and documents that needed to be considered during the development of the Master Plan
- The City reinforced its strategic direction with water efficiencies principles in regard to POS and the need to strategically position any future district and regional sporting and recreational open space.
- The City indicated the only sporting code normative need not currently being met within the City was soccer.
- Confirmed that the position of Pioneer Park was not in keeping with their strategic direction and the City expressed the concern that the potential cost benefit to the community would likely be low.

Department of Education

- Whilst the School were consulted as part of the Darling Range Master Plan the DoE expressed a lack of knowledge of the outcomes of the previous discussions in relation to the proposal to collocate sporting playing fields at the Darling Range College
- The Darling Range College is an independent school which has the responsibility to manage and negotiate the development and shared use of the school and its grounds. DoE therefore have limited influence over the extent of community use which could be secured.
- The Department of Education (strategic planning unit) would be willing to liaise and would promote the shared use of the school and would be willing to arrange further discussion if the matter was to be pursued.

SUMMARY

Overall the consultation highlighted the current state of Pioneer Park as being substandard and not fit for sporting club use. A decision therefore needs to be made immediately on the viability of the continued and future use of the reserve. The clubs have also indicated that they would like to see improved communication and support to reduce the risks to their members and the community with the continued use of Pioneer Park.

The outputs from the consultation process revealed that there is a need to provide rectangular and diamond playing fields for training and competition for the Kalamunda community. It also highlighted

that the cost benefit of redeveloping the reserve would need to be fully explored to warrant substantial financial and resource commitment. The potential problems highlighted by various groups indicated that significant investment would be required to merely remediate the reserve to enable viable playing pitch surfaces to be developed. The Master Plan must therefore consider and detail the cost benefit and risks associated within its recommendations.

Appendix E

Risk Assessment

Appendix E Risk Assessment

Background

The Shire of Kalamunda (Shire) is undergoing a Master Planning process for the redevelopment of Pioneer Park located at Dawson Ave, Forresterfield. Prior to Pioneer Park being used for recreation and sporting pursuits the land was formally used as the Shire's landfill site.

Pioneer Park (Lots 300 and 12588) is located on approximately 57 ha of land, 25 km south-east of the Perth CBD. The site is separated into four lots, supporting different land uses which comprise an area of approximately 52 ha. It is mostly cleared surface area, traversed with tracks and boarded with native vegetation on the east and western portion of the reserve.

Two lots either side of Dawson Avenue make up what is known as Dawson Park, with a subsiding and cracking car park and play equipment (needing replacement) situated in the northern section of the reserve. Crumpet Creek follows the north-west corner the reserve, intersecting the site from Roe Highway, near the car park in the northern section, and running north then east, parallel with the reserve's boundary to intersect with Dawson Avenue. South of the Site lies Dawson Park Primary School and a lot owned by the Agriculture Protection Board and Conservation.

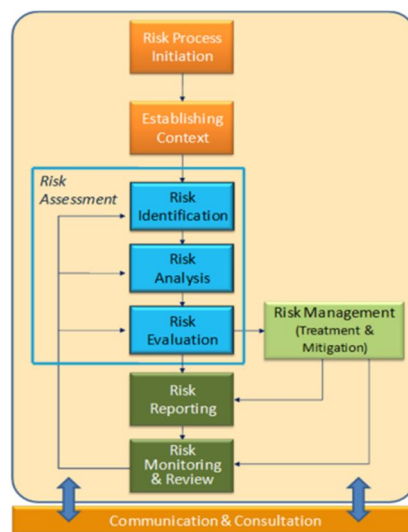
Numerous reports have been conducted identifying potential containments, significant differential settlement across the playing fields and limitations to developing the site. This document review and site analysis report explores the previous documents, history and simply identifies opportunities and constraints to the redevelopment of Pioneer Park.

Risk Management Process

Risk Management is the culture, processes and structures that are directed towards realising potential opportunities whilst managing adverse effects.

The risk assessment approach applied was as per industry and quality management systems. The risk management process is outlined in table 21.

Table 21 Risk Management Process



Rating the risk

In determining the risk level, the following model was utilised for the classification of risk:

Level of Risk = Likelihood x Consequence.

Likelihood and Consequence definitions applied are as per, with the level of risk being determined using the risk rating table.

