Ballarat Airport Master Plan 2013-2033

Prepared for City of Ballarat

By Kneebush Planning Pty Ltd in association with Airports Plus Pty Ltd

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Executive Summary

The Ballarat Aerodrome Master Plan 2004-2014 has helped guide the development of the airport over the last six years. It is common practice to review airport Master Plans every 5 years, and it is also common practice for airport Master Plans to cover a 20 year planning horizon. To this end, the City of Ballarat has prepared this revised 20 year Master Plan for the airport.

The Master Plan provides a strategic framework and is supported by a comprehensive management plan that will be developed upon adoption of this document by the City of Ballarat.

The vision for Ballarat Airport is:

Ballarat Airport is a significant aviation facility servicing western Victoria which will be enhanced to support diversified aviation growth and provide tangible benefits for the community and economy of the region whilst respecting its cultural, historical and social values.

The objectives for the airport are:

- Protect the airport's primary function for aviation.
- Recognise the airport as a valuable community asset which has historical significance and plays an important economic role while accommodating emergency services and community clubs.
- Create positive gains for the community and economy by supporting aviation-related development on the site, particularly the growth of diversified General Aviation activities, provided such growth does not have significant amenity impacts.
- Allow appropriate development of surplus land.
- Protect the option to extend Runway 18/36.
- Ensure compliance with CASA standards and requirements.
- Ensure that future infrastructure upgrades and land development occur in a planned and orderly manner.

The competitive advantages of the Ballarat Airport include:

- Considerable land available for further development and expansion of the existing activities.
- Good access to the rest of Ballarat and importantly offers potential for synergies with future uses on adjacent land designated for industrial and business use.

Key findings of the Master Plan include:

- An economic assessment completed for this Master Plan estimated that the current activities at Ballarat Airport directly generate $10 million in annual production and generate 90 direct FTE jobs and 308 indirect FTE jobs.
- There is potential for a strong future relationship between the Ballarat economy and the aviation sector at large, and shows that quality supply chain opportunities exist for

Ballarat to provide inputs not only to its own aviation businesses, but to aviation businesses far beyond its municipal boundaries.

- The airport is an important infrastructure, economic and social asset for the City.
- There is potential for Ballarat Airport to become an emergency services hub for regional Victoria.
- The site currently accommodates a wide mix of beneficial activities including aviation businesses, recreational aviation uses, community clubs and emergency services operations.
- All businesses operating at the Ballarat Airport have indicated that they intend to expand or invest in their business during the next 3-5 years and, importantly, they all expressed a firm long-term commitment to Ballarat Airport.
- The use of Ballarat Airport has increased considerably over the last 2-3 years, largely due to the commencement of a major commercial pilot training school, but also due to the organic growth of other activities.
- Whilst the airport was constructed over 70 years ago, and pilot training has been a historical activity since it was constructed, the airport is no longer a quiet rural airport like it was for most of its history since the RAAF days.
- The number of aircraft movements at the airport has fluctuated over the years but is now relatively high when compared to similar regional airports.

Key recommendations of the Master Plan include:

- That Council supports the development of the Ballarat Airport on an employment generating basis. That is, it should encourage and in some circumstances actively pursue airport tenants that contribute to the economic and employment base of Ballarat while having minimal impact on airspace capacity and aircraft noise.
- Council should manage flight movements, aircraft noise, operator costs and safety at the Ballarat Airport to minimise adverse impacts, and should accordingly apply a range of identified controls to ensure this is achieved. The result of this will be the continued diversified development of the airport particularly in aircraft maintenance and construction.
- This Master Plan confirms that the City of Ballarat should not pursue a second commercial flight training facility that relies on circuit training of pilots. This recommendation is supported by the findings of the Ballarat Airport Economic Analysis undertaken as part of this Master Planning Project.
- The current provision for emergency services at the Ballarat Airport is considered vital to both Ballarat and wider regional Victoria. A strong case exists for the expansion of emergency services provision at the Ballarat Airport subject to further assessment.
- In support of the previous Master Plan (2004 to 2014) this Master Plan recommends the continued preservation of the North-South Runway (18/36) extension. This main runway was originally over 1800m long but was reduced in the late 1980s at the southern end by 570m to reduce the cost of maintenance. It would be prudent for Council to ensure the future protection of this strategic asset.

More than ever before, Ballarat Airport is now at the point where its ongoing operation and growth needs to be carefully controlled and managed. This requires a clear vision and direction for the airport and a comprehensive management plan. To this end, the Council has prepared this Master Plan which sets out a 20 year planning framework for the safe, secure, efficient and sustainable use and development of the airport.

1 Introduction

Ballarat Airport is a Registered Aerodrome owned and operated by the City of Ballarat. The airport is an important community asset for the City which must be carefully managed to ensure that Ballarat and the wider area continue to benefit from its existence well into the future. The Airport has good access to the rest of Ballarat and importantly offers potential for synergies with future uses on adjacent land designated for industrial and business use. To this end, the Council has prepared this Master Plan for the airport.

1.1 Overview of the Airport

1.1.1 Location

Ballarat Airport is situated approximately 8km north-west of the Ballarat city centre in the City of Ballarat. The airport site is generally bounded by McCartney's Road to the north, Sunraysia Drive and Learmonth Road to the east, Airport Road to the south and Hopetoun Road and Highfield Road to the west (see Appendix 1). Access to the airport is via Airport Road.

1.1.2 Ownership and Land Use

The main airport site has an area of approximately 185 hectares and is freehold land owned by the City of Ballarat (see Appendix 2). This parcel contains the existing airport facilities. There are several largely vacant parcels of Crown land to the south and east of the main airport site. The existing airport site and several Crown land parcels comprise the Ballarat West Employment Zone.

1.1.3 Activities and Facilities

The Ballarat Airport site currently accommodates a range of existing aviation and non-aviation facilities and activities. In terms of aviation facilities there are three runways, a number of taxiways, two large apron areas for aircraft parking and a number of hangar buildings for the storage of aircraft. The current use of these facilities is entirely for General Aviation (GA) purposes. There is currently no Regular Public Transport (RPT) service utilising Ballarat Airport.

The Ballarat Airport plays a mid level role in the Victorian hierarchy of Airports. It is considered a busy regional airport that supports commercial aviation and non-commercial uses. It has capacity to grow landside and airside, however is limited by airspace capacity and noise controls. It is considered comparable to regional airports such as Bendigo Airport and Latrobe Airport, but sits below regional airports such as Mildura Airport and Albury Airport which have RPT services.

Most of the aviation activities at the airport are commercial in nature, including pilot training, aircraft charter, aircraft maintenance, agricultural services and emergency services. The aviation activities also include non-commercial aviation clubs, museums and private recreational flying. There are approximately 90 direct FTE employment positions generated by the aviation activities at the airport.

The airport's non-aviation uses are dominated by 18 different community clubs that use the old WW2 huts as club houses. Members hold meetings and engage in club activities, generally of a non-commercial nature. There are a few commercial tenants of the airport whose activities are not related to aviation.

1.2 Strategic Vision and Objectives

The following vision statement and objectives provide broad guidance and direction for the development of the airport. The development of the vision and objectives was guided by the relevant goals and directions contained in the State Planning Policy Framework, Municipal Strategic Statement, Council Plan and other applicable policies, as well as discussions with key stakeholders.

1.2.1 Strategic Vision

The vision for Ballarat Airport is:

Ballarat Airport is a significant aviation facility servicing western Victoria which will be enhanced to support diversified aviation growth and provide tangible benefits for the community and economy of the region whilst respecting its cultural, historical and social values.

1.2.2 Objectives

The objectives for the airport are:

- Protect the airport's primary function for aviation.
- Recognise the airport as a valuable community asset which has historical significance and plays an important economic role while accommodating emergency services and community clubs.
- Create positive gains for the community and economy by supporting aviation-related development on the site, particularly the growth of diversified General Aviation activities, provided such growth does not have significant amenity impacts.
- Allow appropriate development of surplus land.
- Protect the option to extend Runway 18/36.
- Ensure compliance with CASA standards and requirements.
- Ensure that future infrastructure upgrades and land development occur in a planned and orderly manner.

1.3 Purpose and Objectives of the Master Plan

The Ballarat Aerodrome Master Plan 2004-2014 was completed in 2005. This Master Plan has helped guide the development of the airport over the last six years. However, it is common practice to review airport Master Plans every 5 years, and it is also common practice for airport Master Plans to cover a 20 year planning horizon. To this end, the City of Ballarat has prepared this revised 20 year Master Plan for the airport.

The Ballarat Airport Master Plan 2013-2033 seeks to provide Council with a long term (20 year) planning framework for the safe, secure, efficient, and sustainable use and development of the airport site. It provides clear direction as to how growth is to be accommodated, particularly continued growth and expansion of General Aviation (GA) activities, and how a balance is to be achieved between airport functions and various forms of surrounding land use. It provides an optimal spatial outcome in keeping with commercial business objectives and environmental, planning, security and operational obligations.

Furthermore, with increasing focus on the development of the Ballarat West Employment Zone, it is important to ensure that the airport is sufficiently protected from the encroachment of inappropriate development and that adequate land is set aside for the future growth of the airport. The preparation of this Master Plan in conjunction with planning for the Employment Zone allows these issues to be managed.

The central goal of this Master Plan is to provide a strategic planning document for the airport's future management, growth and development based on sound economic analysis through a detailed economic assessment.

The key objectives of the Master Plan are therefore to:

- Update and expand on the previous Ballarat Aerodrome Master Plan 2004-2014.
- Review the existing status of the airport in regards to aviation use, community club use and other uses.
- Understand and document the constraints and opportunities at the Airport.
- Consider the future requirements of the Ballarat Airport in regards to aviation and other development.
- Ensure that short and long term development in and around the Airport precinct is appropriate and compatible with the primary purpose of the Airport.
- Develop a land use plan and facilities plan for the Airport which considers current and future requirements.
- Manage the social and economic impacts as well as the amenity of the Airport.

1.4 Methodology and Consultation

The methodology used to prepare the Master Plan comprised the following tasks and sub-projects:

- Review of the Ballarat Aerodrome Master Plan 2004-2014.
- Review of various background studies and reports.
- Initial questionnaire sent to all airport tenants.
- One-on-one meetings with airport tenants.
- Letter to relevant government agencies and politicians.
- Article in My Ballarat community magazine.
- Liaison with the City of Ballarat Heritage Advisory Committee.
- Preparation of a SWOT Analysis.
- Two aviation stakeholder workshops.
- Runway and Taxiway Pavement Strength Analysis.
- Airspace Capacity Review.
- Economic Analysis and Investment Opportunity Study.
- Aviation Infrastructure Needs Review.
- Second questionnaire sent to all aviation tenants about future direction of the airport.
- Heritage Review.
- Tenancy Review.

Throughout the project there were regular meetings with the following groups:

- Ballarat Airport Master Plan Working Group which comprised senior representatives of all relevant Council departments.
- Ballarat Airport Advisory Committee.

The next step in the process after the Master Plan is complete will be to develop an implementation plan to realise the potential identified in this report in the short to medium term.

1.5 Report Structure

This report has been structured to provide a clear description of the issues that have been considered in the preparation of the Master Plan and the elements that comprise the Master Plan.

Section 2 of this report describes the Master Plan context, including the historical background, socio-economic context and underlying policy context.

Section 3 of this report outlines the airport's current situation. This includes a description of the airport's existing use, the airfield facilities, buildings, leases, heritage and environmental values.

Section 4 sets out the key findings of the airport SWOT analysis and competition assessment.

Section 5 discusses the commercial and economic development opportunities for the future growth of the airport and job creation. This includes a discussion of several development options and their potential impacts, and identification of a preferred development direction for the airport.

Section 6 of this report provides an analysis of the airport against relevant airport planning criteria. This includes a discussion of runway length, width and strength issues, airspace capacity issues and a forecast of future aircraft movements.

Section 7 sets out the Airport Development Plan. This includes a description of the proposed land use precincts, land use guidelines, aviation facility recommendations and ground access requirements.

Section 8 discusses airport protection requirements, including Obstacles Limitation Surfaces, aircraft noise and planning scheme amendment recommendations.

Finally, section 9 of this report provides recommendations on how to best implement the Master Plan, including trigger points and estimated timing for key actions.

2 Master Plan Context

2.1 Historical Background

Ballarat Airport was constructed in 1940, at the outset of the Second World War, as a Royal Australian Air Force (RAAF) Base, specifically a training school for Wireless Air Gunners under the Empire Air Training Scheme (EATS). This Scheme was established by the British with Canada, Australia and New Zealand to rapidly train air crews for the British Bomber Command, including navigators, wireless operators, air gunners and pilots.

The Wireless Air Gunners School was formally disbanded in January 1946. The RAAF continued to operate the aerodrome until 1961 when it became the property of the City of Ballarat.

Since its RAAF days, the airport has operated as a General Aviation airport for the Ballarat region. Several of the original Second World War buildings associated with the WAG school remain on the site. These buildings are primarily 'P-Type Huts' and 'Bellman Hangars' neither of which were originally intended to be permanent structures. Nevertheless, these buildings today provide accommodation for a number of community organisations (the P-Type Huts) and aviation activities (the Bellman Hangars).

Originally the airport had three runways, the two runways still existing, plus a third runway orientated roughly east-west located to the south of Airport Road. However records show that by 1953 the third runway was no longer in use. The main north-south runway (18/36) was originally over 1800m long but was reduced in the late 1980s at the southern end by 570m to reduce the cost of maintenance. The pavement associated with this longer runway still exists but is in poor repair.

The Ballarat Aerodrome Master Plan 2004-2014, completed in 2005, was the first Master Plan for the Airport. This Master Plan has helped guide the development of the airport over the last 5 years. This Master Plan is discussed further in section 2.4 of this report.

Over the last few years there have been a number of developments at the airport, including the construction of additional hangars, upgrade of infrastructure, the establishment of a major commercial flying school and the construction of a parallel taxiway providing access to the southern end of the main runway.

2.2 Site Context

The Ballarat Airport is now identified as part of the larger Ballarat West Employment Zone (BWEZ) which comprises all of the land highlighted on the Land Tenure Plan at Appendix 2. The BWEZ is a long term project being implemented by the City of Ballarat to unlock land for industry and create significant employment opportunities for the City's growing population. The Employment Zone will create new opportunities for modern and competitive manufacturing facilities in Ballarat as well as associated opportunities for logistics, transport and commercial activities. A separate Master Plan has been prepared by Council to facilitate the development of those parts of the Employment Zone not required for airport purposes; however provision for the establishment of aviation related industries is being made in the BWEZ.

As shown on the plan at Appendix 2, the main airport site is freehold land owned by the City of Ballarat. This parcel contains the existing airport infrastructure and has an area of approximately 185 hectares. There is a secondary parcel of land, abutting the southern and eastern boundaries of the main parcel, which is Crown land permanently reserved for aerodrome purposes. This parcel accommodates the former extension of the existing north-

south runway which is no longer utilised, but which has been retained for future use. There is also another parcel of land, abutting the southern boundary of the secondary parcel, which is Crown land temporarily reserved for aerodrome purposes. All three of these parcels of land are zoned Special Use Zone 6 – Ballarat Airfield under the Ballarat Planning Scheme (see Appendix 3).

Whilst the Master Plan focuses on the primary airport site, it also relates to parts of the other two land parcels (reserved for aerodrome purposes) which are required for the runway extension reservation. Planning for these areas has been aligned with the preparation of a Master Plan for the Ballarat West Employment Zone in 2011-2012.

Beyond the BWEZ, the general land use patterns and characteristics are as follows:

- Rural living and sparse development to the west;
- Farming to the north and north-west;
- An established residential pocket at Sunraysia Drive and the construction of new residential communities along Howe Street (Miners Rest) to the north-east;
- Industrial activities (and a small pocket of housing) to the east; and
- Winter Swamp, Remembrance Drive and the Ballarat West residential growth area to the south.

It is noted that the land to the north of the airport, on the north side of McCartneys Road, is identified in the Council's Industrial Framework Plan, which forms part of the Municipal Strategic Statement, as "Future Industrial (Subject to Further Investigation)".

The airport site is located only a short distance from the Western Freeway which is located near the north-east corner of the site. It is also located adjacent to the future Western Link Road which has been funded by the current State Government and will run along the eastern boundary of the BWEZ, and which will ultimately connect the Western Highway and the Midland Highway to the south of Sebastopol. These nearby road assets, combined with the Ballarat-Ararat Railway which traverses the southern part of the BWEZ, provide the airport site with significant transport advantages and opportunities which will be captured through the development of a freight hub.

2.3 Socio-Economic Context

Ballarat is growing and its population is expected to reach 100,000 in 2013 and to grow by at least 30,000 new residents over the next 15 years. It has a diverse workforce with a wide range of skills. It has a particular strength in food processing as well as transport and machinery manufacturing and there is a strong pool of workers that are able to support the expansion and growth of this manufacturing industry sub-sector. The region also has a large proportion of degree or higher qualified labour which provides capacity for management and R&D expansion. These characteristics provide an ideal scenario for an expansion of aircraft manufacturing, maintenance and engineering capacity at the Ballarat Airport.

Ballarat Airport is recognised as an important socio-economic asset for the City of Ballarat. There are currently several businesses successfully operating at airport. These include STAA, Aerovision, Field Air, Composite Components, County Helicopters, Ballarat Aero Club, Inbound Aviation, and New Horizons Microlight School. These businesses are important because they employ people on a part-time or full-time basis, operate multiple aircraft, provide a quality product or service, can demonstrate a track record of success, and have developed a

respected local profile. During the stakeholder consultation, all of the businesses have indicated that they intend to expand or invest in their business during the next 3-5 years and, importantly, they all expressed a firm long-term commitment to Ballarat Airport.

An economic assessment completed for this Master Plan estimated that the current activities at Ballarat Airport directly generate $10 million in annual production and generate 90 direct FTE jobs and 308 indirect FTE jobs.

The businesses that operate from the Ballarat Airport therefore play an important economic role in the City of Ballarat.

The airport is also important due to its role in accommodating or facilitating a range of other activities, including:

- Emergency services (including significant use by CFA and DSE during summer in association with their aerial fire fighting activities). This role is likely to expand in the future.
- Charter services.
- Recreational aviation (eg. Light Sport Aircraft).
- Community clubs.
- Heritage conservation / aviation museums / tourism (former WW2 Wireless Air Gunners training school; two aircraft museums).

There is currently approximately 8,800m^2 of hangar space at the airport. A total of around 3,740m^2 of this hangar space was constructed since the year 2000, but with 1,500m^2 introduced much more recently in 2009. This information indicates that the development of hangar space at the airport has occurred at an uneven rate.

2.4 Policy Context

This section provides an overview of the policies that relate to or influence the future use and development of Ballarat Airport. These are important considerations for the development of the Ballarat Airport Master Plan. It is important to understand the underlying policy context to ensure that the Master Plan is consistent with existing strategic objectives and guidelines.

2.4.1 State Planning Policy Framework

Clause 18.04 of the State Planning Policy Framework (part of the Ballarat Planning Scheme) specifies the following objectives and strategies relating to planning for airports and airfields:

Clause 18.04-2 - Planning for Airports

The objective of this clause is:

- *To strengthen the role of Victoria's airports within the State's economic and transport infrastructure and protect their ongoing operation.*

The strategies to achieve the above objective include:

- *Protect airports from incompatible land-uses.*

- *Ensuring that in the planning of airports, land-use decisions are integrated, appropriate land-use buffers are in place and provision is made for associated businesses that service airports.*
- *Ensuring the planning of airports identifies and encourages activities that complement the role of the airport and enables the operator to effectively develop the airport to be efficient and functional and contributes to the aviation needs of the State.*

Clause 18.04-3 - Planning for Airfields

The objective of this clause is:

- *To facilitate the siting of airfields and extensions to airfields, restrict incompatible land use and development in the vicinity of airfields, and recognise and strengthen the role of airfields as focal points within the State's economic and transport infrastructure.*

The strategies to achieve the above objective include:

- *Avoid the location of new airfields in areas which have greater long-term value to the community for other purposes.*
- *Plan the location of airfields, existing and potential development nearby, and the land-based transport system required to serve them as an integrated operation.*
- *Plan the visual amenity and impact of any use or development of land on the approaches to an airfield to be consistent with the status of the airfield.*
- *Plan for areas around all airfields such that:*
    - *Any new use or development which could prejudice the safety or efficiency of an airfield is precluded.*
    - *The detrimental effects of aircraft operations (such as noise) is taken into account in regulating and restricting the use and development of affected land.*
    - *Any new use or development which could prejudice future extensions to an existing airfield or aeronautical operations in accordance with an approved strategy or master plan for that airfield is precluded.*

The above policies provide a strong basis for this Master Plan, both in terms of on-airport development and off-airport protection.

Clause 15.03 – Heritage

The objective of this clause is to ensure the conservation of places of heritage significance. It applies to the airport site, as Ballarat Airport has been identified as a heritage place.

2.4.2 Municipal Strategic Statement

The Municipal Strategic Statement (part of the Ballarat Planning Scheme) contains the following strategic directions for Ballarat Airport:

Clause 21.02-4 – Infrastructure

This clause notes that Ballarat Airport issues include: protecting the airport from encroachment by inappropriate land uses; and expanding the capacity of the aerodrome.

Clause 21.03 – Ballarat's Strategic Framework

The Overall Framework Plan identifies the airport land as being suitable for short to medium term industrial growth.

Clause 21.05-2 – Heritage

This clause contains the objective to protect places of heritage significance. It includes the strategy to require that new development interprets the cultural significance of the place and respects heritage and cultural boundaries. It is relevant as Ballarat Airport has been identified as being of State significance, listed on the Victorian Heritage Register and protected by Heritage Overlay HO190.

Clause 21.07-2 – Ballarat Airfield

This policy contains the following strategic directions for the Airport:

> *Ballarat Airfield is an important asset for a growing City and region. The recreational and charter use of the airfield will be maintained with special emphasis placed on promoting the complex's strategic function for police, ambulance and other emergency agencies. The encroachment of land uses and forms of development which could restrict the future use of the Airfield will be prevented. Upgrading the Airfield's main runway has the potential to enhance Ballarat as a tourism destination. A runway with the capacity to take 12,000kg aircraft would enable the airfield to receive small, regular public transport aircraft seating 30 passengers.*
>
> ***Objectives and Strategies***
>
> *Objective 1* — *To provide for the continued operation and future upgrade of the Ballarat Airfield.*
>
> *Strategy 1.1* — *Encourage the use of airfield land for airfield compatible purposes.*
>
> *Strategy 1.2* — *Prevent the use and development of airfield and surrounding land for purposes that would have a negative impact on the airfield's operation, particularly the establishment of residential and other sensitive uses on land under airfield flight paths.*

Once again, the above policy provides a strong basis for this Master Plan, both in terms of on-airport development and off-airport protection.

Clause 22.05 – Heritage Conservation

This policy applies to all heritage places in the City of Ballarat affected by a Heritage Overlay.

2.4.3 City of Ballarat Council Plan 2009-2013

'*Ballarat: Today Tomorrow Together'* is the strategic planning framework for, and an expression of, the City of Ballarat's activities to responsibly manage Ballarat's growth and governance. Its overall goal is to help sustain growth and to strengthen communities, both now and into the future.

The Council Plan sets out the following three focus areas and goals:

- *Growth and Development: Ensuring a sustainable mix of residential, commercial and industrial development and infrastructure that provides for a high quality of life.*

- *People and Communities: A safe, healthy, environmentally sustainable, innovative and well serviced community that has equal access to opportunities, is proud of its unique heritage, optimistic about its future, is welcoming of diversity and respected by others.*
- *Destination and Economy: A respected regional leader that facilitates tourism, residential and business attraction by re-shaping people's perceptions around the unique lifestyle benefits of Ballarat.*

In relation to the first Council Portfolio, Growth and Development, one of the identified actions is to develop an integrated and sustainable vision to manage future growth projections via the Ballarat West Growth Zone, including these key projects: Western Link Road, Airport Upgrade and Master Plan and Ballarat West Growth Zone.

The Council plan highlights the importance of Ballarat Airport to the growth and development of the Ballarat West Growth Zone and the City as a whole.

2.4.4 Ballarat Aerodrome Master Plan 2004-2014

The Ballarat Aerodrome Master Plan 2004-2014 was published in early 2005. This Master Plan has helped guide the development of the airport over the last 5 years.

The following is a summary of the 2004-2014 Master Plan:

Aviation

- The current runway configuration has the capacity of over 100,000 movements per annum and would be greater with the addition of extra taxiways if required.
- Provision for runway 18/36 to be extended to the south up to 450m to give a total length of less than 1800m (1695m). Protection of this extension was deemed important as it would allow the operation of a Regular Public Transport service, which is currently not feasible with the current runway length. This position is still supported.
- Provision of protection of runway 18/36 runway strip to a width of 150m and provision for runway 05/23 runway strip to a width of 150m.
- Provision of a parallel taxiway south of 'A' taxiway to service future hangar development and runway 18/36 extension.
- Provision for developing new areas of apron to service various sized hangars as and when demand required.
- Provision of a zone to ensure that the passenger terminal can be developed as and when required.

Non Aviation

- Provision of a zone to ensure community activities can continue and be expanded.
- Provision for adequate room for expansion of existing non-aviation activities.
- Provision for gateway development within the aerodrome reserve.
- Ensure protection of an alternative road access corridor in any future development of crown land associated with the aerodrome reserve.

It is noted that the parallel taxiway south of Taxiway A has since been constructed, as have a number of new hangars, and a number of other infrastructure upgrades were completed in 2012 as part of the Ballarat Airport Infrastructure Upgrade Project (see section 2.5).

2.4.5 Ballarat Aerodrome and West Common Land Use Concept Plan 2008

The Ballarat Aerodrome and West Common Land Use Concept Plan was prepared for the City of Ballarat by Beca Pty Ltd in January 2008.

This report established a Land Use Concept Plan for the area now known as the Ballarat West Employment Zone (which includes the airport land). The plan provided an overview of the issues and constraints associated with development of the land and identified future development opportunities. The outcome was a concept plan showing indicative land use precincts, possible future road locations and development constraints. It also set out a number of recommended actions to be undertaken to facilitate development of the land. The Land Use Concept Plan was adopted by the City of Ballarat at a meeting held on 26th March 2008 as the basis for future strategic work.

The Ballarat Aerodrome and West Common Land Use Concept Plan is more relevant to the BWEZ Master Plan, however those aspects that are relevant to the airport have been considered as part of the preparation of this Master Plan.

2.4.6 Ballarat Aerodrome and West Common Preliminary Infrastructure Master Plan 2008

The Ballarat Aerodrome and West Common Preliminary Infrastructure Master Plan was prepared for the City of Ballarat by Beca Pty Ltd in April 2008. This report followed the preparation of the Land Use Concept Plan (outlined above).

The purpose of the report was to identify the infrastructure needs for development of the study area (now known as the Ballarat West Employment Zone). In addition to identifying infrastructure requirements the report also made recommendations relating to design principles, staging of development, road network, traffic management, governance issues and site ownership/management.

The Ballarat Aerodrome and West Common Preliminary Infrastructure Master Plan is more relevant to the BWEZ Master Plan, however those aspects that are relevant to the airport have been considered as part of the preparation of this Master Plan.

2.4.7 Ballarat Review of Future Industrial Areas 2009

The Ballarat Review of Future Industrial Areas was prepared by CPG Australia for the City of Ballarat in June 2009. The aim of the report was to undertake a land demand analysis and comparative analysis of potential future industrial sites to determine the quantity and location of land for future industrial use.

The report supported the designation of the “Airport North” site as “short to medium term industrial growth” in the Ballarat Planning Scheme. The CPG report formed the basis of Amendment C138 to the Ballarat Planning Scheme.

2.4.8 City of Ballarat Economic Strategy 2010-2014

SGS Economics and Planning Pty Ltd (SGS) was commissioned by the City of Ballarat in October 2009 to prepare the Ballarat Economic Strategy, 2010 – 2014. This Strategy is

structured around a long term (20 year) vision and has three themes which capture the essence of Ballarat's desired economic future. They are:

Theme 1: Regional Development – The Capital of Western Victoria

Theme 2: Economic Growth and Diversification – Australia's Premier High Tech & Knowledge Based Regional Economy

Theme 3: Capitalising on Population Growth - A Bigger and More Diverse Community

The research and consultation that was undertaken as part of this report's preparation identified seven 'industry sector' priority areas for Ballarat: business services, health and community services, education, tourism, retail, manufacturing and ICT (information, communications and technology). In addition to these sectors, two economy wide themes were identified as being critical to Ballarat's economic future: human capital and workforce; and business development and innovation. These topics cut across all industry sectors and were considered fundamental 'pre-conditions' for investment and economic development.

The strategy highlights that transport and logistics, which supports manufacturing and other industries and shares common land and infrastructure needs, represents a key opportunity for Ballarat given its vibrant manufacturing sector, the strategic location of the City, proximity to Melbourne and the Port of Geelong and availability of local assets, particularly rail and the Ballarat Aerodrome. To this end the strategy recommends that suitable land adjacent to the Ballarat Aerodrome should be secured for a future transport and logistics hub.

The Ballarat Economic Strategy helped guide the consideration of commercial and economic development opportunities for the airport site.

2.5 Infrastructure Upgrade Project

Between 2009 and 2012 there have been a number of infrastructure upgrades at the airport and further upgrades are currently being planned, all part of the Ballarat Infrastructure Upgrade Project. As stated on Council's website, "The Airport is a critical asset to Ballarat and the continual improvement of infrastructure enables the Airport to meet the ongoing needs of the community and the businesses located at the airport."

In 2010, Council completed Stage 1 of the Infrastructure Upgrade Project. The Stage 1 works included:

- A new international standard runway lighting system which can be pilot activated.
- Installation of a Precision Approach Path Indicator (PAPI) – a visual aid that provides guidance information to assist pilots maintain the correct runway approach.
- Installation of a new water main and fibre optic conduit along Airport Access Road.
- Construction of 400 metres of new taxiway alongside runway 18/36 (Ballarat's primary runway).
- 820 metres of drainage to prepare land within the Airport precinct for future development in line with the Ballarat Aerodrome Masterplan 2004 – 2014.
- Remote access to the Ballarat weather station for pilots.
- Fencing in some areas of the airport precinct.

In 2012 Council finalised Stage 2 of the infrastructure upgrade works. The Stage 2 works included:

- Further installation of water mains and fibre optic conduit.
- Installation of fire services infrastructure.
- Further stormwater and drainage works.
- Installation and upgrade of electrical infrastructure.
- Installation of sewerage lines and pumps.
- Construction of a new apron area and associated taxiways.
- Installation of taxiway lighting.
- An extension of the airside security fence.
- Construction of a new road within the aviation precinct.
- Construction of car parking areas.
- Construction of a hangar.
- Resealing of runway 18/36.

The Infrastructure Upgrade Project was supported by funding through the State Government and Regional Development Victoria.

3 Current Situation

The following section provides information regarding the existing site conditions. An Existing Conditions Plan is attached at Appendix 1. Key issues/actions are highlighted in **bold text** and are discussed further in section 7 of this report.

3.1 Ownership and Management

The Ballarat Airport is currently owned and operated by the City of Ballarat. This has been an historic role of Council since the Airport was handed over by the Australian Government in 1961. It operates with the guidance of an Airport Advisory Committee and at the time of preparing the Master Plan has one part-time Airport Manager and one part-time Airport Maintenance Officer.

