Report

# Echuca Aerodrome Master Plan

**Prepared for Campaspe Shire Council**

**By Beca Pty Ltd (Beca)**
**ABN: 85 004 974 341**

Prepared in association with Airports Plus Pty Ltd and Buchan Consulting Pty Ltd

17 August 2010

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# PART A: ISSUES AND OPPORTUNITIES PAPER

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## Document Acceptance

| Action | Name | Signed | Date |
|---|---|---|---|
| Prepared by | Trent Kneebush | | |
| Reviewed by | Anne Batrouney | | |
| Approved by | Mark R Wilson | | |
| on behalf of | Beca Pty Ltd | | |

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# Appendices

# 1 Introduction

The Shire of Campaspe is located approximately 180 kilometres north of Melbourne's CBD, encompassing a total land area of approximately 4,525 square kilometres. It is bounded to the west by Gannawarra Shire Council, Loddon Shire Council and the City of Greater Bendigo, Strathbogie Shire Council to the south, the City of Greater Shepparton and Moira Shire Council to the east and Murray Shire Council, located in New South Wales, to the north.

Echuca is the Shire's largest and most diverse centre which serves local, regional and tourist purposes. Its catchment area is estimated to include 50,000 people within a 70 kilometre radius. It is a vibrant and growing provincial city of around 12,000 people situated on the banks of the Murray River where it forms is an important industrial, community, health, recreational and transportation hub for northern Victoria and southern New South Wales.

The Echuca Aerodrome is located to the south-east of the Echuca CBD, adjacent to Echuca's main industrial area and east of the Echuca-Toolamba railway line. The aerodrome is currently used for "General Aviation" (GA) purposes, and the site contains a number of hangars which accommodate light aircraft associated with GA activities. The aerodrome is also home to the Echuca Aero Club.

## 1.1 Objectives of the Proposed Master Plan

There is currently no Master Plan for the Echuca Aerodrome. The overall objective of the Echuca Aerodrome Master Plan Project is to prepare a strategic plan for the aerodrome to provide Campaspe Shire Council with a long term planning framework for the safe, secure, efficient and sustainable use and development of the aerodrome site. It seeks to provide clear direction as to how future growth will be accommodated and how a balance can be achieved between aerodrome functions, non-aviation development and various forms of surrounding land use.

More specifically, the objectives of the project are to:

- Identify future needs and requirements for the aerodrome over the next 10-15 years
- Identify the site's constraints and challenges
- Review the planning controls applying to the site and surrounds
- Identify current infrastructure inadequacies at the site
- Identify potential opportunities for development of the site for aviation and non-aviation purposes
- Prepare a land use strategy for the aerodrome
- Prepare a supporting business case

## 1.2 Purpose of this Issues and Opportunities Paper

This Issues and Opportunities Paper provides a review and analysis of background information relevant to the Echuca Aerodrome as well as an overview of the key issues affecting the site and surrounds which will ultimately shape the development of the final Master Plan. This paper will be a key input into the preparation of the Master Plan (refer to Part B).

## 1.3 Methodology

The preparation of this Issues and Opportunities Paper has been informed by:

- Discussions with the project Steering Committee;
- One-on-one consultation with various stakeholders;
- A workshop with relevant authorities on 23 July 2009;
- A workshop with aerodrome user's and land owners on 23 July 2009;
- Review of various documents and other information provided by Campaspe Shire Council and obtained from other sources.

# 2 The Subject Site and Surrounds

The following section provides information regarding the existing site conditions and the surrounding land. The plan at Appendix A shows the site and surrounds.

## 2.1 The Subject Site

### 2.1.1 Existing Conditions

The Echuca Aerodrome is located on Echuca-Kyabram Road (also known as Cornelia Creek Road and McKenzie Road), on the south-eastern fringe of Echuca, approximately 3km south of the Echuca CBD. Overall the subject site has a land area of approximately 210 hectares, made up of two main parts as shown on the plan at Appendix A and described below:

- The main part of the subject site, containing the existing aerodrome facilities, is located on the western side of Echuca-Kyabram Road. This part has an area of approximately 167 hectares and is comprised of both Council owned land and freehold allotments. It is generally bounded by the Cornelia Creek Industrial Estate to the north, Echuca-Kyabram Road to the east, Benson Road to the south and Old Aerodrome Road to the west.
- The second part of the subject site is Council owned land located on the eastern side of Echuca-Kyabram Road. This part has an area of approximately 43 hectares and was originally set aside for a possible future east-west runway. This land is generally bounded by Benson Road to the south, Echuca-Kyabram Road to the west, Mary Ann Road to the east and privately owned lots to the north. This land is currently vacant.

There are 15 subdivided lots located on the Echuca Aerodrome site, the majority of which are privately owned. Nine of these allotments contain existing hangars which are all used for storing light aircraft for General Aviation (GA) purposes. It is noted that the Council recently refused a permit application to use one of the existing hangars (Lot 9) for Motor Vehicle Sales. The refusal of the permit application was appealed by the applicant but the Victorian Civil and Administrative Tribunal upheld Council's decision and refused to grant a permit for the proposed use.

The Echuca Aero Club currently operates from the Echuca Aerodrome site (Lot 2) and the Antique Aeroplane Association also uses the site from time-to-time.

The Echuca Aerodrome is also used by emergency services such as Air Ambulance Victoria. Existing aviation/aerodrome facilities are discussed in Section 2.2 below.

Access to the property is via Echuca-Kyabram Road. Connectivity within the aerodrome site is provided by internal service roads, namely Cressna Court, Arrow Court and Piper Drive. An unconstructed road reserve (Old Aerodrome Road) runs down the western boundary of the site adjacent to the railway line.

The subject land is generally flat and vegetation generally consists of grasses with very few trees. A large portion of the land not currently used for aviation facilities is used for agriculture. However, the site is known to contain some native vegetation in particular locations, particularly adjacent to the sealed runway and the site's frontage to Echuca-Kyabram Road (see Appendix A). It is noted that there are two protected native plant species known to occur at the aerodrome, namely *Sclerolanea Napiformis* (Turnip Copperburr) and *Swainsona Plagiotropis* (Red Swainson-pea). This is discussed further at Sections 3 and 4 of this report.

### 2.1.2 Existing Aerodrome Facilities

**Runways**

There are two existing runways currently provided at Echuca Aerodrome.

Runway 17/35 is 1102m long and 30m wide with a central 18m bitumen sealed surface. At the runway ends the paved sections of runway have been widened by 10m for the last 30m to provide turning nodes, allowing aircraft to turn and line up on the runway for take-off. The runway is contained in a runway strip 1222m long and 90m wide. The paved section of the runway surface consists of a bitumen seal with 5mm aggregate on a gravel base and was resealed around 2000. The pavement is rated with a pavement classification number (PCN) 9 with a maximum tyre pressure of 800 kpa (11.6 PSI). The remaining section of the runway is grass with the edges marked with white cones and is unrated.

The runway is equipped with a single stage low intensity edge lighting system which can be activated by pilots using frequency 122.8. The lights are situated outside the white cone markers marking the edge of the runway.

**Rwy 35 threshold**

**Rwy 05/23**

Runway 17/35 is the primary runway due to the prevailing wind and night lighting. Aircraft operating on runway 17/35 operate normal left hand circuits. Both runway directions have a RNAV (GNSS) Non Precision Approach procedure published allowing aircraft to make straight in approaches. The aerodrome is equipped with a non-directional beacon (NDB) and a procedure has been designed allowing aircraft to locate the aerodrome and enter the circuit for runway 17 using this navigational aid.

Runway 05/23 is 510m long and 18m wide and is contained in a runway strip 630m long and 60m wide. The runway surface is grass and has no pavement rating. The runway ends are marked with white cones and aircraft operate normal left hand circuits. The runway is mainly used by ultralight aircraft and for training purposes.

**Taxiways**

The taxiways do not have designated letters. The main sealed taxiway connects runway 17/35 with a small terminal apron and a parallel taxiway. This taxiway is 10.5m wide and is 80m long. This taxiway is equipped with blue edge lighting to provide guidance for pilots to the terminal apron.

A parallel taxiway, running the full length of runway 17/35, provides access to the thresholds of runway 17/35 and to runway 05/23. The two short sections of taxiway north and south of the

terminal apron have bitumen sealed pavements and connect the terminal apron with the refuelling apron to the north and the sealed parking apron to the south. The north section of taxiway is 130m long and 10.5m wide. The south section of taxiway is 70m long and 10.5m wide.

The remaining north section of taxiway connecting to the threshold of runway 17 has a gravel surface and is 505m long and 9m wide. The remaining south section of taxiway connecting to the threshold of runway 35 has a gravel surface and is 200m long and 5m wide. The one remaining gravel taxiway located at the north end of the aerodrome provides access to runway 05/23 and is 5m wide.

**Primary taxiway accessing terminal apron**

**Taxilane accessing hangars**

The taxilanes provided as access to the hangars have a bitumen sealed pavement 3.6m wide. The taxilane adjacent to the Aero Club is 115m long and then changes direction to the south and continues another 65m. The taxilane to the four northern hangars is also 3.6m wide and crosses a drainage pipe with headwalls that are 7.2m wide. An area of 10mm asphalt extends the length of the northern hangars out to the taxilane pavement.

### Aprons

Terminal Apron: This apron is approximately 40m x 35m (1,400m2) and is situated directly adjacent to the terminal building. The pavement surface is a bitumen seal with 5mm aggregate. The main purpose of this apron is for the parking of the Air Ambulance King Air 200 operated by the RFDS. The apron can also be used by itinerant aircraft for loading and unloading of passengers. There are no aircraft markings on the apron. One floodlight is located adjacent to the apron for night operations.

Refuelling Apron: This apron is situated north of the terminal apron and is approximately 40m x 40m (1,600m2). The pavement surface is a bitumen seal with 5mm aggregate. There is only one yellow painted line on the apron which indicates to pilots that the area in front of the fuel bowser is restricted to aircraft refuelling.

Aircraft Parking Apron: This apron is situated south of the terminal apron and is approximately 76m x 74m (5,600m2). The pavement surface is a bitumen seal with 5mm aggregate. Two areas for aircraft parking with cable tie-downs are uniformly spaced either side of the centre of the apron. Aircraft taxi through this apron to the gravel apron to access the threshold of runway 35. There are no aircraft markings on the apron.

### Buildings

The terminal building is the only building on the site owned by the Shire of Campaspe and comprises an open area of 85m2 with some tables and chairs for the use of waiting passengers. In addition the building contains male and female toilets, a small kitchen and two offices.

The Echuca Aero Club has clubrooms and two hangars situated north of the terminal building. There are eight additional hangars on the site; all privately owned. Other buildings on the site are a small shed containing maintenance equipment used on the aerodrome and a small shed utilised by an agricultural spraying contractor.

### Other Facilities

The aerodrome has one refuelling facility owned and operated by the Echuca Aero Club and comprises a 30,000 litre underground tank which dispenses Avgas through a bowser situated adjacent to the refuelling apron. No Jet A1 fuel is available at the aerodrome.

A Non-Directional Beacon (NDB), owned by the Shire of Campaspe, is situated south of the terminal building. This navigational aid is maintained by Airservices Australia under contract.

**Fuel bowser and underground tank**

**Non-directional beacon**

Echuca Aerodrome has a Weather Station located south of the terminal building which does not provide information directly to pilots.

There is a small gravel carpark which has the capacity to park up to eight vehicles that is situated adjacent to the terminal building. A larger carpark with a capacity of up to 20 vehicles is associated with the Aero Club south of the Aero Club building.

## 2.2 Surrounding Land

The following surrounds the Echuca Aerodrome:

North: Industrial land, specifically the Cornelia Creek Industrial Estate. This land is currently zoned Industrial 1 Zone.

East: The land east of the Echuca Aerodrome is used for a variety of purposes, including industrial, farming and residential. This land is zoned Industrial 1 Zone, Farming Zone and Rural Living Zone.