Table 22 Risk Rating

LIKELIHOOD	CONSEQUENCES				
	INSIGNIFICANT (1)	MINOR (2)	MODERATE (3)	SIGNIFICANT (4)	SEVERE (5)
Almost Certain (5)	Medium (5)	High (10)	High (15)	Very High (20)	Very High (25)
Likely (4)	Low (4)	Medium (8)	High (12)	High (16)	Very High (20)
Possible (3)	Low (3)	Medium (6)	Medium (9)	High (12)	High (15)
Unlikely (2)	Low (2)	Low (4)	Medium (6)	Medium (8)	High (10)
Rare (1)	Low (1)	Low (2)	Low (3)	Low (4)	Medium (5)

Context

The context of this risk assessment comprised of identification of risks and associated treatments relating to the redevelopment of Pioneer Park and the Shire of Kalamunda in providing community infrastructure; rectangular and diamond pitch and associated infrastructure.

Primarily, risks have been identified relating to the provision of the planning, environmental impact and construction with additional implementation risks relating to the effectiveness of the decisions made as a result of the Master Plan.

Options Risk Analysis

This section sets out the associated risk rating of the analysed options for the purposes of redevelopment of Pioneer Park. It provides a further assessment of the individual risks associated with the development of the options and seeks to confirm the preferred / optimum option from the five shortlisted options in order that a decision on the future of Pioneer Park can be made. The analysis does not include any current controls and mitigation measures (residual risk measures) which may be in place as this would be analysed in detail during subsequent phases.

In determining the risk level, the classification of risk used the following process: Level of Risk = Likelihood x Consequence. Likelihood and Consequence definitions applied are as identified in Table 23 below, with the level of risk being determined using the risk rating diagram contained at table 24.

Table 23 Risk Assessment Factors

Likelihood is assessed as:		Consequence is assessed as:	
1. Rare	The event may occur in exceptional circumstances during the life of the project	1. Insignificant	Insignificant increase in cost or time; barely noticeable degradation of quality or decrease in scope.
2. Unlikely	The event could occur sometime during the project	2. Minor	10% increase in cost; 5% increase in time or some quality degradation with minor areas of scope affected.
3. Possible	The event should occur at some time during the project	3. Moderate	10-20% increase in costs; 5-10% increase in time or reduction in the quality that will require sponsor approval with major areas of scope affected.
4. Likely	The event will probably occur during the life of the project	4. Significant	20-40% increase in cost; 10-20% increase in time, or a reduction in the quality and scope that is unacceptable to sponsor
5. Almost Certain	The event is expected to occur during the life of the project	5. Severe	>40% increase in cost; >20% increase in time or project end item is effectively useless.

Detailed Analysis and Impact

This detailed analysis and impact for the options is identified in the table below and the likelihood / consequences for each risk identified. The parameters of the criteria of risk have been categorised under 4 broad headings of time, cost, scope and quality.

Project risks all reference back to these parameters and these are required to be weighted accordingly. For the purpose of this assessment the 4 broad headings are afforded the following weighting –

- Time – 40% based on the urgent need to understand and make a decision of the future of Pioneer Park and the risks raised within the consultation.
- Cost – 30% based on the need to ensure that the options are completed within a reasonable budget having regard to the constraints associated with each option.
- Scope – 10% based on the impact on likely scope – All options identified have the capability of accommodating softball and rugby.
- Quality – 20% based on the need for the resultant facility to meet minimum service requirements and be at least to / above the development standard of the current site.

The points associated with the criteria under the four broad headings are totalled and then an average score provided which is then multiplied by the weighting. This then provides an overall section score which is then compiled to provide an overall risk score (the lowest score = the lowest risk).

Table 24 Site Assessment Ranking –site options (colour scheme relates to risk rating implications)

Very High (Rating score #5)		High (Rating score #4)		Medium (Rating score #3)		Low (Rating score #2)	
Criteria	Description	Option 1	Option 2	Option 3a	Option 3b	Option 3c	Rating
Time							
Timing of development	There are likely to be any issues to allow the project to be completed in the required timeframes	20	20	6	9	4	5
Planning / Regulatory	Are there likely to be any planning issues or restrictions with the option?	20	20	4	6	6	4
Servicing	Are there likely to be issues with the upgrading of services	16	16	4	6	12	3
Average Weighted Score (40%)							