It is common practice for regional airports to be owned and operated by the local Council however Council could review this status at a future point in time. Council will therefore regularly review ownership and governance structures to ensure maximum performance of the Airport.

3.2 Existing/Current Activities

The aircraft activity at the airport is currently entirely General Aviation (GA). There are no Regular Public Transport (RPT) services at present.

3.2.1 General Aviation Activities

The Airport site currently accommodates a range of existing General Aviation activities. Most of the aviation activities at the airport are commercial in nature and include:

- Reconnaissance, photography, charter flights, emergency services (Aerovision);
- Flight training, aircraft hire and storage, recreation (Ballarat Aero Club);
- Aircraft hire service (Central Highlands Air Services);
- Inspection, repairs and maintenance for advanced airframes (Composite Components);
- Helicopter storage, agricultural spraying, charter, offices (County Helicopters);
- Import/export of aircraft, maintenance, aerial agriculture, fire services (Field Air);
- Aircraft storage, ultralight pilot training (Inbound Aviation);
- Aircraft storage (Ballarat Sports Aviators Co-op);
- Microlight training and storage (New Horizons Microlight School); and
- Flight training (ST Aerospace Academy (STAA)).

It has been estimated that the STAA flying school accounts for approximately 50% of aircraft activity at the airport. In addition to STAA, other flying organisations also use Ballarat Airport as a training location. These include Ballarat Aero Club and Inbound Aviation as well as organisations based at other airports (eg. Turbo Aero Maintenance Pty Ltd and Oxford Aviation Academy Australia Pty Ltd which are both based at Moorabbin Airport). It is estimated that approximately two-thirds of the aircraft activity at the airport is related to pilot training.

There are a number of non-commercial aviation activities which include:

- Training centre, club rooms (Australia Air League);
- Aircraft storage (Alizzi);
- Aviation museum, tourism facility, aircraft storage (Ballarat Aviation Museum);
- Aircraft museum and restoration (Friends of the Anson); and
- Aircraft storage (Jeday Pty Ltd)

3.2.2 Emergency Services

The Ballarat Airport currently plays a key role in Emergency Services delivery for Ballarat and Western Victoria.

Air Ambulance Victoria aircraft visit Ballarat Airport three to four times per week. These aircraft land on the movement area and road ambulance collect or despatch patients to hospital. The ambulance service has no office or hangar/storage at the Ballarat Airport.

Airport tenant Aerovision has three aircraft contracted to the State Government for six months over the summer period for fire fighting. On days of Total Fire Ban and other days of high risk approximately twenty (20) DSE fire fighting staff and Aerovision team members are stationed at the Airport. The Airport holds 150,000 litres of water underground and is centrally located to serve the State's fire hot spots.

Field Air Ballarat currently has two fixed wing aircraft contracted to the State Government over the summer period. Field Air also has a part ownership in one of the Convair CV-580 aircraft that are employed by the State Government and is flown from America to Australia for the summer. Some maintenance work is conducted on the Convair fleet at the start and end of the fire season.

Toll Remote Logistics has an Erickson Air Crane employed by the State Government that is stationed at Ballarat over the summer. The Erickson parks on the apron area near the Runway 05 threshold, with a 40,000 litre mobile fuel tanker and there are six (6) associated staff that work out of the Aerovision office.

Police helicopters refuel at Ballarat and at times park waiting for further instructions. While the current airport amenities and facilities are adequate, they are not considered ideal for optimum future emergency service delivery.

3.2.3 Non-Aviation Activities

Ballarat Airport's non-aviation activities generally comprise a variety of community clubs that use the WW2 huts as club houses. There are 18 different community clubs on the airport site where members hold meetings and engage in club activities, generally of a non-commercial nature.

There are, however, a few commercial tenants of the airport whose activities are not related to aviation. These include: Ballarat Solar Park Pty Ltd (energy generation), Stay Upright Motorcycle Techniques (motor cycle training and license testing) and the Victoria Police (pistol training).

In general there is a dominance of commercial uses among the aviation activities and a dominance of community uses among the non-aviation activities. These two patterns reflect that:

- Council has been careful not to allow non-aviation commercial enterprises to consume airport land, which is limited in supply and therefore more valuable than general industrial/employment precincts; and
- The airport is an important community asset, and the presence of the community clubs has helped to keep the heritage buildings operational when they might otherwise have fallen into a state of disrepair as most buildings were designed / constructed as temporary structures.

These two patterns of land use should continue.

3.3 Aviation Facilities

The Ballarat Airport contains the following existing aviation facilities.

- Runway 18/36
- Runway 05/23
- Runway 13/31
- Five (5) Taxiways
- Two (2) Aprons
- Fuel Facilities
- Non-Directional Beacon

Each of these facilities is described in detail below.

It is noted that currently Ballarat Airport is restricted to aircraft below 5,700kg maximum take-off weight (MTOW).

It is also noted that the airport does not have a dedicated glider strip.

3.3.1 Runway 18/36

Runway 18/36 is oriented north-south and is 1245m long and 30m wide and is the primary runway at the Ballarat Airport. The surface of the runway is a bituminous sprayed seal with a 7mm aggregate wearing course (recently resealed). The runway's published pavement classification number (PCN) is 6 with a subgrade rating of B. It has a 5700kg MTOW.

This runway is a Code 3 instrument non-precision approach runway. The runway is equipped with a single stage low intensity runway lighting system. A precision approach path indicator (PAPI) visual aid is located on the left hand side as aircraft approach each end of the runway.

This runway is the most frequently used due to the prevailing wind and the availability of night lighting and PAPI. Aircraft operating on runway 18 are required to operate right hand circuits. Pilots are also encouraged to use runway 18 when wind conditions are negligible.

This runway is considered suitable for current aircraft operations.

In the 2004 Master Plan runway 18/36 was identified as having potential to be extended in a southerly direction if larger aircraft requiring a longer runway length commenced operating at the airport. **The need to continue to protect and plan for a runway extension is essential for the long term growth of aviation activity at Ballarat Airport. As indicated in the 2004 Master Plan any runway extension should not increase the total length of the runway beyond 1800m. This matter is discussed further in section 7.3 of this report.**

3.3.2 Runway 05/23

Runway 05/23 is oriented in a south-west/north-east direction and is 1265m long and 30m wide. The surface of the runway is a bituminous sprayed seal with a 7mm aggregate wearing course. The runway's published PCN is 6 with a subgrade rating of B.

This runway is a Code 3 non instrument runway. There is no lighting provided on this runway.

This runway is considered suitable for current aircraft operations.

3.3.3 Runway 03/31

Runway 13/31 is oriented north-west/south-east and is 568m long and 30m wide. This runway has a grass surface and the central 10m of the runway has a graded gravel surface to assist aircraft operations in wet weather. The runway is a Code 1 non instrument runway.

This runway is considered suitable for current aircraft operations.

3.3.4 Taxiways

There are two (2) bituminous sprayed seal taxiways connecting the main apron to the runways.

Taxiway A is a Code C taxiway, 15m wide and 300m long that provides access to runway 18/36 from the south end of the main apron.

Taxiway B is also a Code C taxiway. It is 45m wide and only 30m long and provides access to runway 05/23 from the north end of the main apron.

Taxiway C is a short gravel taxiway, 7.5m wide, providing access from runway 05/23 to the threshold of runway 31 and is suitable for Code A aircraft operations.

Taxiway D, recently constructed as part of the Infrastructure Upgrade Project, joins Taxiway A with the threshold of runway 36 and runs parallel with runway 18/36. This taxiway has been constructed 15m wide and is 380m long and is intended to be a Code C taxiway.

Taxiway D has been constructed as a 15m wide Code C taxiway but is located 84m from the centreline of runway 18/36. The required separation distance for a taxiway associated with a Code 3C NPA runway is 93m. This theoretically makes the runway a Code 3A runway and the taxiway a Code A taxiway instead of being a Code 3C runway and a Code C taxiway. This has no impact on current aircraft operations but will limit any future larger aircraft operations.

The widening of Taxiway D on the west side will enable the taxiway centreline to be relocated 9m to the west to comply with Code 3C requirements. This matter is discussed further in section 7.4 of this report.

Taxiway D can be extended in a northerly direction to provide further aircraft access to runway 18/36, particularly the runway 18 threshold. This is also discussed further in section 7.4.

Taxilane E has been constructed at right angles to Taxiway D and proceeds in a westerly direction to service a number of existing and proposed future hangars. It is a Code B taxilane and is approximately 220m long.

As part of Stage 2 of the Infrastructure Upgrade Project, two new Code B taxilanes (called Taxilanes F and G) have recently been constructed to the south of Taxilane E. These taxilanes are shown on the plan at Appendix 5. Like Taxilane E, these taxilanes are constructed at right angles to Taxiway D and proceed in a westerly direction to provide access to a new apron area, a new hangar and a number of future hangar sites surrounding the apron.

3.3.5 Aircraft Parking Areas

One apron is currently provided for all the airside facilities at Ballarat Airport. The apron is approximately 30,000 square metres and has a bituminous sprayed seal surface with a 7mm aggregate wearing course. Several large areas of the apron have been reconstructed and resealed in the last five years.

The Infrastructure Upgrade Project, has recently constructed a large new apron area south of Taxilane E (see Appendix 5). This apron is intended to provide dedicated parking positions for specific aircraft types associated with flying training and reduce aircraft parking congestion on the main apron.

3.3.6 Fuel Facilities

The two types of fuel commonly used in aircraft are available at Ballarat Airport. AVGAS is dispensed 24 hrs/day via a bowser located adjacent to the main apron which is operated and maintained by the Ballarat Aero Club. Jet A1 is dispensed via a fuel bowser and/or tanker operated by Field Air. The fuel facilities are considered adequate for current and future foreseeable aircraft operations, **although the location of the AVGAS facility on the airside of the airport adjacent to the main apron is not ideal. This matter is discussed further in section 7.9 of this report.**

3.3.7 Navigational Aids

A non-directional beacon (NDB) located at Ballarat Airport enables pilots to locate Ballarat Airport from up to 30 nautical miles (NM) away and also provides an approach procedure for runway 36, allowing aircraft to descend to 677 feet above the airport in low visibility to join the circuit area.

Approach procedures are also published using GPS navigation for both runway 18 and runway 36. These procedures enable aircraft to approach runway 18 and descend to 807 feet above the airport and to approach runway 36 and descend to 629 feet above the airport in the runway direction that the aircraft is approaching.

3.4 Pavement Strength

Currently Ballarat Airport is restricted to aircraft below 5,700 kg MTOW. If aircraft above 5,700 kg MTOW with a tyre pressure greater than 450 KPA intend to operate at the airport approval from the airport operator is required (refer Notes 1 & 2 under the heading Remarks in AIP En Route Supplement Australia (ERSA), 10 March 2011). ERSA also indicates that runway 18/36 and runway 05/23 have a pavement classification number (PCN) 6 on a subgrade category B.

In December 2010 the City of Ballarat arranged for Heavy Falling Weight Deflectometer (HWD) tests to be undertaken on the airport pavements and for geotechnical testing, including boreholes to be dug in the various pavements, to analyse pavement thickness, material properties and subgrade strength.

In January 2011 this data was analysed and it was determined that the subgrade category of B may be incorrect and should be changed to the lower category C, **Council should investigate this issue further to determine the appropriate course of action. The current restrictions on aircraft operations below 5,700 kg MTOW should remain in place unless pavement strengthening is undertaken (see section 7.6).** However, one of the outcomes of the geotechnical testing and analysis was that runway 18/36 has varying strengths in different sections of the runway and some sections have a higher strength than the current pavement rating.

It is noted that geotechnical testing of the apron areas was only undertaken on the taxilane connecting taxiway A and taxiway B. Therefore it is assumed that the pavement strength of the remainder of the apron is of a similar strength.

MOS Part 139 - Aerodromes, Chapter 6, Section 6.2.10.2 states that "CASA does not specify a standard for runway bearing strength, however, the bearing strength must be such that it will not cause any safety problems to aircraft. The published PCN value should be suitable for the aircraft that regularly use the airport". As the two paved runways at Ballarat Airport are PCN 6 they are suitable for the current aircraft operations.

The trigger for increasing the pavement strength would be the commencement of operations with larger aircraft, i.e. SAAB 340, Dash 8 Q400 etc. Further information regarding pavement strength is provided in section 7.6 of this report.

3.5 Buildings

The plans at Appendix 4 show the existing Aerodrome Buildings.

There are 13 existing hangars on the airport site comprising:

- five (5) hangars with direct access to the main apron;
- three (3) hangars with direct access to Taxiway A;
- four (4) hangars with direct access to Taxilane E; and
- one (1) hangar with direct access to Taxilane F.

There is also a terminal building of approximately 150 square metres and three other buildings adjacent to the apron that are used by aviation businesses. The existing terminal building is generally suitable for current operations, given the fact that there are no RPT services. **However the amenities available in the terminal building and the adjacent toilets could be improved for itinerant visitors and charter operations. This is discussed further in section 7.8.**

There are numerous other buildings on the site, the majority being the old WW2 huts used by community clubs.

According to airport leasing information and analysis of aerial photography, the main hangars at Ballarat Airport have a total area of approximately 8,800m2. This measure relates to the older hangars H4 to H8, and the newer hangars 9A-C and 10A-C, but does not include annexes, terminal, and other smaller airport buildings which do not have immediate airside access to the apron.

Hangars H4 (Ballarat Aero Club) to H7 (Field Air) were the original hangars built in 1940. More recent development only began in 2000 with the construction of hangar 9A. Subsequently, hangar 10A was constructed in 2002, hangars 9B and 9C were constructed in 2003, hangar 11A was built in 2007 and hangars 10B and 10C were constructed in 2009.

A new hangar for STAA was constructed in 2012 and is located to the south of Taxilane E in conjunction with Stage 2 of the Infrastructure Upgrade Project. This is approximately 576m^2 in area, representing approximately a 6.5% addition to total hangar space when completed in 2012.

Additional future hangar sites will become available as a result of the planned capital works to the south of Taxilane E, with an indicative future capacity of approximately 8,000m^2 to 10,000m^2 of hangar space in addition to the STAA facility.

A layout plan showing the facilities to the south of Taxilane E is attached at Appendix 5.

3.6 Ground Access

The main ground/vehicle access to the airport is via Airport Road and Drome Road.

Within the airport site itself there are a number of streets which provide access to the hangars and other buildings.

Many of the internal streets do not have signed street names which can cause confusion and this therefore requires attention. It has been suggested that heritage road names be used.

A new road servicing the Aviation Development Area south of Taxilane E was constructed as part of Stage 2 of the Infrastructure Upgrade Project, as shown on the plan at Appendix 5 and discussed further in section 7.11 of this report. Planning should be undertaken to identify triggers and funding for completing the internal road network and new access road into the Airport.

3.7 Utility Services

A detailed study of the airport's utility services is not included as part of this Master Plan. This is because for the last two years Council has been undertaking an airport infrastructure upgrade project (as discussed in Section 2.5) including significant upgrades to the airport's utility services. Refer to Appendix 5 & 6.

In 2010 the airport underwent Stage 1 of the Infrastructure Upgrade Project which included improvements to some of the utility services at the airport. The Stage 1 works included:

- Installation of a new water main and fibre optic conduit along Airport Road; and
- Installation of 820 metres of drainage to prepare land within the airport precinct for future development in line with the Ballarat Aerodrome Master Plan 2004 – 2014.

Stage 2 of the Infrastructure Upgrade Project included:

- Further installation of water mains and fibre optic conduit;
- Installation of fire services infrastructure;
- Further stormwater and drainage works;
- Installation and upgrade of electrical infrastructure; and
- Installation of sewerage lines and pumps.

The intent of these utility upgrade works has been focused on upgrading the services coming into the airport, and particularly to facilitate the servicing of development in the main Aviation Development Area (south of Taxilane E). The internal site network servicing existing premises within the airport may still need improvement.

The Ballarat West Employment Zone Master Plan also deals with the provision of utility services and proposes a number utility service upgrades for this precinct. This is addressed in a detailed report prepared by AECOM titled "Civil Infrastructure Assessment – Ballarat West Employment Zone" (January 2013).

The maps at Appendix 6 show the existing utility services available to the site.

The age and capacity of the existing utility services infrastructure within the airport site has been a problem for some existing tenants, particularly for some of the occupiers of the "Green Hangars" (Precinct A3) and the WW2 huts located away from the main aviation areas of the airport. This became evident through the stakeholder consultation.

Whilst the infrastructure upgrade project improved the incoming utility services and facilitated the provision of appropriate utility services to the Aviation Development Area, further detailed work is likely to be required to address specific servicing problems being experienced by tenants on other parts of the airport site. This is discussed further in Section 7.12 of this report.

3.8 Tenancies

There are currently 63 active "tenancies" on the airport land (a tenancy is occupancy or use of airport land or a building on the airport site by a person, company or club, whether or not a valid lease or licence currently exists).

In conjunction with the preparation of this Master Plan, a Tenancy Review has been undertaken. This involved a review of all tenancies on the airport site including all of the community clubs which lease the old RAAF huts.

The existing tenancies can be divided into the following categories:

- Residential (3)
- Community (23)
- Commercial (29)
- Grazing (1)
- Other (7)

The purpose of the Tenancy Review was to:

- Confirm and document the status of all existing tenancies on the airport site.
- Identify tenancy issues that need to be addressed.
- Understand the current and future needs of airport tenants.
- Consider guidelines for new leases and renewals.

The outcomes of the Tenancy Review are set out in a separate report which identifies a number of tenancy matters which will need to be addressed by Council including issues related to the following:

- Utility services.
- Drainage/flooding.
- Car parking.
- Lease terms and conditions.
- Lease boundaries.
- Payment of Council rates.
- Building structure (particularly roof issues).
- Inadequate space (extra space required).

Resolution of the tenancy issues will be a major undertaking, both in terms of human and financial resources, and will need to be undertaken over time. This is discussed further in Section 7.13 of this report.

3.9 Historical Cultural Heritage

The Ballarat Airport site has historical cultural heritage values of significance to the City of Ballarat and the State of Victoria. In particular, the former Ballarat RAAF Base is of historical and social significance to the State of Victoria. Two studies have been undertaken in recent years which provide detailed information and guidelines relating to the historical cultural heritage values of the site. They are:

- Ballarat Aerodrome Conservation Management Plan, Ivar Nelsen, 27 May 2008 (as amended April 2012).
- Ballarat West Employment Zone: Historical Archaeological Assessment, Biosis Research, October 2010.

Due to its historical cultural heritage values, the airport site (generally to the north of Airport Road) is included on the Victorian Heritage Register and the Heritage Overlay also applies to the site under the Ballarat Planning Scheme.

Further information regarding these matters is outlined below.

3.9.1 Ballarat Aerodrome Conservation Management Plan 2008 (as amended 2012)

The Ballarat Aerodrome Conservation Management Plan (CMP) was prepared by Ivar Nelsen in May 2008 to assist the City of Ballarat in the future planning and day-to-day management of the Ballarat Airport. The CMP was amended in April 2012 to reflect amended boundaries of the Heritage Victoria registration. The CMP confirms that the Ballarat Airport is of cultural value to Ballarat and the State of Victoria.

The CMP confirms that the Airport is the most intact surviving Victorian example of the training schools that were rapidly constructed across Australia specifically to train aircrews under the Empire Air Training Scheme in the early years of the Second World War. It was also the first of three Wireless Air Gunnery Schools established nationally and the only such school in Victoria. The training facilities provided an opportunity to educate about the operations of the Air Force throughout the Second World War, in particular the relationship of the Commonwealth allies against the German forces. For these reasons, the Ballarat Airport is considered to be of both historical and social significance.

The Airport's cultural value in this regard was recognised by its inclusion on the Victorian Heritage Register in 2007 (H2113) and the application of a Heritage Overlay (HO190).

Section 5 of the CMP identifies a series of Conservation Policies providing direction for conservation, management, features/buildings/structures, interpretation and future research. Behind those statements are several crucial observations:

- *The existing Ballarat Aerodrome is only a shadow of its WWII extent. Roughly less than a quarter of the 200+ WWII buildings remain.*
- *The core features of the WWII Ballarat Aerodrome are still extant, although not necessarily intact. They include the Tarmac and Teaching Precincts and Cypress Pine Plantation as well as the uniformity, consistency, repetitiveness and Spartan qualities of the built environment.*
- *The 'conservation' of the Ballarat Aerodrome's cultural values is not synonymous with its 'restoration' as in house-museums. Inherent to its conservation is the continued use of the Aerodrome and its buildings for aviation, community and business activities, including managing change.*

Section 6 of the report provides various Conservation Guidelines for maintenance and development of the site. **These guidelines should be considered as part of any future development planning on the airport site (refer to section 7.14 for further information).**

The Ballarat Aerodrome Conservation Management Plan has been considered as part of the preparation of this Master Plan. In addition, Ivar Nelsen was engaged to provide specific heritage conservation advice and input for this Master Plan (as outlined in section 7.1 of this report).

3.9.2 Ballarat West Employment Zone: Historical Archaeological Assessment 2010

In October 2010, Biosis Research was commissioned by the City of Ballarat to complete an historical archaeological assessment of the Ballarat West Employment Zone including the Ballarat Airport site. The aim of the assessment was to examine the historical cultural heritage of the study area and to develop recommendations to enable the City of Ballarat to assess the feasibility of future commercial and industrial developments in the area.

In relation to European cultural heritage, the report concluded that the existing CMP prepared by Ivar Nelsen provided comprehensive guidelines for managing heritage values. Further, no additional historical archaeological sites or areas of historical archaeological potential were identified within the study area, outside of the boundaries of the Victorian Heritage Register site number H2113, and therefore works could proceed in these areas with no further historic cultural heritage constraints.

3.9.3 Victorian Heritage Register

The Ballarat Aerodrome is included on the Victorian Heritage Register, VHR number H2113, File number PL-HE/03/0656. The Statement of Cultural Heritage Significance identifies that the former Ballarat RAAF Base is of historical and social significance to the State of Victoria "*for its ability to demonstrate the importance of military aviation to the defence of Australia and its Allies during the Second World War, the first conflict in which aircraft played a major role in combat for the Australian military*" (p. 7).

The diagrams at Appendix 7 show the land and buildings included in the registration.

In accordance with s67 of the Heritage Act 1995 all new buildings and works on the airport site as defined by the diagram in the Heritage Victoria citation, will generally require a Heritage Permit from Heritage Victoria. Any permit issued will most likely include conditions such as detailed recording (including illustration) and mapping of the features, or detailed archaeological investigation.

There are a number of approved permit exemptions as detailed in section 6.4.1 of the CMP including: regular site maintenance, fire suppression duties, weed and vermin control, landscape maintenance, public safety and security, various signage and site interpretation activities, mineral exploration and various minor external and internal works to buildings.

The City has also made an application to Heritage Victoria for a Permit Exemption or a Permit for the construction of hangars within the Aviation Development Area (south of Taxilane E). At the time of writing Heritage Victoria had not made a decision on this application.

3.9.4 Heritage Overlay

Heritage Overlay HO190 relates to the Former Ballarat RAAF Base. The overlay applies to the land included on the Victorian Heritage Register, as well as land to the south of Airport Road.

Whilst a permit is normally required to subdivide land, demolish or remove a building and to construct a building or construct or carry out works under this overlay, Clause 43.01-2 of the Ballarat Planning Scheme specifies that a permit is not required to develop a heritage place which is included on the Victorian Heritage Register. A permit would be required from Heritage Victoria under the Heritage Act 1995, with the exception of the permit exemptions noted in Section 3.8.3 above for development on land within the Heritage Victoria registration area.

The application of the heritage overlay however, indicates that the site has local, as well as State, significance, as identified in the statement of significance for the site.

3.10 Aboriginal Cultural Heritage

An Aboriginal Cultural Heritage Assessment of the Ballarat West Employment Zone was undertaken by Biosis Research in October 2010.

This assessment was undertaken to inform future planning processes for the Ballarat West Employment Zone and covered the land parcels associated with the Ballarat Airport, as well as land to the east and south of the airport. The assessment included both desktop and field work, with representatives of the Registered Aboriginal Party (RAP), the Wathaurung Aboriginal Corporation, present during the field work.

Four Aboriginal Places comprising artefact scatters and isolated artefacts on rises overlooking waterways and swamps were recorded during the field survey. A number of areas of cultural heritage sensitivity were also identified, however, none of these identified sites or areas are on the main airport site. **However, following consultation with the RAP representatives it was determined that there was a high likelihood of additional Aboriginal places within the boundary of the study area including the airport site.**

Three management recommendations were made as a result of the findings:

- A registered cultural heritage place, and all land within 50 metres of a registered cultural heritage place, is an area of cultural heritage sensitivity as defined in the Aboriginal Heritage Act 2006. Four Aboriginal cultural heritage places were identified in the study area. Therefore, if any future proposed activity is a high impact activity (as defined in Division 5 of the Aboriginal Heritage Regulations 2007), and the activity will take place in an identified area of sensitivity (as per the Aboriginal Heritage Regulations 2007), an approved Cultural Heritage Management Plan will be required before the activity can commence.
- The full extent and nature of the identified cultural heritage sites has not been defined and it is likely that there are additional Aboriginal Cultural Heritage Places within the areas of sensitivity identified in the study area. Under the Act it is an offence to carry out an activity which harms, or is likely to harm, Aboriginal cultural heritage other than through an approved Cultural Heritage Management Plan or Cultural Heritage Permit. Therefore, if the requirement for a CHMP is not triggered by the regulations (or through an EES/being directed by the Minister) it is recommended that a Voluntary CHMP be prepared.
- If any suspected human remains are found during any future activity within the study area works must cease and the Victoria Police and the State Coroner's Office should be notified immediately.

Given the above, prior to any development on the airport, it is recommended that the outcomes and recommendations of the Aboriginal Cultural Heritage Assessment should be carefully reviewed and considered. Further investigations and possibly approvals may be required before development can proceed on some parts of the airport site. Consideration of and alignment with any plans developed as part of the planning for either the Ballarat West Link Road or the Ballarat West Employment Zone should be a priority. This matter is dealt with further in section 7.15.

3.11 Flora and Fauna

A Flora and Fauna Assessment of the Ballarat West Employment Zone, including the Ballarat Airport site, was undertaken by Biosis Research in September 2010. Further surveys were undertaken by Biosis Research in May 2011. The purpose of these studies was to identify the

natural values of the area to assist the City of Ballarat with future planning and management of the BWEZ.

The initial report included the following observations which partly relate to the airport site (refer also to the map at Appendix 8 – Figure 2 dated 28 January 2010):

> *The majority of the study site consists of primarily introduced vegetation. There are seven scattered indigenous canopy trees across the site which provide habitat for bird species. Roadside vegetation contains planted trees, both native and introduced, over a predominantly introduced understorey.*
>
> *The study area supports one ecological vegetation class (EVC), Heavier-soils Plains Grassland, which is endangered within the Victorian Volcanic Plains Bioregion. This vegetation community is listed under the FFG Act (as Western (Basalt) Plains Grasslands Community) and the EPBC Act (as Natural Temperate Grasslands of the Victorian Volcanic Plain).*
>
> *According to our habitat assessment for threatened species (using Threatened Species Rating table, DSE 2007) the areas of Heavier-soils Plains Grassland provide the 'remaining 50%' of habitat for the endangered Fragrant Leek-orchid, the vulnerable Striped Legless Lizard and critically endangered Golden Sun Moth, although these species were not recorded during the current assessment. Targeted surveys are recommended for the aforementioned species in identified habitat if these areas are proposed for development. A further survey is also recommended for specific areas where native grasses were present but as a result of recent slashing and grazing, their extent could not be adequately assessed.*
>
> *Overall, the presence of native grasslands and scattered trees are of high biodiversity value and represent important habitat for fauna. Much of the remaining area is grazed by sheep and cattle and consists of primarily introduced vegetation which is of negligible value for biodiversity.*

The initial report provided the following recommendations:

- Areas of Heavier-soils Plains Grassland should be protected and managed appropriately as this vegetation is endangered within the Victorian Volcanic Plain, as well as being listed under the FFG Act and EPBC Act. The remainder of the study area has low natural values and consists of primarily introduced vegetation.
- Any development works should consider the control and management of environmental weeds as well as sediment control measures, particularly near the adjacent Winter Swamp.
- Undertake further flora surveys in identified areas to ascertain if these areas constitute native vegetation under Victoria's Native Vegetation Framework and if they meet the criteria for the nationally significant Natural Temperate Grasslands of the Victorian Volcanic Plain.
- Undertake targeted surveys for the Fragrant Leek-orchid, Striped Legless Lizard and Golden Sun Moth in identified areas if these areas are proposed for development.

The latter report, prepared in May 2011, describes the outcomes of the additional surveys as recommended by the original study. These surveys covered specific areas identified as potentially supporting Plains Grassland EVC and areas supporting habitat for the nationally critically endangered Golden Sun Moth *Synemon plana* (GSM).

It is important to note that the area for which the additional assessments were commissioned was restricted to the southern half of the study area and only included those areas likely to be impacted by development in the near future (generally south of Airport Road – see Appendix 8, Figure 2 dated 8 February 2011). The additional areas identified for further assessment but not commissioned at that time are all located on the airport site (see Appendix 8 – Figure 4).

The report concluded that:

- None of the areas covered by the additional surveys support Plains Grassland EVC or any other EVC and therefore, based on vegetation, no further consideration of these areas is required. **However, other areas (generally north of Airport Road) still require further assessment prior to development.**
- Golden Sun Moth (GSM) is present within the north-south portion of the Airport Drive site, but is unlikely to be present within the Hangar and Rail sites or the east-west portion of the Airport Drive site (see Appendix 8 – Figure 3). Based on the known occurrence of GSM on the north-south portion of the Airport Drive site and DEWHA definitions of an action that may lead to a significant impact on the GSM, it is possible that any development or any other action (as defined) within the north-south portion of the Airport Drive site could have a significant impact on GSM. **Any development or other action proposed to be undertaken in the portion of the Airport Drive site identified in the report as Potential Extent of Golden Sun Moth habitat be referred under the Environmental Protection and Biodiversity Conservation Act 1999 to the Australian Government Minister for the Environment, Heritage and the Arts.**
- Any development within close proximity to the known population of GSM within the Airport Drive site could present either a direct or an indirect impact on the GSM population. **Therefore, as an appropriate risk management strategy, we recommend that any proposed development around the potential extent of Golden Sun Moth habitat be considered in light of its possible impact on GSM and that where appropriate an EPBC Act referral be lodged to establish certainty for the development.**

Given all of the above, prior to any development on the airport site the outcomes and recommendations of the flora and fauna studies outlined above should be carefully reviewed and considered. Further flora and fauna investigations and possibly approvals may be required before development can proceed on some parts of the airport site. Consideration of and alignment with any plans developed as part of the planning for either the Ballarat West Link Road or the Ballarat West Employment Zone should be a priority. This matter is dealt with further in section 7.16.

4 SWOT Analysis and Competition Assessment

To help clarify the future direction of the airport and key issues to be addressed in the Master Plan, a SWOT analysis of the airport was undertaken. The following points summarise the airport's strengths, weaknesses/constraints, opportunities and threats/risks. The SWOT analysis was based on an assessment of the existing facilities, a review of background information, relevant policies and consultation with stakeholders.