West: Old Aerodrome Road and the Melbourne-Murray River Railway are situated immediately west of the subject site, zoned Public Use Zone 4 - Transport. Land zoned Low Density Residential Zone, Residential 1 Zone and Floodway Zone is located in the aerodrome's wider context.

South: The land south of the subject site is used for agricultural purposes, zoned Farming Zone.

It is noted that Echuca-Kyabram Road is a Road Zone – Category 1 (VicRoads road).

The Echuca South East Industrial and Commercial Growth Corridor Land Strategy is currently being prepared by Centrum Planning. This project seeks to identify long term opportunities for the growth of industry and business in Echuca. The project's study area comprises land located within, and in the vicinity of, the Echuca Aerodrome. Accordingly the outcomes of Echuca South East Industrial and Commercial Growth Corridor Land Strategy will have significant ramifications for the future development of the aerodrome site.

# 3 Planning Context and Criteria

An understanding of the regional economy and the drivers of economic growth in the region is an important contextual consideration for this study. In addition, a number of policies, controls and criteria that relate to the future use and development of the Echuca Aerodrome also need to be considered. This comprises provisions from the Campaspe Planning Scheme, local planning strategies, environmental requirements and CASA regulations. As this is the first strategic plan for the Echuca Aerodrome, it is important to understand this underlying economic and planning policy context to determine any land use issues and development constraints relevant to the achievement of the Master Plan objectives.

## 3.1 Regional Economy

This section provides an economic analysis of the Echuca Region and the issues affecting future economic development.

### 3.1.1 Overview – Regional Economic Development

Echuca and the Campaspe Region, like other regions in the Murray Darling Basin, is facing a number of challenges. These challenges relate to: the impact of environmental factors (especially water); population trends and future demand for services; maintaining industries and jobs in the region; developing new areas of employment; and retaining young people.

Key environmental issues include: the impacts of drought and climate change on water availability; and the current and future use of agricultural land in the region. These issues are of major importance because of the scale of agribusiness and related food processing operations in Campaspe (at Echuca, Kyabram, Rochester and Tongala).

Major industry issues for the region include: maintaining and developing the food processing and related manufacturing and logistics activities; continuing to develop the tourism sector; the impacts of global economic conditions (and the GFC) on export demand, prices and credit availability in the food sector; the continuing restructuring of the dairy industry; and the pressures on local businesses from the economic slowdown.

Continued population growth will drive the demand for services, and in combination with the industry factors will have some influence on future requirements for industrial land requirements in the region.

### 3.1.2 Structure of the Regional Economy

#### a. Campaspe Shire

In examining the context for the future of the aerodrome, it is important to understand the role that Echuca plays in the broader regional economy.

Campaspe Shire has a population of 37,769 and includes the towns of Echuca, Kyabram, Rochester, Rushworth, Tongala and a number of smaller centres. The major centre Echuca is located 180 kilometres north of Melbourne, on the Victoria/New South Wales border. The Shire has experienced continued population growth, with much of this growth being in Echuca.

Agriculture and manufacturing (mainly food processing) are key sectors in the Campaspe Shire and account for almost one third of jobs. These two sectors account for 4700 jobs out of a total in the Shire of 14,505 jobs. When the other activities that support food processing and agriculture are

taken into account (eg. engineering, packaging, equipment manufacturing and maintenance services, transport and logistics), the importance of these sectors is magnified.

- Agribusiness (17% of regional jobs) includes: dairying, cropping; tomatoes, cereals, vegetables, viticulture, sheep / wool; and beef cattle.
- An analysis of jobs data for the Echuca Statistical Local Area (SLA), which includes Echuca, Kyabram and Rochester, showed a total of 560 food processing jobs of a total of 983 manufacturing jobs.[1] The major food processors located in the Echuca area are: Cedenco, Simplot, Fonterra (Echuca), Heinz (Echuca) and Murray Goulburn is located at Rochester. Other plants in the broader Campaspe Region are Fonterra (Stanhope), Nestle (Tongala) and Heinz (Girgarre).

Agribusiness and the food sector are experiencing pressure from drought and water allocations and from slower export demand as a result of global economic conditions. The dairy industry continues to undergo restructuring and modernisation. The food processing sector has undergone considerable change over the last decade, with the acquisition of major brands and manufacturing capacity by the large processors, including those located in the Campaspe Region.

Tourism has developed significantly over the last 20 years and is a major regional industry, which is focused mainly on Echuca/Moama and the Murray River. Tourism will continue to be a major activity. It is currently experiencing some pressures from the current weaker economy and competition from other locations. The industry is positioning itself for future long term growth through new marketing strategies and investment in facilities.

[1] Echuca SLA ABS Census 2006 (Working Population Data). The Echuca SLA had a total of 6462 jobs.

**Table 1. Jobs by Industry - Campaspe LGA 2006**

| Campaspe LGA Employment 2006 | | | | |
|---|---|---|---|---|
| **Industry** | **Male** | **Female** | **Persons** | **Share %** |
| **Goods Producing** | | | | |
| Agriculture, Forestry & Fishing | 1,638 | 769 | 2,407 | 16.6 |
| Mining | 0 | 7 | 7 | 0.0 |
| Manufacturing | 1,759 | 538 | 2,297 | 15.8 |
| Electricity, Gas & Water Supply | 80 | 0 | 80 | 0.6 |
| Construction | 661 | 123 | 784 | 5.4 |
| **Total Goods Producing** | **4138** | **1437** | **5575** | **38.4** |
| **Goods Related Services** | | | | |
| Wholesale Trade | 391 | 133 | 524 | 3.6 |
| Transport, Postal and Warehousing | 394 | 118 | 512 | 3.5 |
| **Total Goods Related** | **785** | **251** | **1036** | **7.1** |
| **Business & Knowledge based** | | | | |
| Information Media and Telecommunications | 49 | 54 | 103 | 0.7 |
| Finance and Insurance Services | 106 | 205 | 311 | 2.1 |
| Rental, Hiring and Real Estate Services | 92 | 106 | 198 | 1.4 |
| Professional, Scientific and Technical Services | 188 | 252 | 440 | 3.0 |
| Administrative and Support Services | 97 | 127 | 224 | 1.5 |
| **Total Business and Knowledge Based** | **532** | **744** | **1276** | **8.8** |
| **Government & Defence** | | | | |
| Government Administration & Defence | 240 | 280 | 520 | |
| **Total Government Administration & Defence** | **240** | **280** | **520** | **3.6** |
| **In Person Service industries** | | | | |
| Accommodation, Cafes & Restaurants | 296 | 498 | 794 | 5.5 |
| Retail Trade | 787 | 1,179 | 1,966 | 13.6 |
| Education & Training | 276 | 760 | 1,036 | 7.1 |
| Health & Social Assistance | 227 | 1,336 | 1,563 | 10.8 |
| Arts & Recreational Services | 50 | 82 | 132 | 0.9 |
| Other Services | 273 | 240 | 513 | 3.5 |
| **Total In Person Service Industries** | **1,909** | **4,095** | **6,004** | **41.4** |
| Inadequately described | 44 | 37 | 81 | 0.6 |
| Industry of employment not stated | 3 | 10 | 13 | 0.1 |
| **Total** | **7,651** | **6,854** | **14,505** | **100.0** |

Source: ABS Census Data 2006 (Working Population)

## b. Regional Characteristics – Echuca/Moama

### Echuca/Moama

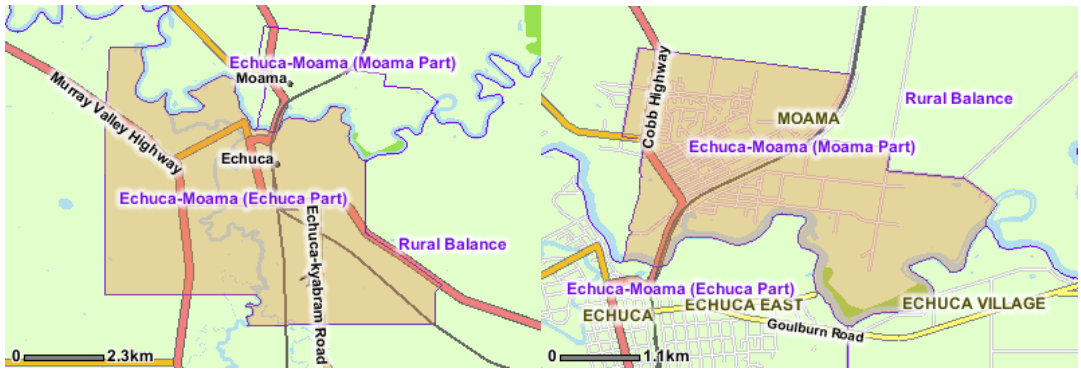
From economic development and industrial land requirements perspectives, it is important to examine the Echuca/Moama cluster.

The twin towns of Echuca/Moama have been important for economic development, for tourism and for Echuca's role as a regional service centre. They are a major contributor to the population growth that has been experienced. With its strategic location Echuca, has developed as a significant regional centre for retail, business services, professional services, health services and government services.

Echuca's location is of strategic importance. It is the closest point to Melbourne on the Murray River, which has been a major factor in the development of the short stay tourist market. In combination, Echuca and Moama provide significant tourism accommodation. Echuca is the major city in an agribusiness and food processing region, and acts as a regional hub for a broader cross border region.

## Population

Together Echuca/Moama is a significant centre, with Echuca accounting for almost 80% of regional population and employment.




Echuca/Moama had a total population of 15,688 in 2006, with 12358 or 79% of these persons being resident in Echuca.

**Table 2. Echuca/Moama Population 2006**

| Population 2006 | | | | |
|---|---|---|---|---|
| | Males | Females | Persons | % |
| Echuca | 5,917 | 6,441 | 12,358 | 78.8 |
| Moama | 1,607 | 1,723 | 3,330 | 21.2 |
| Echuca /Moama | 7,524 | 8,164 | 15,688 | 100.0 |

Source: ABS Census 2006 Resident Population Data

There are some differences between the two areas in terms of population characteristics. The population of Moama is older, and as a consequence, there is a lower labour force participation rate due to a higher percentage of retired persons.

**Table 3. Selected Population Characteristics – Echuca/Moama**

| | Echuca | | | Moama | | | Echuca/Moama | | |
|---|---|---|---|---|---|---|---|---|---|
| | Males | Females | Persons | Males | Females | Persons | Males | Females | Persons |
| Persons aged 15 years and over | 4,538 | 5,151 | 9,689 | 1,330 | 1,449 | 2,779 | 5,868 | 6,600 | 12,468 |
| Population All persons | 5,917 | 6,441 | 12,358 | 1,608 | 1,723 | 3,331 | 7,525 | 8,164 | 15,689 |
| **Share** | | | **78.8** | | | **21.2** | | | **100** |
| Labour force status(a): | | | | | | | | | |
| Employed, worked full-time(b) | 2,181 | 1,102 | 3,283 | 573 | 256 | 829 | 2,754 | 1,358 | 4,112 |
| Employed, worked part-time | 464 | 1,337 | 1,801 | 130 | 337 | 467 | 594 | 1,674 | 2,268 |
| Employed, away from work(c) | 189 | 155 | 344 | 43 | 49 | 92 | 232 | 204 | 436 |
| Unemployed, looking for work | 124 | 146 | 270 | 41 | 38 | 79 | 165 | 184 | 349 |
| *Total labour force* | *2,958* | *2,740* | *5,698* | *787* | *680* | *1,467* | 3,745 | 3,420 | 7,165 |
| **Share** | | | **79.5** | | | **20.5** | | | |
| Not in the labour force | 1,301 | 2,096 | 3,397 | 430 | 682 | 1,112 | 1,731 | 2,778 | 4,509 |
| % Unemployment(d) | 4.2 | 5.3 | 4.7 | 5.2 | 5.6 | 5.4 | 4.4 | 5.4 | 4.9 |
| % Labour force participation(e) | 65.2 | 53.2 | 58.8 | 59.1 | 46.9 | 52.8 | 63.8 | 51.8 | 57.5 |
| % Employment to population(f) | 62.4 | 50.4 | 56.0 | 56.1 | 44.3 | 49.9 | 61.0 | 49.0 | 54.7 |

Source: ABS Census 2006 Resident Population Data

### Employment by Industry

A total of 6817 residents of Echuca/Moama were in employment in 2006.