Very High (Rating score #5)		High (Rating score #4)		Medium (Rating score #3)		Low (Rating score #2)	
Criteria	Description	Option 1	Option 2	Option 3a	Option 3b	Option 3c	Rating
Cost							
Public Liability Cost	A critical incident occurs resulting in a hefty liability case	20	20	4	4	4	4
Ongoing Cost	Are there likely to be high annual costs such as, operation, maintenance, subsidising land lighting etc.	20	20	6	4	6	3
Capital Cost	Are there any issues with the option that may make it more expensive to build on	25	25	6	4	9	4
Funding Opportunities	Is the site likely to result in difficulties in securing funding from State Government, or other parties	20	20	4	4	4	4
Level of State Govt Support	Are there likely to be any issues or positives with State Govt for the option	20	20	4	4	4	4
Weighted Score (30%)							
Scope							
Level of Stakeholder Support	Are there likely to be many issues or positives with other Stakeholders for the option	16	16	4	4	6	2
Funding	Are there limited or a variety of funding sources available to deliver the staged development of each option	20	20	4	4	4	4

Very High (Rating score #5)		High (Rating score #4)		Medium (Rating score #3)		Low (Rating score #2)	
Criteria	Description	Option 1	Option 2	Option 3a	Option 3b	Option 3c	Rating
Regulatory Requirements	Are there any statutory requirements which may reduce the scope of works / impact on development	20	20	4	16	16	5
Weighted Score (10%)							
Quality							
Quality of facilities	Will the option be incapable of providing for fit for purpose modern facilities	12	12	9	10	4	3
Access	Are there any access issues/restrictions for accessing the facility	8	8	4	6	6	2
Potential to grow	The site of insufficient capacity and flexibility to accommodate future proofing of venue for growth	12	12	12	12	4	3
Associated Facilities	The ability for the associated facilities to meet the needs of the user groups	10	10	6	4	4	2
Weighted Score (20%)							

Primarily, risks have been identified relating to the provision of the planning, environmental impact and construction with additional implementation risks relating to the effectiveness of the decisions made as a result of the Master Plan.

Continue to Use Pioneer Park in its current state

- The risk assessment identified a medium (8) risk to the user groups and the Shire in continuing to use Pioneer Park in its current form.
- There is a risk of potential harm to users and the community; to the Shire financially and in respect of the time it would take to rebuild the Shire's reputation if an accident occurred.

Redevelopment of the site

- Unsecured access to Pioneer Park is increasing the risks of Acts of God, damage to flora and fauna and increased dumping of contaminants at the site
- Car parking cost, quality will continue to be a high risk given the unknown substructure
- Gateway Project is exacerbating the high risks to the redevelopment of Pioneer Park, as public liability, OH&S concerns and the addition to the cycle path through the reserve increasing security risks.
- The risk assessment identified 2 medium (8) to high (12) risks to the user groups and the Shire in the redevelopment of Pioneer Park.
- The remediation and redevelopment of playing fields, sports pavilion and associated infrastructure of Pioneer Park has numerous environmental and financial risks to the community and the Shire. A large amount of resources and time would need to be invested to redevelop Pioneer Park as an accessible and quality asset.

Overall the risk associated with and the low cost benefit of redeveloping Pioneer Park; would deem that direction not a viable option.

Risk Identification and Analysis

Identified risks were then analysed individually and have been summarised in Table 25 below.

Table 25 Risk Analysis

Ref#	Type	Identified risk	How it can happen	Current Controls	Likelihood	Consequence	Residual risk rating
1	Reputation	Engagement Shire of Kalamunda reputation will be negatively impacted due to community dissatisfaction with how it has consulted with the clubs representative and the broader football community.	The community perceive that the Shire officers have not used established relationships and consulted in an appropriate manner.	Stakeholder engagement during plan	Low (3)	Minor (2)	Low (3)
2	Reputation	Engagement Shire of Kalamunda reputation will be negatively impacted due to community dissatisfaction with how the Shire has communicated decisions	Community dissatisfaction with the lack of information and consultation; Increase in community expectations A member of the public goes to the media with the incorrect information.	Stakeholder engagement during plan	Low (3)	Minor (2)	Low (3)
3	Reputation	Relationships Shire of Kalamunda reputation will be negatively impacted due to established working relationship with clubs being compromised.	The community dissatisfaction with the lack of information and consultation, or consultation conducted in the incorrect or non-agreed manner. Perception of lack of equity and equality within clubs	Established working relationships are monitored and maintained regularly to ensure that the manner of engagement established is adhered to at all times.	Low (3)	Minor (2)	Medium (6)