Further detail and analysis of these points is provided in section 5 of this report:

4.1 Strengths and Advantages

Ballarat Airport has a number of strengths and advantages which provide a strong foundation for the future of the facility. The key strengths and advantages are outlined below:

- Regional prosperity, liveability and affordability.
- Large population base in the region and skilled workforce.
- Proximity to Melbourne and ability to cater for GA overflow from Melbourne.
- Location and accessibility.
- Large freehold site area and potential to expand.
- Lighting and PAPI on Runway 18/36.
- Potential to extend Runway 18/36 if required.
- Existing aviation businesses on the site.
- Land available to expand aviation-related development.
- Planning policy support for airport growth and development.
- Ballarat West Employment Zone – industry, jobs, output, better protection of pilot school.
- Low rents, low cost, low regulation environment.
- Good infrastructure including runways.
- Freeway access and Link Road access.
- Strong labour force.
- Access to University of Ballarat.
- Latent demand for hanger space.
- Good maintenance facilities on site.
- Ballarat has an established manufacturing base.

4.2 Weaknesses and Constraints

The key weaknesses of the airport are considered to be:

- The current Class G (uncontrolled) airspace classification has the ability to process up to approximately 60,000 movements per year (without extra airspace management controls).
- Runway and taxiway pavement strength is an issue in some locations which restricts larger/heavier aircraft.
- The current length of runway 18/36 limits the use of the airport by larger/heavier aircraft.
- Taxiway D – Code A rating.
- Decline in domestic General Aviation (GA) overall (refer to section 5.2).
- Heritage, flora and fauna restrictions on some parts of the site including the airfield.
- Drainage / flooding issues on some parts of the site.
- Location and condition of terminal building not suitable for RPT services.
- Surrounding urban / residential development and noise sensitive land uses.
- Council's financial ability to invest in infrastructure upgrades, maintenance and airspace management controls.
- Limited facilities for helicopters.
- Insufficient promotion of capacity.

- Poor signage.
- Proximity to Melbourne.

4.3 Opportunities

The key opportunities for the airport are considered to be:

- Global aviation growth (particularly in aircraft and parts manufacturing, pilot and technician training, airport management to facilitate the movement of aircraft, aircraft maintenance and storage facilities).
- Overall decline in domestic GA as a whole, but rapid growth of recreational and sporting aviation in Australia.
- GA spillover growth out of Melbourne (due to constraints and pressures at Essendon and Moorabbin airports).
- Opportunity to become a dedicated emergency services hub to service wider Victoria as suggested by the CFA. Provision to potentially cater for multi-engine tankers such as the Avro RJ85 or Convair CV-580 in the future.
- Opportunity to fill supply chain gaps.
- Population growth and prosperity in the region.
- Linkages with the Ballarat West Employment Zone (eg. freight, upstream supply relationships).
- Some existing tenants have indicated a desire for more hangar space.
- Latent demand for hanger space (there have been enquiries from several prospective tenants interested in new hangar space).
- STAA have plans to increase current fleet size and increase enrolments.
- The need for an aircraft maintenance facility has been mentioned by some airport tenants.
- Access to University of Ballarat for training, R&D etc.
- Scope for higher rents and revenues.
- Clustering opportunities.

It is noted that a Regular Public Transport (RPT) service is considered unlikely in the short term due to the competition and lack of demand caused by the airport's proximity to Melbourne. However, a small-scale RPT service might become viable in the future, and should therefore be allowed for in the Master Plan.

4.4 Threats and Risks

In addition to the growth constraints, the following risks and threats also need to be considered:

- Aircraft noise complaints.
- Community awareness of the economic and social value of the Ballarat Airport.
- Potential for an aircraft accident.
- Potential for an airport security incident.
- Competition from other airports.
- Encroachment of further urban / residential development around the airport.
- Construction of Obstacle Limitation Surfaces (OLS) intrusions.
- Continued decline in domestic GA.
- High upgrade and manufacturing costs.

4.5 SWOT Summary

The SWOT analysis shows that most of the Ballarat Airport's strengths lie in its location, land capacity and growth capability. If appropriate management controls are in place (to manage the constraints and risks), the airport is in a strong position to exploit a number of potential

growth opportunities and generate further social and economic benefits for the Ballarat community.

4.6 Competition Assessment

The Economic Analysis and Investment Opportunity Study prepared by Essential Economics included a competition assessment comparing Ballarat Airport with other regional aerodromes. This assessment highlighted that Australia has more than 2,000 airports and airfields, which can be classified into five broad categories:

A. The ten major city airports (Sydney, Melbourne, Brisbane, Perth, Adelaide, Canberra, Darwin, Gold Coast, Hobart and Cairns)

B. Major regional airports (eg Launceston, Gladstone and Dubbo)

C. Secondary metropolitan airports and large GA centres (eg Avalon, Essendon and Moorabbin)

D. Smaller regional community airports and aerodromes (eg Ballarat, Bendigo and Latrobe)

E. Small 'satellite' airfields or landing strips in outer metropolitan locations (eg Lilydale, Barwon Heads and Tyabb).

According to the Essential Economics report, Ballarat Airport, being a category D airport, competes with airports in categories C, D and E, in two main ways:

- As an alternative or preferred location for aviation/airport activities that must occur in the western Victorian 'catchment' (eg. attracting a local flying enthusiast to hangar his plane at Ballarat instead of Bacchus March).
- As an alternative or preferred location for footloose investors looking for a home (eg. a domestic or international aircraft component manufacturer wanting to set up a new operation or relocate an existing one).

The Economic Analysis and Investment Opportunity Study concludes that the Ballarat Airport has the following important competitive strengths that make it attractive to potential business investors and private aviators:

- *Ballarat has an established manufacturing base and skilled workforce. This makes it an attractive place for aviation sector input businesses to potentially locate to, because employers would have the confidence that they have access to manufacturing workers who have skills in the types of industries identified in the supply chain analysis.*

- *The relatively short distance to Melbourne compared with virtually all other airports of the same category makes Ballarat one of the most attractive regional airport solutions in the fall-out from the situation (rising costs, congestion, etc) now prevailing in relation to metropolitan GA, especially for private aviators seeking to store, maintain and repair their own aircraft in cheaper hangars.*

- *The quantity of land available for aviation development in the current hanger expansion area is vast, and potentially more land can be made available in other (as yet undeveloped) areas of the airport if required. Council is actively supporting and encouraging aviation development at the airport, and this sends a positive signal to would-be investors that ongoing/long-term support for aviation in Ballarat can be expected.*

These trends and opportunities outline above indicate that there is potential for growth and further development at Ballarat Airport. These matters are discussed in more detail in the following section.

5 Commercial and Economic Development Opportunities

The Ballarat Airport Economic Analysis and Investment Opportunity Study was prepared by Essential Economics in May 2011. This report provides an economic analysis and guidance on the long-term investment opportunities available to the Ballarat Airport and identifies a set of strategic development options for Council's consideration and to inform the new Master Plan. The following sections are derived from the Essential Economics report.

5.1 Aviation Industries in Ballarat

The aviation sector comprises a wide range of activities across the manufacturing, transport and technical service industry groupings. Aviation sector industries can interact with other industries in a number of simple or complicated ways. These interactions can generally be grouped into 'upstream' relationships and 'downstream' relationships, as follows. Upstream relationships refer to business inputs i.e. suppliers of raw materials, machinery, components, natural resources etc. Downstream relationships refer to business outputs, i.e. consumers of the aviation product or service.

On average, approximately 30% (by value) of business inputs to the local aviation sector are sourced from within Ballarat, with 20% coming from elsewhere in Victoria and 50% from interstate locations. On the output side, approximately 20% of customers who consume products or services produced by the local aviation sector are located in Ballarat, while 50% are located elsewhere in Victoria and 30% are interstate or international.

The degree of local procurement in industry supply chains is generally determined by the following factors:

- *Availability;*
- *Price; and*
- *Quality.*

Ballarat Airport businesses have indicated that a lack of availability is the main factor inhibiting much higher levels of local procurement, and in some cases, exclusive local procurement.

In the medium-term, supply chain gaps can be filled locally in two main ways:

- *Nurturing 'home-grown' aviation businesses in Ballarat through strategic support for higher-order aviation inputs, e.g. plane, helicopter and parts manufacturers; maintenance and engineering, etc., so that local suppliers are available to future airport tenants*
- *Attracting established aviation supplier businesses (in the relevant fields) to Ballarat so that businesses can procure locally.*

The aviation sector's most important upstream (supply) relationships exist with the following manufacturing and wholesaling activities:

- *Tyre manufacturing*
- *Petroleum fuel refining, manufacturing, wholesaling*
- *Chemical and synthetic product manufacturing*
- *Non-metallic mineral manufacturing (eg glass)*
- *Structural steel fabricating*

- *Scientific equipment manufacturing*
- *Electronic component manufacturing*
- *Communication equipment manufacturing*
- *Material, machinery and equipment wholesaling*
- *Electricity, gas, water and waste services*
- *Non-residential building construction*
- *Civil engineering and site preparation services.*

Support and encouragement for the establishment or growth of these activities in Ballarat will increase the potential for growth of aviation activities at Ballarat Airport. The BWEZ will assist in this regard (this has been addressed in the economic assessment prepared for the BWEZ Master Plan).

Some of the industries identified above already have a presence in the Ballarat region, and form a part of the manufacturing base identified as a sectoral priority area in the City of Ballarat Economic Strategy 2010 - 2014. This points to the potential for a strong future relationship between the Ballarat economy and the aviation sector at large, and shows that quality supply chain opportunities exist for Ballarat to provide inputs not only to its own aviation businesses, but to aviation businesses far beyond its municipal boundaries.

5.2 Long-Term Opportunities in Aviation

The Ballarat Airport Economic Analysis and Investment Opportunity Study provides a strategic overview of past and future trends in international and domestic aviation, and describes the opportunities these trends present for Australian aviation businesses.

The global aviation sector is a competitive, fast-changing and dynamic sector. It is acutely sensitive to fluctuations in market conditions and factor costs, such as business-cycle volatility, oil price movements and shock events. Yet the sector has been growing overall and is forecast to boom during the next two decades. Most of the growth in aviation is expected to be driven by higher demand for RPT. RPT growth will be underpinned by economic growth and the rise of the Asia-Pacific region in particular as an economic force.

The global GA sector, comprising activities such as aircraft maintenance, pilot training, aerial agriculture, aero-medical services, fire-fighting, surveying, and various business and private uses such as aircraft charter and recreational flying, will also expand substantially.

GA incorporates the full range of private and commercial activities occurring in smaller aircraft at secondary airports such as Ballarat. In recent years large variations have occurred in the performance of GA sub-sectors within Australia, resulting in an overall decline in domestic GA as a whole. However there has been rapid growth in recreational and sporting aviation, which is probably the most pronounced trend in domestic GA in the past decade.

The broad-based international growth of Regular Public Transport (RPT) and GA will create demand in the following market segments:

- *Aircraft and parts manufacturing;*
- *Pilot and technician training;*
- *Airport capacity to facilitate movement of aircraft; and*

- *Aircraft maintenance and storage facilities.*

Strategic economic shifts in the Asia-Pacific region are expected to drive major changes in the global aviation sector. These changes will create growth conditions for international and Australian businesses engaged in aircraft and parts manufacturing, pilot and technician training, airport management and development, and aircraft maintenance and storage facilities. However, while the future of aviation in a global sense is promising, domestic trends show a decline in GA in recent years. The notable exception in the story of domestic GA decline has been the recreational sub-sector, which has bucked the trend and grown substantially.

Furthermore, the Economic Analysis also recommended against attracting further pilot training operations due to the likely impact on airspace capacity.

5.3 Development Options and Impacts

The Ballarat Airport Economic Analysis and Investment Opportunity Study sets out three broad development options for the Ballarat Airport based on an assessment of the airport's constraints, global and domestic aviation trends, and Ballarat Airport's competitive advantages. These options are:

- Commercial GA Focus
- Sports Aviation, Tourism and Heritage Specialism
- Diversified (Non-Specialist) GA Growth

In addition to the three options identified by Essential Economics there are two further options which should be considered. They are "Organic Growth" and "Go for Broke".

All five of these development options and their potential impacts are summarised below. For each option the estimated or forecast impacts over the 20 year planning horizon are outlined. This summary was informed by the Essential Economics study and stakeholder consultation including the results of the second questionnaire relating to the future direction of the airport that was sent to all aviation tenants.

It should be noted that the establishment of an RPT service is included in Option 5: Go for Broke only.

5.3.1 Option 1 – Organic Growth

As the name suggests, this option essentially involves doing nothing in terms of intervention in, or proactive management of, airport growth. In other words, under this option the management and growth of the airport would be uncontrolled; a *laissez-faire* approach.

Development of additional hangar space at the airport has occurred at an average rate of approximately 375m2 per year since 2000, although this involved a small number of major projects over 2002/2003 and in 2009. This information indicates an uneven rate of development, with a total of around 3,750m2 of hangar space introduced since the year 2000, but with 1,500m2 introduced much more recently in 2009. Seven (7) individual hangars have been constructed since 2000 (approximately 0.6 hangars per year).

Currently, approximately 90 direct FTE employment positions are generated by the aviation activities at the airport, with most of this employment associated with STAA and Field Air. Indirect employment generation is estimated to be 308 FTE jobs and total Gross State Product (GSP) output is estimated to be $9.95m.

If it is assumed that the growth rate over the last 10-11 years continues under an Organic scenario, the rate of hangar space development would be approximately 375m2 per year. Enterprise growth would occur at a rate of approximately 0.6 per year.

In accordance with the forecasting undertaken by Essential Economics, each new commercial GA business is forecast to generate an average of approximately ten (10) new jobs, measured in terms of full-time equivalent (FTE) employment. This estimate was based on current information about employment at the airport for each existing business. Each new recreational flying business is expected to generate average employment of one (1) FTE staff, having regard for the current employment patterns of these types of users, the seasonal variations, emphasis on part-time inputs, etc.

Estimates of the indirect employment effect were prepared by Essential Economics with reference to official employment multipliers prepared by the ABS. The same multipliers will be used for this Organic scenario.

Likewise, the calculation of the direct value of annual production from additional new business activity will use the same method used by Essential Economics for the other options (using industry level data of Victoria's Gross State Product (GSP) in the ABS National Accounts and the number of people employed).

Based on the above, the economic impacts of Option 1 over the 20 year planning horizon are estimated to be:

- Hangar space: up to an additional 7,500sqm
- Enterprise growth: 12 new businesses (6 commercial, 6 recreational)
- Direct employment generation: 66 new jobs
- Indirect employment generation: 219 new jobs
- Total GSP output: $7.2m
- Minimal infrastructure development costs.

The main social impact of this option (and all options) will be associated with noise disturbance for residents living under aircraft flight paths, and the perceived safety concerns that residents might have in relation to airport activities. However for this option, which involves minimal intervention in or management of the growth of the airport, it is considered that the social impacts of aircraft noise and safety concerns could be higher than development options involving proactive intervention and management. Uncontrolled airport growth could have real noise and safety implications.

The infrastructure development costs associated with this option are considered to be low because if the historical growth pattern continues it is unlikely that any further major infrastructure upgrades would be required in the short to medium term beyond what is already planned or known to be required for the existing aviation activities at the airport.

5.3.2 Option 2 - Commercial GA Focus

This option represents a growth scenario through which Ballarat Airport becomes intrinsically linked with GA excellence and gains a strong reputation in Victoria and beyond as a ‘blue-chip’ location for GA activity, as is presently the case with leading GA facilities such as Essendon and Moorabbin Airports.

The main types of GA uses envisaged under this option include maintenance, engineering, storage, charter, emergency and surveying work, with some growth in sports and recreational flying.

The underlying premise of Option 2 is that future development will occur at a greater rate than has currently been observed at Ballarat Airport, and will involve more significant investment in mainly commercial GA-related activities and facilities. Growth in recreational flying and other similar activities would continue to occur, but would not be the main source of future growth.

Under Option 2, the estimated economic impacts over the 20 year planning horizon are:

- Hangar space: up to an additional 10,000sqm
- Enterprise growth: 15 new businesses
- Direct employment generation: 105 new jobs
- Indirect employment generation: 357 new jobs
- Total GSP output: $11.6m
- Medium infrastructure development costs - dependent on industries attracted and trigger points for infrastructure upgrades.

The main social impact of this option will again be associated with noise disturbance for residents living under aircraft flight paths, and the perceived safety concerns that residents might have in relation to airport activities. However, because this option involves intervention in and management of airport growth, and is likely to involve less aircraft movement activity when compared to other options, the social impact of this option is considered to be medium-low. Commercial GA activities are expected to generate fewer aircraft movements compared to Recreational GA activities, provided the Commercial GA option does not include any major changes to current commercial flight training activities.

The infrastructure development costs associated with this option are considered to be medium due to potential for larger aircraft needing to use the airport. Larger aircraft may trigger the need to upgrade pavements earlier, or extend existing pavements, such as lengthening of the main runway. Larger aircraft also have larger hangar space requirements.

5.3.3 Option 3 - Sports Aviation, Tourism and Heritage Specialism

The most pronounced trend in Australian GA has been the rapid growth of sports and recreational aviation, made possible by the introduction of the Light Sport Aircraft (LSA category. As more people become aware of LSA and the accessibility of the RA-Aus recreational licence, the sports aviation industry will expand at an even faster rate than has been recently observed. This will create a unique market opportunity for a dynamic regional airport like Ballarat to specialise in recreational flying and promote itself as a young, fun and adventurous destination.

Importantly, this development option presents an opportunity to tie-in the airport's strong heritage theme under a broader 'aviation tourism' banner, and potentially increase exposure for regular activities such as RAAF events, museum events and antique aircraft shows.

The underlying premise of Option 3 is that future development will involve faster take-up of airport space by recreational users rather than by commercial GA activities. Given the mainly smaller requirements in terms of hangar space for (some, but not all) recreational organisations

and private individuals, the estimated rate of growth in hangar development would be lower than in Option 2.

Under Option 3, the estimated economic impacts over the 20 year planning horizon are:

- Hangar space: up to an additional 8,000sqm
- Enterprise growth: 13 new businesses
- Direct employment generation: 49 new jobs
- Indirect employment generation: 153 jobs
- Total GSP output: $5.3m
- Low infrastructure developments costs.

The social impact of this option (ie. noise disturbance and safety concerns) is considered to be medium-high when compared to the other options. Whilst light/recreational aircraft generally have lower noise impacts when compared to commercial aircraft there is potential for this option to generate a higher number of aircraft movements. Furthermore, this option may also increase perceived safety concerns associated with the range and mix of activities including gliders, microlights, ultralights, and training for recreational licences.

The infrastructure development costs associated with this option are considered to be low because it is unlikely that any further major infrastructure upgrades would be required in the short to medium term beyond what is already planned or known to be required for the existing aviation activities at the airport.

5.3.4 Option 4 - Diversified (Non-Specialist) GA Growth

This development direction represents a diversified, 'portfolio' approach to growth. It takes advantage of the slow leakage of GA activity from metropolitan airports to regional airports, but does not require that Ballarat specialises in commercial GA or recreational/sports GA. Instead, it encourages a very broad mix of intensive and non-intensive aviation uses at the airport, and the pursuit of discrete opportunities in response to market conditions. This option therefore entails a less interventionist approach than Options 2 and 3 though one which still requires detailed planning for the use of airport land, careful management and particularly consideration of airspace management issues.

The provision of more basic but essential aviation requirements such as aircraft storage and hangar space would be an important component of this option.

Emergency service provision is also envisaged under this scenario. For example, the need for the Victorian Government to expand and strengthen its aerial fire-fighting capability presents a significant opportunity for Ballarat Airport as evidenced by the 2010/2011 trialling of multi-engine tankers by the Victorian State Aircraft Unit

Option 4 involves ongoing future development at a slightly higher rate to that already experienced in recent years, and with a diversity of uses including some GA businesses and some recreational enterprises.

Under Option 4, the estimated economic impacts over the 20 year planning horizon are:

- Hangar space: up to an additional 8,000sqm
- Enterprise growth: 14 new businesses

- Direct employment generation: 77 new jobs
- Indirect employment generation: 255 jobs
- Total GSP output: $8.4m
- Medium infrastructure development costs.

The social impact of this option is considered to be medium because it is essentially a combination of Options 2 and 3 (nominally 50% Commercial GA and 50% Recreational GA). Noise and safety issues would require careful consideration and management, particularly due to the mix of activities, but provided this is done the social impacts of this option should be less than Option 3.

The infrastructure development costs associated with this option are considered to be medium because as with Option 2, commercial GA activities may involve larger aircraft needing to use the airport. Larger aircraft may trigger the need to upgrade pavements earlier, or extend existing pavements, such as lengthening of the main runway.

5.3.5 Option 5 - Go for Broke

This option is essentially a combination of Options 2, 3 and 4 but with the addition of Regular Public Transport (RPT) services and would see the implementation of a major investment attraction program based on key growth sectors ie. Mining Hub for fly in and fly out movements. Emergency service provision would also be a key component of Option 5.

Because this option was not part of the assessment prepared by Essential Economics there are no detailed economic impact figures for this option. However, as this option represents a high growth scenario it is assumed the economic impacts would high.

Whilst the economic impact of this option would be high there are a number of issues that do not make this a viable investment option for the Ballarat Airport. In this regard it is worth quoting section 7.1 of the Essential Economics report titled “The Role of RPT”:

> *RPT is a cut-throat industry in Australia, with a long history of failed regional ventures. Currently no RPT exists at Ballarat Airport and there is no significant track record of there being any commercially-viable RPT at Ballarat. Nevertheless, the long-term potential of limited RPT at Ballarat Airport should be considered in terms of attracting future investment and economic opportunity.*
>
> *If there were to be any RPT at Ballarat Airport, it would most likely be in the form of a small regional operator connecting Ballarat with a western/northern Victorian or interstate destination. For RPT to be established, a commercial provider would need to be convinced that there is a sufficient market for operating the route at a rate of return that justifies the investment risk.*
>
> *If deemed feasible by a commercial operator, the establishment of RPT would have implications for Ballarat's Airport identity as a GA facility. This is because even a limited operation would create the need for some upgrading of passenger infrastructure on the ground, and a detailed site configuration plan would need to be prepared and implemented.*
>
> *The introduction of RPT would trigger the interest of CASA, resulting in an aeronautical study and an assessment of the need for an Air Traffic Control tower at Ballarat. The Airspace Capacity Study by Airbiz indicates that the capital cost of introducing a tower would be of the order of $6.5m, and with $1.5m in annual operating costs.*

On balance, we do not consider that RPT is a viable investment opportunity for Ballarat Airport to actively pursue in the foreseeable future. This is because the RPT industry is highly volatile and can succeed only when there is a genuine market-driven need for a service to a particular location, and a commercial entrant has a financial incentive to deliver a service. Such a need has not been identified during the course of this study or during any consultations.

It is possible that RPT might become viable during the second-half of the 20-year airport planning horizon. With population and economic growth occurring across Victoria's regions, the need for regional and rural communities to be connected not only to capital cities but to each other will increase. Some of these new networks will be road-based, but some networks (or parts of networks) will likely need to be air-based because of the high cost of road-building/maintenance and the long travel distances involved.

In our opinion, Council should monitor the market for at least 5-10 years before making any investments in RPT. The airport Master Plan should take into account the possibility of small-scale RPT becoming viable in the latter half of the planning period, but not give weight to it as a probable outcome at this stage.

In addition to the above issues, the social impact of Option 5, in terms of noise and safety concerns, would potentially be high when RPT is added to commercial and recreational activities at the airport. However, it is noted that the benefits of Ballarat having an RPT service could be seen as out-weighing or reducing the negative social impacts in terms of access and transport diversity.

The infrastructure development costs of this option would also be high due to the probable need to upgrade passenger facilities, lengthen the main runway and invest in air traffic control measures.

5.4 Preferred Development Option

The following table summarises the potential impacts of the five options discussed above. The impacts of the options are in addition to the economic value of the current airport and assume full development.

Table 1 – Summary of Development Options and Impacts

Option	Activity Focus*	Positive Attributes		Negative Attributes		Overall Ranking
		Potential Demand	Economic Impact	Noise & Safety Impact	Dev't Costs	
1. Organic	CGA & RGA	Low	Low	Medium	Low	Medium
2. Commercial GA Focus	CGA	Low	Medium	Medium-Low	Medium	Medium-High
3. Recreational GA Specialism	RGA	Low	Low	Medium-High	Low	Medium-Low
4. Diversified GA (Managed)	CGA & RGA	Medium	Medium	Medium	Medium	High
5. Go For Broke	CGA, RGA & RPT	Medium	High	High	High	Medium

* CGA = Commercial General Aviation, RGA = Recreational General Aviation, RPT = Regular Public Transport.

The above table shows that each option has advantages and disadvantages. This is a simplistic view of the five scenarios but serves the purpose to identify the preferred development direction for the airport. Whilst more detailed refinement is required through the implementation phase it is clear that Option 4 - Diversified GA is the preferred development option. Overall Option 4 has the best balance of positive and negative attributes. There is considered to be medium demand for Option 4 with potential for medium economic impacts balanced against medium noise and safety concerns and medium development costs. Each of the other options have lower positive and/or higher negative attributes.

It should be noted that the Essential Economics report concluded that Option 2 – Commercial GA Focus:

- will have the highest economic and employment contribution;
- is likely to have the greatest long-term impact in terms of building the local supply-chain capacity; and
- is most consistent with the goal of developing a more self-reliant aviation sector in Ballarat.

However, when social (noise and safety) and development cost factors are considered Option 4 ranks above all of the other options. The results of the questionnaire relating to the future direction of the airport that was sent to all aviation tenants generally support Option 4.

Furthermore, based on the economic assessment it is unlikely that Ballarat Airport will see massive development in the foreseeable future. Added to this are common concerns over noise, safety and other constraints around financing and general management controls. This supports the adoption of Option 4 and its philosophy of diversified but managed growth.

5.5 Investment Attraction

In order to achieve the preferred development scenario, Council or other parties must proactively market the precinct to attract the targeted aviation tenants. Therefore an investment attraction program will be required that incorporates an investment prospectus, promotional campaign and sales activity.

6 Critical Planning Parameters

This section provides an analysis of the airport against relevant airport planning parameters to help guide the Airport Development Plan. Key issues/actions are highlighted in **bold text** and are discussed further in section 7 of this report.

6.1 Aerodrome Reference Code

Australia has adopted the International Civil Aviation Organisation (ICAO) methodology of using a code system, known as the Aerodrome Reference Code, to specify the standards for individual aerodrome facilities which are suitable for use by aircraft within a range of performances and sizes.

The Aerodrome Reference Code is based on the characteristics of an aircraft not the airport. Once the critical aircraft (or design aircraft) is determined then the aerodrome facilities are designed and built to meet those characteristics. The critical aircraft nominated in the Ballarat Aerodrome Master Plan 2004-2014 was the Dash 8-300 which is a Code 2C aircraft. However, currently the aviation facilities at Ballarat Airport are capable of handling a Code 3C aircraft. The one limiting factor, as discussed in section 3.3 of this report, is pavement strength.

The table below indicates the aircraft characteristics that determine the Aerodrome Reference Code.

Table 2 - Aerodrome Reference Code extracted from MOS Part 139 - Aerodromes

Aerodrome Reference Code				
Code Element 1		**Code Element 2**		
Code number	**Aeroplane reference field length**	**Code letter**	**Wing span**	**Outer main gear wheel span**
1	Less than 800 m	A	Up to but not including 15 m	Up to but not including 4.5 m
2	800 m up to but not including 1200 m	B	15 m up to but not including 24 m	4.5 m up to but not including 6 m
3	1200 m up to but not including 1800 m	C	24 m up to but not including 36 m	6 m up to but not including 9 m
4	1800 m and over	D	36 m up to but not including 52 m	9 m up to but not including 14 m
		E	52 m up to but not including 65 m	9 m up to but not including 14 m
		F	65 m up to but not including 80 m	14 m up to but not including 16 m

6.2 Determining Runway Length, Width and Strength

Determining runway length, width and strength for an airport needs to be based on the critical aircraft that are likely to use the airport in the future. Usually this is based on RPT aircraft.

A number of aircraft are commonly used in the Australian aviation industry for small passenger operations and for corporate charter. The majority of passenger operations into regional centres on the eastern seaboard are serviced by turboprop aircraft with a seating capacity up to 70 passengers. The two most common aircraft are Dash 8 Q400 and SAAB 340. However, Ballarat Airport currently has no RPT service.

There are many types of corporate aircraft used in Australia, the majority of which cannot operate into Ballarat Airport or are restricted due to the runway lengths and the pavement strength rating. Typically, corporate aircraft operating in Australia are the Canadair Challenger 604 used by the RAAF to transport VIPs and Cessna Citation/Learjet or similar used by many businesses as charter aircraft.

Table 3 below shows the characteristics of a range of typical aircraft.

Table 3 - Typical Aircraft Types[1]

Aircraft	Seats	ARFL (m)	MTOW (kg)	ACN[2]	CODE
Dash 8-300	50	1122	18642	10	2C
Dash 8 Q400	70	1354	29347	16.5	3C
Jetstream 31	18	1440	6950	4.4	3C
ATR 72-600	50	1165	21566	12	3C
SAAB-340	35	1220	12370	5.7	3C
Metro III	19	991	6577	4	2B
Metro 23	19	1341	7545	4	2B
Challenger 604	12	1780	21617	13	3B
Hawker 900	8	1513	12700	7	3B
Learjet 55	8	1292	9298	6	3A
B737-800	180	2256	70535	46	4C
A320-200	180	2058	72000	40	4C

Note 1: For indicative purposes only. Specific values for particular aircraft should be obtained from the aircraft operator or the aircraft manufacturer.
Note 2: The ACN is based on the aircraft's maximum take-off weight on a flexible pavement with a sub-grade rating of "B".

The Aeroplane Reference Field Length (ARFL) published by aircraft manufacturers for each aircraft type is a guide only when determining suitable runway length. Many other factors can also influence usable runway length including the elevation of the airport, air temperature, wind speed and direction. In practice, a longer runway length is usually required.

As an example, Hamilton Airport has an RPT service operated by Sharp Airlines which currently uses Metro III/23 aircraft. The ARFL of these aircraft is 991m and 1341m respectively. However the main runway at Hamilton Airport is in the process of being extended by 300m from its current length of 1404m to 1704m. This extension is required due to the fact that in summer, when the air temperatures are higher, the Metro aircraft cannot operate fully loaded on the existing runway length.

Runway length can therefore be a limiting factor for aircraft operations. The two main runways at Ballarat Airport are of an adequate length for the aircraft types currently operating and would be suitable for some passenger aircraft, i.e. Metro III/23 and SAAB 340 (subject to pavement strength) although such aircraft are likely to have passenger/freight restrictions in summer when air temperature can sometimes require a longer runway as indicated above. The runway length would need to be increased if larger passenger aircraft such as Dash 8 Q400 and ATR 72-600 were to operate in the future (this is discussed further in section 6.4). Furthermore, current pavement strength would limit the number of movements of these aircraft types.

The pavement strength can be a major limiting factor for aircraft operations. The construction materials used and the constructed depth of the pavement determine pavement strength. For a pavement to be determined suitable for an aircraft operation the designated Pavement Classification Number (PCN) should match the Aircraft Classification Number (ACN) which is determined by the aircraft manufacturer.

Currently Ballarat Airport is restricted to aircraft below 5,700 kg MTOW. ERSA also indicates that runway 18/36 and runway 05/23 have a Pavement Classification Number (PCN) 6. As the two paved runways at Ballarat Airport are PCN 6 they are suitable for the current aircraft operations. The trigger for increasing the pavement strength would be the commencement of operations with larger aircraft, i.e. SAAB 340, Dash 8 Q400 etc. This matter is dealt with further in section 7.6.