- Manufacturing is a major sector of employment for these Echuca/Moama residents and accounted for 1002 jobs or 15% of their jobs. The major areas of manufacturing employment were in food processing (492), metal products (105) and machinery (67). Manufacturing along with construction, transport and wholesale generate the major requirements for industrial space.
- The service role of the area is reflected in the dominance of other sectors: retail (960 or 14% of employment); accommodation & food services (820 or 12%); health care and social assistance (723 or 11%). Reflecting the population growth and related building activity, construction comprised 625 jobs or 9%.

**Table 4. Employed Persons by Industry – Echuca / Moama**

| Employed Persons 2006 | Echuca | | Moama | | Echuca Moama | |
|---|---|---|---|---|---|---|
| **Industry** | **Persons** | **%** | **Persons** | **%** | **Persons** | **%** |
| Agriculture, forestry & fishing | 134 | 2.5 | 55 | 4.0 | 189 | 2.8 |
| Mining | 10 | 0.2 | 4 | 0.3 | 14 | 0.2 |
| **Manufacturing** | **817** | **15.1** | **185** | **13.3** | **1,002** | **14.7** |
| Electricity, gas, water & waste services | 41 | 0.8 | 9 | 0.6 | 50 | 0.7 |
| **Construction** | **500** | **9.2** | **125** | **9.0** | **625** | **9.2** |
| Wholesale trade | 147 | 2.7 | 36 | 2.6 | 183 | 2.7 |
| **Retail trade** | **771** | **14.2** | **189** | **13.6** | **960** | **14.1** |
| **Accommodation & food services** | **602** | **11.1** | **218** | **15.7** | **820** | **12.0** |
| Transport, postal & warehousing | 194 | 3.6 | 64 | 4.6 | 258 | 3.8 |
| Information media & telecommunications | 58 | 1.1 | 16 | 1.2 | 74 | 1.1 |
| Financial & insurance services | 106 | 2.0 | 22 | 1.6 | 128 | 1.9 |
| Rental, hiring & real estate services | 103 | 1.9 | 25 | 1.8 | 128 | 1.9 |
| Professional, scientific & technical services | 171 | 3.2 | 43 | 3.1 | 214 | 3.1 |
| Administrative & support services | 116 | 2.1 | 35 | 2.5 | 151 | 2.2 |
| Public administration & safety | 225 | 4.1 | 41 | 2.9 | 266 | 3.9 |
| **Education & training** | **401** | **7.4** | **61** | **4.4** | **462** | **6.8** |
| **Health care & social assistance** | **583** | **10.7** | **140** | **10.1** | **723** | **10.6** |
| Arts & recreation services | 92 | 1.7 | 37 | 2.7 | 129 | 1.9 |
| Other services | 225 | 4.1 | 48 | 3.5 | 273 | 4.0 |
| Inadequately described/Not stated | 130 | 2.4 | 38 | 2.7 | 168 | 2.5 |
| **Total** | **5,426** | **100.0** | **1,391** | **100.0** | **6,817** | **100.0** |

Source: ABS Census 2006 (Resident Population Data)

The following table shows employed persons by age group. Reflecting the population structure employed persons, who are resident in Moama tended to be older than those in resident in Echuca.

**Table 5. Employed Persons by Age – Echuca Moama Region**

| | 15-19 years | 20-24 years | 25-34 years | 35-44 years | 45-54 years | 55-64 years | 65-74 years | 75-84 years | 85 years and over | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Echuca | 462 | 461 | 1,055 | 1,340 | 1,273 | 706 | 109 | 12 | 6 | 5,424 |
| Share % | 8.5 | 8.5 | 19.5 | 24.7 | 23.5 | 13.0 | 2.0 | 0.2 | 0.1 | 100.0 |
| Moama | 102 | 105 | 308 | 284 | 316 | 226 | 44 | 6 | 0 | 1,391 |
| Share % | 7.3 | 7.5 | 22.1 | 20.4 | 22.7 | 16.2 | 3.2 | 0.4 | 0.0 | 100.0 |
| Echuca Moama | 564 | 566 | 1,363 | 1,624 | 1,589 | 932 | 153 | 18 | 6 | 6,815 |
| Share % | 8.3 | 8.3 | 20.0 | 23.8 | 23.3 | 13.7 | 2.2 | 0.3 | 0.1 | 100.0 |

Source: ABS Census 2006 (Resident Population Data)

### 3.1.3 Economic Drivers and Their Impacts

The major drivers of future growth in the Echuca area are: population growth; its regional service role; agriculture and food processing; and tourism. The outlook will also depend on the retention of existing businesses and the attraction of new businesses. All of these factors will be important for the future growth of Echuca and for employment patterns. Growth in the region will have implications for commercial, retail and industrial land requirements.

#### a. Population Growth

**Echuca has experienced continued population growth.**

Echuca is an area that is projected to have continuing population growth. This is being driven by a number of factors: a sponge city effect as persons are attracted from rural areas and from the smaller towns; a tree change effect as people are attracted to Echuca for lifestyle reasons (families) and for retirement (most of these people are attracted from Melbourne). This population driven growth will increase demand for a range of services (retail, health, other services, construction) and will increase the regional demand for industrial land for light industrial uses.

Campaspe Shire's population increased by 6.5% between 1996 and 2006, with much of this growth occurring in the Echuca area. Recent projections show continued growth in the population.

**Table 6. Campaspe LGA Population - 1996-2006**

| Age | 1996 Census | | | 2001 Census | | | 2006 Census | | | Persons - Change | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | F | P | M | F | P | M | F | P | 1996-2001 | 2001-2006 | 1996-2006 |
| Campaspe Shire | 17,029 | 16,987 | 34,016 | 17,143 | 17,249 | 34,392 | 18,077 | 18,131 | 36,208 | 376 | 1,816 | 2,192 |

Source: ABS Census Data (Resident Population)

An analysis of census data on changes in place of residence, shows that both Echuca and Moama attract new residents mainly from Victoria.

The Department of Sustainability and Environment prepares population projections for all LGAs. The following are the latest projections to 2026, for selected areas, and these show that Campaspe's population will increase by 5162 between 2006 and 2026. Again much of this growth is expected in the area around Echuca.

**Table 7. Population Projections (Persons) by Selected LGAs - 2006-2026**

| Year to June 30th | 2006 | 2011 | 2016 | 2021 | 2026 | Change 2006-2026 | % change 2006-2026 |
|---|---|---|---|---|---|---|---|
| Mildura (RC) | 51,824 | 53,351 | 54,135 | 54,820 | 55,523 | 3,699 | 7.1 |
| Swan Hill (RC) | 21,285 | 21,672 | 21,803 | 21,949 | 22,091 | 806 | 3.8 |
| **Gannawarra (S)** | **11,665** | **11,553** | **11,330** | **11,070** | **10,810** | **-855** | **-7.3** |
| Greater Bendigo (C) | 96,741 | 106,016 | 115,476 | 125,267 | 134,705 | 37,964 | 39.2 |
| Macedon Ranges (S) | 39,989 | 42,898 | 46,152 | 49,898 | 54,039 | 14,050 | 35.1 |
| Mount Alexander (S) | 17,656 | 18,914 | 20,172 | 21,468 | 22,756 | 5,100 | 28.9 |
| Central Goldfields (S) | 12,739 | 13,180 | 13,566 | 13,957 | 14,401 | 1,662 | 13.0 |
| Loddon (S) | 8,095 | 7,990 | 7,874 | 7,749 | 7,674 | -421 | -5.2 |
| Greater Shepparton (C) | 59,280 | 63,208 | 66,368 | 69,139 | 71,606 | 12,326 | 20.8 |
| **Campaspe (S)** | **37,486** | **39,051** | **40,305** | **41,490** | **42,648** | **5,162** | **13.8** |
| Mitchell (S) | 32,082 | 37,102 | 42,565 | 48,689 | 55,364 | 23,282 | 72.6 |
| Moira (S) | 27,983 | 29,516 | 30,728 | 31,859 | 32,964 | 4,981 | 17.8 |
| **Regional Victoria** | **1,383,937** | **1,466,939** | **1,545,995** | **1,628,058** | **1,711,142** | **327,205** | **23.6** |

Source: Department of Sustainability and Environment - *Victoria in Future 2008*

### b. Regional Centre Role

**Echuca's role as a regional centre drives service demand and requirements for commercial and industrial land, beyond that required to service its own resident population.**

Echuca benefits from broader regional economic trends as it acts as a service centre for much of Campaspe Shire, for Moama and for other areas of Murray Shire. This is reflected in the significant number of jobs in retail, business services, health and education, construction and light industrial activities.

### c. Agribusiness and Processing

**Agribusiness and food processing remain critical for the current and future economy.**

- Agriculture and the food sector: the Campaspe Shire and Echuca have been important areas for the food processing sector - mainly dairy products, tomato processing and vegetables.
- The food sector is a major area of direct employment in the region and has a number of supply chain linkages covering packaging manufacturing; engineering services; and transport and logistics.
- It is located in the area because of the access to agricultural and horticulture products. A significant reduction in this sector would have major negative impacts on the region, in terms of employment and regional income.

### d. Tourism

**Echuca has developed a significant tourism sector but there is a need to act to strengthen the market**.

Echuca/Moama has been successful in developing its tourism sector. A key issue will be maintaining the sector and refocusing it, in what are competitive state and national markets.

- Echuca is accessible to Melbourne and this has been the major market for the short stay market (breaks and events).
- The tourism sector indicates that the market position has been slipping and there has been limited investment in the sector in recent years. The recent GFC has added to these pressures and has forced some changes in ownership of significant business assets and led to some redevelopment occurring. Significant investment in the sector is being planned and this includes refurbishment plans for the wharf.
- A comparison is made with Mildura, which has opened up it markets by positioning itself as a food region. It is serviced by flights which have opened up the market from Melbourne and Sydney.
- The tourism sector sees tapping the Sydney market as important for future growth. This will require some flights into the region. A Sydney/Albury/Echuca/Mildura connection was seen by some in the industry as one option. However it is recognised that the Echuca Aerodrome cannot take larger aircraft, without substantial investment in runway extensions and upgrades.
- Strategies are being developed to refocus the market to generate future growth.

**e. Impacts of Recession**

**The region is being affected by the recession and by industry restructuring.**

The current recession has led to some weakening in business activity, some job losses and an increase in unemployment in the region (in all areas of Campaspe and in adjacent LGAs).

Over the medium term, Echuca and the Campaspe Region has also been affected by restructuring in the food processing sector over the last decade.

From a skills perspective, the economic slow down has taken pressure off some of the industry skill shortages that were being experienced in 2006-2008. Regional shortages have tended to be in areas of professions (especially health) and trades (construction and metals and engineering) and sectors including tourism, transport and dairy). However with a reduction in training activity, some of these skill pressures will again emerge in the recovery phase.

The following table provides estimates of unemployment for December 2007 and December 2008 (latest available) for the region [2]. The data shows that: the Shires tended to have unemployment rates lower than the State average in 2007. By December 2008, this situation was changing, with unemployment rates increasing substantially between 2007 and 2008 (including all areas in Campaspe Shire).

This trend largely reflects the impacts of the recession during the second half of 2008. Other adjacent areas have also experienced a significant increase in unemployment over the period.