Ref#	Type	Identified risk	How it can happen	Current Controls	Likelihood	Consequence	Residual risk rating
4	Business Resilience	<p>Continuity of Project staffing</p> <p>Staffing within the project is not clearly defined and dedicated, lacking the effectiveness to ensure deadlines are met.</p>	<p>Changes in staffing levels or workload;</p> <p>Lack of staff knowledge from outside of the project team;</p> <p>External parties are unable to meet deadlines.</p>	<p>Council briefing to confirm the importance of the plan;</p> <p>Cross-functional project team will ensure a number of staff are across the project</p>	Low (1)	Minor (2)	Low (3)
5	Business Resilience	<p>Construction</p> <p>The construction site is disrupted for extended periods of time resulting in time and cost blow outs and poor reputation</p>	<p>Labour disruptions;</p> <p>OH&S procedures and practices are not in place or followed;</p> <p>Inaccurate Record Management;</p> <p>Acts of God;</p> <p>Public Liability Claim;</p> <p>Inappropriate contract and procurement process</p> <p>Losing control over the Project Governance structure</p> <p>Lack of capability in asset management</p> <p>Inappropriate performance specifications</p>	<p>Preparation and Development of the following is considered best practice:</p> <p>Project Management Plan;</p> <p>Preparation of Site Management Plan;</p> <p>Project Management Files;</p> <p>Allocated Project Manager from the beginning of project;</p> <p>Establish Project team with specific knowledge and skills set;</p> <p>Procurement Plans;</p> <p>Quality Plans;</p> <p>Resources increased;</p> <p>Good Planning practices;</p>	Low (2)	Minor (3)	Medium (6)

Ref#	Type	Identified risk	How it can happen	Current Controls	Likelihood	Consequence	Residual risk rating
6	Business Resilience	Operational Inability to effectively operate and manage the site resulting in cost/quality and time blow outs	Lack of core capability Infrastructure gap to facilitate growth and partnerships OH&S – increase in near misses and accidents Inability to facilitate the growth of the sport due to reduced access to facilities Distance and locations of training and competition venues	Strategic Plan Governance structures Plan to build relationships and partnerships at all levels Policies and Procedures Engagement and communication strategies	Low (2)	Significant (8)	Medium (8)
7	Financial	Budget Insufficient funds budgeted for the project.	Inaccurate cost estimates; State priorities change. Misunderstanding the market needs	Monitoring industry trends with pricing estimates for similar consultancy works.	Low (2)	Minor (2)	Low (4)
8	Financial	Funding Unable to secure appropriate external funding	Inability to apply for funds; Not meeting funding requirements;	In communication with State government officers Establish networks and links.	Low (2)	Moderate (3)	Medium (6)

Ref#	Type	Identified risk	How it can happen	Current Controls	Likelihood	Consequence	Residual risk rating
9	Financial	Funding Inappropriate management of Funding/grant	Funding/grant requirements are not meet; Inaccurate or lack of record keeping; Project updates are not sent to funding body.	Project Management Files; Regular Audits of files; Monthly reporting; Project handover procedures.	Low (2)	Moderate (3)	Medium (6)
10	Financial	Procurement / Ongoing Financial Management Inaccurate whole of life costing's and poor planning results in poor financial situation	Lack of staff knowledge or dissemination of information to internal project team; Inaccurate information received. Costs increase at a rate greater than CPI inappropriate contract and procurement process	Ensure customer surveys are completed and targets meet Strategic Reviews Reporting requirements to State	Low (2)	Moderate (3)	Medium (6)

Ref#	Type	Identified risk	How it can happen	Current Controls	Likelihood	Consequence	Residual risk rating
1 1	Regulatory / Environ Regulatory / Environmental	Statutory/Environmental requirements Identified Servicing, statutory or environmental requirements not being managed appropriately significantly delaying the project	Land use requirement and planning frameworks change; Quality of project is compromised and budget constraints. Increase in regulatory requirements Civil infrastructure requirements do not allow preferred building location requirements The correct process is not adhered or short cuts are taken Change in political environment Development Application is not excepted Increase in insurance requirements and public liability Water Availability within the site	Cross-functional project team with relevant expertise; Project Manager ensuring constant consultation with the team to ensure regulatory requirements are met; Consultation with the regulatory authorities during the project Engagement of consultant with expertise Site Selection Criteria Research/investigation and attendance at conferences and forums to consider all aspects including changes in technology and ongoing maintenance	Low (3)	Significant (8)	High (12)
1 2	Regulatory / Environmental	Statutory/Environmental requirements Governing bodies may not support the project resulting in it concluding	Political shift or governance; Not communicating and providing the correct information when required.	Keeping abreast of decision making and other proposals; Communication with all key government bodies.	Unlikely (2)	Significant (4)	Medium (8)