The width of the runway is the final limiting factor that can restrict larger jet aircraft operations. The two main runways at Ballarat Airport have a width of 30m which is an adequate width for current aircraft operations. As this runway width is Code C it is also suitable for some RPT jet aircraft.

6.3 Selected Design Aircraft

Currently the aviation facilities at Ballarat Airport are generally capable of handling a Code 3C aircraft. The one limiting factor already discussed in this report is the pavement strength of the runways, taxiways and apron, and the associated restrictions on aircraft above 5,700 kg MTOW.

It is not envisaged that aircraft larger than Code 3C, i.e. Code 4C, B-737 aircraft will operate at Ballarat Airport in the life of this Master Plan. Major changes would need to occur to the aviation facilities before Code 4C aircraft could operate into Ballarat Airport. These changes would include lengthening the runway to at least 2000m, widening the runway to 45m, increasing the width of the runway strip to 300m and dramatically increasing the strength of the runway to cater for heavy aircraft. The OLS parameters would also change to include a 2% approach surface (currently 3.33%).

Aircraft used for RPT operations above 20,000 kg MTOW also trigger the requirements for the implementation of a Transport Security Program and this would include screening of passengers, carry-on baggage and check-in baggage, upgrading of the physical security of the airport including the airport perimeter fencing and access gates and installation of security cameras.

Therefore a realistic design aircraft is the SAAB 340. A heavier aircraft such as the Dash 8 Q400 could be used as the design aircraft if it were planned to significantly upgrade the pavements. In any event both aircraft are Code 3C aircraft.

In summary, the design aircraft should have Code 3C characteristics to continue to protect the airport for this type of aircraft operation and the MTOW of the design aircraft may increase over time subject to pavement strength.

6.4 Preserving Runway 18/36 Extension

Reservation of land for an extension of Runway 18/36 is considered critical for the future of Ballarat Airport.

Runway 18/36 is currently 1245m long and this is the primary runway due to the prevailing wind and night lighting. As outlined in section 6.2, the current runway length is suitable for the aircraft types currently operating at Ballarat Airport and would be suitable for some passenger aircraft, i.e. Metro III and SAAB 340. However, such aircraft are likely to have passenger/freight restrictions in summer due to air temperature effects. The runway length at Ballarat Airport would need to be increased for these aircraft to operate without passenger/freight restrictions or if larger aircraft such as the Dash 8 Q400 and ATR 72-600 were to operate in the future.

Whilst a Regular Public Transport (RPT) service is considered unlikely in the short term due to lack of demand, proximity to Melbourne and other issues, a small-scale passenger service might become viable in the future, and provision for this to occur should be included in the Master Plan. There may be other important and beneficial reasons why a longer runway is required in the future, including for:

- large fire fighting aircraft (such as the Convair CV580 fire bombers)
- a corporate aircraft operator
- attracting new aviation businesses to the airport
- freight aircraft associated with an intermodal freight hub

For these reasons, including provision for an extension of Runway 18/36 is considered to be consistent with the preferred development option (Option 4: Diversified GA Growth).

The 2004-2014 Master Plan included provision for the main runway to be extended to the south by 450m (up to a total length of 1695m). Generally, regional airports providing a runway length of 1600m or more are able to handle most aircraft types operating in regional Australia.

It is noted that Runway 18/36 was originally over 1800m long but since the 1980's the final 570m has not been maintained to reduce costs. The pavement associated with the longer runway still exists and could possibly be upgraded in the future to provide a longer runway.

Vacant Crown land reserved for aerodrome purposes and also zoned under the Ballarat Planning Scheme for airfield purposes is available to the south of Runway 18/36 which can accommodate recommissioning of the runway by at least 555m (up to a total length of 1800m). The need to continue to protect and plan for a runway extension is considered essential for the long term growth of aviation activity at Ballarat Airport. This was confirmed through the stakeholder consultation conducted during preparation of this Master Plan. If the runway extension option is removed from the long term plan for the airport, the growth and development of the airport will be constrained. Without the ability to extend the main runway, it is highly unlikely that an RPT service could operate from the airport and any activity involving large aircraft would also be limited, including emergency services.

Most regional airports in south-eastern Australia have a main runway which is at least 1600m long. As previously noted, the main runway at Hamilton Airport (which has an RPT service operated by Sharp Airlines using Metro III/23 aircraft) is soon to be extended by 300m to create a total length of 1704m due to passenger/freight restrictions that the current runway length places on the RPT service during summer. A totally new 1600m long runway will soon be constructed at Bendigo Airport, with the ability to extend it by a further 250m in the future. Table 4 provides examples of several other airports.

Table 4 – Length of Main Runway at Regional Airports

Airport	Length of Main Runway
Ballarat	1245m (potential to recommission to an 1800m)
Latrobe	1430m
Mount Hotham	1460m
Swan Hill	1495m
Mount Gambier	1524m
Bendigo	1600m (new runway with ability to be extended by a further 250m)
Portland	1616m
Cowra	1630m
Wangaratta	1640m
Parkes	1684m
Hamilton	1704m (extended from 1404m)
Dubbo	1708m
Flinders Island	1720m
Wagga Wagga	1768m
Wollongong	1819m
Mildura	1830m
Albury	1900m
Tamworth	2200m

While preserving the Runway 18/36 extension is seen as strategically prudent it is the recommendation of this Master Plan and the previous 2004- 2014 Master Plan that the runway extension should not increase the total length of the runway beyond 1800m. The primary reason for restricting the runway length to 1800m or below is to ensure that the runway does not change from a Code 3 runway to a Code 4 runway as this triggers a number of other changes, including widening of the entire runway to 45m (significant cost) and changing the characteristics of the Obstacle Limitation Surfaces (OLS). The important changes to the OLS would include the reduction of the slope of the approach surface to 2% and the widening of the approach surface to 300m at its origin. There is not an identifiable need for a runway longer than 1800m as this length can cater for all aircraft expected to operate in the foreseeable future, including limited use by medium size RPT jet aircraft.

The potential extension of Runway 18/36 to the south by up to 555m is considered to be an essential component of the long term plan for Ballarat Airport and was identified as a key element of the Ballarat Airport in the 2004-2014 Master Plan. It is considered that any potential negative effects do not outweigh the need to protect and plan for the extension.

The Ballarat West Employment Zone Master Plan identified parcels of land for future aviation development and preserves other parcels to enable the 18/36 runway extension to 1800m. **This approach must be reinforced through the Ballarat Planning Scheme to protect the airport from future encroachment.**

It should be noted that the land required for the runway extension is currently:

- vacant Crown land reserved for aerodrome purposes;
- within a Special Use Zone (SUZ6 – Ballarat Airfield) which has as its primary purpose "*To provide for the use of land for the purpose of an airport and complementary uses*";
- constrained by the existing runway's OLS surfaces and the associated Design and Development Overlays (DDO17 and DDO18);
- constrained by the existing runway's ANEF contours and the associated Airport Environs Overlay (AEO1 and AEO2); and
- reserved for a runway extension under the 2004-2014 Master Plan.

Extension of Runway 18/36 to the north would be difficult due to the proximity of McCartneys Road with privately owned land on the north side of the road.

The recommissioning of an 1800m runway would have an off-airport aircraft noise effect by moving aircraft flight paths associated with Runway 18/36 further south over the Ballarat West Growth Area (BWGA). However, the noise modelling undertaken in 2010 (discussed in section 8 of this report) was based on the main runway being extended by 400m to the south making it 1645m long. That modelling showed that the BWGA would not be affected by the ANEF contours, but the northern part of the growth area would be affected by the N60 and N70 contours.

It should be noted, however, that a 555m runway extension would not, in itself, generate noise. If the runway extension is constructed in the future, the effect in terms of aircraft noise would be dependent upon the existing and proposed use of the runway at that time (type of aircraft, number of movements, time of day etc). **This is a matter that would need to be considered as part of any decision to construct the runway extension, and it would need to be weighed against the benefits of the trigger for the extension (eg. attracting a new business to the airport, introduction of RPT service etc).**

Given the above, it is not considered that potential noise effects outweigh the need to protect and plan for the extension of Runway 18/36 in this Master Plan.

6.5 Runway Strip Width

The runway strip for Runway 18/36, being a Code 3 instrument non-precision approach runway, must be protected to 150m and is currently marked correctly with the gable markers being located 90m wide marking the graded portion of the runway strip. **However, the published information in ERSA for the Runway 18/36 runway strip width requires updating and should be changed to 150m.**

The runway strip for Runway 05/23, being a Code 3 non instrument runway, must be protected to 90m. This runway is currently marked correctly with the gable markers being located 90m wide. The runway strip width for this runway is correctly reflected in ERSA.

The runway strip for Runway 03/31, being a Code 1 non instrument runway, must be protected to 60m. The gable markers for this runway are currently 90m wide. The runway strip width for this runway is correctly reflected in ERSA.

6.6 Runway End Safety Areas (RESA)

The RESA at Ballarat Airport are 60m long and 60m wide and commence at either end of each Code 3 runway. This is the minimum standard required for RESA but if air transport operations commence using jet aircraft then the RESA would need to be lengthened to 90m long. It is possible that CASA may recommend that 90 m is the minimum RESA length for all aircraft operations in the next five years. There is discussion in aviation regulation and planning areas that the RESA should be included as part of a public safety zone. In the future a public safety zone may be required at the ends of runways and that area is protected under planning schemes.

A change to the location of the RESA will be triggered if runway 18/36 is lengthened as a result of this Master Plan. The RESA will need to be relocated at both ends of the runway to outside of the runway strip. **Therefore when planning for a runway extension allowance must be made for the RESA to be located beyond the end of the runway strip and that the runway strip is located 60m beyond the end of the runway. This means an additional 150m should be allowed for beyond the end of any runway extension.**

In the case of Ballarat Airport the runway 18 RESA can be located outside of the runway strip and still be contained within the airport site. The south end of runway 36 is where any lengthening of the runway would occur and therefore allowance for an extended RESA must be included in any future land planning requirements. This matter is addressed in sections 7.1.1 and 7.3 of this report.

6.7 Airspace Capacity

Very early in the discussions with airport users it became clear that airspace capacity was a significant issue at Ballarat Airport, largely due to the rapid growth of pilot training aircraft movements over the last 2-3 years. As a result, aviation and airport consultants Airbiz were engaged to undertake an Airspace Capacity Study to confirm the exact nature and significance of the issue. Their report revealed the following:

- In the period November 2009 to October 2010 there were approximately 49,000 runway movements at the airport.
- Although the airport movement area is capable of handling 100,000 movements per year, the current Class G (uncontrolled) airspace classification has the ability to process up to approximately 60,000 movements per year (without extra airspace management controls).
- Movement numbers at the airport during the study indicate that approximately 83% of airspace capacity is already being used (without extra airspace management controls).
- The Class G airspace therefore limits the capacity for growth without extra airspace management controls being put in place.

(It should be noted that aircraft movements can and will fluctuate over time. STAA has advised that the number of movements dropped in 2010/2011).

Airbiz estimated that the STAA flying school accounted for approximately 50% of aircraft activity at the airport during the study period. In addition to STAA, other flying organisations also use Ballarat Airport as a training location. These include Ballarat Aero Club and Inbound Aviation as well as organisations based at other airports (eg. Turbo Aero Maintenance Pty Ltd and Oxford Aviation Academy Australia Pty Ltd which are both based at Moorabbin Airport). It was estimated that approximately two-thirds of the aircraft activity at the airport was related to pilot training. This is summarised in Table 5 below.

Table 5 – Flight Training Movements*

Activity	Estimate of Runway Movements	% of Total Movements
Flight training by STAA	24,500	50%
Flight training by other operators	8,333	17%
Non flight training movements	16,167	33%
Total	**49,000**	**100%**

*Indicative only, based on 2009/10 data.

With appropriate management of the airspace it is considered possible to contain movements to the current practical capacity limit of 60,000 movements and ultimately to see a more efficient / optimised use of the airspace capacity to support current and future uses. Controlling or reducing the number of movements made by flight training schools is one measure that should be investigated and considered. According to the Airbiz report, other potential airspace management controls/actions that should be considered before traffic levels reach 60,000 per annum include:

Short-Term Actions:

- Review flying training schedules on a regular basis in order to spread peak activity to other times;
- Review practice instrument approach training demand with airspace capacity, and consider options for restrictions such as spreading activity;
- Maximum use of satellite aerodromes;
- Consider requesting CASA to review the need to promulgate the local flying training area;
- Consider supplying a response to CASA regarding a proposed discrete CTAF between Yarrowee and Ballarat;
- Consider establishing and promulgating local two way route structures both on the airfield and to/from training areas;
- Consider the value of additional broadcasts (such as the downwind call);
- Consider establishing ERSA restrictions on the number of aircraft that can operate in the circuit simultaneously (e.g. maximum of 3 not including arrivals and departures);
- Consider establishing restrictions or procedures for controlling the use of simultaneous runway operations (SIMOPS);
- Consider nominating a dedicated flying safety officer (voluntary position) in order to coordinate safety activities and resources, and to encourage occurrence reporting;
- Consider establishing a formal Safety Management System in line with the CASA standards for a Certified aerodrome; and
- Council consider commissioning a bi-annual airspace/operations review, similar to this review, in order to assess the safety, efficiency and regulatory compliance of operations at the airport.

Medium-Term Actions:

- Introduce CA/GRS or an enhanced UNICOM service;
- Examine the feasibility of providing full length taxiways to the threshold of all runways, and consider some additional taxiway lighting at night.

Long-Term Actions:

- Examine the feasibility of providing a second parallel runway 18/36.

In relation to the last dot point above, it is worth quoting from the Airbiz report which makes the following comments in relation to a second parallel runway 18/36:

> *One potential method for increasing airspace capacity at a busy GA training aerodrome is to supply an additional parallel runway for circuit training. In the case of Ballarat aerodrome this could be a short grass runway parallel to and on the eastern side of the existing runway 18/36.*
>
> *The maximum capacity benefit of providing another runway would only be obtained by operating two independent counter-rotating circuits (as is done at the ex-GAAP aerodromes – Figure 2-9); this could potentially double the capacity in the circuit area.*
>
> *If parallel runways were spaced sufficiently apart to permit independent approaches, then one runway could be utilised solely for touch-and-go and the other runway (closer to the apron) for departures and arrivals. This arrangement works best in a controlled environment.*
>
> *However, the current noise abatement restrictions over the built up area to the east of runway 18/36 would seem to prohibit independent counter rotating circuits and force all the circuit aircraft into one circuit direction (left hand runway 36 or right hand runway 18).*
>
> *Having an additional runway would produce only a small gain in capacity if there is still only one circuit pattern available.*

At Ballarat Airport only one circuit pattern is available for runway 18/36 (ie. left hand circuits on runway 36 and right hand circuits on runway 18). As a result, a second parallel runway 18/36 would only produce a small gain in capacity, and given the likely costs involved (land and construction), this option has not been included in this Master Plan.

The implementation of airspace management controls could increase the airspace capacity above 60,000 movements per year through more efficient and optimised use of the Glass G airspace. However, there must be some consideration of the cost associated with implementing such controls and the associated impact on the community (ie. noise) if that number were to grow beyond 60,000. **It is recommended that further work be undertaken to investigate and consider the implications of movements increasing over 60,000 per year, which should include discussions with CASA and agreed to by stakeholders.** This is consistent with the philosophy of the preferred development option. Some of the short-term options would appear to be relatively easy to implement with minimal cost, and would potentially also have safety benefits for the airport, including:

- Review flying training schedules on a regular basis in order to spread peak activity to other times;
- Review practice instrument approach training demand with airspace capacity, and consider options for restrictions such as spreading activity;
- Maximum use of satellite aerodromes;
- Consider the value of additional broadcasts (such as the downwind call);
- Consider establishing ERSA restrictions on the number of aircraft that can operate in the circuit simultaneously (e.g. maximum of 3 not including arrivals and departures);
- Consider nominating a dedicated flying safety officer (voluntary position) in order to coordinate safety activities and resources, and to encourage occurrence reporting.

The current position of Council is to maintain a level below 60,000 movements, as it wishes to ensure social amenity is not impacted further.

Based on this Council position and the findings of the Airspace Capacity Study and Economic Analysis, Council should not allow the establishment of a second commercial flight training facility that relies on circuit training of pilots.

It should be noted that the triggers for CASA assessing the need for a change in airspace classification and the provision of Air Traffic Services (a Control Tower) at Ballarat include the introduction of Regular Passenger Transport (RPT) operations, such as a scheduled airline service; the number of passengers the airport is handling; and the number of aircraft movements. At 49,000 movements per annum, the introduction of RPT services would lead to a CASA review of the Ballarat airspace.

6.8 Aircraft Movement Forecast

Airport Master Plans usually include aircraft activity forecasts which are used to check that the airport facilities are adequate for the indicated movements and also to indicate the timing for future airport infrastructure development.

As stated in the 2004-2014 Master Plan, the theoretical capacity of the current runway and taxiway configuration is over 100,000 movements per annum, and would be greater with the addition of extra taxiways. However, this assumes that there is sufficient airspace capacity and there are airspace management controls in place.

The Airbiz airspace capacity report highlighted that the current Class G (uncontrolled) airspace classification has the ability to process up to approximately 60,000 movements per year (without extra airspace management controls). As stated in section 6.7 above, in 2009/10 Ballarat Airport had approximately 49,000 aircraft movements associated with the runways (although anecdotally it is understood that the number dropped in 2010/2011).

In recent years large variations have occurred in the performance of General Aviation (GA) sub-sectors in Australia, resulting in an overall decline in GA as a whole. For example, the number of business hours flown has been gradually declining, but in the recreational and sporting sub-sectors the number of hours flown has been increasing substantially.

Taking into consideration these factors, a 1.5% compound growth rate has typically been adopted for planning purposes at other GA airports. Applying this growth rate to Ballarat Airport (based on 49,000 movements in 2010) indicates that the forecast movements in the year 2030 could be approximately 65,000 movements per year. Although this number of movements can be accommodated with the current runway configuration, as previously stated there must be some consideration of the cost associated with managing aircraft movements and the associated impact on the community if that number were to grow beyond 60,000.

The current position of Council is to maintain a level below 60,000 movements. This is consistent with the philosophy of the diversified development option. **A full business case and community consultation will be required for any increase over 60,000 movements**. It is noted, however, that at a 1.5% growth rate, 60,000 movements would not be reached until about the year 2024.

7 Airport Development Plan

This section sets out the Airport Development Plan including the land use plan and future facility (physical infrastructure) requirements for Ballarat Airport. This section draws together all of the airport development actions arising from the previous sections of this report, and is essentially the action plan for the airport.

7.1 Land Use Precincts

To assist Ballarat City Council in planning future use and development of the airport site, a Land Use Precincts Plan has been prepared. This plan forms the basis of the Master Plan for the future use and development of the site. The proposed Land Use Precincts Plan for the airport is attached at Appendix 9.

The Land Use Precincts Plan shows three categories of precincts:

- Aviation / Airfield (12 precincts)
- Buffer / Open Space (4 precincts)
- Conservation / Community (3 precincts)

Each of the land use precincts shown on the plan has different characteristics and objectives which are set out in the table at Appendix 10. The key issues and requirements relating to the precincts are discussed below.

The use and development of the precincts shown on the Land Use Precincts Plan should be consistent with the guidelines and requirements outlined in this section. These guidelines incorporate the advice of Council's heritage advisor, Ivar Nelsen, who prepared the Ballarat Aerodrome Conservation Management Plan (referred to in Section 3.8) and also provided input into the preparation of this Master Plan.

7.1.1 Aviation / Airfield Precincts

The Aviation / Airfield Precincts contain the existing aviation/airfield facilities, including the runways, taxiways, aprons, navigational aids and hangars. This precinct must be retained and protected for future airport operations and facilities. There are 12 Aviation / Airfield Precincts as described below.

a. Precinct A1 - Runways Precinct

This precinct contains the existing runways and associated taxiways and therefore is the most important airport precinct.

As outlined in section 6.5, the runway strip for Runway 18/36, being a Code 3 instrument non-precision approach runway, must be protected to at least 150m and is currently marked correctly with the gable markers being located 90m wide marking the graded portion of the runway strip.

The runway strip for Runway 05/23, being a Code 3 non instrument runway, must be protected to at least 90m. This runway is currently marked correctly with the gable markers being located 90m wide.

The runway strip for Runway 03/31, being a Code 1 non instrument runway, must be protected to at least 60m. The gable markers for this runway are currently 90m wide.

If parallel taxiways are to be constructed, further land, outside the runway strip width, will need to be set aside. For this reason the width of Precinct A1, where it accommodates Runways 18/36 and 05/23, is wider than the runway strip width requirements to enable parallel Code C taxiways to be constructed on one or both sides.

The width of Precinct A1 on the east side of Runway 18/36 is wide enough to accommodate a parallel glider strip (refer to section 7.3).

b. Precincts A3, A4, A5 and A6 - Airport Core

Precincts A3, A4, A5 and A6 form the existing central core of the airport and contain the existing aviation support facilities.

Precinct A3 contains what are known as the "Green Hangars". There are seven (7) existing hangars in this precinct. As shown on the Infrastructure Upgrade Project Stage 2 Layout Plan at Appendix 5, there is potential for an additional hangar to be constructed at the eastern end of the existing hangars plus a future helicopter parking area. Reservation of a dedicated helicopter parking area is considered prudent having regard to the nature of helicopter operations and CASA requirements relating to helicopters[1], and this location is advantageous due to its proximity to the main runway. It also provides an opportunity to market the airport to helicopter operators, not just fixed-wing aircraft operators. According to CASA (August 2012)[2]:

> *At present helicopters make up 13 per cent of the approximately 14,800 aircraft on the CASA Aircraft Register. Helicopter numbers have almost doubled in 10 years in Australia – from 1,034 in 2002 to 1,975 in mid-August 2012 – and they will double again, in perhaps as early as seven years as a result of the accelerating rate of growth generated by the demands from Asia for Australia's energy and mineral resources.*

Precinct A4 is currently largely vacant except for the three WW2 huts and some other small buildings located on the eastern boundary, one of which is currently used by the CFA/DSE for the storage of fire fighting equipment. Given the location of this precinct and its airside accessibility, this precinct is well suited as a dedicated Emergency Precinct for future aviation development (ie. a secondary Aviation Development Area; the primary Aviation Development Area being Precinct A7). The CFA/DSE have expressed interest in Precinct A4 for a possible future fire base including facilities for parking/storing fire suppression aircraft. Whilst the CFA/DSE's plans still need to be confirmed, this is considered to be an appropriate location for a fire base. In the short term this precinct should be retained and protected for this purpose or to be utilised for other emergency services

Precinct A5 contains the original airport hangars (Bellman Hangars) and the main apron. This precinct should be retained and protected for its existing use. There is limited opportunity for further development in this precinct.

The four historic Bellman Hangers should continue to visually dominate Precinct A5. Requirements for large new building developments should be accommodated in the new Aviation Development Precinct. Proposals for modest scaled new buildings (not hangars) may be considered within A5, but should be physically separated from the four Bellman hangers

[1] Manual of Standards Part 139 – Aerodromes, Section 8.11: Helicopter Areas on Aerodromes; CAAP 92-2 (1) — Guidelines for the establishment and use of helicopter landing sites.

[2] http://www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_101057.

and recessive in visual terms. New building requirements should not render the historic Bellman Hangers and P1 Huts redundant.

Precinct A6 is the triangular grassed area north of Precincts A3 and A5 which accommodates the Non-Directional Beacon (NDB) and Automatic Weather Station (AWS). As this precinct may contain protected Heavier- Soils Plains Grassland, there could be limited opportunity for further development in this precinct (refer to Section 3.10). **Further flora and fauna investigations are recommended before any further development is contemplated in this precinct.** If such investigations reveal that development is possible, a portion of this precinct could be considered for an extension of the main apron and/or helicopter parking.

c. Precincts A2 and A8 – Precincts to Preserve Runway 18/36 Extension

Precinct A2 is set aside for the potential future extension of Runway 18/36, as discussed in Section 6.4 of this report. The length of this precinct has been determined using preliminary survey information provided by Airport Survey Consultants and is sufficient to accommodate an extension of Runway 18/36 up to 555m long (plus 60m runway strip, 90m RESA and OLS protection) enabling the runway to have a total length of up to 1800m. **It is noted however, that the exact location of the southern boundary is subject to detailed survey to finalise the levels and locations of the proposed runway threshold and proposed east-west road to the south. The proposed east-west road is required because Airport Road would need to be closed/truncated to enable the construction of the runway extension.**

The width of the Precinct A2 is sufficient to accommodate the required 150m wide runway strip plus provision of a Code C taxiway on both sides.

As outlined in Section 3.10 of this report, the flora and fauna surveys undertaken by Biosis Research found that Golden Sun Moth (GSM) is present within Precinct A2 (referred to as the “Airport Drive site” by Biosis Research). Biosis Research recommended that any development within close proximity to the known population of GSM within the Airport Drive site could present either a direct or an indirect impact on the GSM population. Therefore, as an appropriate risk management strategy, they recommended that any proposed development around the potential extent of GSM habitat be considered in light of its possible impact on GSM and that where appropriate an EPBC Act referral be lodged to establish certainty for the development.

Precinct A8 should be reserved for possible future aviation development if the runway recommissioning takes place. This precinct could accommodate a possible future RPT passenger terminal and facilities to accommodate future air freight should it be required.

d. Precinct A7 – Primary Aviation Development Area

Precinct A7 is the primary Aviation Development Area. This precinct is the ideal area for expansion of aviation activity, in particular further hangar construction, and should be reserved for this purpose.

The northern part of this precinct is where a new apron, hangar and access road has been constructed as part of the Infrastructure Upgrade Project, as discussed in Section 2.5 and shown on the plan at Appendix 5. It is expected that this parcel should be sufficient to cater for hanger demand for the next 10-15 years while the southern area will cater to the long term supply of development land (10-20 years).

A concept plan for the whole of this precinct has been prepared, which is attached at Appendix 12, to show how aviation facilities in this area should be developed in the future. This is discussed further in Section 7.7.

The large Cypress trees, which define the western edge of the precinct become important to visually screen the new Aviation Development Area from the historic Teaching Precinct and to maintaining the 'void' of Buffer/Open Space areas (B1, B2 and B3). **These trees should be retained and reinforced wherever possible.**

At the south end Precinct A7 contains several buildings which made up the maintenance depot of the WW2 base (Building Nos. 1354, 135, 136, 144 and 268). These are identified in the Conservation Management Plan as contributory and their retention is encouraged but not required according to Council's heritage advisor, Ivar Nelsen (the author of the CMP). Should the evolution of the Aviation Development Area extend in the future to the location of these buildings, they may be used or the P1 Huts may be relocated within the Teaching Precinct (C2 and C3) for community use.

The utilisation of the Barracks Road (eastern most north-south road) for a new main entrance to the new Aviation Development Area is appropriate but must leave intact the trees on the western side of the precinct, as well as the main traditional access to the Tarmac Precinct - Drome Road.

It should be noted that drainage works have taken place in the southern part of Precinct A7. These drainage works were deemed necessary to improve water flow for the aviation precinct generally. In the longer term drainage works on the BWEZ should improve the drainage on site to enable the contraction of the area required for water retention on the airport site and reclaim land for development in the medium to long term.

e. Precincts A9, A10, A11 and A12

Precincts A9, A10, A11 and A12 are suitable for possible future aviation development or complimentary uses and should be reserved for this purpose.

It is noted that Precinct A12 will not form part of the Ballarat Airport parcel, but is protected in the BWEZ Master Plan for aviation related industry. **Given that Precinct A12 will be freehold land, access to the runway will need to be carefully planned and controlled. A further study is recommended to determine runway access and compliance requirements for this precinct.**

It is essential that any development in these areas does not conflict with aircraft operations. Buildings and structures must not intrude into the airport's Obstacle Limitation Surfaces (OLS).

Any development in these precincts must also take into account the outcomes of the flora and fauna and cultural heritage studies discussed in Section 3 of this report.

7.1.2 Buffer / Open Space Precincts

a. Precincts B1, B2 and B3

Buffer/Open Space Precincts B1, B2 and B3 reflect the traditional separation of training/living precincts from flight areas at all RAAF bases. The continuation, and reinforcement, of the separation of the former Tarmac and Teaching Precincts will assist in the legibility of the original WW2 base's layout and cultural value. Refer to the guidelines in 6.2.1 of the Conservation Management Plan.

Some development has occurred over time in these precincts but it has generally been limited in density and size, and has avoided introducing new buildings. The Buffer/Open Space Precincts should not be viewed as a 'built-development' area. Intensive, large or intrusive development should be located elsewhere, preferably in the A precincts. The use of buffer areas for passive recreation and discrete overflow car parking may be considered. Relatively small buildings may also be considered around the perimeter of the buffer areas, if they are suitably designed and sited to minimise their presence and maximise the open space of the buffer areas.

Precinct B1 is the site of the current solar park. That facility may remain and there is scope for expansion if required. Its physical definition by fences should be discrete and inconspicuous. The area should be viewed as contiguous with Precincts B2 and B3. No buildings or structures, other than an interpretative shelter and/or service structure, should be allowed, and these too should be discrete and inconspicuous. Vegetation should be limited to grasses (native and/or lawn) with low shrubs to define the road patterns. Car parking, if required, should be visually discrete and inconspicuous, possibly combined with nearby car parking requirements, to minimise visual intrusion.

Precinct B2 is an amalgamation of left-over spaces, primarily containing the present motorcycle school, drains and road junctions. It is however part of the overall Buffer/Open Space Precinct. The major built feature within B2 is the motorcycle school. According to Council's heritage advisor, the school makes no contribution to the cultural values of the Ballarat Aerodrome, and it is desirable in the long term to relocate/remove the school and return the area to an open landscaped area continuous with B1 and B3. Refer to the guidelines in 6.2.1 of the Conservation Management Plan.

According to Council's heritage advisor, a recent 'plantation' of native trees in B2, just north of the motorcycle school, is inconsistent with the objectives of the Buffer/Open Space Precincts and should be removed in favour of grasses (native and/or lawn) with low shrubs to define the road patterns. This area may be considered for discrete, overflow car parking. The area between the motorcycle school and Precinct A5 may be used for low visibility uses such as car parking or passive recreation.

Buildings or structures within B2 should be avoided, with the possible exception of relatively modest and inconspicuous aviation related offices on the eastern edge and accessible from the proposed new access road on that edge. Car parking, if required, should be visually discrete and inconspicuous, possibly combined with nearby car parking requirements to minimise visual intrusion.

Precinct B3 is a combination of the former western sports oval and the western perimeter of the former Teaching Precinct. This is a relatively intact portion of the original buffer area of the aerodrome – in terms of its relative lack of built development. The continued use of the western sports oval as a sports venue is strongly encouraged. A limited number of modest buildings to support the use may be considered but should be sited and designed to be discrete and inconspicuous.

The remainder of the B3 area should be kept free of significant built development. The area may be used for community/sports activities but buildings to support these activities should be within the former Teaching Precinct (C2). Intensive, large or intrusive development should be located elsewhere. Car parking, if required, should be visually discrete and inconspicuous, possibly combined with nearby car parking requirements to minimise visual intrusion.