[2] *Small Area Labour Market Data, December Quarter 2008*, Department of Education, Employment and Workplace Relations.

**Table 8. Unemployment (Persons) – Campaspe LGA and Selected SLAs - Dec 2007 and Dec 2008**

| Map Reference | Statistical Local Areas (SLAs) | Unemployment Rate % | Unemployed Persons | Unemployment Rate % | Unemployed Persons | Labour Force |
|---|---|---|---|---|---|---|
| ID | Name | Dec-07 | Dec-07 | Dec-08 | Dec-08 | Dec-08 |
| 1 | Campaspe (S) – Echuca | 3.1 | 179 | 5.0 | 272 | 5449 |
| 2 | Campaspe (S) – Kyabram | 2.7 | 189 | 4.1 | 271 | 6580 |
| 3 | Campaspe (S) – Rochester | 2.3 | 108 | 3.3 | 146 | 4469 |
| 4 | Campaspe (S) – South | 3.1 | 60 | 4.6 | 84 | 1815 |
| | **Total Campaspe (S)** | **2.9** | **536** | **4.2** | **773** | **18313** |
| | Gannawarra (S) | 3.8 | 253 | 4.0 | 264 | 6542 |
| 5 | Gr. Shepparton (C) – Pt A | 4.5 | 1091 | 6.9 | 1599 | 23115 |
| 6 | Gr. Shepparton (C) – Pt B East | 1.4 | 35 | 1.9 | 46 | 2429 |
| 7 | Gr. Shepparton (C) –Pt B West | 2.7 | 131 | 3.8 | 180 | 4678 |
| 8 | Moira (S) – East | 3.0 | 121 | 5.0 | 192 | 3871 |
| 9 | Moira (S) – West | 2.8 | 276 | 4.5 | 418 | 9342 |
| **n/a** | Victoria | 4.6 | 127500 | 4.8 | 133900 | - |

Sources: (1) Small Area Labour Market Data, December Quarter 2008, Department of Education, Employment and Workplace Relations (Smoothed Series) (2) Labour Force Australia, ABS May 2009 Labour force is defined broadly as all persons either working, or actively seeking and available to start work.

### f. Industrial Land Requirements

A major issue is the future requirements for industrial land and where these requirements can be accommodated.[3]

As part of the next stage of this project, Buchan Consulting will be examining the future requirements for industrial space that will be driven by population growth and by potential industry growth.[4] This analysis will be linked to the other research that is being undertaken by Centrum Planning for the Industrial Strategy.

The current pattern of industrial land use comprises:

- The occupation of large sites by the food processors and medium sites by some of the linked industries (eg. engineering and packaging).
- The current industrial areas provide for a mix of light industrial activities that are associated with servicing the regional industry mix and the regional population in a growth area. This includes construction related activities (building products, builders); automotive services (repairs, servicing, tyres, trailers); engineering businesses; transport and storage; wholesalers; farm products; and some highway retail.

[3] Issues in relation to the development of the industrial areas are being undertaken in a separate project by other planning consultants.

[4] Based on recent site visits, Buchan is compiling a data base on businesses by location in the industrial areas.

## 3.2 Campaspe Planning Scheme

This section outlines the relevant planning policies and controls contained within the Campaspe Planning Scheme that are relevant to the future use and development of land within the study area. These policies and controls will need to be considered during the preparation of the Master Plan.

### 3.2.1 State Planning Policy Framework (SPPF)

The following State Planning Policies are relevant to the Echuca Aerodrome Master Plan Project:

**Clause 15 – Environment**

Clause 15.01 – Protection of catchments, waterways and groundwater

The objective of this clause is:

"*To assist the protection and, where possible, restoration of catchments, waterways, water bodies, groundwater, and the marine environment*".

Clause 15.05 – Noise Abatement

The objective of this clause is:

"*To assist the control of noise effects on sensitive land uses*".

Clause 15.09 – Conservation of native flora and fauna

The objective of this clause is:

*"To assist the protection and conservation of biodiversity, including native vegetation retention and provision of habitats for native plants and animals and control of pest plants and animals".*

**Clause 17 – Economic Development**

Clause 17.03 – Industry

The objective of this clause is:

"*To ensure availability of land for industry and to facilitate the sustainable development and operation of industry and research and development activity*".

Clause 17.04 – Tourism

The objective of this clause is:

*"To encourage tourism development to maximise the employment and long-term economic, social and cultural benefits of developing the State as a competitive domestic and international tourist destination".*

**Clause 18 – Infrastructure**

Clause 18.04 – 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.*

Clause 18.09 – Water supply, sewerage and drainage

The objective of this clause is:

*To plan for the provision of water supply, sewerage and drainage services that efficiently and effectively meet State and community needs and protect the environment.*

### 3.2.2 Local Planning Policy Framework

The Campaspe Municipal Strategic Statement (MSS) does not explicitly make reference to the Echuca Aerodrome.

It does however refer to the importance of protecting the Shire's natural assets and properly managing environmental threats. Importantly, Clause 21.04-2 seeks to ensure that new uses and developments:

- *Are located on land that has the capability to sustain the development;*
- *Do not impact on significant native vegetation or habitat;*
- *Includes appropriate revegetation and tree planting programs;*
- *Do not impact on adjoining environmentally sensitive areas;*
- *Meet approved guidelines for soil erosion control;*
- *Locate land-based effluent disposal systems in appropriate locations;*
- *Is undertaken in accordance with Salinity Management Plans and Nutrient Management Plan Guidelines; and*
- *Are undertaken in accordance with the Guidelines for the Protection of Water Quality (2001).*

The MSS acknowledges the importance of industry and agricultural sectors to the prosperity of the Shire. Clause 21.04-3 also refers to the significance and growth of the tourism industry to the municipality. Importantly, Council encourages the development of new tourist attractions and services throughout the Shire to complement the existing tourist enterprises and further the economic well being of the community through the creation of employment opportunities and wealth.

### 3.2.3 Zoning Controls

The subject site is zoned Public Use Zone 4 – Transport (PUZ4) under the Campaspe Planning Scheme. The purpose of this zone is:

- *To recognise public land use for public utility and community services and facilities.*
- *To provide for associated uses that are consistent with the intent of the public land reservation or purpose.*

The site's current zoning may be appropriate for a fully Council owned and operated aerodrome. However, as previously discussed, a number of privately owned allotments are located on the subject site and within the Public Use Zone. This could be considered contrary to the intent and objectives of the Public Use Zone 4 – Transport. Moreover, if non-aviation development is proposed on parts of the site not required for aviation purposes, an alternative zone will need to be considered for these areas. Accordingly, consideration will be given to a more appropriate future zoning for this site, or parts of the site, as part of the Master Plan. This matter is discussed further in Section 4.5.

### 3.2.4 Overlay Controls

The following overlay controls apply to the Echuca Aerodrome Master Plan site. The land affected by these overlays is shown on the plan at Appendix A.

**Land Subject to Inundation Overlay**

A portion of the subject site is affected by the Land Subject to Inundation Overlay (LSIO). The purpose of this overlay is:

- *To identify land in a flood storage or flood fringe area affected by the 1 in 100 year flood or any other area determined by the floodplain management authority.*
- *To ensure that development maintains the free passage and temporary storage of floodwaters, minimises flood damage, is compatible with the flood hazard and local drainage conditions and will not cause any significant rise in flood level or flow velocity.*
- *To reflect any declaration under Division 4 of Part 10 of the Water Act, 1989 where a declaration has been made.*
- *To protect water quality in accordance with the provisions of relevant State Environment Protection Policies, particularly in accordance with Clauses 33 and 35 of the State Environment Protection Policy (Waters of Victoria).*

The LSIO traverses the centre of the subject site. It is important that the Master Plan appropriately acknowledges and responds to the susceptibility of this land to flooding.

**Floodway Overlay**

A portion of the subject site is affected by the Floodway Overlay (FO). The purpose of this overlay is:

- *To identify waterways, major flood paths, drainage depressions and high hazard areas which have the greatest risk and frequency of being affected by flooding.*
- *To ensure that any development maintains the free passage and temporary storage of floodwater, minimises flood damage and is compatible with flood hazard, local drainage conditions and the minimisation of soil erosion, sedimentation and silting.*
- *To reflect any declarations under Division 4 of Part 10 of the Water Act, 1989 if a declaration has been made.*
- *To protect water quality and waterways as natural resources in accordance with the provisions of relevant State Environment Protection Policies, and particularly in accordance with Clauses 33 and 35 of the State Environment Protection Policy (Waters of Victoria).*

The FO applies to the south-eastern corner of the subject site. It is important that the Master Plan appropriately acknowledges and responds to the susceptibility of this land to flooding.

### 3.2.5 Other Planning Controls

The following other planning controls are relevant to the Echuca Aerodrome Master Plan Project.

**Clause 52.17 – Native Vegetation**

The purpose of this Particular Provision is to protect and conserve native vegetation and to reduce the impact of land and water degradation and provide habitat for plants and animals. In particular, this clause aims to achieve the following objectives:

- *To avoid the removal of native vegetation.*

- *If the removal of native vegetation cannot be avoided, to minimise the removal of native vegetation through appropriate planning and design.*
- *To appropriately offset the loss of native vegetation.*
- *To provide for the management and removal of native vegetation in accordance with a property vegetation plan.*
- *To manage vegetation near buildings to reduce the threat to life and property from wildfire.*

In accordance with the provisions of Clause 52.17 – Native Vegetation, a planning permit is required to remove, destroy or lop any native vegetation on the subject site.

It is noted that this planning control seeks to implement *Victoria's Native Vegetation Management – A Framework for Action* (Department of Natural Resources and Environment 2002). A summary of the intent and requirements of this Framework is provided at Section 3.4.3 of this report.

**Airport Environs Overlay**

Although the Airport Environs Overlay does not currently apply in Echuca, the purpose of this planning control is nevertheless relevant to the Echuca Aerodrome Master Plan. The objectives of the Airport Environs Overlay are:

- *To implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.*
- *To identify areas which are or will be subject to high levels of aircraft noise, including areas where the use of land for uses sensitive to aircraft noise will need to be restricted.*
- *To ensure that land use and development are compatible with the operation of airports in accordance with the appropriate airport strategy or master plan and with safe air navigation for aircraft approaching and departing the airfield.*
- *To assist in shielding people from the impact of aircraft noise by requiring appropriate noise attenuation measures in new dwellings and other noise sensitive buildings.*
- *To limit the number of people residing in the area or likely to be subject to significant levels of aircraft noise.*

The outcomes of an Australian Noise Exposure Forecast (ANEF) provide the basis for the application of the Airport Environs Overlay. A discussion of the ANEF issue relevant to the Echuca Aerodrome is included at Section 4.11.

## 3.3 Background Strategies, Plans and Guidelines

### 3.3.1 Campaspe 2020 Plan

Campaspe 2020 Plan provides strategic direction for the growth and development of the townships comprising the Shire over 20 years. The vision for the municipality as articulated in the Plan is:

> *It is the year 2020; Campaspe is a leader of Local Government in Australia.*
>
> *This has been achieved by being responsive to the community's needs by working in partnership with the community and all levels of the government.*
>
> *People choose to live and come to Campaspe because of the lifestyle and opportunities, which are sustainable and challenging.*
>
> *It builds on diversity, is receptive, supports the community and provides opportunity to succeed and develop.*

The objectives and corresponding actions associated with the achievement of this vision relate to five broad themes, namely:

- Servicing people,
- Providing leadership,
- Enhancing environment,
- Encouraging industry, and
- Providing infrastructure.

The Plan details that Echuca is the Shire's largest and most diverse centre which serves local, regional and tourist purposes. In 2007 the Shire had an estimated resident population of 37,769 people however its catchment area is estimated to include over 50,000 people within a 70 kilometre radius. Overall, the city is an important industrial, community, health, recreational and transportation hub for northern Victoria and southern New South Wales.