Risk Evaluation and Treatment

Table 26 outlines the organisational risk acceptance criteria and tolerance tables and the requirement to treat risks where the value of the risk is greater than 8 (i.e. Medium to High).

Table 26 Risk Treatment Plan

Risk	Short Risk Description	Treatment Details	Responsible Officer	Completion Date	Projected		
					Likelihood	Consequence	Rating
6	Operational Inability to effectively operate and manage the site resulting in cost/quality and time blow outs	Implement recommendations within the Master Plan	Shire of Kalamunda	Immediately	Low (2)	Significant (8)	Medium (8)
		Open communication and engagement with the users and community	Shire of Kalamunda	Immediately			
		Engage with City of Belmont officers to workshop recommendations within the Master Plan	Shire of Kalamunda	Short term			
11	Statutory/Environmental requirements Identified Servicing, statutory or environmental requirements not being managed appropriately significantly delaying the project	Investigate all requirements	Consultant	ongoing	Low (3)	Significant (8)	High (12)
		Engagement of State and Commonwealth Government departments to identify potential constraints or opportunities	Consultant	ongoing			
12	Statutory/Environmental requirements Governing bodies may not support the project resulting in it concluding	Engagement of State and Commonwealth Government departments to identify potential constraints or opportunities	All		Unlikely (2)	Significant (4)	Medium (8)

Appendix F

Floodlighting Design Considerations

Appendix F Floodlighting Design Considerations

Typical Softball field lighting design

The following section illustrates the flood lighting requirements for softball and rugby playing fields. This is not specific to Pioneer Park, they are generic requirements for each sport and estimated cost excluding site conditions, project management and construction costs.

Softball

For each softball field 6 X 25m Poles with 44 PHILIPS OPTIVISION MVP507 1xMHN-LA2000W/400V/842 NB/60 for each softball pitch for national Club level.