The existing perimeter trees around the sports oval, and along the western perimeter of the area should be retained and reinforced wherever possible. The avenue of Cypress

trees along Drome Road must be retained. The area should be kept free of further native trees in favour of grass (native and/or lawn). The relocation/removal of the Police shooting range is desirable in the long term although not mandatory. Every opportunity should be taken to minimise its inconsistent visual presence.

b. Precinct B4 – Runway 18/36 Obstacle and Safety Buffer Zone

Precinct B4 is set aside as an obstacle and safety buffer for the extension of Runway 18/36. Like the other buffer precincts, Precinct B4 should not be viewed as a 'built-development' area. Intensive, large or intrusive development should be located elsewhere. The use of this precinct for passive recreation and discrete overflow car parking may be considered. Relatively small buildings may also be considered if they are suitably designed and sited to minimise their impact on aircraft operations.

Development that involve accommodation; storage of flammable, explosive or noxious materials; or large numbers of people should not be allowed in this precinct.

7.1.3 Conservation / Community Precincts (C1, C2, C3)

The Conservation/Community Precincts comprise the original Teaching Precinct of the WW2 RAAF base. They are of very high heritage value. (Refer to the guidelines in 6.2.1 of the Conservation Management Plan.)

The identification of Precincts C1, C2 and C3 is contemporary and must not obscure the value of the former Teaching Precinct as a whole or its visual treatment as a whole to ensure a greater level of visual continuity across the sub-precincts.

The Conservation/Community Precincts reflect the rigid uniformity of the WW2 layout of the Teaching Precinct and even with its partial integrity is an area of commemoration and memorialisation, rather than new development. Creativity will be essential in the physical development/conservation of these precincts as a whole. The introduction of new amenities to support the community use of the areas, such as parking, barbeque or playgrounds, would be appropriate. It is not required that the Conservation/Community Precincts be 'restored' back to a previous appearance.

Most of the buildings and features identified in the Victorian Heritage Register (VHR) Extent of Registration are within the Conservation/Community Precincts. Proposals for new buildings within these precincts should only be considered if they:

- the use cannot be accommodated in any existing buildings;
- are focused in western end of the Precinct – C2;
- reflective of the pattern, scale and built form of the P1 Huts, with capacity to combine and adapt buildings; and
- are discrete and inconspicuous in terms of materials, colours and visual impact.

Intensive, large or intrusive development should be located elsewhere. The continued use of the area however for community activities and groups is appropriate and should be encouraged – but controlled in terms of visual impact. As a whole area, a uniform approach to the landscaping of the Conservation/Community Precincts will be crucial.

a. Precinct C1 - Headquarters and Parade Ground

Precinct C1 is the site of the original Headquarters Building (building 17O) and its associated Parade Ground. This building and feature were the central focus for the RAAF training facility in terms of administration, formal ceremonies, planning and architecture.

The physical and visual connection of the Headquarters Building and the Parade Ground should be maintained and visually, if not functionally, linked. In particular:

- the Parade Ground should be retained as a large formal open space and its boundary, symmetry and relationship to the Headquarters building should be reinforced wherever possible;
- the existing perimeter cypress pine planting on the north and east sides should be retained and reinforced wherever possible;
- **the existing square of native vegetation in the centre of the Parade Ground should be removed and the area maintained as an open space. The existing circular dirt track around the space should be removed and the area covered with a single material – preferably compacted gravel with a clearly defined rectilinear hard edge perimeter.**
- no buildings or structures should be permitted within the Parade Ground - with the exception of temporary structures for special events;
- it is possible, with creativity, to utilise the Parade Ground space as an events or passive recreation area, or a venue for sculptures or memorials**.** The Parade Ground would be the ideal venue for a simple memorial to the service personnel – possibly reflecting rows of troops on parade. **Consideration should be given to undertake further work to develop this concept.**

No new buildings should be allowed adjacent to the Headquarters Building although sensitive extensions of that building may be considered. Landscaping associated with the building should be formal and utilise introduced varieties.

b. Precinct C2 – Community Use Area

Precinct C2 contains the majority of the remaining P1 Huts from the former Teaching Precinct, all of which are identified in the VHR Extent of Registration. The buildings are used for a variety of community uses and the C2 area should be the focus of further community use.

Wherever possible the exterior of the P1 Huts should be reinstated to their WW2 appearance, with generous consideration of alterations in less visible areas. There should be no restrictions on the interiors of the building. Other, relocated P1 Huts may be introduced into this area.

In the now vacant areas of C2, the focus should be on the development of a landscaped area continuous with C3. New or relocated buildings should avoid the eastern portion of C2.

The continued use of the P1 Huts is essential and it may be necessary to review existing occupants of existing buildings to seek a best-fit and avoid either excessive new buildings and/or excessive alterations to existing buildings.

c. Precinct C3 – Memorial Park

Precinct C3 is a contiguous part of the original Teaching Precinct, although it contains relatively few remaining buildings. It should remain relatively vacant, locating new building requirements in either C2 or the new Aviation Development Area (A7).

No buildings or structures, other than interpretative shelters and/or service structures, should be allowed generally. It is possible to consider however aviation related offices along Barracks Road if they are discrete and inconspicuous, accessible only from Barracks Road (the proposed new airport entry), and in building envelope and location are reflect the previous P1 huts. A location on the east side of Barracks Road is preferred.

The existing WW2 buildings should be retained and utilised, in particular the Gymnasium (building 154). Its use as a museum however is not mandatory and its use as a more active community function may be considered.

Vegetation should be limited to grasses (native and/or lawn) with low shrubs to define the road patterns. Car parking, if required, should be visually discrete and inconspicuous, possibly combined with nearby requirements to minimise visual intrusion.

7.2 General Land Use Guidelines

Use and development of the individual precincts should comply with the following general guidelines:

- Future use and development must comply with the Master Plan and be compatible with ongoing airport operations.
- Land should be reserved for its designated use in accordance with the Land Use Precincts Plan and associated guidelines.
- A detailed precinct development plan should be prepared prior to development in any individual precinct.
- Environmental and heritage constraints need to be confirmed and managed.
- Ensure that appropriate utility services are provided for new development.
- Ensure that industrial activities do not produce air emissions that are likely to impact on aviation activities.
- Ensure that building lighting does not impact on aviation operations.
- Ensure that landscaping is not bird-attracting.
- Ensure that buildings do not exceed the heights specified in the Obstacle Limitation Surfaces (OLS) chart that will impact on flight paths or airport operations.
- Ensure that land use and development restrictions relating to the NBD are met.
- Ensure that land uses are not sensitive to aircraft noise (residential uses should generally be discouraged).
- Ensure that convenient, safe and efficient vehicle access is provided within and to the site.

7.3 Emergency Services

The current provision for emergency services at the Ballarat Airport is considered vital to both Ballarat and wider regional Victoria. Services currently include Police Airwing, Air Ambulance Operations and Fire Base Operations.

The case exists for the expansion of emergency services provision at the Ballarat Airport. Factors supporting this case include:

- Proximity to Victoria’s fire hot spots (Grampians, Otways, Alpine areas, Wilson’s Prom etc)
- Land / space availability
- Supporting local industry
- Existing reputation
- Commercial benefit
- Trigger for further investment

In order to fully assess this opportunity a scoping document detailing the evidence of supply and demand as well as feasibility would need to be undertaken with agency partners. A process of seeking funding would then follow.

While current infrastructure is considered adequate, to ensure full benefit to community, upgrades including access, site allocation and infrastructure are likely to be required.

7.4 Runway System

The existing runway system is considered suitable for current aircraft operations. The major change that could be required in the future is an extension of Runway 18/36 (as discussed in Section 6.4 of this report).

The extension of Runway 18/36 by 555m (to a total length of 1800m) has been included in the Master Plan to provide for larger aircraft, including RPT aircraft, if required in the future. The need to continue to protect and plan for a runway extension is essential for the long term growth of aviation activity at Ballarat Airport.

As stated in section 6.4, if the runway extension is constructed in the future, the effect in terms of aircraft noise would be dependent upon the existing and proposed use of the runway at that time (type of aircraft, number of movements, time of day etc). This is a matter that would need to be considered as part of any decision to construct the runway extension, and it would need to be weighed against the benefits of the trigger for the extension (eg. attracting a new business to the airport, introduction of RPT service etc).

In addition to the runway extension itself, RESA requirements will also need to be met. In the case of Ballarat Airport the runway 18 RESA can be located outside of the runway strip and still be contained within the airport site. The south end of runway 36 is where any lengthening of the runway would occur and therefore allowance for an extended RESA has been included in the Master Plan (Precinct A2).

During stakeholder consultation, the possible future need for a glider runway strip was mentioned, particularly due to the recent establishment of a glider club at the airport. A glider runway strip (60m wide) could fit between the existing Runway 18/36 runway strip (75m each side of runway centreline) and the title boundary to the east (which is approximately 140m to the east of the 18/36 centreline).

Prior to the introduction of a glider strip at the airport it is strongly recommended that Council consult with CASA due to the number of aircraft movements at the airport and potential issues associated with mixing gliders with training aircraft. There could be significant capacity and safety implications if glider operations were to increase at the airport.

7.5 Taxiways/Taxilanes

Ballarat Airport has three published taxiways (A, B and C) in ERSA. The new taxiway parallel with Runway 18/36 has been designated Taxiway D but is not currently published in ERSA. The taxilanes running at right angles to Taxiway D have been designated Taxilanes E, F and G and are also not published. It is not normal practice to designate taxilanes **but it was suggested in the 2009 Aerodrome Safety Inspection that the taxilanes be assigned designations D1, D2, D3 etc. as there are likely to be a number of them in the future.** Taxiway designations should follow in sequential order so as not to confuse pilots.

As discussed in Section 3.3.4, Taxiway D requires remedial works to address CASA requirements. In particular, **Taxiway D will require widening on the west side, to enable the taxiway centreline to be relocated 9m to the west, to comply with Code 3C requirements.**

It is important that any planning for any additional aircraft aprons and aircraft parking positions are based on the requirement that the Taxiway D centreline is 93m from the centreline of Runway 18/36 and that the clearances associated with Taxiway D are based on Code C taxiway strips, which is 26m from the centreline of the taxiway.

There are no known issues with any of the other existing taxiways or taxilanes.

Due to the number of aircraft operations the need to reduce runway occupancy time by aircraft taxiing on the runway will become more important. The provision of parallel taxiways will greatly improve the capacity of the runways and will provide for safer operations of all aircraft using Ballarat Airport. Initially the north portion of the 18/36 parallel taxiway (Taxiway D extension) would be constructed as this runway is the most frequently used**. It is recommended that the taxiway extension be constructed as a Code C taxiway, 15 m wide and with the centreline 93m from the runway centreline, when demand requires.**

The 05/23 parallel taxiway would not need to be constructed for some years and would only be required if aircraft operations grew significantly.

7.6 Aircraft Parking Areas

Whilst there does not appear to be a significant need at present, **the main apron could be extended in a north-east direction if required.** However, as previously noted, the area north-east of the apron may contain grassland protected under the EPBC Act and may require referral before development can take place. This requires further investigation. However, a second apron area has been constructed in Precinct A7 associated with the relocation of the pilot training school and this has reduced aircraft parking congestion on the main apron.

No further aircraft parking areas are required for the foreseeable future.

7.7 Pavement Strength

The existing pavement strength issues were discussed in Section 3.3 of this report. As noted in that section, as the two paved runways at Ballarat Airport are PCN 6 they are suitable for the current aircraft operations. The current restrictions on aircraft operations below 5,700 kg MTOW should remain in place unless pavement strengthening is undertaken.

The trigger for increasing the pavement strength of the runways would be the commencement of operations with larger aircraft, i.e. SAAB 340, Dash 8 Q400 etc.

Aurecon's report regarding the HWD results concluded that the subgrade category of B may be incorrect. Further investigation is required and if deemed necessary, the subgrade category should be changed to the lower category C.

7.8 Aviation Development Area

Future hangar developments are to occur in the Aviation Development Area (Precinct A7) located south of existing green hangars.

A concept plan for this precinct has been prepared, which is attached at Appendix 12, to show how aviation facilities in this area should be developed in the future.

The northern portion of the layout is based on the Infrastructure Upgrade Project Stage 2 Layout Plan at Appendix 5. This provides for a new row of hangars to be located on the south side of Taxilane E for aircraft up to Code B. Vehicle access to these hangars will be via a road at the rear of the hangars. On the south side of this road there is provision for multiple hangars to be constructed in a "C" shape around a new apron area serviced by two taxilanes off Taxiway D (one an entry, one an exit). These facilities will also be for aircraft up to Code B. It is estimated that this part of the plan provides for the construction of approximately 15-20 hangars.

The southern portion of the hangar layout allows for larger hangars to be constructed and for Code C aircraft (36m wingspan) to access these hangars. These larger hangars could be used by aircraft maintenance organisations for example. Alternatively this southern portion could be the site for a future RPT passenger terminal.

The hangar layout depicted in the concept plan allows separation of the airside and landside areas. Road access is provided at the rear of the hangars and services can also be located in this road reserve. With adequate fencing and locked gates the airside of the airport can be protected from inappropriate vehicle access.

The future hangars in this precinct will not be affected by the OLS, provided development closest to the runway is below approximately 8m (see Appendix 12; to be confirmed by survey). The height of development further away from the runway can be increased in accordance with the OLS chart.

7.9 Terminal Building

The existing terminal building and associated car park are generally suitable for current operations, given the fact that there are no RPT services. **However the amenities available in the terminal building and the adjacent toilets could be improved for itinerant visitors and charter operations as demand increases.**

In the previous Master Plan it was noted that, as the terminal building remains open at all times security of furniture and fittings is a deterrent for providing adequate amenities and that it might be possible to improve amenities if security was improved. It was suggested that a solution could be to provide a keypad electronic locking system on the access doors and publish the code in ERSA. This is often done on gates accessing the movement area. This ensures that only legitimate passengers and aircrew access the facilities.

If RPT operations commenced at Ballarat Airport then the terminal would either need to be expanded/redeveloped or a totally new terminal building constructed in a new located. Depending on the type and size of aircraft used for RPT operations the terminal would need to be a minimum of 700-1000 sq metres to cater for check-in counter, airline office, baggage makeup and collection and security.

The Infrastructure Upgrade Project Stage 2 Layout Plan at Appendix 5 shows a “Future Terminal” zone where the current car park is located, with a “Future Terminal Carpark” to the south. This is one option, however the construction of a new terminal in this location could restrict access to the existing hangars to the east. A terminal building in this location may also restrict access to and from Taxiway A when RPT aircraft are loading and unloading passengers.

An alternative location for a future RPT passenger terminal is either Precincts A7 or A8. Provision should also be made for an Aviation Freight operator in either of these precincts should the need arise.

7.10 Fuel Facilities

The location of the AVGAS facility on the airside of the airport adjacent to the main apron is not ideal. If the apron area was to be extended it would be in a north-east direction where the AVGAS facility is currently situated. This may be a trigger to relocate the AVGAS facility to an airside/landside boundary location that would enable fuel tankers to replenish the fuel supply without entering airside. A suitable relocation site has not been investigated as part of this report.

7.11 Navigation Aids

The navigational aids are considered suitable for the foreseeable future.

The RNAV approach for runway 18 is not a straight-in approach due to terrain being on the centreline of the runway approximately 3 NM from the threshold. Changes in the way that aircraft will be able to navigate in the next 2 - 3 years using more precise GPS may have an impact on the approach procedure design for Ballarat Airport. One of these changes may include the ability for aircraft to use GPS more accurately to obtain a lower height above the ground in low visibility when undertaking an approach to a runway threshold.

The area around the Non-Directional Beacon (NDB) should be protected in accordance with the requirements of Chapter 11 of the Manual of Standards Part 139.

7.12 Ground Access

The Road Network Plan at Appendix 13 shows the proposed new roads associated with this Master Plan.

A proposed new east-west road will be required to provide access to the airport if the extension of Runway 18/36 is constructed in the future. This is because Airport Road will need to be closed/truncated to enable the construction of the runway extension. The plan at Appendix 13 shows the approximate location of this road (subject to survey and detailed design).

A new road is also proposed along the western boundary of the Aviation Development Area (Precinct A7). This road should ultimately be linked to the new east-west road referred to above, to create a new entrance into the airport.

Signage directing users to the Airport is sufficient however more obvious entry signage to the Airport might be beneficial in raising the precinct's profile.

In addition to the above, the following ground access improvements are recommended based on the outcomes of stakeholder consultation:

- **Installation of street lights on the corner Learmonth Road and Airport Road.**
- **Installation of street name signs to identify the internal streets (ideally using the original WW2 RAAF base street names).**
- **Construction of a new car park in the triangular area at the rear of Buildings 11-15**.

7.13 Utility Services

The existing situation with respect to utility services was outlined in section 3.6 of this report. This included details of the utility upgrades being undertaken as part of the Infrastructure Upgrade Project. It was noted that, whilst the Infrastructure Upgrade Project is likely to improve the incoming utility services and will facilitate the provision of appropriate utility services to the Aviation Development Area, further detailed work is likely to be required to address specific servicing problems being experienced by tenants on other parts of the airport site.

A report prepared for the City of Ballarat relating to Stage 2 of the Infrastructure Upgrade Project noted that:

Water Services

"While the reliability of the incoming water main will be enhanced by the Stage 2 works, the existing site network will not dramatically improve its reliability from the proposed works. Master planning should consider including a replacement of the entire water network with Authority water mains in the future."

"If Council require airside protection to be implemented, a council operated fire services system would need to be implemented complete with fire brigade boosters and associated hydrants."

Sewerage Services

"Future works for the site that would enable Authority sewer assets to be rolled out progressively would include the provision of a non-airside Authority pump station to service the entire airport site, making the existing main pump station redundant. This would require the provision of a circa 2.1km sewer rising main, making connection to Learmonth Road, in conjunction with the diversion of existing sewers to discharge to the Authority pump station.

Based on the provision of a central Authority pump station, Authority sewerage infrastructure could be rolled out in a staged basis to meet the site needs both in terms of replacing old infrastructure and accommodating new development."

It is recommended that further work be undertaken to align and cost future infrastructure requirements to ensure sufficient capital funding is available over the short, medium and long term. This work must consider not only this Master Plan but also the infrastructure upgrade completed in 2012 and works planned for the Ballarat West Employment Zone.

Furthermore, major development on the airport site and on land adjacent to the airport will require detailed studies of servicing requirements.

7.14 Tenancies / Leases

7.14.1 Tenancy Review Report

As outlined in Section 3.7 of this report, a separate Tenancy Review report was prepared in conjunction with this Master Plan. This report identifies a number of tenancy opportunities / items which will need to be addressed by Council including issues related to the following:

- Utility services.
- Drainage/flooding.
- Car parking.
- Lease terms and conditions.
- Lease boundaries.
- Rating / Fee Structure.
- Building structure (particularly roof issues).
- Inadequate space (extra space required).

Resolution of the tenancy issues will be a major undertaking for Council, both in terms of human and financial resources, and will need to be undertaken over time. The outcomes of the review are to be incorporated into the Implementation Plan.

7.14.2 Future Leases

As recommended in the Tenancy Review report, it is considered that **Council needs to adopt a framework and set of performance criteria for the assessment of future use and development proposals (leases) at the airport.** These criteria would be used to assess each use and development proposal to determine whether the proposal is considered satisfactory and appropriate for the airport. This is consistent with the philosophy of the preferred development direction discussed in Section 5.4.

The following is a possible list of performance criteria:

- Airspace impact
- Safety impact
- Noise/amenity impact
- Community benefits
- Infrastructure impact
- Employment impact
- Revenue impact
- Airside impact
- Landside impact
- Opportunity cost
- Heritage impact
- Environmental impact
- Consistency with Airport Master Plan
- Consistency with Conservation Management Plan
- Stakeholder impact

Each criterion could be given a weighting based on its level of importance.

A Council policy and procedures would need to be established to implement these criteria. This should be incorporated into the Implementation Plan.

7.15 Historical Cultural Heritage

Sections 3.8 of this report outlined the historical cultural heritage constraints and requirements relating to the airport site. Section 6 of the Conservation Management Plan (Ivar Nelsen, 2008) provides various Conservation Guidelines for maintenance and development of the site. **These guidelines will need to be considered as part of any future development planning on the airport site.**

In accordance with s67 of the Heritage Act 1995 all new buildings and works on the airport site will generally require an application for a Heritage Permit (unless exempted).

7.16 Aboriginal Cultural Heritage

Section 3.9 of this report outlined the Aboriginal cultural heritage constraints and requirements relating to development on the airport. It was determined that there is a high likelihood of additional Aboriginal places within the boundary of the study area including the airport site.

Given the above, prior to any development on the airport, the outcomes and recommendations of the Aboriginal Cultural Heritage Assessment (Biosis Research, October 2010) should be carefully reviewed and considered. Further Aboriginal cultural heritage investigations and possibly approvals may be required before development can proceed on some parts of the airport site. **Consideration of and alignment with any plans developed as part of the**

planning for either the Ballarat West Link Road or the Ballarat West Employment Zone should also be a priority.

7.17 Flora and Fauna

Section 3.10 of this report outlined the flora and fauna constraints and requirements relating to development on the airport.

Prior to any development on the airport site the outcomes and recommendations of the flora and fauna studies outlined in section 3.10 should be carefully reviewed and considered. Further flora and fauna investigations and possibly approvals may be required before development can proceed on some parts of the airport site.

In particular the following should be noted (refer also to the maps at Appendix 8):

- None of the areas covered by the additional surveys support Plains Grassland EVC or any other EVC and therefore, based on vegetation, no further consideration of these areas is required. However, other areas (generally north of Airport Road) still require further assessment prior to development.
- Golden Sun Moth (GSM) is present within the north-south portion of the Airport Drive site, but is unlikely to be present within the Hangar and Rail sites or the east-west portion of the Airport Drive site. Based on the known occurrence of GSM on the north-south portion of the Airport Drive site and DEWHA definitions of an action that may lead to a significant impact on the GSM, it is possible that any development or any other action (as defined) within the north-south portion of the Airport Drive site could have a significant impact on GSM. Any development or other action proposed to be undertaken in the portion of the Airport Drive site identified in the report as Potential Extent of Golden Sun Moth habitat be referred under the Environmental Protection and Biodiversity Conservation Act 1999 to the Australian Government Minister for the Environment, Heritage and the Arts.
- Any development within close proximity to the known population of GSM within the Airport Drive site could present either a direct or an indirect impact on the GSM population. Therefore, as an appropriate risk management strategy, we recommend that any proposed development around the potential extent of Golden Sun Moth habitat be considered in light of its possible impact on GSM and that where appropriate an EPBC Act referral be lodged to establish certainty for the development.

Consideration of and alignment with any plans developed as part of the planning for either the Ballarat West Link Road or the Ballarat West Employment Zone should be a priority.

8 Airport Protection

A key issue for all airports is to ensure that the use and development of surrounding land does not prejudice the ongoing operation of the airport. This primarily involves ensuring that:

- development proposals near the airport do conflict with the airport's Obstacle Limitation Surfaces (OLS);
- changes of land use near the airport are not for land uses which may be sensitive to aircraft noise (e.g. residential land uses); and
- appropriate planning scheme policies and controls are in place to ensure these matters can be adequately enforced.

These matters are discussed further below.

8.1 Obstacle Limitation Surfaces

Airspace protection is critically important for all airports, particularly protection of the airport's Obstacle Limitation Surfaces.

The CASA *Manual of Standards Part 139 - Aerodromes* defines Obstacle Limitation Surfaces (OLS) as:

"A series of planes associated with each runway at an aerodrome that defines the desirable limits to which objects may project into the airspace around the aerodrome so that aircraft operations at the aerodrome may be conducted safely."

The OLS are determined by the Aerodrome Reference Code for each runway. At Ballarat Airport the main runways are both Code 3C.

8.1.1 OLS Chart and Surveys

An OLS chart for Ballarat Airport has been produced by Airport Survey Consultants in 2007 (see Appendix 14). This chart is based on Runways 18/36 and 05/23 both being Code 3 non precision instrument runways, with a 400m extension to the south end of Runway 18/36. A new OLS chart will be required if Runway 18/36 is proposed to be extended beyond 1645m.

The OLS associated with all three runways are surveyed on an annual basis. Currently there are obstacles penetrating the approach surface for runway 18 that are above the 3.33% gradient; this gradient should be protected for this runway. There is also a note in the ERSA Runway Distant Supplement stating that the approach surface for this runway terminates at the threshold and not the runway strip end. It is likely that that this non-compliance will not be acceptable to CASA in the future. Although not directly a matter for the Master Plan process, the approach surface for runway 18 should be made compliant with CASA standards. **Action will be required to remove the obstacles that are penetrating the approach surface with the origin of the surface based at the runway strip end or 60m from the threshold.**

The OLS are directly affected by any future extension of runway 18/36. As long as the overall length of any runway extension is below 1800m then the runway remains a Code 3 runway and the parameters of the OLS do not change. Currently only a few permanent obstacles penetrating the runway 36 approach affect the published information and most of these are located close to the end of the existing runway. A runway extension will move the origin of the approach and take-off surfaces beyond the new runway end and therefore a survey of the

objects in the new approach/takeoff surface will need to be undertaken to confirm their location.

The future buildings in the Aviation Development Area (Precinct A7) will not be affected by the OLS**, provided development closest to the runway is below approximately 8m (to be confirmed by survey).** The height of development further away from the runway can be increased in accordance with the OLS chart. Future buildings erected close to both runways will be required to have a maximum building height restriction applied to ensure that they remain below the transitional surface.

8.1.2 Planning Scheme Overlay Control

The OLS restrictions should be incorporated into the Ballarat Planning Scheme via an overlay control. **The existing Design and Development Overlay schedules in the planning scheme relating to the OLS (DDO17 and DDO18) are based on a previous OLS chart and the existing runway lengths and therefore need to be updated to protect the possible future extension to Runway 18/36 (to 1800m).** The OLS chart and associated planning scheme controls should protect the runway extension.

8.2 Aircraft Noise

The assessment of aircraft noise effects is an important consideration in the development of an airport Master Plan. It aims to ensure that:

- Sensitive land uses are not located in areas of unacceptable aircraft noise;
- The amenity of other surrounding developments is not adversely affected by aircraft noise; and
- Airport operations are protected long term from conflicts due to the encroachment of inappropriate development into noise affected areas.

8.2.1 Noise Modelling Studies

An Australian Noise Exposure Forecast (ANEF) study was undertaken for Ballarat Airport in 2004 by AOS Airport Consulting Pty Ltd. This study was based on a 10 year (2014) forecast of aircraft movements and included a 400m extension to the southern end of Runway 18/36.

Another aircraft noise modelling study for Ballarat Airport was undertaken in 2010 based on a forecast of aircraft activity in the year 2030 and this also included a 400m extension to Runway 18/36. This study comprised an ANEF and also included N60 and N70 (“Number Above”) contours for information purposes. It should be noted that the primary purpose of this study was to understand the potential impact of aircraft noise on the Ballarat West Growth Area.

The 2010 noise study was considered by Ballarat Council at its meeting on 24 November 2010. At that meeting Council resolved to:

- Confirm that the Ballarat Airport is a critical infrastructure asset of the City of Ballarat.
- Note that the Ballarat Airport is operating within acceptable noise standards applicable to the operation of an aerodrome.
- Note and receive the N60 and N70 contours and further note that the ANEF contours are the operable instrument with regard to identification of acceptable noise levels.
- Note that the contents of the Ballarat Aerodrome Noise Modelling Study and Assessment of Impact on the Ballarat West Growth Area will inform the precinct Structure Planning process supporting the Ballarat West growth zone.

8.2.2 Australian Noise Exposure Forecast

An ANEF is a contour map showing the forecast of aircraft noise levels that are expected to exist around an airport in the future. The current system used for land use planning around airports in Victoria is still the ANEF system.

As noted above, ANEF studies were undertaken for Ballarat Airport in 2004 and 2010. Copies of the resulting ANEF contour charts are attached Appendix 15.

It is noted that the ANEF contours produced in 2010 are generally smaller than the previous ANEF contours produced in 2004. This was due to changes in the noise modelling software as well as differences in the assumptions used in the two studies. For example, in the 2010 study the number of RPT movements was reduced to 694 per year which was considered to be more realistic compared to the previous 1200 RPT movements. The 2010 study also did not include the very noisy BAe Strikemaster (which was in the previous study) as this aircraft had ceased operating at Ballarat Airport.

8.2.3 Australian Standard AS2021-2000

Recommendations relating to land use within the ANEF contours are contained in Australian Standard AS2021-2000 "Acoustics – Aircraft Noise Intrusion – Building Siting and Construction". These recommendations are summarised in Table 5 below. This is a summary only; Council should consult the Australian Standard for full details of the land use recommendations, and associated notes and conditions.

Table 6: Building Site Acceptability Based on ANEF Zones

(Based on Australian Standard AS 2021-2000 Table 2.1)

Building Type	ANEF Zone of Site		
	Acceptable	**Conditional**	**Unacceptable**
House, home unit, flat, caravan park	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF
Hotel, motel, hostel	Less than 25 ANEF	25 to 30 ANEF	Greater than 30 ANEF
School, university	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF
Hospital, nursing home	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF
Public building	Less than 20 ANEF	20 to 30 ANEF	Greater than 30 ANEF
Commercial building	Less than 25 ANEF	25 to 35 ANEF	Greater than 35 ANEF
Light industrial	Less than 30 ANEF	30 to 40 ANEF	Greater than 40 ANEF
Other industrial	Acceptable in all ANEF zones		

'Acceptable' means that special measures are usually not required to reduce aircraft noise.
'Conditional' means that special measures (noise attenuation) are required to reduce aircraft noise.
'Unacceptable' means that the development should not normally be considered.

8.2.4 Planning Scheme Overlay Control

In Victorian Planning Schemes, the Airport Environs Overlay (AEO) is used to implement the ANEF and AS2021-2000 land use recommendations. An AEO currently applies over the Ballarat Airport site and surrounds which is based on the ANEF contours produced in 2004. **As the 2010 ANEF contours are smaller than the 2004 ANEF contours it is recommended that Council retain the current AEO.**

8.3 Ballarat Planning Scheme

The Ballarat Planning Scheme currently contains a suite of planning policies and controls specifically relating to Ballarat Airport and its ongoing operation. This includes:

- Clause 18.04: Airports (refer to Section 2.4.1 of this report)
- Clause 21.07-2: Ballarat Airfield (refer to Section 2.4.2 of this report)
- Special Use Zone Schedule 6: Ballarat Airfield (which applies to the airport site)
- Design and Development Overlay Schedule 17: Ballarat Airfield – Building Height Above 5 Metres.
- Design and Development Overlay Schedule 18: Ballarat Airfield – Building Height Above 15 Metres.
- Airport Environs Overlay Schedules 1 and 2.

Most of these planning schemes policies/controls were introduced by Amendment C74 which came into operation in February 2007. With the possible exception of the changes to the DDOs as discussed in Sections 8.1.2, no further amendments to the Ballarat Planning Scheme are considered necessary. **However, it would be prudent to undertake a further review during the development of the Comprehensive Management Plan.**

8.4 National Airports Safeguarding Framework

In May 2012, the Standing Council on Transport and Infrastructure (SCOTI) endorsed the National Airports Safeguarding Framework (NASF), which includes the following elements:

- Principles for National Airports Safeguarding Framework
- Guideline A: Measures for Managing Impacts of Aircraft Noise
- Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports
- Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports
- Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation
- Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports
- Guideline F: Managing the Risk of Intrusions into the Protected Airspace of Airports.