This is considered to have important implications for the future role and development of the Echuca Aerodrome. As a key piece of infrastructure, the future aerodrome will be important to supporting the growth of the Echuca and its hinterland.

### 3.3.2 Campaspe Council Plan 2009-2013

The Campaspe Council Plan outlines the strategic objectives for the Shire between 2009 and 2013. The plan is set around four key foundations with associated strategic objectives as detailed in the table below.

| Foundation | Strategic Objective |
|---|---|
| Social Environment | Build vibrant communities with strong identities<br>Build social inclusion, especially for people who are isolated<br>Contribute to an efficient social service system with single entry points and clear pathways |
| Economic Environment | Support existing industry maintenance, growth and expansion<br>Plan for industry transition, diversification and change<br>Attract and encourage new investment |
| Natural Environment | Protect our biodiversity and land<br>Respond to climate change<br>Improve water quality and conservation<br>Minimise waste to landfill |
| Built Environment | Develop and use frameworks that improve the built environment for community wellbeing<br>Preserve and enhance public areas and infrastructure to provide safe, accessible and attractive places and facilities<br>When we build or replace community assets, we consider its importance to the community, its affordability and our sustainability |

Of particular relevance to this study is the Council's objective to attract and encourage new investment.

### 3.3.3 Integrated Strategy Plan

The *Integrated Strategy Plan* was adopted by Campaspe Shire Council in 1996. The Plan presents Council's views on broad policy issues and provides a 15 year land use planning framework. It

comprises objectives, policies and actions for reference, consideration and implementation by decision making bodies.

The Planning Vision Statement articulated in the Integrated Strategy Plan is:

> *"The Shire of Campaspe and its residents are working in partnership to ensure the balanced physical, economic and social development of their urban and rural communities. Development and growth of sustainable and viable agricultural, commercial, service, industrial and tourist enterprises is strongly encouraged.*
>
> *Priorities for the Shire of Campaspe and its residents are: the effective management of natural resources, agriculture and the environment; enhancement and promotion of the unique characteristics of the Shire; and the maintenance of a safe and prosperous living environment for existing and future residents."*

Of relevance the Integrated Strategy Plan encourages the protection and management of the environment and advocates that Council is proactive in the maintenance of biodiversity. It also promotes the development of the tourism industry as a means of strengthening social, economic and physical aspects of the Shire.

### 3.3.4 Industrial Estate Development Guidelines

The *Industrial Estate Development Guidelines* for the Cornelia Creek Road Industrial Estate seek to assist the development of industrial areas and encourage economic development in the Shire of Campaspe. These guidelines are relevant to the Echuca Aerodrome Master Plan as the Cornelia Creek Road Industrial Estate adjoins the northern boundary of the subject site. It is noted that Cornelia Creek Road is another name for the road referred to elsewhere in this report as Echuca-Kyabram Road.

These guidelines aim to achieve the following:

- Encouraging good standards of development;
- Providing greater scope for developments which meet market needs and which demonstrate innovative design;
- Achieving consistency in the application of requirements for industrial development throughout the City; and
- Enabling Council to quickly assess permit applications for developments.

The Guide groups design aspects of industrial development into six elements linked to an initial site analysis. The elements seek to provide a method for quality site responsive design. The Elements addressed in the guidelines relate to:

- Plans;
- Site Layout;
- Construction;
- Access and Parking;
- Services; and
- Landscaping, Fences, Sights and Lighting.

## 3.4 Environmental Requirements

### 3.4.1 Register of the National Estate

The Echuca Aerodrome is included on the Register of the National Estate as an 'Indicative Place'. This means:

*Data provided to or obtained by the Australian Heritage Council or the former Australian Heritage Commission has been entered into the database and the place is at some stage in the assessment process. A decision on whether the place should be entered in the Register has not been made.*

The registration relates to:

*Tussock grassland, herbfield or low chenopod shrubland (possibly disclimax). May be dominated by one of many species but most frequently pilose form (DANTHONIA SETACEA). Site at the southern and western extremities appear to be ecotonal.*

It is noted that the National Estate Register was frozen on 19 February 2007 however it will continue as a statutory register until February 2012.

### 3.4.2 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) is the Australian Government's principal piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places - defined in the Act as matters of national environmental significance.

According to Council's Conservation Officer, there are two plants protected by the EPBC Act known to occur at the aerodrome, namely *Sclerolanea Napiformis* (Turnip Copperburr) and *Swainsona Plagiotropis* (Red Swainson-pea).

### 3.4.3 Victoria's Native Vegetation Management – A Framework for Action

*Victoria's Native Vegetation Management – A Framework for Action* (Department of Natural Resources and Environment 2002) was released in 2002. It was developed to implement the objectives of Victoria's Biodiversity Strategy as well as the National Strategy for the Conservation of Australia's Biological Diversity.

The primary goal identified for native vegetation management is the 'reversal, across the entire landscape, of the long-term decline in the extent and quality of native vegetation, leading to a net gain'. Net gain occurs when overall gains in native vegetation are greater than overall losses, and where individual losses are avoided where possible. Accordingly in applying the policy framework, there are three key steps for land managers and owners to address when considering vegetation clearing:

1) Avoid adverse impacts, particularly through vegetation clearance;

2) If impacts cannot be avoided, minimise impacts by careful planning, design and management; and

3) If clearing must occur, the clearing must be offset.

*Victoria's Native Vegetation Management – A Framework for Action* is implemented via Clause 52.17 – Native Vegetation of the Victorian Planning Provisions. It is noted that a planning permit is required to remove native vegetation and the three-step approach described above is an integral part of the decision making process relating to such permits.

## 3.5 Aircraft Planning Criteria

The CASA *Manual of Standards Part 139 - Aerodromes* sets out the relevant aircraft planning criteria.

### 3.5.1 Aerodrome Reference Code

The Aerodrome Reference Code is based on the characteristics of an aeroplane not the aerodrome. Once the critical aeroplane is determined then the aerodrome facilities are designed and built to meet those characteristics. At Echuca Aerodrome no critical aeroplane would have originally been selected and the facilities were built to a general standard and not aircraft specific. The following table indicates the size of aircraft that determine the Aerodrome Reference Code.

**Aerodrome Reference Code**

| 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 |

The above table is copied from the CASA Manual of Standards Part 139, Chapter 2.

### 3.5.2 Determining Runway Length, Width and Strength

A number of aircraft are commonly used in the Australian aviation industry for small passenger operations and for business charter. The majority of passenger operations into regional centres on the eastern seaboard are serviced by turbo prop aircraft with a seating capacity up to 50. The two common aircraft are Dash 8 and SAAB 340.

There are many business aircraft used in Australia but the common aircraft that may wish to operate into Echuca Aerodrome and has in the past is the Canadair Challenger 604 used by the RAAF to transport Federal Parliamentarians within Australia. Cessna Citation/Learjet or similar aircraft are used by many businesses to transport their senior management within Australia. None of these aircraft can operate into Echuca Aerodrome unrestricted in its current configuration. The runway length, width and the current pavement strength limit all these aircraft to operate below their Maximum Takeoff Weight (MTOW).

The Aeroplane Reference Field Length (ARFL) published by aircraft manufacturers for each aircraft type determines the runway length.

**Typical Aircraft Type**

| Aircraft | Seats | ARFL | MTOW (kg) | ACN |
|---|---|---|---|---|
| Dash 8-300 | 50 | 1122 | 18642 | 14 |
| Jetstream 31 | 32 | 1440 | 7000 | 6 |
| Kingair 350 | 12 | 1100 | 6800 | 8 |
| SAAB-340 | 30 | 1220 | 12370 | 8 |
| Metro III | 18 | 991 | 6577 | 10 |
| Challenger 604 | 12 | 1780 | 21500 | 17 |
| Learjet 55 | 8 | 1292 | 9298 | 10 |

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) given to an aircraft by the manufacturer.

Runway width is the final limiting factor that can restrict larger aircraft from operating. Runway 17/35 pavement width at Echuca Aerodrome, although published at 30m, is only 18m wide. Therefore, only Code B and below Code B aircraft can operate at Echuca Aerodrome without applying for a dispensation.

### 3.5.3 Selected Critical Aircraft

For the purpose of this Master Plan the critical aircraft selected is a Dash 8-300. This aircraft can operate at a Code 2B aerodrome and Echuca Aerodrome is built to Code 2B standard. However this does not take into account pavement strength and as Echuca Aerodrome has a PCN of 9, this aircraft would be weight restricted until the pavements were upgraded. It is not expected in the life of this Master Plan that passenger services would operate with Dash 8 aircraft. However, it is important to protect the aerodrome so that expansion can occur to cater for larger aircraft types to operate in the future.

# 4 Master Planning Issues and Opportunities

This section discusses the key issues and opportunities which have arisen from the investigations undertaken to date, and which will need to be addressed by the Echuca Aerodrome Master Plan. The aim will be to develop a strategic direction for the aerodrome, derived from these issues and opportunities, which achieves a balance between aerodrome functions, non-aviation development and various forms of surrounding land use.

## 4.1 Aerodrome Location

The Echuca Aerodrome is conveniently located on Echuca-Kyabram Road, on the south-eastern fringe of Echuca, approximately 3km south of the Echuca CBD. However, as will be outlined in later sections, the current site has a number of issues and constraints which need to be considered when planning for the long term future of the aerodrome. These issues and constraints relate to the location of the site, as well as other matters. Future expansion of the aerodrome (eg. a new east-west runway) and further development of aviation activities on the site will be constrained. The proximity of residential land uses is an issue.

## 4.2 Land Use

The Echuca Aerodrome is currently used for General Aviation purposes (GA). In particular, the predominant use of the facility is for recreational flying and light aircraft purposes. It is noted that the Antique Aircraft Association use the site for their biennial show. It has been suggested by some stakeholders that there may be opportunities to provide further aviation related development activities on the site such as an “airpark”, pilot training facilities and further aviation events. Such opportunities are discussed further in Section 4.8.

Importantly, the outcomes of the consultation workshop with aerodrome users and landowners indicated that there is demand for more GA hangars at the Echuca Aerodrome. This stated demand should be appropriately considered during the master planning process. Restrictions on the use of future hangars should also be considered to minimise potential land use conflicts.

Furthermore, the issues and opportunities analysis has identified surplus land that is not required for aviation purposes and could potentially be developed for non-aviation uses such as industrial or commercial development. Such development could provide funds for improvements to the aerodrome. The Master Plan should ensure that any new land uses established on the site do not adversely impact or impede the primary aerodrome functions or aviation activities undertaken at the Echuca Aerodrome.

The separation of aviation and non-aviation activities should also be considered in the master planning process (ie. separate zones/precincts). In general it is not considered appropriate for non-aviation activities to be located within the aviation zone/precinct. This is supported by the recent decision of the Victorian Civil and Administrative Tribunal to refuse an application for the use of Lot 9 for Motor Vehicle Sales.

## 4.3 Surrounding Land

As previously discussed, there is residential land located west and north of the subject site, as well as rural living land to the east. This existing surrounding land uses place constraints on the use and development of the aerodrome, particularly in terms of future expansion and increased aviation activity.

It was reported during the consultation workshop with aerodrome users and landowners that there have been some complaints associated with aircraft noise in these residential areas, although this did not appear to be a major issue [5]. As there is no current ANEF, it is difficult to determine the exact extent of the off-site noise issue. However, it must be recognised that noise impacts will only increase as aircraft movements increase over time.

The master plan will make recommendations about planning controls applying to the land surrounding the aerodrome. However, for the long term security of the aerodrome, any future residential rezonings or residential development within the vicinity of the aerodrome should be very carefully considered.