Figure 34 Typical Floodlighting Design for Softball

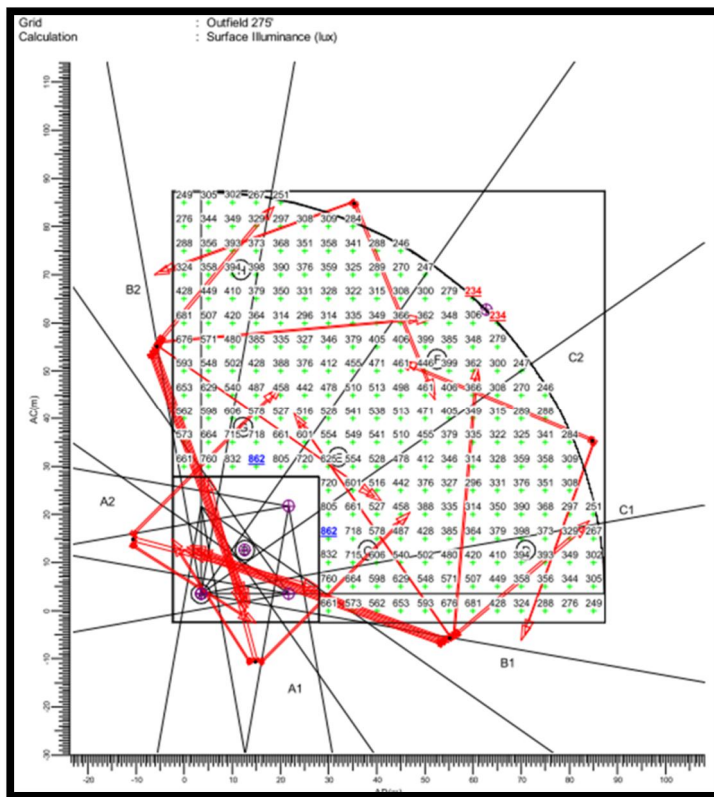
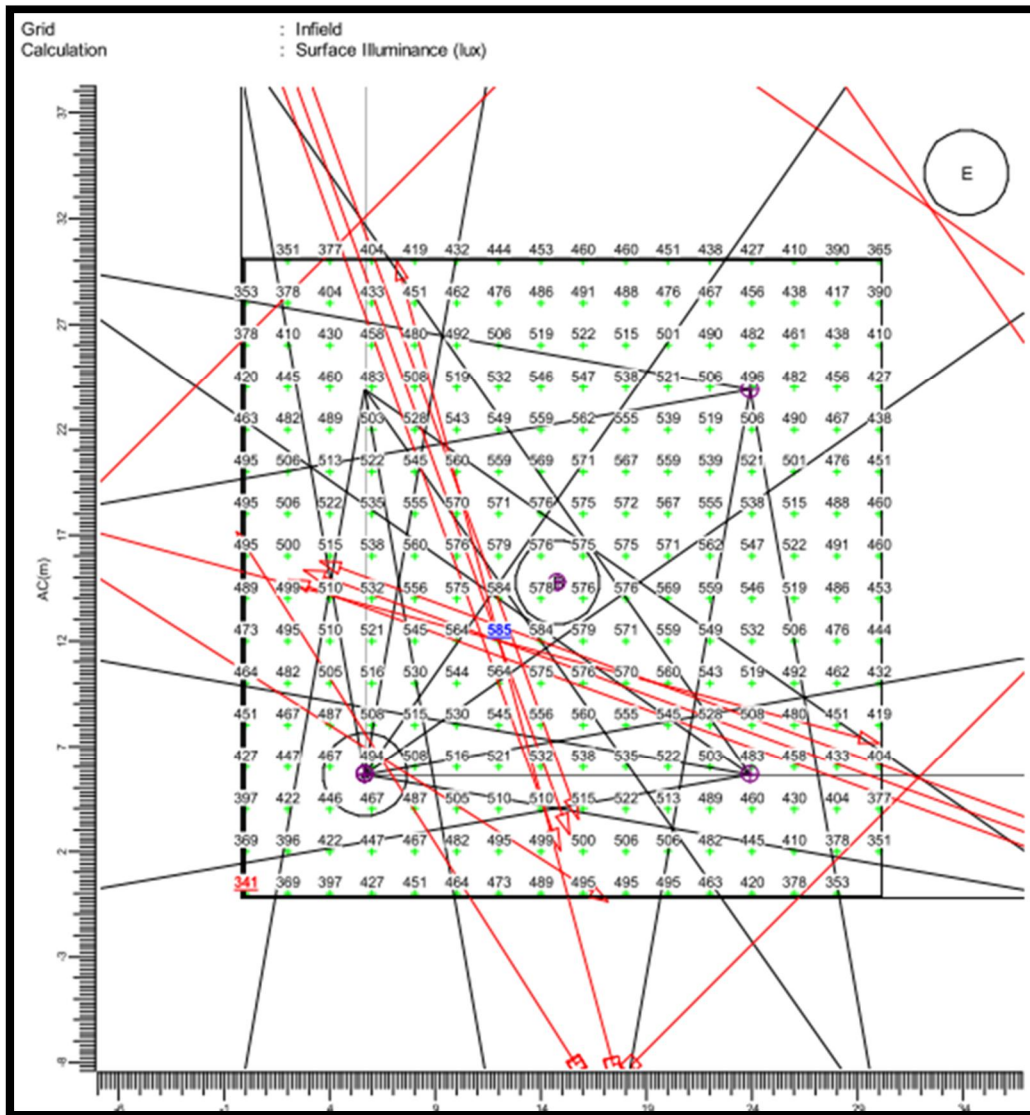
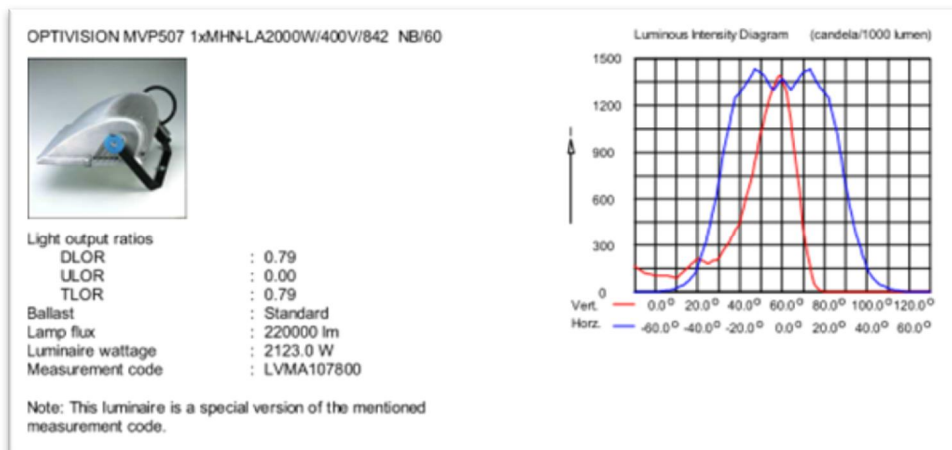