NASF was an initiative of the Commonwealth Government's 2009 Aviation White Paper and was developed by the National Airports Safeguarding Advisory Group (NASAG), which consists of Commonwealth, state and territory transport and planning officials and representatives from the Commonwealth Government Department of Defence, the Civil Aviation Safety Authority, Airservices Australia and the Australian Local Government Association.

SCOTI's endorsement of the Framework (particularly Guideline A) was subject to the Commonwealth's intention to seek a review of Australian Standard AS2021-2000. At the time of writing the review of AS2021 had been initiated but not formally commenced.

It is the responsibility of each State/Territory jurisdiction to implement the Framework into their respective planning systems. At the time of writing the Victorian Government had not made any announcements regarding implementation of NASF into the Victorian planning system. It is understood that this may be due to the review of AS2021.

Whilst NASF has not yet been formally implemented in the Victorian planning system, Council should be aware of and consider its principles and guidelines when making decisions relating to land use and development on and around Ballarat Airport. Council should also ensure that it monitors any further development of the Framework by NASAG or decisions regarding its implementation, and it should also monitor the review of AS2021. The outcomes of these processes may have important implications for Ballarat Airport and its surrounds.

9 Recommendations and Actions

This Master Plan provides Ballarat City Council with a strategic direction and guidelines for future development of Ballarat Airport. It is a strategic document that aims to assist Council in planning for the next 20 years. Implementation of this plan will require a number of actions to be undertaken.

It is also recommended that a detailed and costed Management Plan be prepared identifying immediate, medium-term and long-term actions to achieve the vision and directions identified in this Master Plan. The Management Plan should clearly identify all required actions, lead agency, stakeholder interest, priority and cost if possible. Particular attention should be given to actions which relate to:

- Legislative compliance
- Safety management
- Infrastructure provision
- Tenancy issues
- Development facilitation
- Airport protection

The Management Plan will be an important tool to achieve economic and social benefits from the airport whilst minimising adverse impacts from development of the airport site.

The following tables (Table 7 and Table 8) set out the immediate recommendations and actions arising from this Master Plan. It includes trigger points and a broad indication of likely timing for each action.

This is provided as a starting point. The complete suite of actions will be developed as a separate project as part of the Comprehensive Management Plan once the Master Plan is approved.

Table 7: Airport Master Plan Next Steps

Action	Trigger Point / Rationale	Indicative Timing
Commence Community Engagement.	Council approval to release the Draft Master Plan for community comment	March 2013 Complete
Adopt Master Plan.	Finalisation of Master Plan	June 2013
Prepare Comprehensive Management Plan.	Adoption of the Master Plan	Mid 2013 – early 2014
Undertake Governance Review.	Adoption of the Master Plan	Mid 2013 – early 2014
Develop and Implement Investment Attraction Program - Investment prospectus and video complete.	Adoption of the Master Plan	Mid 2013 – early 2014

Table 8: Summary of Recommendations

Summary of Action	Trigger Point / Rationale	Indicative Timing
Prepare a fully costed Comprehensive Management Plan including an Infrastructure Plan for use in capital works planning.	Upon adoption of Master Plan	Short Term
Review National Airports Safeguarding Framework (NASF).	Upon adoption of Master Plan	Short Term
Scoping of potential Emergency Services Precinct.	Upon adoption of Master Plan	Short Term
Rectify Taxiway D issues.	To comply with CASA requirements	Short Term
Develop policy and procedures for the consideration of new development proposals and leases.	To minimise potential land use conflicts and safety issues	Short Term
Consider Conservation Management Plan and Cultural Heritage Assessment and Flora and Fauna Assessment and assess lease performance criteria.	To minimise potential land use conflicts	Short Term
Update ERSA (Runway 18/36 strip width), Taxiway D and Taxilanes E, F and G issues.	To ensure that ERSA is correct	Short Term
Commence an Airspace Capacity Management Program to hold movements below 60,000 until full investigation has taken place.	Implement short term actions identified by Airbiz	Short Term
Maintain and reinforce trees on west boundary of precinct A7 and along Drome Road.	Ensure no plans for removal and add to planting program	Short Term
Review governance and management arrangements on a regular basis.	Development of Comprehensive Management Plan	Short Term
Survey Aviation Development area A7 to ensure 8m height limit.	To ensure OLS is not affected.	Short Term
Undertake study to confirm exact location of 18/36 Runway south boundary and East-West Road location and height.	Prior to finalisation of Parcel boundaries during BWEZ Crown Land Strategy Implementation	0-1 year

Amend DDOs 17 and 18.	To ensure consistency with the current OLS chart	0-1 year
Correct approach surface for runway 18.	To ensure compliance with CASA standards. Remove obstacles that are penetrating the approach surface	0-1 year
Remove vegetation in the former Parade Ground.	Conservation Management Plan	0-2 years
Implement recommendations of the Tenancy Review report.	To address tenancy issues	0-2 years
Investigate the implications of aircraft movements increasing over 60,000 per year.	To increase airspace capacity over 60,000 movements per year	0-2 years
Removal of newly planted trees in Precinct B2.	To achieve consistency with objectives of buffer/open space precincts	0-2 years
Installation of street name signs to identify the internal streets.	To improve access within the airport and minimise confusion	0-2 years
Installation of street lights on the corner Learmonth Road and Airport Road.	To improve safety at the intersection	1-2 years
Construction of a new car park in the triangular area at the rear of Buildings 11-15.	To provide additional car parking facilities for Precinct A5	1-2 years
Undertake a bi-annual review of Airspace and Operations.	To maintain safety and capacity	2 years
Relocate the AVGAS facility to an airside/landside boundary location.	To enable fuel tankers to replenish the fuel supply without entering airside	2-3 years
Construction of a new access road and entry into airport. Plan, design and seek funding.	To improve access to the Aviation Development Area; development of BWEZ	3-5 years
Extend Taxiway D to the north to the threshold of Runway 18. Code C. 15m wide and centre line 93m from runway centre line.	To improve capacity and operation of the airport circuit area.	3-5 years

Construction of Runway 05/23 parallel taxiway.	Increased aircraft movements	5-10 years (as required)
Reconstruction of runway 18/36 pavement. HWD Report recommendation to improve subgrade from B to C.	Increase capability to handle heavier aircraft above 5,700kg (on either current or extended runway)	When and if heavier aircraft are permanently based at the airport
Preservation of runway 18/36 extension to no greater than 1800m. Ensure allowance for RESA 150m beyond end of runway.	Aircraft requiring longer runway length.	When aircraft requiring longer runway (eg. RPT or corporate aircraft) are permanently based at the airport or are going to regularly use the airport
Development of new hangars.	When required by interested operators	As required
Development of helicopter parking area.	When required by helicopter operators	As required
Development of emergency services hub.	As evidenced by Emergency Services Scoping Document	As required
Widen Taxiway D to comply with Code 3C requirements.	Runway 18/36 needs to be used for Code 3C aircraft	As required
Upgrade existing terminal or investigate new terminal building.	Introduction of RPT service	As required
Prepare a new OLS chart.	If runway 18/36 is to be extended by more than 400m	As required
Address heritage requirements.	Prior to development on the airport site, to ensure compliance with heritage legislation	As required
Address flora and fauna requirements.	Prior to development on the airport site, to ensure compliance with environmental legislation	As required
Undertake impact study of glider strip in consultation with CASA.	As required	As required

Manage and monitor airport development, continue two patterns of development with aviation separated from non-aviation.	Ongoing	Ongoing
Implement recommendations for Precincts C1, C2 and C3.	When resources are available	As required
Further study to investigate Precinct A12's access to runway.	As required	As required
Further ecological survey of grasses to determine development potential of A6 and extend apron in A5 north	As required	As required
Prepare a detailed precinct development plan before development of each precinct.	As required	As required
Review Master Plan and ANEF at 5 yearly intervals.	5 years from 2010	2015

Appendix 1

Existing Conditions Plan

BALLARAT AIRPORT MASTER PLAN EXISTING CONDITIONS PLAN

CADASTRE
RAILWAY LINE
CONTOURS
EXISTING RUNWAY
EXISTING AIRPORT PRECINCT
RESIDENTIAL ZONES

DRAWING NO: BAMP-002
REVISION NO: F
DATE: 6 MAY 2013
SCALE: 1:12,500 @A4
GCS: GDA94 MGA54

0 100 200 300 600 Metres

N

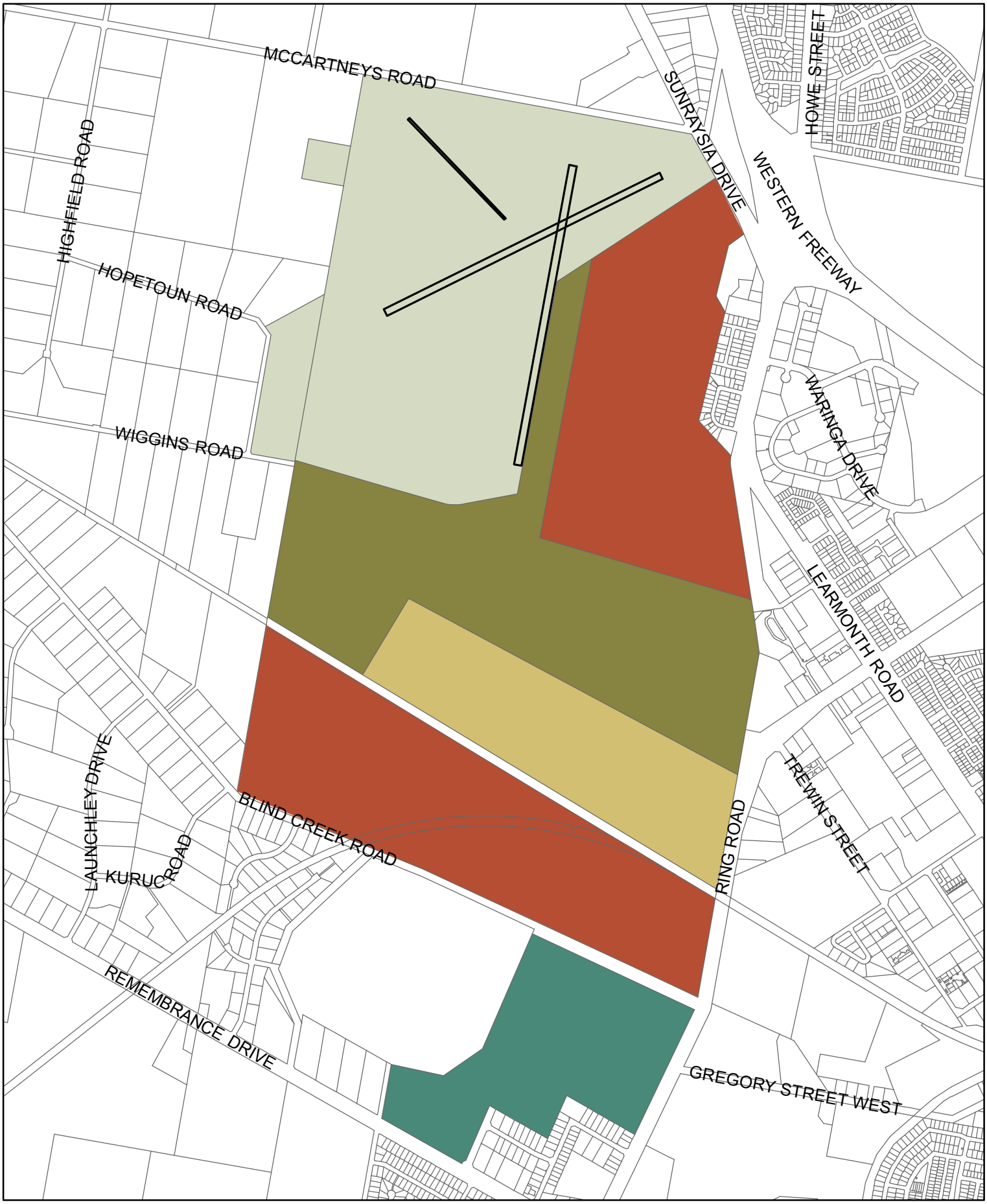
kneebush planning

HARVEST DIGITAL PLANNING

Appendix 2

Land Tenure Plan

BALLARAT AIRPORT MASTER PLAN LAND TENURE PLAN



- COUNCIL LAND - FREEHOLD
- CROWN LAND - COMMON RESERVE
- CROWN LAND - PERMANENTLY RESERVED FOR AERODROME PURPOSES
- CROWN LAND - TEMPORARILY RESERVED FOR AERODROME PURPOSES
- CROWN LAND - UNRESERVED

DRAWING NO: BAMP-006
REVISION NO: C
DATE: 6 MAY 2013
SCALE: 1:20,000 @A4
GCS: GDA94 MGA54

0 0.2 0.4 0.6 1.2 km

N

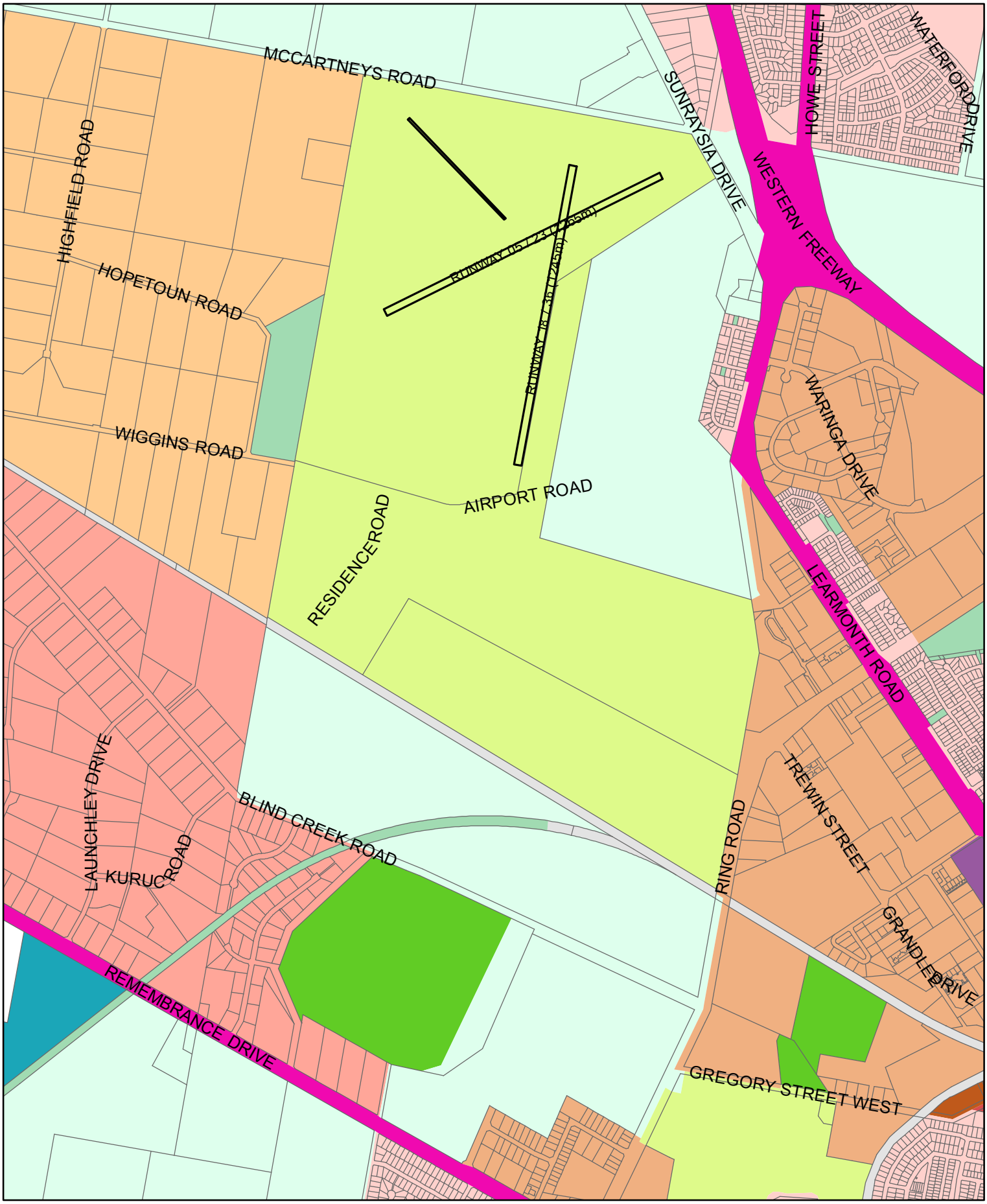
kneebush planning

HARVEST DIGITAL PLANNING

Appendix 3

Zoning Plan

BALLARAT AIRPORT MASTER PLAN ZONING PLAN



B4Z	LDRZ	R1Z
CDZ1	MUZ	RDZ1
FZ	PCRZ	RLZ
IN1Z	PPRZ	SUZ
IN3Z	PUZ4	

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REVISION NO: C
DATE: 6 MAY 2013
SCALE: 1:20,000@A4
GCS: GDA94 MGA54

0 0.2 0.4 0.6 1.2 km

N

kneebush planning

HARVEST DIGITAL PLANNING

Appendix 4

Aerodrome Buildings

Aerodrome Buildings

Apron Area

1a. Fuel Tank
1b. Non Directional Radio Beacon
1c. Wind Socks
1d. Weather Station
9a. Jeday Pty Ltd
9b. Alizzi Aviation
9c. Inbound Aviation
10a. New Horizons Microlight School
10b. Ballarat Sports Aviators
10c. Joe Luciani
11a. County Helicopters
8a. Terminal
8. ST Aerospace Academy (STAA)
H8. Ballarat Aviation Museum
H4. Ballarat Aero Club
H5. Aerovision
H6. Field Air
H7. Field Air
15a. Central Highlands Air Services
15b. Ballarat Woodworkers Guild
11. Ballarat Woodworkers Guild
12. Field Air
13. Field Air
13d. ST Aerospace Academy (STAA)
14. Field Air
16. Field Air
17. Field Air Office
18. Field Air Fuel Tank
19. Country Fire Authority
20. Toilet Block
21. Field Air

Building Area

58. Cameron Wright
58a. Field Air
59. Ballarat Drag Racing Club
60a. Ballarat & District Model Railroad
60b. Australian Air League
62. Fuellers
64. Friends Of The Anson
81a. Ballarat Light Car Club
28. Ballarat Polo Crosse Club
30. Ballarat Scenic Cyclists
31. Ballarat Amateur Radio Club
32. Residence Flat
34. Ballarat Road Rodders
39. Ballarat 4wd Club
40. Ballarat & District Early Holden Club
41. Ballarat Light Car Club
42. Victoria Police
43. Victoria Police
44a. Central Highlands Dart Club
44b. Ballarat Billiards Association
46. City Of Ballarat
47. Victoria Police
48. City Of Ballarat
52. City Of Ballarat
53. Toilet Block
54. City Of Ballarat
55. Wendouree Archery Club
56. Ballarat Morris Minor Club
23. Ballarat Model Auto Racing Club
24. Roland Wade
25. Ballarat Rovers Motorcycle Club
82. Stay Upright Motorcycle School
83. Ballarat Solar Park

CITY OF BALLARAT

AIRPORT TERMINAL

Aerodrome Buildings

Apron Area

1a. Fuel Tank
1b. Non Directional Radio Beacon
1c. Wind Socks
1d. Weather Station
9a. Jeday Pty Ltd
9b. Alizzi Aviation
9c. Inbound Aviation
10a. New Horizons Microlight School
10b. Ballarat Sports Aviators
10c. Joe Luciani
11a. County Helicopters
8a. Terminal
8. ST Aerospace Academy (STAA)
H8. Ballarat Aviation Museum
H4. Ballarat Aero Club
H5. Aerovision
H6. Field Air
H7. Field Air
15a. Central Highlands Air Services
15b. Ballarat Woodworkers Guild
11. Ballarat Woodworkers Guild
12. Field Air
13. Field Air
13d. ST Aerospace Academy (STAA)
14. Field Air
16. Field Air
17. Field Air Office
18. Field Air Fuel Tank
19. Country Fire Authority
20. Toilet Block
21. Field Air
23. Ballarat Model Auto Racing Club
24. Roland Wade
25. Ballarat Rovers Motorcycle Club
83. Ballarat Solar Park

CITY OF BALLARAT

Appendix 5

Infrastructure Upgrade Project Stage 2 Layout Plan

Notes:
1. One way traffic flow for aircraft as indicated on plan.
2. Orientation of aircraft in parking bays are to be based on the safest mode of operation and to avoid intrusion into the taxilane zone.
3. PA-28 aircraft on the western side of the apron can power in/power out where the lead-in line continues through if the front stand is empty.

Future Hangar Reserve
CAC Site
Future Carpark
Parking Clearance Line
Code B Taxilane
Pole
PA-28
DA42
Future Hangar Reserve
Code B Taxilane Clearance
Code B Taxilane
Carpark
Fence
Observation Tower
Flying Academy Facility
RL 444 (Maximun OLS Height Limit for 8M High Observation Tower)
Code C Taxiway Clearance
Future Terminal Carpark
Existing Hangar
Robinson R44
Future Terminal
Future Helicopter Parking
Future Hangar
Existing Hangar
Taxiway A
Existing Code B Taxiway
20 0 20 40 60 80
SCALE IN METRES 1:1,500 @ A3