## 4.4 Land Ownership

The Echuca Aerodrome currently comprises several privately owned subdivided lots, and the Council has plans for further subdivision. It is generally considered that the fragmentation of ownership of the aviation precinct (hangar area) is not sensible or appropriate as this removes a level of control from the Council and can lead to land use issues such as the motor vehicle sales application. Accordingly, the master plan will need to consider whether any further subdivision of the land should occur in the aviation precinct. Rather, future hangars should be developed by the Council and leased to facilitate the establishment of potential future aviation activities on the site and so the Shire retains ultimate control.

The fragmented land ownership further complicates the infrastructure and regulatory compliance issues outlined later in this report (refer to Sections 4.9 and 4.12) because in order to address these matters a number of separate landowners need to be involved. If the Council controlled all of the land, it would certainly simplify the management of these matters. This raises a number of questions. Should the Council buy back all of the privately owned lots, or perhaps just the undeveloped lots? Could a Body Corporate be set up and would this help? What should the management structure be for the aerodrome? These are questions that the master plan will need to address.

In the areas not required for aviation/aerodrome purposes, where the land could potentially be developed for non-aviation purposes such as industrial or commercial development, subdivision and sale of the land could be considered.

Any leasing or sale of the subject land needs to be undertaken in accordance with the terms of the transfer of the land from the Commonwealth to the Shire (dated 14 November 1972) and the Deed between the Echuca Aerodrome Committee of Management and the Commonwealth (dated 5 June 1992). The terms of these documents may place restrictions or requirements on any leasing or sale of the land, and as a result the Council should seek legal advice regarding this matter.

## 4.5 Planning Scheme

The following opportunities and constraints pertaining to the Campaspe Planning Scheme are identified for the Echuca Aerodrome.

### 4.5.1 Municipal Strategic Statement

The Campaspe Municipal Strategic Statement (MSS) does not explicitly make reference to the Echuca Aerodrome. There are opportunities to incorporate the outcomes of the Echuca Aerodrome

[5] While the Aero Club has received noise complaints, no complaints have been lodged with Council.

Master Plan into the MSS, thereby providing strategic support for the recommended future use and development of the subject site.

### 4.5.2 Zoning Controls

The subject site is currently zoned Public Use Zone 4 – Transport. While this supports the "public" operations of the aerodrome itself, it is not appropriate for privately owned lots established on the subject site. Nor does the current zoning support the potential future development of non-aviation uses on the site. Accordingly it is proposed that the master planning process will identify a more suitable zoning for the land, such as the Special Use Zone which applies to the Mildura Airport site.

### 4.5.3 Overlay Controls

To implement the Obstacle Limitation Surfaces (OLS) and thereby ensure that the height of future development on, and in proximity of, the subject site does not adversely impact on or constrain the future operations of the Echuca Aerodrome it may be necessary to apply the Design and Development Overlay. This overlay is currently used at a number of aerodromes in Victoria to implement their OLS through planning scheme controls.

Furthermore it may be prudent to apply the Environmental Significance Overlay or the Vegetation Protection Overlay to protect the existing native grass areas.

It may also be necessary to apply the Airport Environs Overlay to protect future sensitive land uses in proximity of the subject site from noise associated with the aerodrome's activities. As previously noted, however, this overlay control must be based on an ANEF and such an assessment of aircraft noise has not been undertaken for the Echuca Aerodrome.

## 4.6 Environmental Issues

As outlined in Section 3.4, there is existing protected native vegetation known to occur on parts of the aerodrome site. Whilst a large portion of the land is used for agriculture, and will therefore likely be devoid of any native vegetation, the protection of areas of remnant native vegetation will need to be taken into account during preparation of the Master Plan.

The Council is proposing to undertake a full flora and fauna investigation of the site in September 2009 in order to determine the exact extent of native vegetation on the subject land. Nevertheless, it is likely that the Master Plan will need to respond to and provide for the protection of existing native grass areas. The findings of the flora and fauna investigation should be incorporated into the final Master Plan.

It is further noted that the subject site currently accommodates a 1:100 year floodway through the centre of the site as well as a waterway/creek in the south-west corner. These areas are protected by the Land Subject to Inundation Overlay and Floodway Overlay respectively. The Echuca Aerodrome Master Plan should likewise respond to these existing land constraints.

## 4.7 Aircraft Activity Forecast

Master Plans usually include aircraft activity forecasts. Echuca Aerodrome has no historical statistical records of annual aircraft activity. Therefore an estimate only of annual movements and of forecast growth of annual movements has been prepared. The purpose of this estimate is to check that the current aerodrome facilities are adequate for the indicated movements and to indicate the timing for future aerodrome infrastructure development.

The estimate of annual movements is based on information received regarding weekly movements observed by aerodrome staff. A movement is defined as the landing and take-off of one aircraft.

Observed movements are in the range 175 - 225 movements per week which translates to an annual range of movements of between 9,000 and 11,000 per annum. Aircraft movements of this order are common for aerodromes similar in size to Echuca Aerodrome.

Growth in general aviation in Australia has been stable at 1 - 2% per annum for the last twenty years. The Commonwealth Department of Infrastructure produces general aviation activity reports annually verifying this growth trend. The other area of growth in aviation that may occur is with charter operations. Taking into consideration these factors, a 1.5% compound growth rate has been applied for all aircraft activity at Echuca Aerodrome. Applying this growth rate indicates that the forecast movements in the year 2023 could be in the range of approximately 11,000 to 13,500 movements per annum.

The capacity of the current runway and taxiway configuration is much greater than the number of aircraft movements forecast. Therefore there is no requirement to calculate the current busiest peak hour or forecast the busiest peak hour for the next 10-15 years. The current runway configuration has the capacity for handling over 60,000 movements per annum.

## 4.8 Aviation Development

### 4.8.1 Current Aviation Activity

Aviation activity and the use of the aerodrome have been driven by specialist local, regional and some metropolitan demand by light aircraft owners and users. It has not been generated by the major regional drivers of population growth or tourism growth.

The local aviation sector sees conditions as favourable for continued demand for light aircraft use coming out of Melbourne and New South Wales. These users will continue to be the major drivers of growth for aviation in the area and at Echuca Aerodrome specifically.

However, future longer term growth in the broader region may open up the demand for larger commuter flights (for tourism and business) although over the life of this master plan commuter flights are considered unlikely. Furthermore, due to the constraints on the current aerodrome it is considered that, in the longer term, this would require the development of a regional airport that can accommodate larger aircraft.

### 4.8.2 Future Activities

The stakeholders have identified a number of future uses that could drive the development of the current aerodrome.[6] These are:

- The demand for hangars for the storage and protection of aircraft is growing as Melbourne aerodromes are at capacity and are relatively expensive. The next ring of aerodromes such as Ballarat, Bendigo and Shepparton will reach capacity in the next 5 - 7 years and are also increasing charges. Echuca has the land available for future hangar development at a reasonable cost.
- Creating an active tourism facility through establishing it as a base for the Antique Airplane Association through the provision of hangars and facilities, the establishment of an aircraft museum and further aviation events.

[6] These were discussed in the workshop and some individual consultations.

- The increase in the numbers of planes at the aerodrome would increase the demand for aviation engineering services and would generate additional demand for sites.
- Development of other activities including tourist charter flights, pilot training and a parachute school.
- Creation of an "airpark" zone (holiday home and hanger) on the west side of aerodrome.[7]
- There is scope to use the east and/or west sides of the aerodrome for commercial/industrial development.

An increase in these activities could lead to the development of a light aviation industry cluster. The potential scale of activities will be assessed in the next phase of this study.

## 4.9 Assessment of Aerodrome / Aviation Facilities

The aviation facilities at Echuca Aerodrome are suitable for light aircraft below 5,700kg to operate without restriction. Occasionally larger aircraft have utilised the aerodrome for one off operations and training including RAAF C-130, DC3 and the Challenger 604. These aircraft commonly operate into aerodromes of similar size to Echuca and are not an indication of the normal size of aircraft that can operate utilising the aerodrome facilities.

Runway 17/35 as described earlier is a 30m runway with an 18m paved central section. The pavement has many undulations and is holding water in various sections along the length of the runway after rain. This is an indication that the base course of the runway is not of an adequate thickness to withstand movement of the sub-grade. The runway would not have adequate strength to handle operations of aircraft larger than 5,700kg on a regular basis. If the pavement was to be strengthened it would also need to be widened to a minimum of 23m to cater for a greater range of aircraft types.

The runway length is adequate for current aircraft operations and it may be possible to extend the southern end of the runway up to 200m within the existing site. The electrical power line and trees on the southern boundary of the aerodrome would need to be removed for this extension to occur.

The cross grass runway 05/23 can only be used by light aircraft in wind conditions that are favourable to the orientation of the runway. A longer length runway would increase the useability of this runway but it is not possible on the current orientation and location to extend the runway due to obstacle limitation. As other portions of the aerodrome site are subject to other controls including flood mitigation and vegetation protection it is not feasible to change the location of the cross runway.

The land located on the east side of Echuca-Kyabram Road which has been set aside for a possible future east-west runway is separated from the main aerodrome site by the existing Echuca-Kyabram Road and reserve. Given the existence of the road, as well as potential noise sensitivity issues to the west and east, it is not considered feasible to use this land for a future east-west runway.

The primary taxiway is currently constructed to Code B standard but it is noted that the pavement is approximately 9.5m wide and the taxiway edge lights are located too close to the taxiway edge.

[7] It was suggested that there is space for 100 airpark blocks on the west side.

This taxiway should be constructed to 10.5 m wide and the taxiway edge lights must be located outside the edge of the taxiway approximately 1 m from the edge.

**Rwy 17/35 staining from water holding**

**Primary taxiway edge and lighting**

The remaining sealed taxiways should also be widened to 10.5m to meet the minimum requirements for Code B taxiways. The gravel taxiways are adequate for their intended use. However, it was noted that some obstacles, specifically headwalls for drainage pipes located under the taxiways are inside the taxiway strip. The graded portion of a taxiway strip for Code A aircraft is 22m and for Code B 25m. The headwalls are only 12m apart on these gravel taxiways.

The terminal apron is relatively small in dimension and anecdotal evidence provided by the aerodrome users indicated that when a King Air 200 Air Ambulance is parked on the edge of the apron adjacent to the terminal it is not possible for other aircraft to taxi to and from the runway. The single apron floodlight would not meet the standards in MOS Part 139 - Aerodromes, Chapter 9.

The hangar layout that has been adopted only provides 22m between the hangar doors on each side of the taxi lane and a narrow pavement 3.6 m wide is provided as access to the hangars. Any paved areas used for taxiing aircraft should be 7.5m wide as a minimum and the width between the hangar lines should be a minimum of 32.5m for Code A aircraft and preferably 43m wide for Code B aircraft.

The Council owned Non-Directional Beacon (NDB) is working satisfactorily but this particular model of equipment is now nearly 40 years old. The NDB does not require upgrading unless the contractor (Airservices Australia) indicates that the equipment cannot be maintained in the future. Aviation in Australia is moving to the next generation of GPS navigation. This will include more accurate information being provided to pilots enabling them to conduct precision navigation in all weather conditions including precision approaches. When this system is fully implemented NDB's may become redundant.

The timeframe for the introduction of GPS navigation is uncertain, but as it does not require any ground based equipment there would be no cost to Council.

## 4.10 Obstacle Limitation Surfaces

The Obstacle Limitation Surfaces (OLS) are determined by the Aerodrome Reference Code for each runway (see Section 3.5.1). At Echuca Aerodrome runway 17/35 is a Code 2 runway and runway 05/23 is a Code 1 runway. The OLS is surveyed annually by a specialist surveyor and the information is published in ERSA-RDS. In addition an OLS chart has been produced which is current. The OLS contours are shown on the plan at Appendix A.

According to the last OLS survey, there are no significant obstacles in relation to Echuca Aerodrome that penetrate the obstacle free gradients for approach and take-off for all four runway ends.

The OLS needs to be considered in the preparation of the Master Plan to ensure that future development on, and in the vicinity of, the subject site does not adversely impact or constrain the future operations of the aerodrome.