Figure 35 Typical Floodlighting Design for Softball



Luminaire Detail

Figure 36 Luminaire Detail



Cost Estimate for two Softball fields

Table 27 Supply and Install of Floodlighting for Softball

Service	Company	Cost including GST
Poles and Footings supply	Aus Pole	\$260 650.00
Floodlight Luminaires supply	Philips Lighting	\$158 400.00
Electrical installation - SMSB Distribution board upgrade - External distribution boards for tower - Dynalite control system - Conduit and pit system - Mains cabling - Aiming and commissioning - Foundation Installation of 12 x 25m lighting towers - Installation of 12 x 25m rigid lighting towers with cross arms	Local Electrical contractor	\$560 000.00

Total Price for the proposed two softball fields lighting upgrade to National Club standards will be \$979,050.00 Excluding GST

Rugby field lighting

Requirements to appropriate Australian Standard AS4282(Control of the obtrusive effects of outdoor lighting), AS2560.2.3 (Specific recommendations for football-all codes).

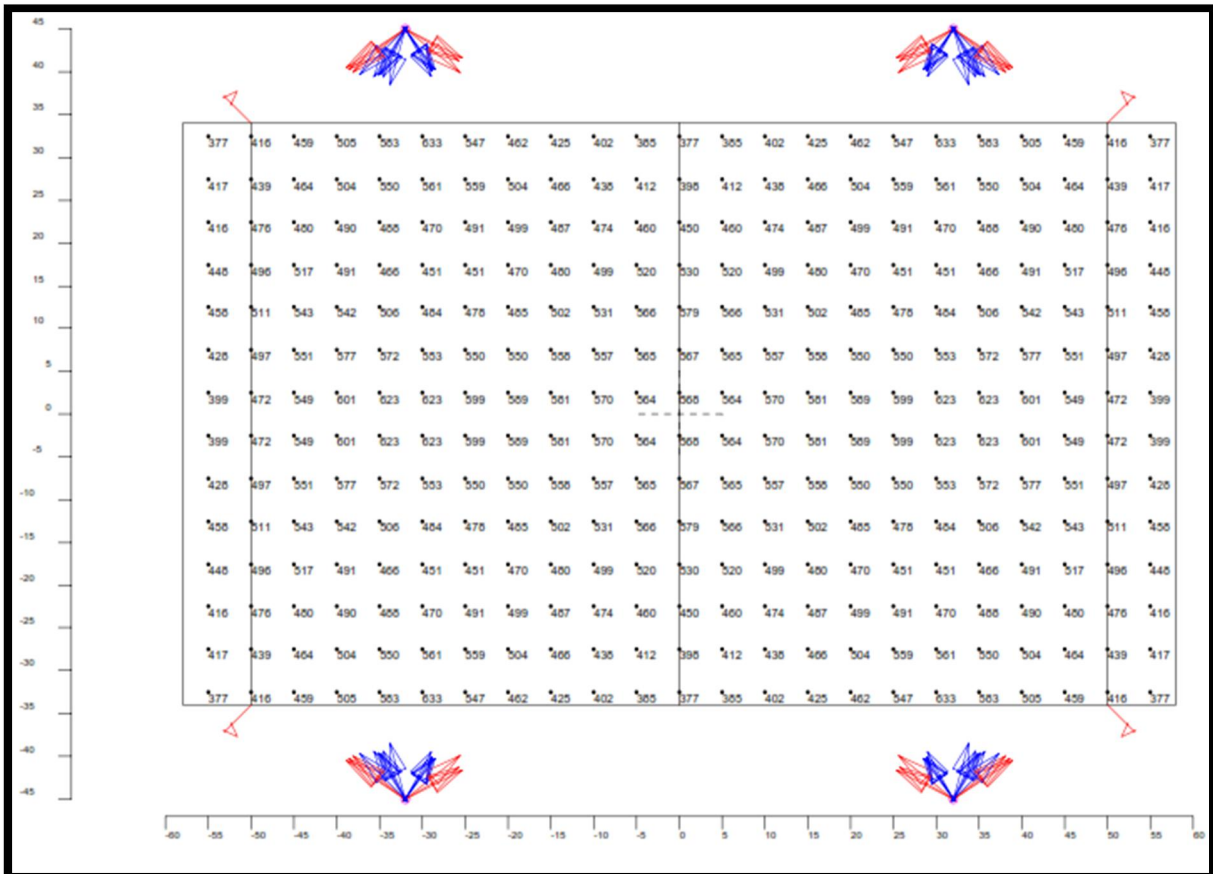
Figure 37 Recommended Illuminances for Rugby