AIRBIZ.aero

BALLARAT AIRPORT
Infrastructure Design

10931 302G
04 November 2011

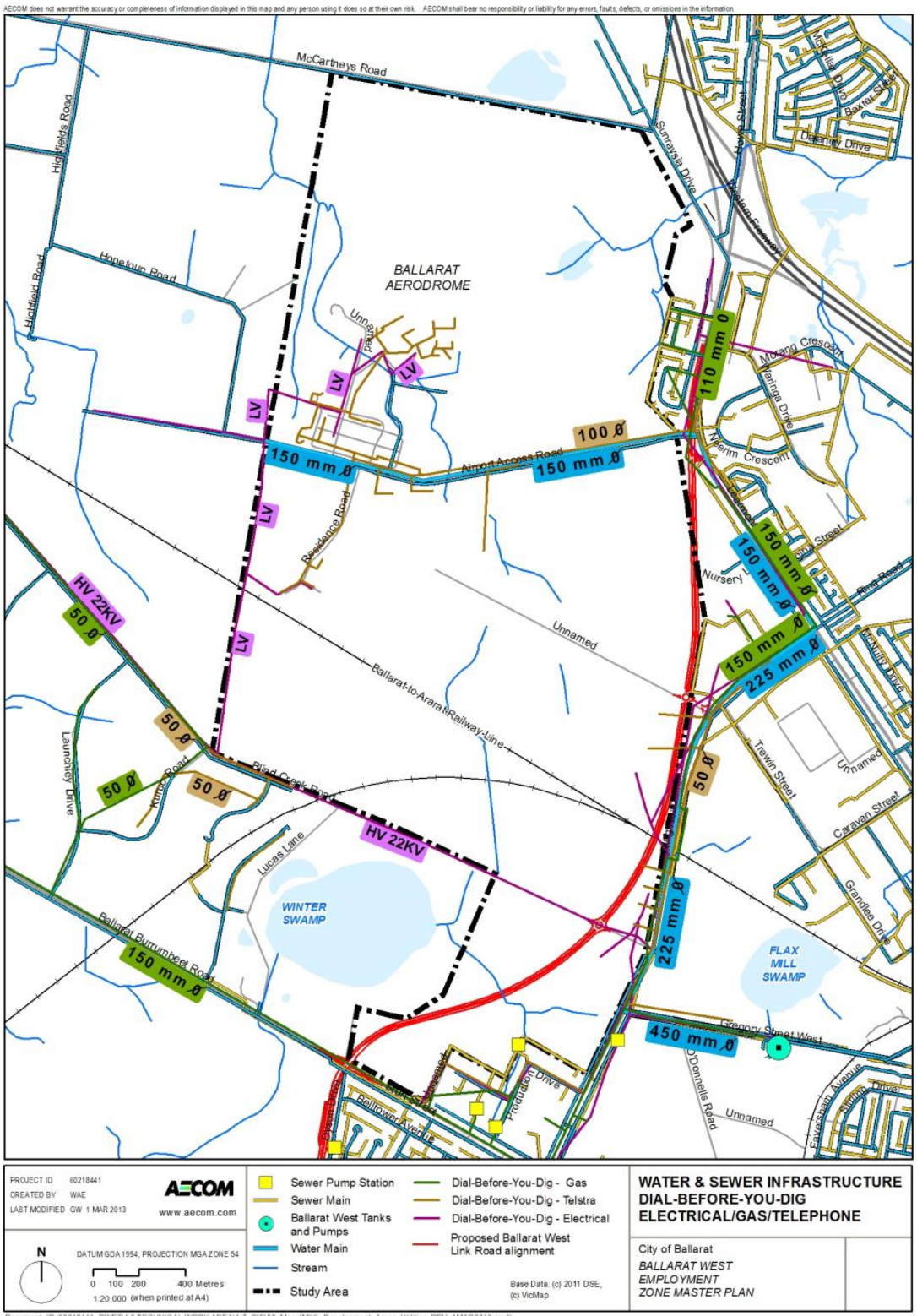
Precinct Layout Plan

G

Appendix 6

Utility Services

Available services to BWEZ



Appendix 7

Victorian Heritage Register Diagrams

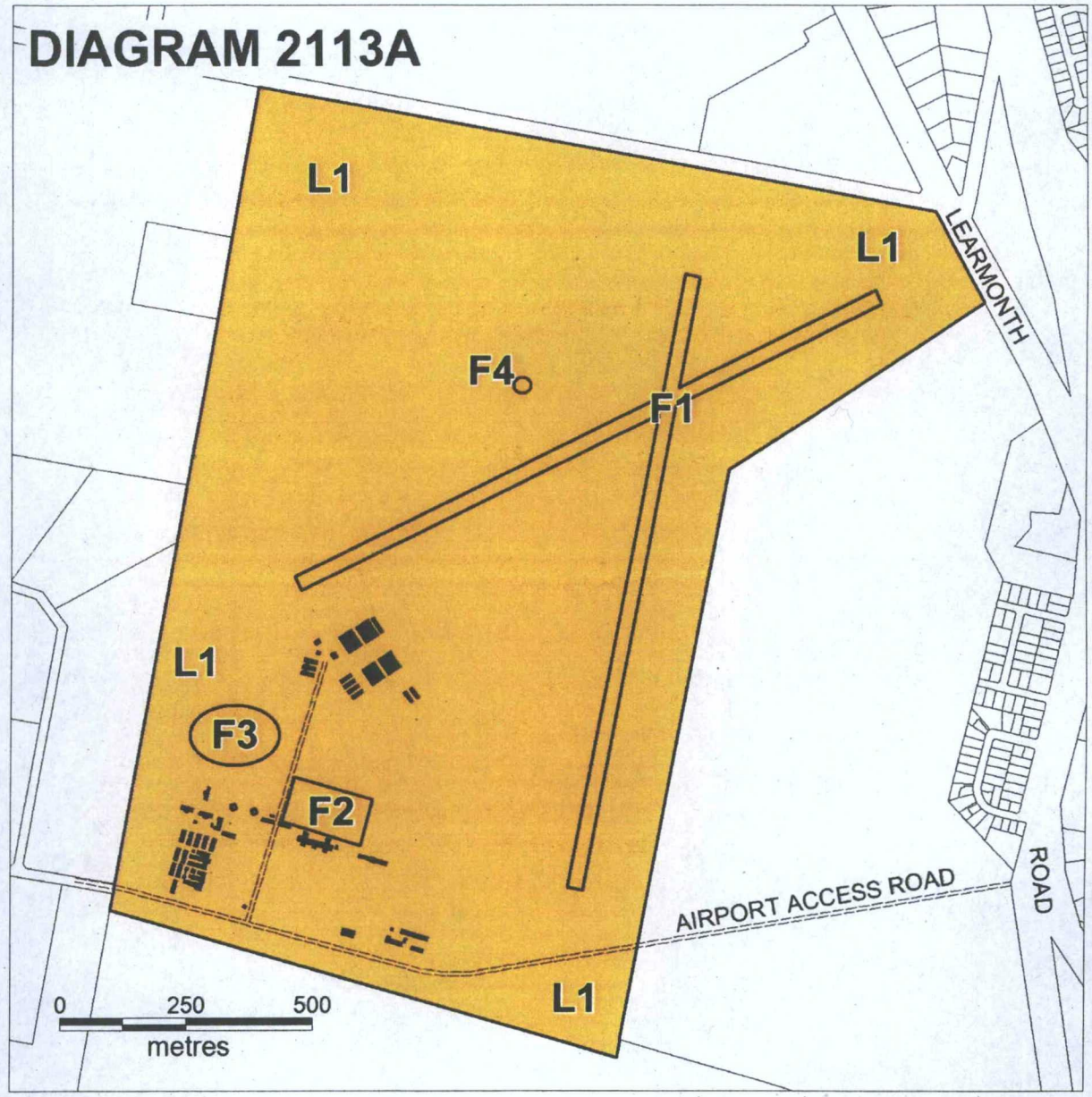


DIAGRAM 2113A
L1
L1
L1
L1
F1
F2
F3
F4
LEARMONTH
ROAD
AIRPORT ACCESS ROAD
0
250
500
metres

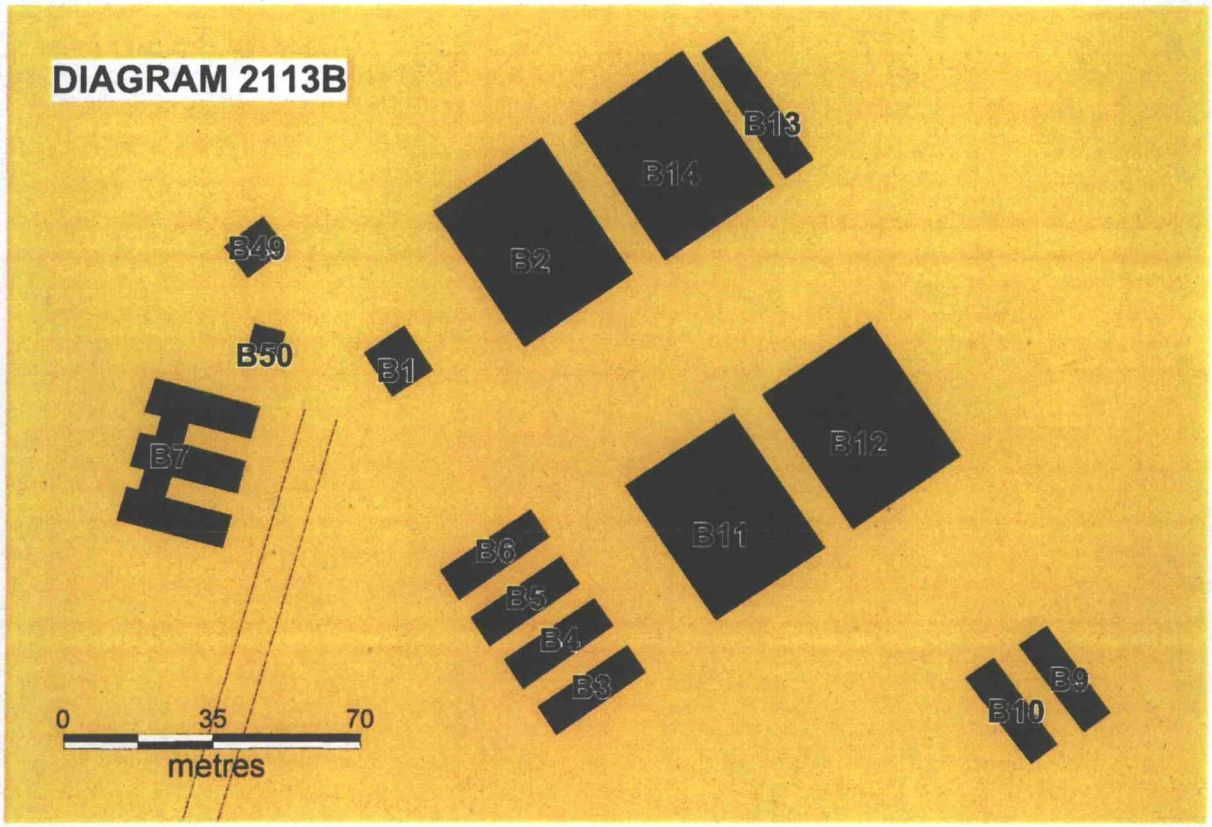


DIAGRAM 2113B
B13
B14
B49
B2
B50
B1
B7
B12
B11
B6
B5
B4
B3
B9
B10
0
35
70
metres

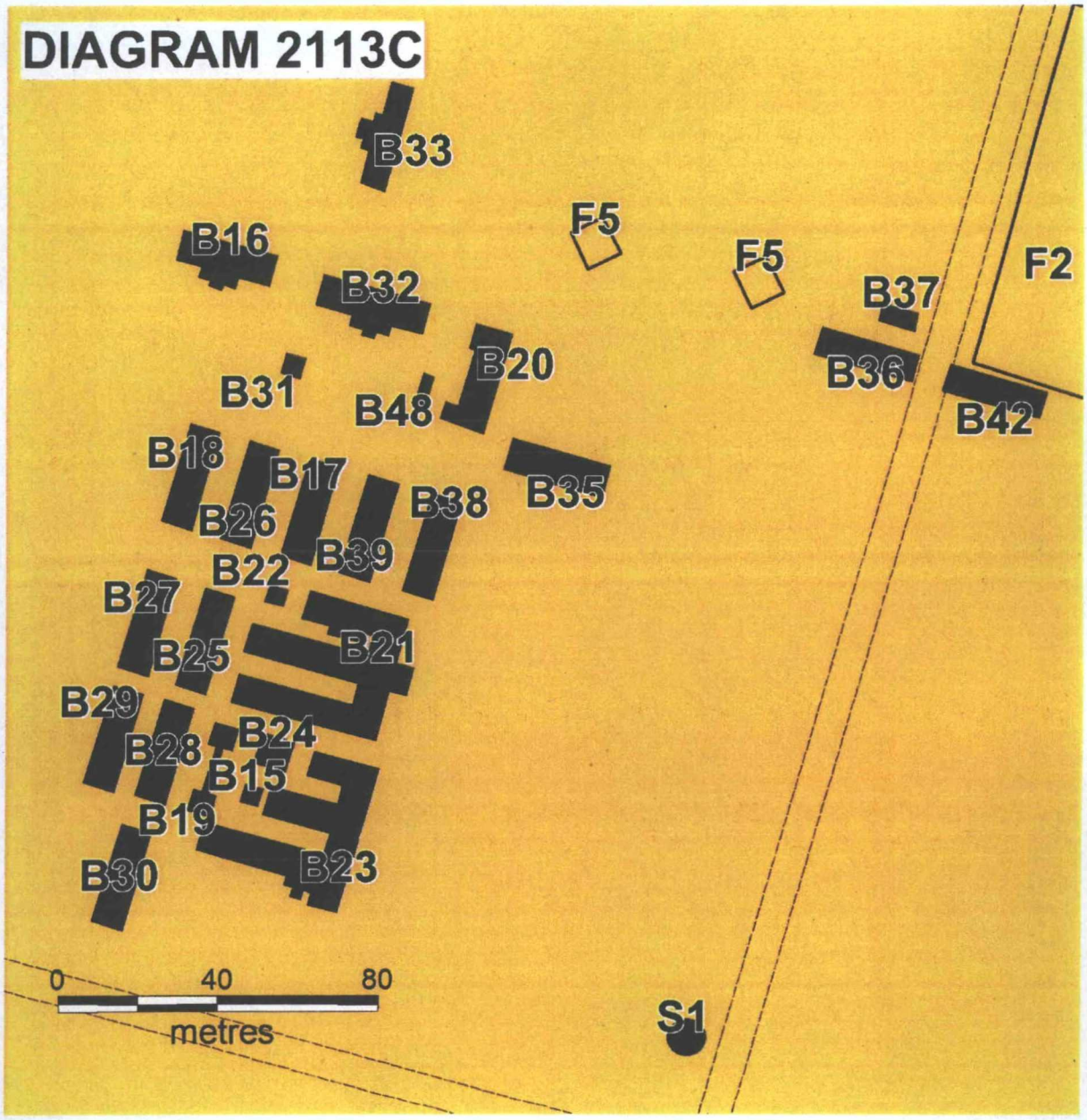


DIAGRAM 2113C
B33
B16
F5
F5
F2
B32
B37
B20
B36
B31
B48
B42
B18
B17
B38
B35
B26
B39
B22
B27
B25
B21
B29
B24
B28
B15
B19
B30
B23
0
40
80
metres
S1

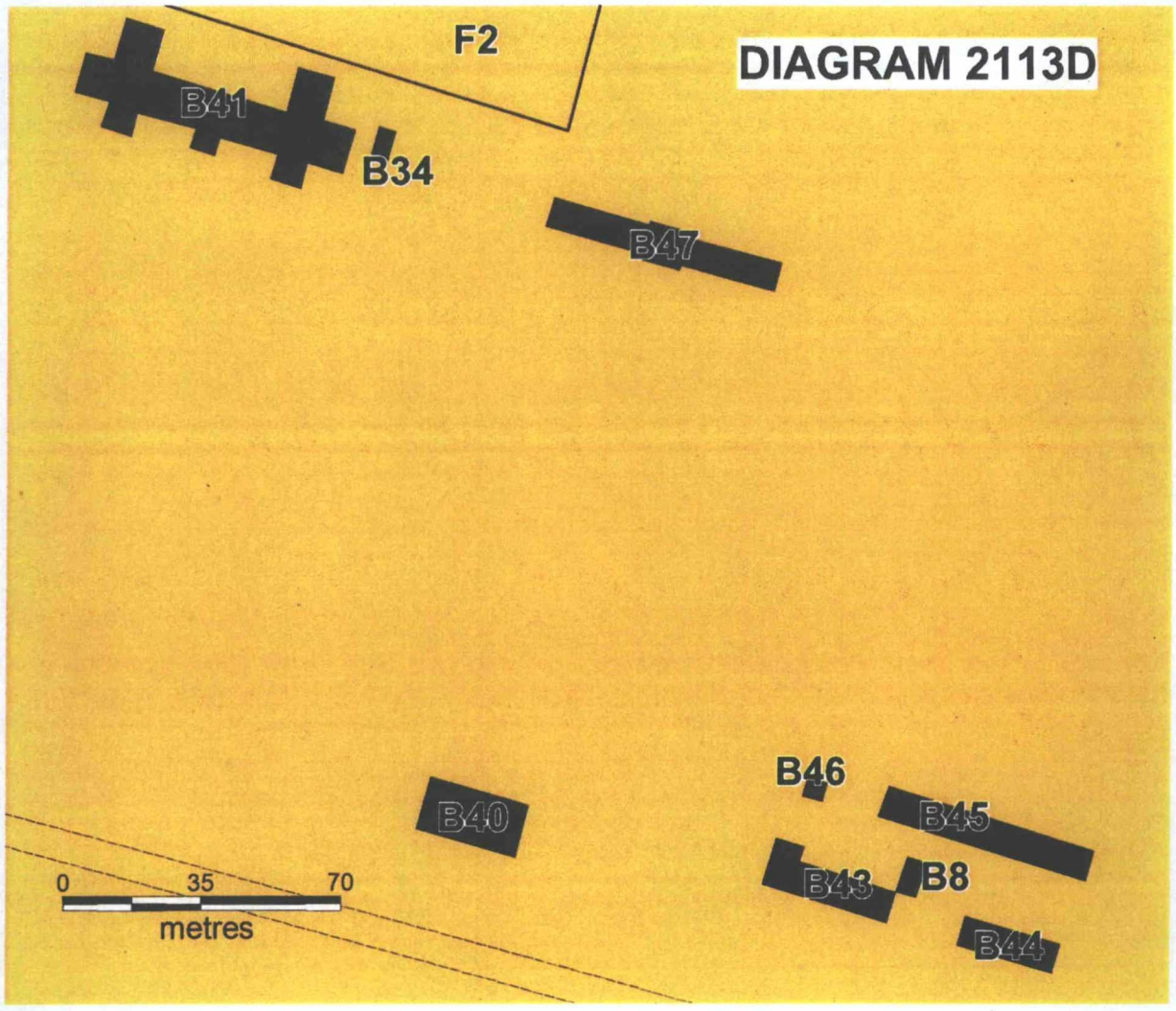
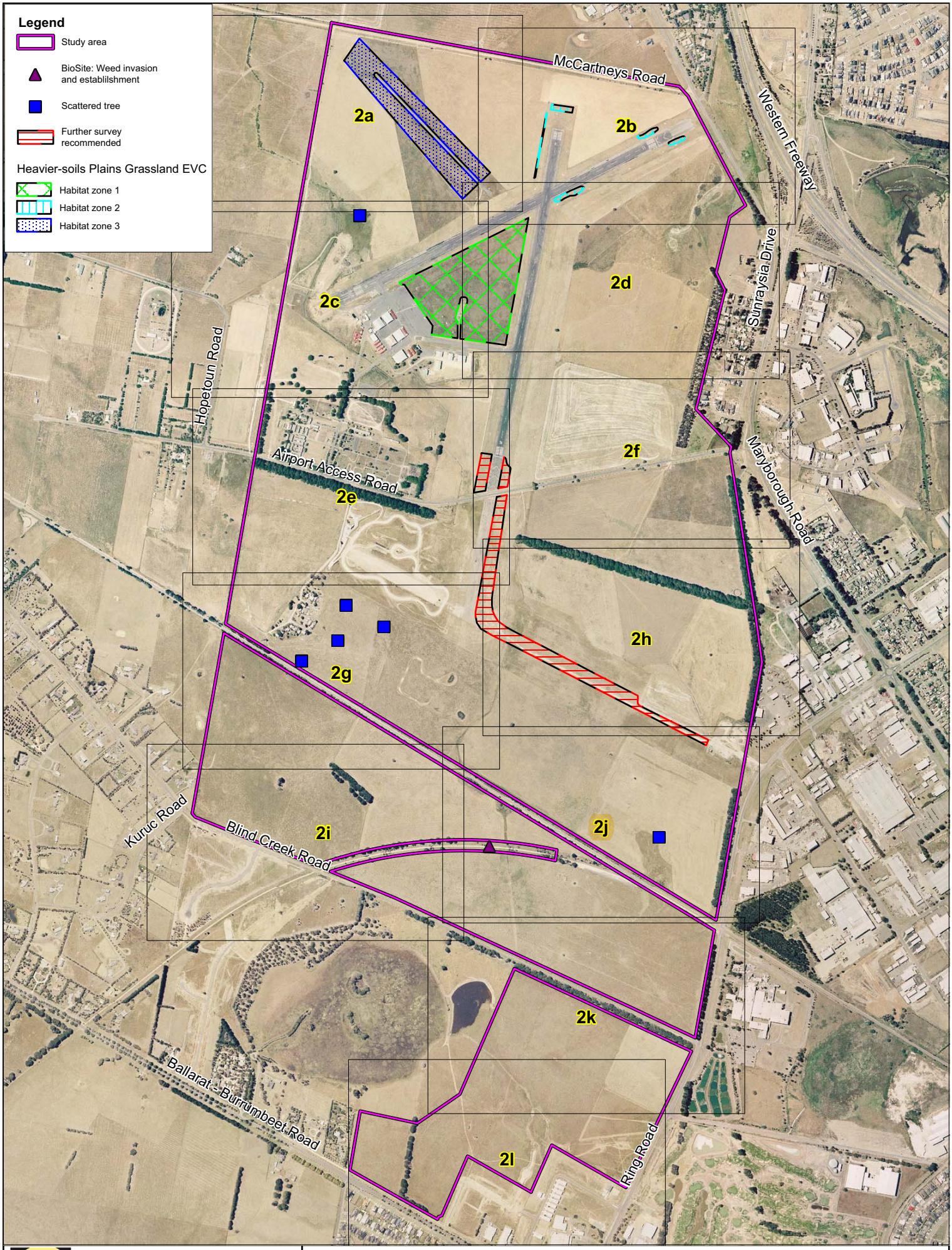


DIAGRAM 2113D
F2
B41
B34
B47
B46
B40
B45
B43
B8
B44
0
35
70
metres

Appendix 8

Flora and Fauna Maps



Biosis Research Pty. Ltd.
38 Bertie Street
(PO Box 489)
Port Melbourne
VICTORIA 3207

Offices also in:
Sydney, Ballarat,
Wollongong, Canberra
& Wangaratta

Figure 2: Ecological Features of the study area

DATE: 28 January 2010
Checked by: SLA | Drawn by: PJY | File number: 8403
Location: P:\MRG 8400s\8403\Mapping\8403 Figure 2.wor

Scale: 0 125 250 375 500 625 metres

MGA94 Zone 54

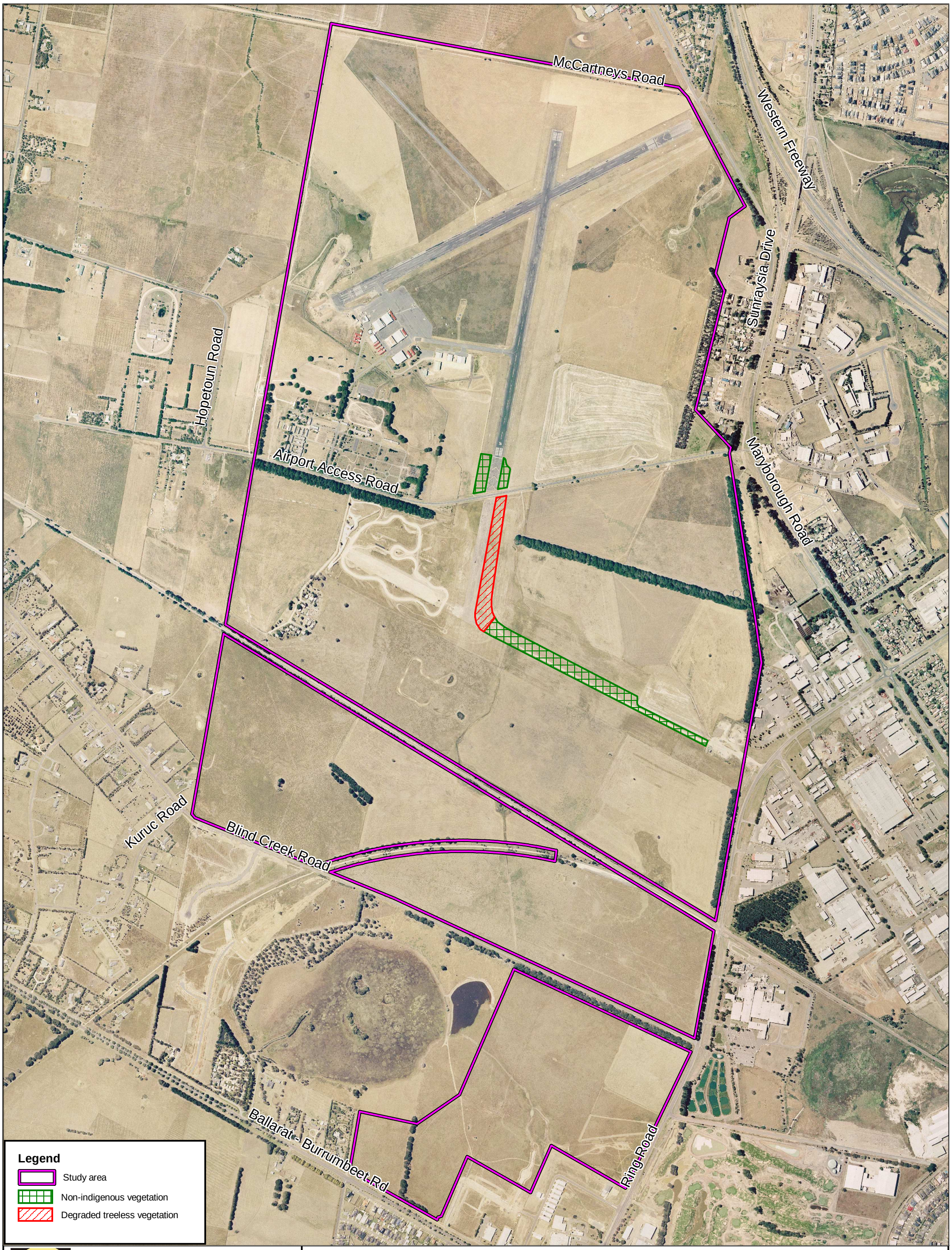


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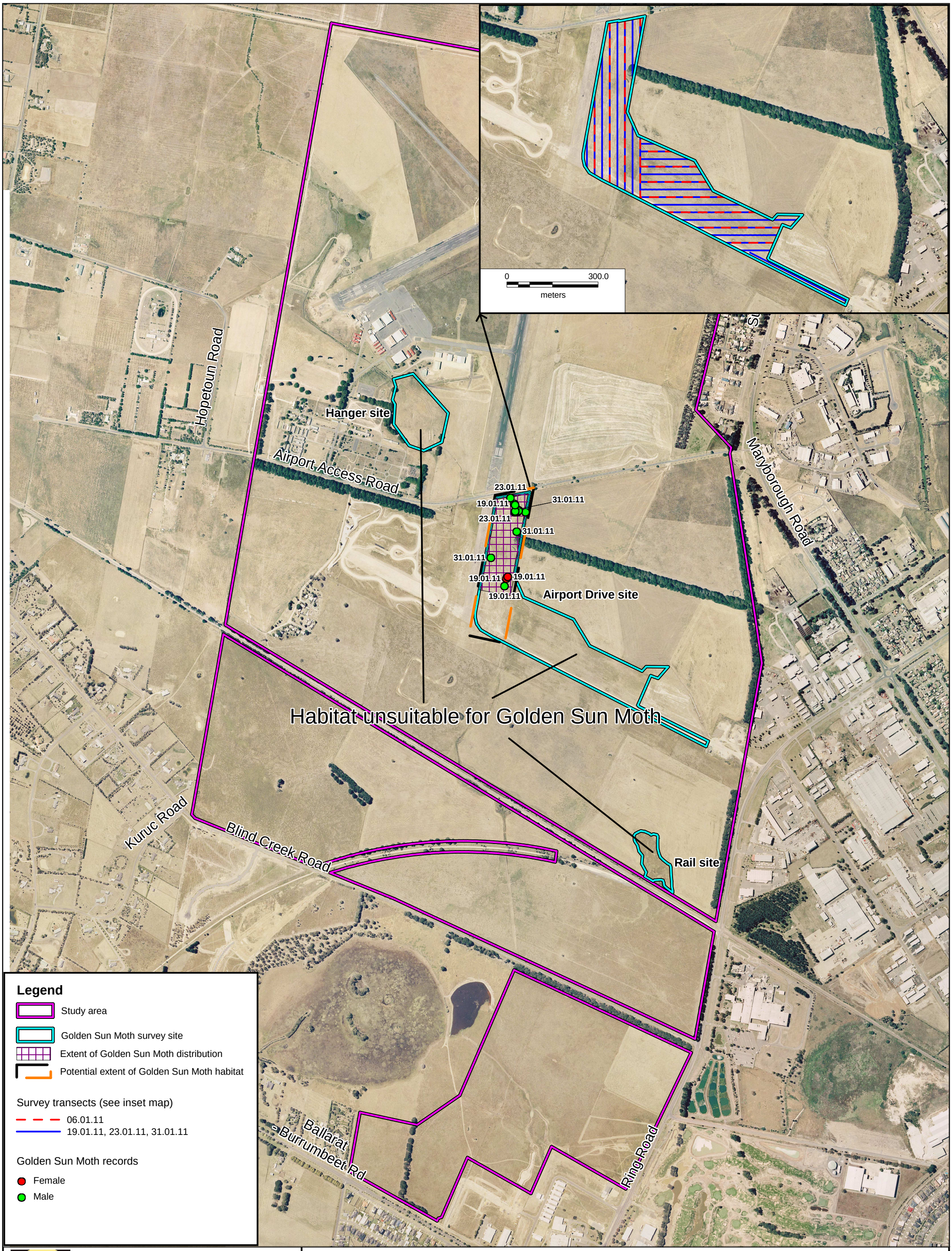
Figure 2: Areas of additional flora survey, Ballarat West Employment Zone

DATE: 8 February 2011		
Checked by: SLA	Drawn by: PJY	File number: 12367
Location: P:\12300s\12367\Mapping\12367 Figure 2.wor		

Scale: 0 125 250 375 500 625 metres

MGA94 Zone 54



BIOSIS RESEARCH

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Figure 3: Golden Sun Moth survey sites and records

DATE: 19 May 2011

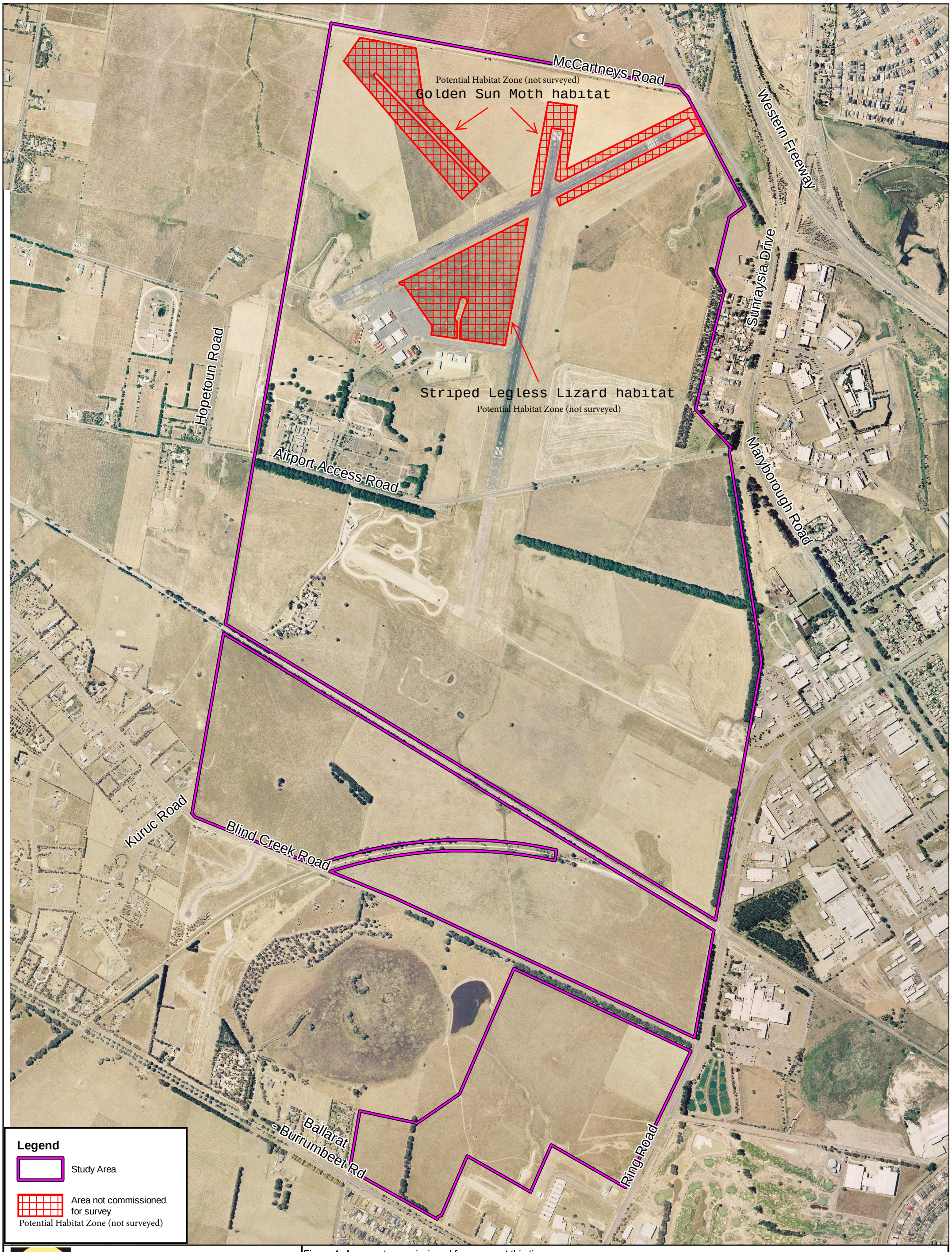
Checked by: JM | Drawn by: PJY | File number: 12367

Location: P:\12300s\12367\Mapping\12367 Figure 3.wor

Scale: (Main map) 0 125 250 375 500 625 metres

MGA94 Zone 54

N W E S



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Port Melbourne
VICTORIA 3207

Offices also in:
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& Wangaratta

Figure 4: Areas not commissioned for survey at this time

DATE: 6 May 2011		
Checked by: WR	Drawn by: PJY	File number: 12367
Location: P:\12300s\12367\Mapping\12367 Figure 4.wor		

Scale: 0 125 250 375 500 625 metres

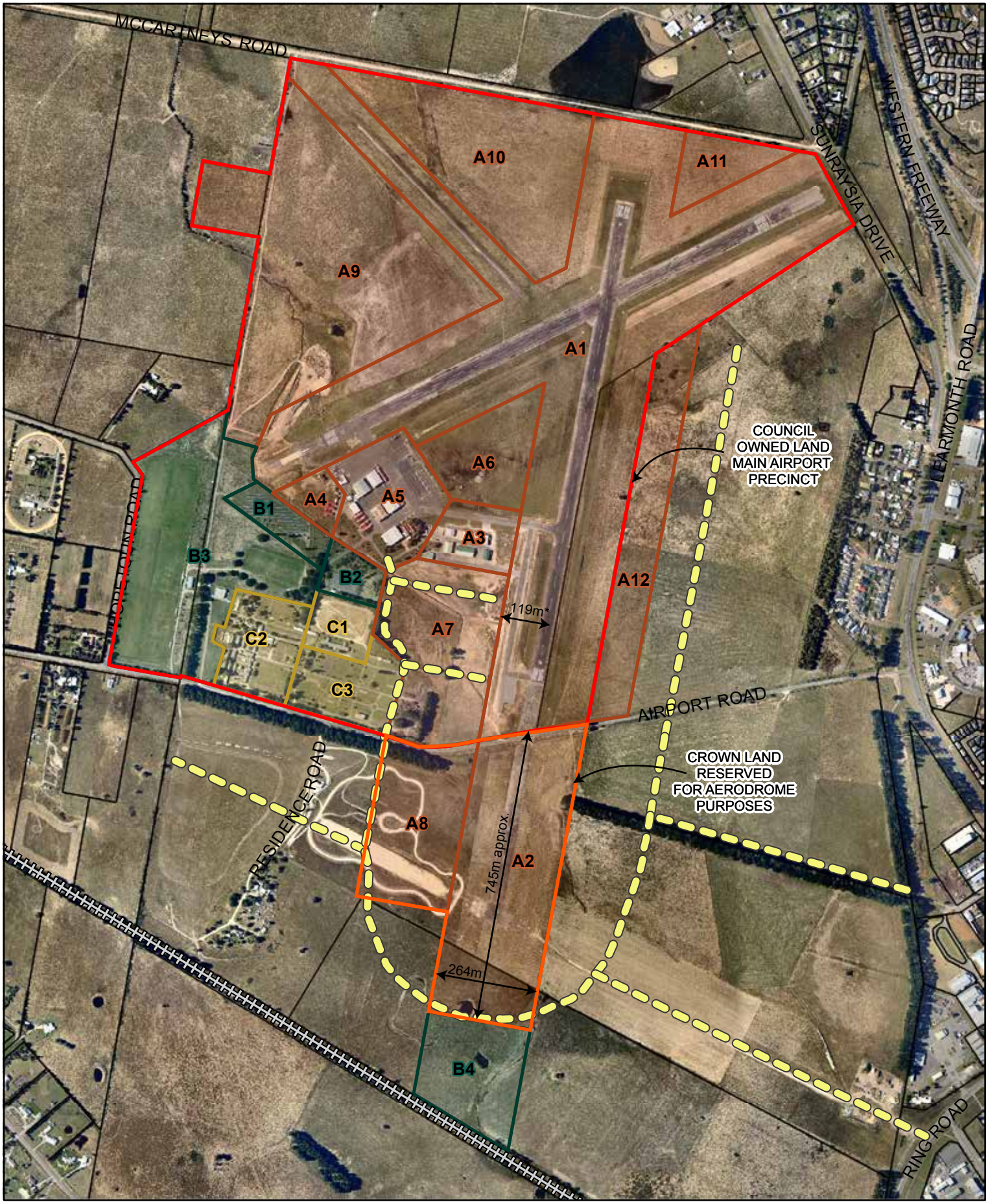
MGA94 Zone 54

N W E S

Appendix 9

Land Use Precincts Plan

BALLARAT AIRPORT MASTER PLAN LAND USE PRECINCTS PLAN



PROPOSED ROAD

LAND USE PRECINCTS

AVIATION

BUFFER / OPEN SPACE

CONSERVATION / COMMUNITY

*from runway centreline

All dimensions subject to survey and detailed design

DRAWING NO: BAMP-001
REVISION NO: G
DATE: 6 MAY 2013
SCALE: 1:12,500@A4
GCS: GDA94 MGA54

0 100 200 300 600 Metres

N

kneebush planning

HARVEST DIGITAL PLANNING

Appendix 10

Land Use Precincts Table

BALLARAT AIRPORT MASTER PLAN 2013-2033
LAND USE PRECINCTS TABLE

PRECINCT	EXISTING USE & KEY CONSTRAINTS	PROPOSED FUTURE USE, KEY ISSUES & OPPORTUNITIES
AVIATION PRECINCTS		
A1	Runways and taxiways. Heavier-Soils Plains Grassland on some parts of the precinct (refer to Biosis report).	Retain and protect existing use. Protect/widen 18/36 and 05/23 runway strips to 150m. Provision for full length Code C taxiways on both Runways 18/36 and 05/23 (gravel but sealed stopping areas). Existing 18/36 parallel taxiway only Code A; upgrade to Code C (move centreline to 93m from runway centreline). Runway pavement strength. Grassland issues will need to be addressed – EPBC Act referral required. No change to zoning or ownership.
A2	Vacant, grazing/cropping. Formerly used for extension to Runway 18/36 but this use ceased in the 1980s. Golden Sun Moth site.	Reserve for future extension of Runway 18/36 up to total runway length of 1800m if required (plus 60m runway strip, plus 90m RESA plus OLS protection). Airport Road would need to be closed/truncated to extend runway. Golden Sun Moth site – EPBC Act referral. Maintain SUZ6 zoning and Crown land reservation for aerodrome purposes – change southern part to permanent reservation.
A3	Existing "green hangars" and associated taxiways and car parking. OLS restrictions.	Retain and continue existing use. Limited opportunity for further development. New helicopter parking area at east end. No change to zoning or ownership.
A4	CFA shed, toilet block, Model Auto Racing Club, Rovers Motorcycle Club. Heritage controls. OLS restrictions.	New aviation development area. Possible Emergency Services Hub (CFA). Drainage issues need to be resolved. OLS restrictions need to be considered. Precinct development plan required. No change to zoning or ownership.
A5	Existing aprons, hangars, terminal building and associated taxiways and car parking. Heritage controls. OLS restrictions.	Retain and continue existing use. Limited opportunity for further development. Possible need to relocate Avgas facility. Terminal building improvements/airport management centre. Car parking to be provided at rear of buildings 11-15 in triangular area. Drainage issues need to be resolved. No change to zoning or ownership.