## 4.11 Australian Noise Exposure Forecast

An Australian Noise Exposure Forecast (ANEF) is not being produced as part of this Master Plan. The ANEF system adopted in Australia is a planning tool used to forecast the level of noise generated by aircraft operations at an aerodrome. The level of noise is determined by the size and type of aircraft, the number of movements and whether the movements occur during the day or at night. Wind conditions and runway orientation are also factored into the model that is used to produce the ANEF.

Echuca Aerodrome is only used by light aircraft and due to the low number of aircraft movements these aircraft do not generate sufficient noise for an ANEF to be meaningful. The contours produced by the ANEF model, if one was produced for Echuca Aerodrome, would all likely fall within the aerodrome property, or marginally outside the property, and would be difficult to decipher.

Without an ANEF it is not possible to apply the Airport Environs Overlay.

## 4.12 Infrastructure and Servicing

### 4.12.1 Topography

The site is relatively flat. Open drains are located within the study area and in general terms drain toward the north-west. The majority of the site is open paddocks, with some mature stands of trees within the road reserve. From information provided by Council grades on site were indicated to be in the order of 1:1000-2000.

The Campaspe River is located to the west of the site and flows north toward the Murray River. A creek is located in the south-west corner of the site and flows into the Campaspe River.

### 4.12.2 Geotechnical

The specific geotechnical conditions of the site are unknown, however information provided by Council ('Test Bore Locations') indicates that there is 'Heavy red clay' to a depth of 6m. It is probable that the clays will be expansive and as such building footings will be relatively more expensive.

Further geotechnical investigations are required to better estimate the costs of providing services and site development, but this is beyond the scope of this study.

### 4.12.3 Stormwater Management

Minimal drainage assets were identified within the study area. Swale drains are located along roadways. From drawings received from Council, grated pits, short lengths of underground reinforced concrete pipe, table drains and culverts were identified within the Aerodrome. They are shown to either discharge to swales on Echuca-Kyabram Road or to an open earth drain which flows to the west side of the site (rough mid point) and discharges under the railway line via private property into the Campaspe River.

An open earth drain on the east side of the Aerodrome site currently captures 200l/s from a rural catchment to the east. This is conveyed via a 600mm diameter reinforced concrete pipe that runs under the taxiway and runway.

We understand that there is a shallow detention basin on site, between Bonanza Court and Arrow Court west of the hangars.

The Land Subject to Inundation and Floodway Overlay indicates that land from the hangar and terminal area to the western site boundary and an area near Echuca-Kyabram Road to the south of the study area are subject to inundation. Small areas on the western boundary and in the south-west corner of the subject area are subject to a 1 in 100 year flood. Council has advised that although the Planning Scheme Land Subject to Inundation and Floodway Overlay information is current, inaccuracies have been identified.

Council has advised that they are currently facing challenges with the quality control and quantity of stormwater discharge surrounding the site. Stormwater presently discharges through the open earth drain within the site, or/and through the railway reserve to the west of the site. An existing detention basin with a pump station is located near Reliance Court within the industrial estate north of the site. Upstream drainage from the industrial estate (with flows of up to 580l/s) flow through this detention basin. However, due to the limited capacity of the current drains within the site and in the railway reserve, Council is looking into the possibility of constructing a detention basin in the north-west corner of the Aerodrome site to control these stormwater flows. The construction of this detention basin is limited by vegetation of significance in that vicinity.

Depending on the layout and type of development, pump stations may be required to manage stormwater due to a lack of fall in some areas of the site.

Open swales would match the existing stormwater infrastructure surrounding the site, which consists of table drains, culverts and open drains.

### 4.12.4 Earthworks and Pavements

The nature of the site indicates that a minimal amount of earthworks should be required, in terms of excavation or filling, to achieve acceptable road grades and alignments.

The extent and type of pavements required, if any, would be a function of the type of land uses that are ultimately selected for the site in accordance with this Master Planning process and the existing geotechnical conditions.

### 4.12.5 Power

Plans received from Powercor indicate that there are areas surrounding the site where underground high voltage cable can be found.

**Echuca Aerodrome (Main Site)**

An underground high voltage cable was identified on Despatch Street to the north of the site.

**Possible Future East-West Runway Area**

An underground high voltage cable was identified off Anderson Road to the south-west of the site.

Powercor has advised that there is most likely capacity to supply power to the site if future development were to occur. The developer will generally be liable for costs at the initial stages of

development; however dependent on the level of power usage, Powercor may subsidise these costs.

### 4.12.6 Water Supply and Wastewater

**Water**

Water is currently supplied via rainwater tanks that collect roof runoff. This includes supply to the clubrooms and terminal building. Each of the newer hangars has its own rainwater tank. No mains water reticulation is available in Echuca-Kyabram Road near the hangars or in Old Aerodrome Road.

Water supply at the aerodrome for fire fighting purposes is a significant issue. While each of the newer hangars has its own rainwater tank, the CFA has advised that these tanks are inadequate for the following reasons:

- Inadequate capacity;
- Connections are not compatible with CFA requirements;
- Incorrectly located;
- Incorrect filling supply; and
- No visual means of identifying the level of remaining water.

The aerodrome's current water supply for fire fighting purposes does not meet CFA requirements. The CFA has advised that any future development of the aviation precinct will require new water tanks connected to a reticulated water network. A minimum requirement of two 144KL water tanks has been estimated by the CFA based on the minimum size of the buildings on the site. These water tanks will need to deliver water at pressures of approximately 200kPa, depending on the design of the system. To develop the entire site, the CFA will require a full pump and booster set to be constructed.

The CFA is a Referral Authority for any development and for any requirements within the Building Code of Australia regarding fire.

Plans supplied by Coliban Water indicate that there are water mains to the north-east of the site. These include:

- A 100mm diameter water main along the west side of Echuca-Kyabram Road terminating near its intersection with Scott Road,
- A 150mm diameter water main along Despatch Street, north of the site.

Coliban Water has advised that there are currently no plans to extend the reticulated water network. Coliban Water would allow a developer to extend a water main to the site to meet the needs of new development. The process of extending water networks is managed by Coliban Water, but the full costs would be borne by the developer.

In summary, the site is significantly constrained by a lack of water supply. Should the site be developed to an extent where demand for water increases, a significant amount of infrastructure and associated cost will be required.

**Wastewater**

Council has advised that wastewater on the site is connected to a single septic tank system. This includes wastewater from the clubrooms, terminal buildings and newer hangars.

Plans supplied by Coliban Water indicate that there are gravity sewer mains and sewer rising mains around Despatch Street to the north of the site. The gravity sewer mains are generally 150mm in diameter and the rising sewer mains are generally 200mm in diameter.

Coliban Water has advised that there are currently no plans to extend the reticulated wastewater network. Coliban Water would allow a developer to extend the sewerage system to the site to meet the needs of new development. Should this occur, the full costs would be borne by the developer. It was also noted that new pump station(s) would be required if the sewer mains were to be extended to service the site.

If a fully reticulated system is not constructed, future developments may require the upgrade of the existing septic tank system and/or the addition of new septic tank systems. These developments may be limited to dry industry only due to the limitations of a septic system and the costs associated with wastewater disposal. The areas of land required for disposal of effluent from septic tank systems may also have an impact on the design of any subdivision proposals.

In summary, the site is constrained by a lack of wastewater connection. Should the site be developed to an extent where wastewater flow increases, a significant amount of infrastructure and associated cost will be required.

### 4.12.7 Telecommunications

Plans supplied by Telstra indicate that there is copper cable in the study area along Piper Drive, around the hangars on Taxi Lane and Arrow Court, and south and south-west of Cessna Court. No optical fibre was noted.

Surrounding the site, assets were located along Echuca-Kyabram Road, Old Aerodrome Road and Despatch Street. Stretches of optical fibre were noted along Old Aerodrome Road to the west, Echuca-Kyabram Road and Denmark Road to the north east, and McMillan Road and Newtons Road to the north. Telstra also indicated that there are smaller stretches of optical fibre surrounding the study area.

Telstra has advised that a substantial network extension of conduit and copper cable/optical fibre would be required to increase capacity/provide access to the site. Wireless Broadband and Narrowband is available via the Telstra mobile service.

The costs associated with providing the site with additional telecommunications hard wired capacity are unable to be determined until the telecommunications requirements are known and detailed.

### 4.12.8 Gas

There are no gas easements or assets located **within** the Aerodrome.

**Echuca Aerodrome (Main Site)**

APA Group has a number of assets surrounding the site including:

- A 150mm diameter steel main running at pressures between 200kPa and 515kPa along Echuca-Kyabram Road which increases to 200mm diameter south of the Denmark Road intersection. It continues south past Benson Road.
- A 125mm diameter plastic polyethylene line running at pressures between 200kPa and 515kPa along Despatch Street, off Echuca-Kyabram Road.
- A 200mm main of unknown specification along Echuca-Kyabram Road.

New development within the main site could be serviced by the existing gas infrastructure.

**Possible Future East-West Runway Area**

There are no gas easements or assets located within this area.

APA Group has advised that the gas mains are able to be extended if required. The costs associated with providing the site with an additional supply of gas are unable to be determined until usage requirements are known and detailed.

### 4.12.9 Underground Equipment

No information was received from Shell Environmental Services.

## 4.13 Traffic and Transportation

Traffic routes and intersections currently serving the Echuca Aerodrome provide local and regional connectivity with limited specific provision made for Aerodrome traffic. Regional and interstate traffic to the Aerodrome area are most likely to arrive in Echuca on: the Northern Highway from Melbourne and Bendigo; the Cobb Highway from New South Wales; and on the Murray Valley highway from the west. These key routes are generally high quality regional link routes and connect into the Aerodrome site via key local routes.

The main local routes are: Ogilvie Avenue, a wide two way, two lane (in parts) road with some signal controlled intersections that runs east west from the Northern Highway / Murray Valley Highway; High St, a two way, two lane road through the urban area which links with the Cobb Highway; and Echuca-Kyabram Road, a two way, single lane road running north south past the Aerodrome site to the south of Echuca, with accesses to industrial sites and the Aerodrome. The current access from these major routes to the Aerodrome requires traffic to pass through Echuca on Ogilvie Avenue (and High St if coming from the north) due to the limited crossing points over the railway line.

Currently the intersections between the main routes and the routes themselves are of a high standard; however the intersection between Ogilvie Rd and Echuca-Kyabram Road is noted to be a priority controlled intersection with limited width and storage for turning vehicles. An upgrade of Strathallan Rd, approximately 5km south of the Aerodrome, is being progressed which will provide an east-west link between the Northern Highway and Echuca-Kyabram Road (which links to the Aerodrome). This link will ultimately enable most of the traffic to the Aerodrome and surrounding industrial space to avoid Echuca, thereby providing an opportunity to improve existing access to the subject site and surrounds.

Aerodrome access is presently via Echuca-Kyabram Road. Intersections here are limited with a small service road and site access adjoining the main carriageway. Passing and waiting space here is limited and there is currently no street lighting or other features to visually enhance these intersections.

It is highlighted that there may be potential to further improve access to the Echuca Aerodrome via the reconstruction of Old Aerodrome Road. The development of this road would allow access to the western side of the subject site. Opportunities to facilitate these access arrangements will be addressed through the Master Planning process and should appropriately consider the impact of Old Aerodrome Road on surrounding land use and any existing native vegetation within the road reserve.

The issue of directional signage to the aerodrome through the town and into the site will also be considered.

# 5 Conclusions and Recommendations

This Issues and Opportunities Paper provides a review and analysis of background information relevant to the Echuca Aerodrome as well as an overview of the key issues affecting the site and surrounds which will ultimately shape the development of the ultimate Master Plan. It also outlines some opportunities for the site. This paper will be a key input into the preparation of the Master Plan which is the next phase of the project.