		Minimum horizontal uniformities ²⁾		Maximum glare rating (GR _{max})	Minimum colour rendering index (R _{s min})	Maximum uniformity gradient
Level of play	Maintained average horizontal illuminance ^{1,3)} (E _{ms}) lux	(U ₁)	(U ₂)			
Recreational level						
Touch and tag	50	0.3	N/A	N/A	65	N/A
Amateur level						
Ball and physical training ⁴⁾	50	0.3	N/A	N/A	65	N/A
Club competition and match practice	100	0.5	0.3	50	65	N/A
Semi-professional level						
Ball and physical training ⁴⁾	50	0.3	N/A	N/A	65	N/A
Match practice	100	0.5	0.3	50	65	N/A
Semi-professional competition	200	0.6	0.4	50	65 ⁴⁾	N/A
Professional level						
Ball and physical training ⁴⁾	100	0.5	0.3	50	65	N/A
Match practice	200	0.6	0.4	50	65	N/A
Professional competition	500	0.7	0.5	50	65 ⁴⁾	20% per 5 m

Typical Rugby field lighting design

For each rugby field 4X25m Poles with 64 PHILIPS OPTIVISION MVP507 1xMHN-LA2000W or National Club level (Will be able to do it with 6 Poles in total for both playing fields)

Figure 38 Rugby field lighting design



Luminaire detail

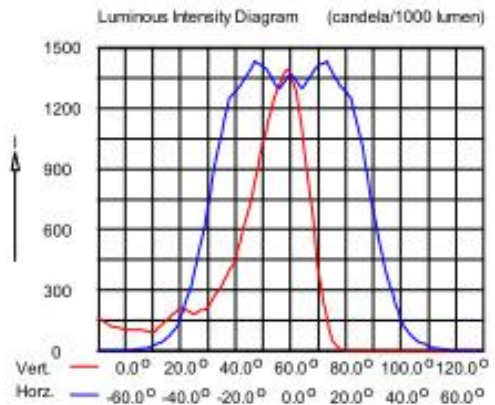
Figure 39 Luminaire detail

OPTIVISION MVP507 1xMHN-LA2000W/400V/842 NB/60



- Light output ratios
- DLOR : 0.79
- ULOR : 0.00
- TLOR : 0.79
- Ballast : Standard
- Lamp flux : 220000 lm
- Luminaire wattage : 2123.0 W
- Measurement code : LVMA107800

Note: This luminaire is a special version of the mentioned measurement code.



Cost Estimate for Rugby fields

Table 28 Supply and Install

Service	Company	Cost including GST
Poles and Footings supply	Aus Pole	\$210 650.00
Floodlight Luminaires supply	Philips Lighting	\$217 600.00
Electrical installation - SMSB Distribution board upgrade - 2 x External distribution boards for tower light - Dynalite control system - Conduit and pit system - Mains cabling - Aiming and commissioning - Foundation Installation of 6 x 25m lighting towers - - Installation of 6 x 25m rigid lighting towers with cross arms	Local Electrical contractor	\$530 000.00

Total Price for the proposed two Rugby fields lighting upgrade to Club and national standards will be \$958,250.00 Excluding GST