A6	Non-Directional Beacon. Automatic Weather Station. Heavier-Soils Plains Grassland. OLS restrictions.	Retain as per existing use and protection of grassland habitat. Development in this precinct would require an EPBC Act referral. Possible extension of main apron. Possible site for helicopter parking. No change to zoning or ownership.
A7	Vacant except for some derelict heritage buildings in the south-west corner. OLS restrictions. Heritage controls.	Primary aviation development area for new hangars, aprons, taxilanes etc. Site for possible future RPT terminal building. OLS restrictions need to be considered. Possible removal of heritage buildings in south-west corner. Precinct development plan required (refer to Precinct A7 Concept Plan). Maintain in Council ownership and SUZ6 zoning.
A8	Light Car Club.	Reserve for future aviation development when runway extension is in place. Possible future RPT terminal site. Light car club use may continue until the land is required for aviation purposes. OLS restrictions need to be considered. Maintain SUZ6 zoning and Crown land reservation for aerodrome purposes.
A9	Vacant, grazing/cropping. OLS restrictions.	Possible future aviation development or complimentary uses subject to OLS restrictions. No change to zoning or ownership.
A10	Vacant, grazing/cropping. OLS restrictions.	Possible future aviation development or complimentary uses subject to OLS restrictions. No change to zoning or ownership.
A11	Vacant, grazing/cropping. OLS restrictions.	Possible future aviation development or complimentary uses subject to OLS restrictions. No change to zoning or ownership.
A12	Vacant, grazing/cropping. Aboriginal cultural heritage sites (refer to Biosis report). OLS restrictions.	Maintain for future aviation development or complimentary uses subject to OLS restrictions. Not in Council owned airport precinct but reserved for aviation or related purposes in BWEZ Master Plan. To be transferred to freehold title.
BUFFER / OPEN SPACE PRECINCTS		
B1	Solar Park.	Retain current use (Solar Park). No change to zoning or ownership.

B2	Stay Upright Motorcycle School and vacant land.	Located on west side of proposed new access road into the airport, opposite the primary Aviation Development Area. Possible site for small scale Airport Management Centre at east end of this precinct opposite Aviation Development Area. No change to zoning or ownership.
B3	Polocrosse.	Retain current use (Polocrosse). No change to zoning or ownership.
B4	Vacant, grazing/cropping. OLS restrictions.	Located at south end of Runway 18/36 extension. Public Safety Zone and OLS restrictions. Maintain SUZ6 zoning. Crown land status and future ownership to be determined by BWEZ Master Plan. Use / development must not interfere with existing or future airport operations.
CONSERVATION / COMMUNITY PRECINCTS		
C1	Various clubs in heritage buildings. Former WW2 headquarters and parade ground. Heritage controls.	Retain current use due to heritage restrictions. Use parade ground as communal BBQ / open space area. No change to zoning or ownership.
C2	Various clubs in heritage buildings. Heritage controls.	Retain current use due to heritage restrictions. No change to zoning or ownership.
C3	Fuelers Inc and Friends of the Anson Museum. Heritage controls. Only two existing heritage buildings.	Development opportunity? Aviation support or museum development. Located on west side of proposed new access road into the airport, opposite the primary Aviation Development Area. Heritage restrictions. No change to zoning or ownership.
ADJOINING / SURROUNDING LAND		
Surrounds	Public and private land. Various uses. Includes Ballarat West Employment Zone land.	OLS/DDO restrictions. ANEF/AEO restrictions. Public Safety Zones.

Appendix 11

Aviation Facilities Plan

BALLARAT AIRPORT MASTER PLAN AVIATION FACILITIES PLAN

EXISTING RUNWAY
RUNWAY EXTENSION
TAXIWAY WIDENING
FUTURE TAXIWAY
AVIATION LAND USE PRECINCT

All dimensions subject to survey and detailed design

DRAWING NO: BAMP-003
REVISION NO: E
DATE: 6 MAY 2013
SCALE: 1:12,500 @A4
GCS: GDA94 MGA54

0 100 200 300 600 Metres

N

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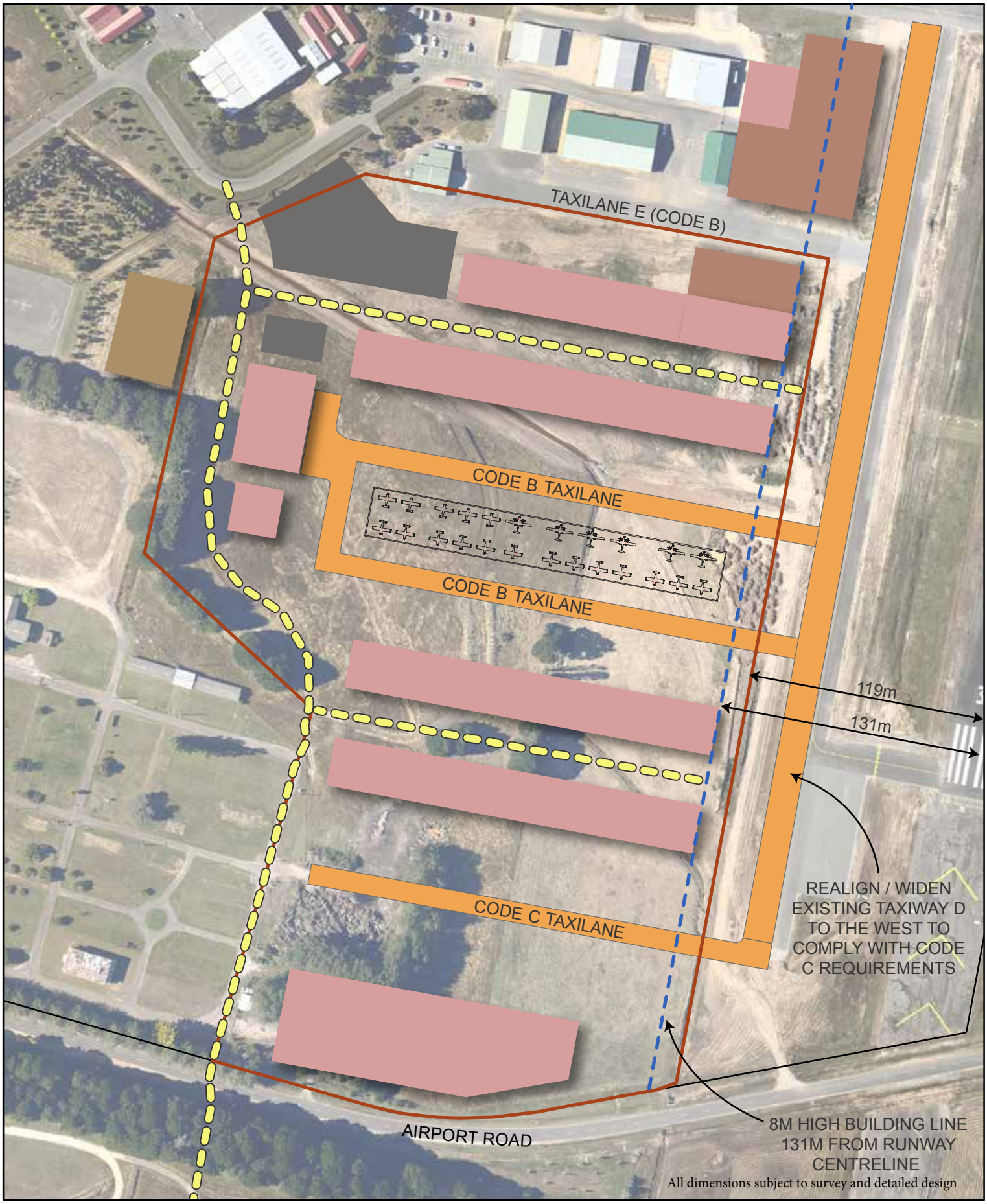
HARVEST
DIGITAL PLANNING

Appendix 12

Precinct A7 Concept Plan

BALLARAT AIRPORT MASTER PLAN PRECINCT A7 CONCEPT PLAN



- PRECINCT A7 BOUNDARY
- FUTURE HANGARS
- FUTURE HELICOPTER PARKING
- MANAGEMENT CENTRE
- FUTURE CARPARKING
- FUTURE TAXIWAY
- PROPOSED ROAD
- 8M HIGH BUILDING LINE

DRAWING NO: BAMP-005
REVISION NO: E
DATE: 6 MAY 2013
SCALE: 1:2,500 @A4
GCS: GDA94 MGA54

0 20 40 60 120 Metres

N

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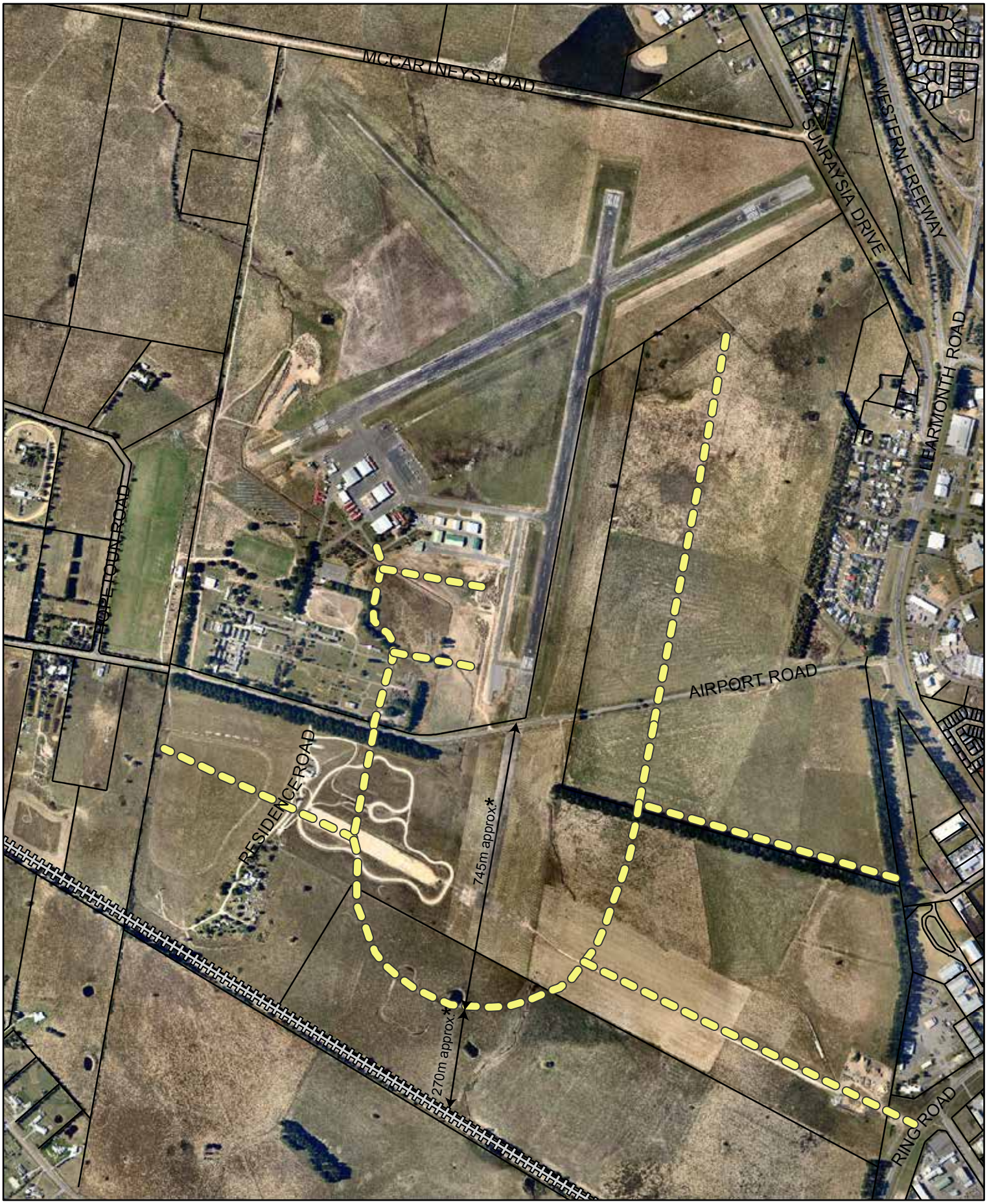
HARVEST DIGITAL PLANNING

Appendix 13

Road Network Plan

BALLARAT AIRPORT MASTER PLAN ROAD NETWORK PLAN



PROPOSED ROAD

* SUBJECT TO SURVEY

DRAWING NO: BAMP-004
REVISION NO: E
DATE: 6 MAY 2013
SCALE: 1:12,500 @A4
GCS: GDA94 MGA54

0 100 200 300 600 Metres

N

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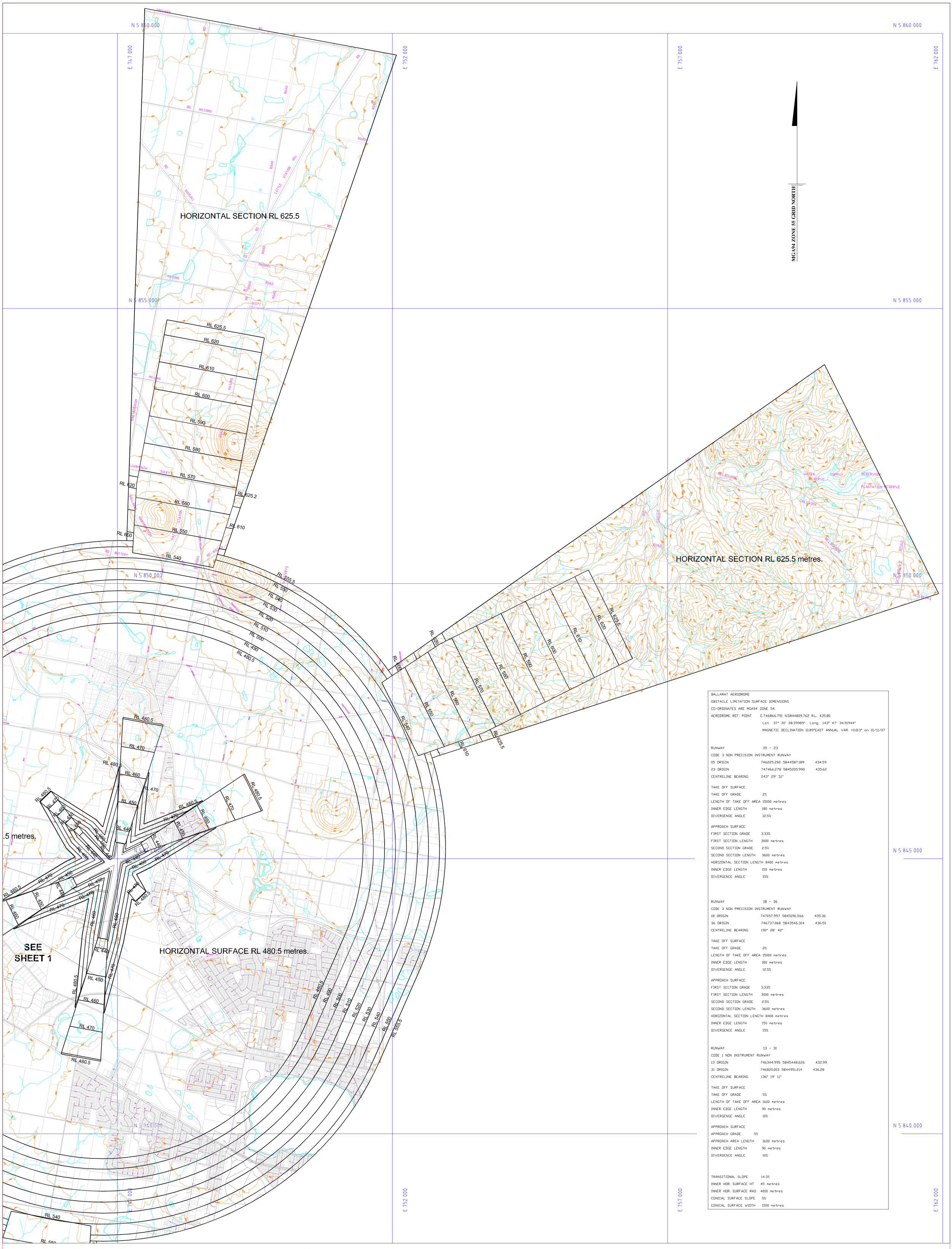
HARVEST DIGITAL PLANNING

Appendix 14

Obstacle Limitation Surfaces Chart



BALLARAT AERODROME
OBSTACLE LIMITATION SURFACE DIMENSIONS
CO-ORDINATES ARE MGA94 ZONE 54.
AERODROME REF. POINT E.746866.791 N.5844809.762 R.L. 435.80
Lat 37° 30' 38.39989" Long 143° 47' 34.91944"
MAGNETIC DECLINATION 10.89°EAST ANNUAL VAR. +0.013° on 01/11/07

RUNWAY 05 - 23
CODE 3 NON PRECISION INSTRUMENT RUNWAY
05 ORIGIN 746225.292 5844587.189 434.59
23 ORIGIN 747466.278 5845205.990 435.62
CENTRELINE BEARING 243° 29' 51"

TAKE OFF SURFACE
TAKE OFF GRADE 2%
LENGTH OF TAKE OFF AREA 15000 metres
INNER EDGE LENGTH 180 metres
DIVERGENGE ANGLE 12.5%

APPROACH SURFACE
FIRST SECTION GRADE 3.33%
FIRST SECTION LENGTH 3000 metres
SECOND SECTION GRADE 2.5%
SECOND SECTION LENGTH 3600 metres
HORIZONTAL SECTION LENGTH 8400 metres
INNER EDGE LENGTH 150 metres
DIVERGENCE ANGLE 15%

RUNWAY 18 - 36
CODE 3 NON PRECISION INSTRUMENT RUNWAY
18 ORIGIN 747057.997 5845281.566 435.36
36 ORIGIN 746737.068 5843546.314 436.50
CENTRELINE BEARING 190° 28' 42"

TAKE OFF SURFACE
TAKE OFF GRADE 2%
LENGTH OF TAKE OFF AREA 15000 metres
INNER EDGE LENGTH 180 metres
DIVERGENGE ANGLE 12.5%

APPROACH SURFACE
FIRST SECTION GRADE 3.33%
FIRST SECTION LENGTH 3000 metres
SECOND SECTION GRADE 2.5%
SECOND SECTION LENGTH 3600 metres
HORIZONTAL SECTION LENGTH 8400 metres
INNER EDGE LENGTH 150 metres
DIVERGENCE ANGLE 15%

RUNWAY 13 - 31
CODE 1 NON INSTRUMENT RUNWAY
13 ORIGIN 746344.995 5845448.626 432.99
31 ORIGIN 746820.003 5844951.214 436.28
CENTRELINE BEARING 136° 19' 11"

TAKE OFF SURFACE
TAKE OFF GRADE 5%
LENGTH OF TAKE OFF AREA 1600 metres
INNER EDGE LENGTH 90 metres
DIVERGENGE ANGLE 10%

APPROACH SURFACE
APPROACH GRADE 5%
APPROACH AREA LENGTH 1600 metres
INNER EDGE LENGTH 90 metres
DIVERGENCE ANGLE 10%

TRANSITIONAL SLOPE 14.3%
INNER HOR. SURFACE HT 45 metres
INNER HOR. SURFACE RAD 4000 metres
CONICAL SURFACE SLOPE 5%
CONICAL SURFACE WIDTH 1500 metres

DRAWN	M.OSCIAK
DATE	OCTOBER 2007
SURVEYED	B.FITZGERALD
DATE	OCTOBER 2007
ARCHIVED	BLT\BLTOLC2007
DRAWING No.	BLT/003 Sheet 2 of 2 Sheets

NOTE:

This Obstacle Limitation Surfaces Plan defines the highest AHD Levels to which obstacles may project into the Airport airspace.

BALLARAT AERODROME OBSTACLE LIMITATION SURFACES

1 : 30,000

0 300 600 1200 1800 2400 3000 3600 4200 4800 5400 6000

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Mobile: 0407 360 008
Fax: (03) 9739 4517
Email: b_fitzgerald@bigpond.com
PO Box 306
Chirnside Park, Vic 3116

BALLARAT AERODROME
OBSTACLE LIMITATION SURFACE DIMENSIONS
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LENGTH OF TAKE OFF AREA 15000 metres
INNER EDGE LENGTH 180 metres
DIVERGENGE ANGLE 12.5%

APPROACH SURFACE
FIRST SECTION GRADE 3.33%
FIRST SECTION LENGTH 3000 metres
SECOND SECTION GRADE 2.5%
SECOND SECTION LENGTH 3600 metres
HORIZONTAL SECTION LENGTH 8400 metres
INNER EDGE LENGTH 150 metres
DIVERGENCE ANGLE 15%

RUNWAY 18 - 36
CODE 3 NON PRECISION INSTRUMENT RUNWAY
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36 ORIGIN 746737.068 5843546.314 436.50
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TAKE OFF SURFACE
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LENGTH OF TAKE OFF AREA 15000 metres
INNER EDGE LENGTH 180 metres
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SECOND SECTION LENGTH 3600 metres
HORIZONTAL SECTION LENGTH 8400 metres
INNER EDGE LENGTH 150 metres
DIVERGENCE ANGLE 15%

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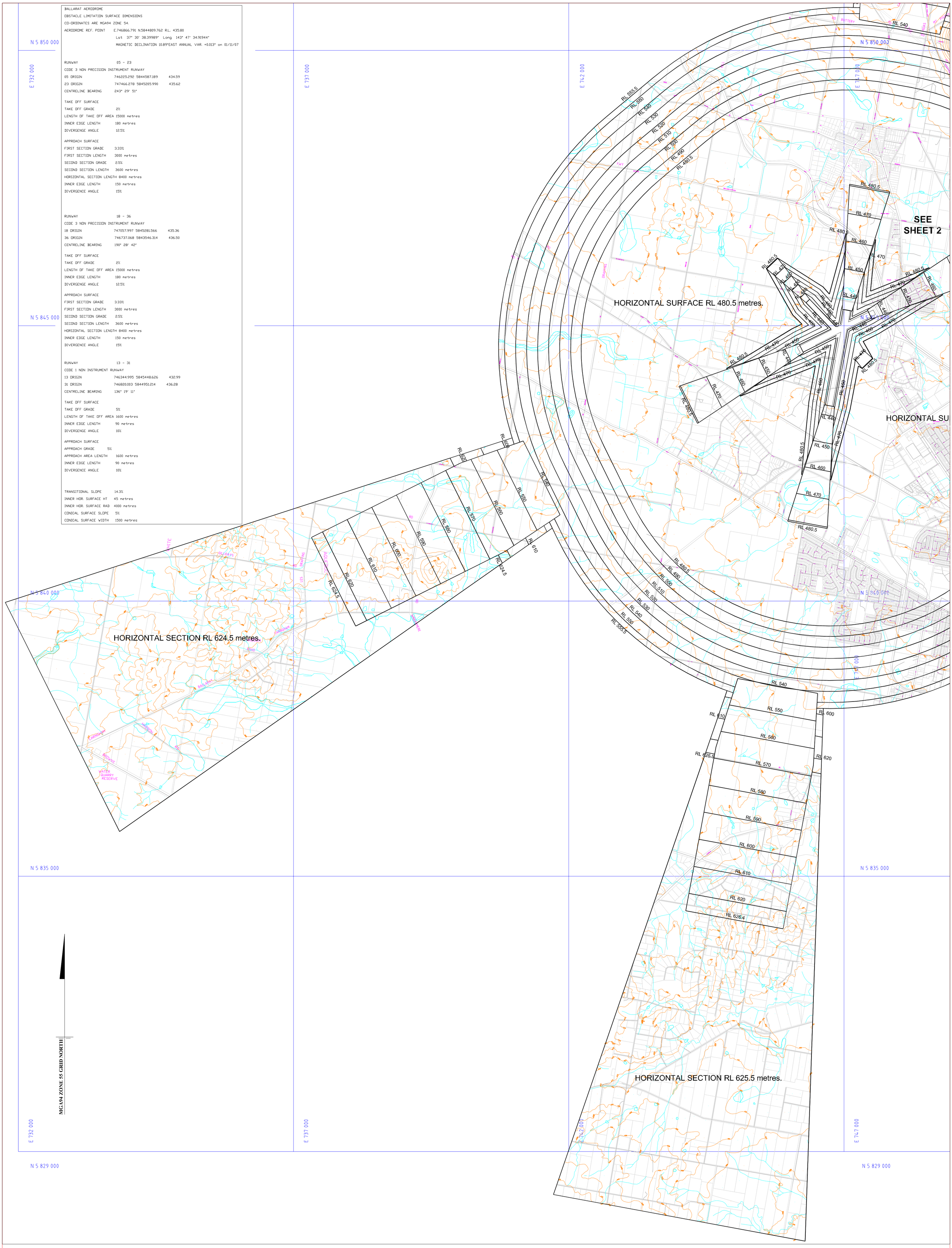
APPROACH AREA LENGTH 1600 metres
INNER EDGE LENGTH 90 metres
DIVERGENCE ANGLE 10%

TRANSITIONAL SLOPE 14.3%
INNER HOR. SURFACE HT 45 metres
INNER HOR. SURFACE RAD 4000 metres
CONICAL SURFACE SLOPE 5%
CONICAL SURFACE WIDTH 1500 metres



DRAWN	M.OSCIAK
DATE	OCTOBER 2007
SURVEYED	B.FITZGERALD
DATE	OCTOBER 2007
ARCHIVED	BLT\BLTOLC2007
DRAWING No.	BLT/003 Sheet 1 of 2 Sheets

NOTE:

This Obstacle Limitation Surfaces Plan defines the highest AHD Levels to which obstacles may project into the Airport airspace.

BALLARAT AERODROME OBSTACLE LIMITATION SURFACES

1 : 30,000

0 300 600 1200 1800 2400 3000 3600 4200 4800 5400 6000

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Fax: (03) 9739 4517
Email: b_fitzgerald@bigpond.com
PO Box 306
Chirnside Park, Vic 3116

Appendix 15

Australian Noise Exposure Forecast Maps

ANEF 2004 - 2014 (basis of Airport Environs Overlay)

AOS AIRPORT CONSULTING

0 1 2 3 4 5 KMS

SCALE 1:50 000 @ A4

Drawing No. AOS 04 331

ISSUE	DATE	DESCRIPTION	APPROVED
4	20/10/04	NEW CONTOURS	SNL
3	16/9/04	NEW CONTOURS	MJT
2	27/8/04	NEW CONTOURS	MJT
1	11/8/04	ORIGINAL ISSUE	MJT

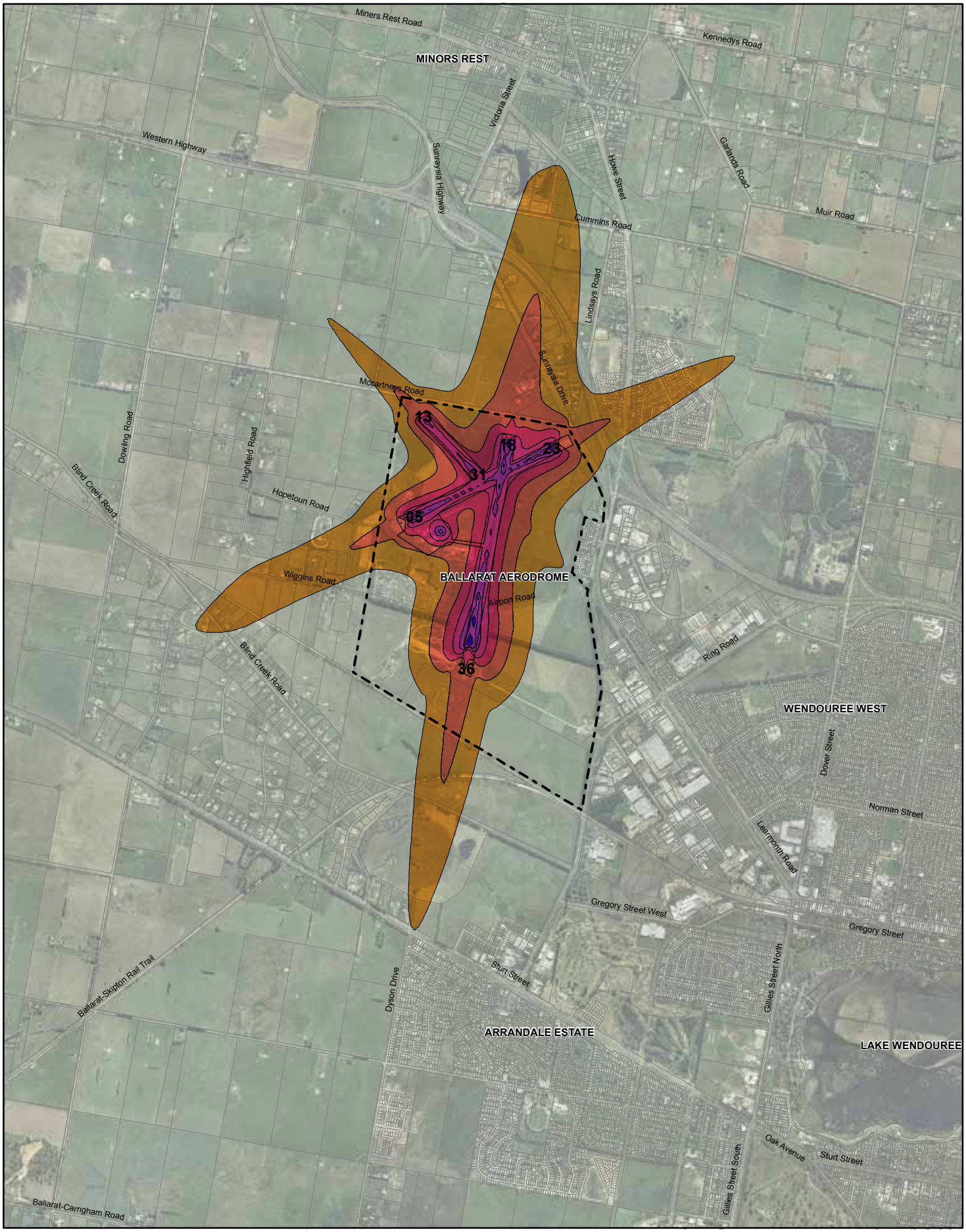
AMENDMENTS

CITY OF BALLARAT

BALLARAT AIRPORT

2014 ANEF

Unofficial ANEF 2010 - 2030



Ballarat Aerodrome

ANEF Contours (2030)

0 250 500 1,000 1,500 m

1:40,000

N

15
20
25
30
35
40
45

Source: "Ballarat Aerodrome Noise Modelling Study & Assessment of Impact on the Ballarat West Growth Area", September 2010.