The key issues, opportunities and questions to be considered in the next phase of the study are:

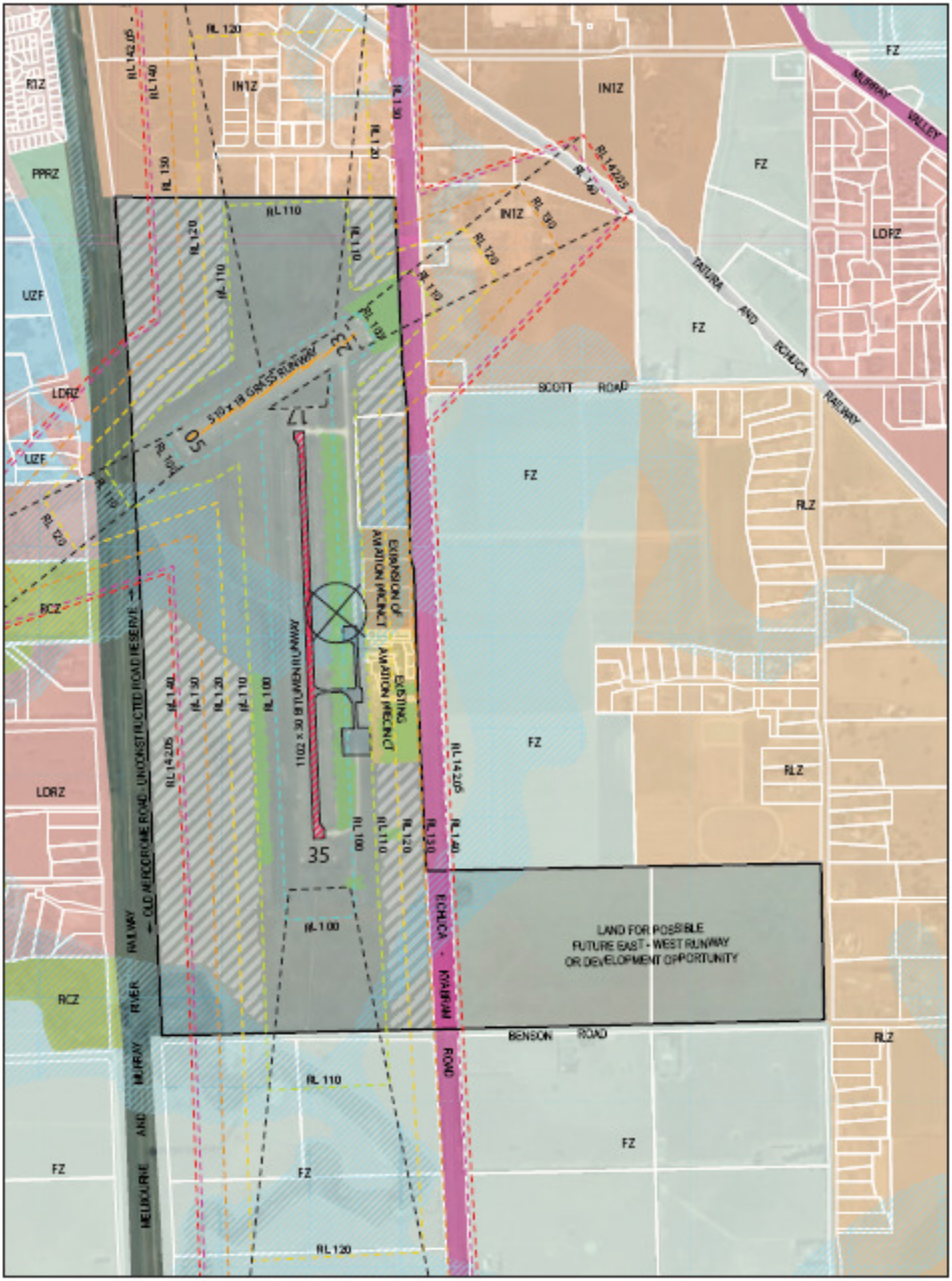
- Expansion of aerodrome facilities (eg. more hangars, longer runway).
- Expansion of aviation activities (eg. charter flights, pilot training).
- Rezoning of the land (eg. Special Use Zone).
- Current non-compliances with CASA standards (eg. distance between existing hangar doors).
- Condition of the main runway's pavement (Runway 17/35).
- Limitations on use of the existing east-west runway (Runway 05/23).
- Subdivision and development of surplus land for non-aviation industrial or commercial purposes.
- Land ownership and management arrangements.
- Protection of native grasses on the site.
- Infrastructure and servicing constraints (eg. water).

In general, the investigations to date have revealed that the existing aerodrome has adequate capacity for the foreseeable future (the life of this master plan) having regard to the existing and likely future aircraft operations. Use of the aerodrome on a regular basis by larger aircraft types or for passenger services is considered unlikely (at least during the life of this master plan). The capacity of the current runway and taxiway system is much greater than the number of aircraft movements forecast. As a result, any consideration of a new facility is not warranted as part of this master plan, but this question should be revisited every five years in accordance with standard master plan review processes.

There are, however, a number of issues which need to be addressed to enable the existing aerodrome to continue to operate safely and effectively. There are also a number of opportunities for development of the site which could provide funds for the necessary improvements and ongoing maintenance. These matters have been identified in this report and will be addressed in further detail in the next phase of the study.

Appendix A

# Constraints and Opportunities Plan




Echuca Aerodrome Master Plan

Constraints and Opportunities

Study Area
Main Runway
Secondary Runway
LSIO (Land Subject to Inundation Overlay)
FO (Flood Overlay)
Industrial 1 Zone
Public Park and Recreation Zone
Public Use Zone - Transport
Road Zone - Category 1
Residential 1 Zone
Low Density Residential Zone
Farming Zone
Rural Living Zone
Rural Conservation Zone
Urban Floodway Zone
Native Grasses
OLS
ARP +30m

0 250 500m

Development Opportunity

Beca

Appendix B

# Employed Persons by Industry Activity: Echuca and Moama

## Appendix B: Employed Persons by Industry Activity: Echuca & Moama

This table provides detailed information on the sectors that employed residents have jobs in.

| Employed Persons 2006 | Echuca | | | Moama | | | Echuca/Moama | | | Share |
|---|---|---|---|---|---|---|---|---|---|---|
| Industry Group | Males | Females | Persons | Males | Females | Persons | Males | Females | Persons | % |
| Accommodation | 48 | 132 | 180 | 37 | 51 | 88 | 85 | 183 | 268 | 3.9 |
| Accommodation and Food Services, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Administrative and Support Services, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Administrative Services | 11 | 35 | 46 | 10 | 7 | 17 | 21 | 42 | 63 | 0.9 |
| Adult, Community and Other Education | 8 | 22 | 30 | 4 | 5 | 9 | 12 | 27 | 39 | 0.6 |
| Agriculture | 96 | 25 | 121 | 41 | 10 | 51 | 137 | 35 | 172 | 2.5 |
| Agriculture, Forestry and Fishing Support Services | 14 | 0 | 14 | 5 | 3 | 8 | 19 | 3 | 22 | 0.3 |
| Agriculture, Forestry and Fishing, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Air and Space Transport | 3 | 3 | 6 | 0 | 0 | 0 | 3 | 3 | 6 | 0.1 |
| Aquaculture | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Arts and Recreation Services, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Auxiliary Finance and Insurance Services | 10 | 7 | 17 | 0 | 3 | 3 | 10 | 10 | 20 | 0.3 |
| Basic Chemical and Chemical Product Manufacturing | 19 | 0 | 19 | 6 | 0 | 6 | 25 | 0 | 25 | 0.4 |
| Basic Material Wholesaling | 40 | 16 | 56 | 9 | 4 | 13 | 49 | 20 | 69 | 1.0 |
| Beverage and Tobacco Product Manufacturing | 16 | 10 | 26 | 13 | 0 | 13 | 29 | 10 | 39 | 0.6 |
| Broadcasting (except Internet) | 3 | 3 | 6 | 0 | 0 | 0 | 3 | 3 | 6 | 0.1 |
| Building Cleaning, Pest Control and Other Support Services | 43 | 29 | 72 | 16 | 3 | 19 | 59 | 32 | 91 | 1.3 |
| Building Construction | 148 | 23 | 171 | 38 | 4 | 42 | 186 | 27 | 213 | 3.1 |
| Coal Mining | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Commission-Based Wholesaling | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Computer System Design and Related Services | 6 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 6 | 0.1 |
| Construction Services | 274 | 31 | 305 | 70 | 5 | 75 | 344 | 36 | 380 | 5.6 |
| Construction, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Creative and Performing Arts Activities | 0 | 4 | 4 | 0 | 0 | 0 | 0 | 4 | 4 | 0.1 |
| Defence | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Education and Training, nfd | 0 | 4 | 4 | 0 | 4 | 4 | 0 | 8 | 8 | 0.1 |
| Electricity Supply | 10 | 5 | 15 | 0 | 0 | 0 | 10 | 5 | 15 | 0.2 |
| Electricity, Gas, Water and Waste Services, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Exploration and Other Mining Support Services | 3 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 3 | 0.0 |
| Fabricated Metal Product Manufacturing | 79 | 9 | 88 | 17 | 0 | 17 | 96 | 9 | 105 | 1.5 |
| Finance | 27 | 40 | 67 | 4 | 9 | 13 | 31 | 49 | 80 | 1.2 |
| Financial and Insurance Services, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Fishing, Hunting and Trapping | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Food and Beverage Services | 164 | 255 | 419 | 54 | 73 | 127 | 218 | 328 | 546 | 8.0 |
| Food Product Manufacturing | 295 | 125 | 420 | 48 | 24 | 72 | 343 | 149 | 492 | 7.2 |
| Food Retailing | 94 | 138 | 232 | 19 | 33 | 52 | 113 | 171 | 284 | 4.2 |
| Forestry and Logging | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Fuel Retailing | 9 | 21 | 30 | 3 | 3 | 6 | 12 | 24 | 36 | 0.5 |
| Furniture and Other Manufacturing | 13 | 0 | 13 | 8 | 0 | 8 | 21 | 0 | 21 | 0.3 |
| Gambling Activities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Gas Supply | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Grocery, Liquor and Tobacco Product Wholesaling | 24 | 8 | 32 | 8 | 3 | 11 | 32 | 11 | 43 | 0.6 |
| Health Care and Social Assistance, nfd | 0 | 11 | 11 | 0 | 4 | 4 | 0 | 15 | 15 | 0.2 |
| Heavy and Civil Engineering Construction | 15 | 3 | 18 | 7 | 0 | 7 | 22 | 3 | 25 | 0.4 |
| Heritage Activities | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Hospitals | 42 | 203 | 245 | 0 | 38 | 38 | 42 | 241 | 283 | 4.2 |
| Information Media and Telecommunications, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Insurance and Superannuation Funds | 10 | 7 | 17 | 5 | 3 | 8 | 15 | 10 | 25 | 0.4 |
| Internet Publishing and Broadcasting | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Internet Service Providers, Web Search Portals and Data Processing Services | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Library and Other Information Services | 3 | 3 | 6 | 0 | 3 | 3 | 3 | 6 | 9 | 0.1 |
| Machinery and Equipment Manufacturing | 50 | 9 | 59 | 8 | 0 | 8 | 58 | 9 | 67 | 1.0 |
| Machinery and Equipment Wholesaling | 21 | 8 | 29 | 7 | 0 | 7 | 28 | 8 | 36 | 0.5 |
| Manufacturing, nfd | 58 | 5 | 63 | 22 | 4 | 26 | 80 | 9 | 89 | 1.3 |
| Medical and Other Health Care Services | 31 | 74 | 105 | 11 | 22 | 33 | 42 | 96 | 138 | 2.0 |
| Metal Ore Mining | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Mining, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |

| Employed Persons 2006 | Echuca | | | Moama | | | Echuca/Moama | | | Share |
|---|---|---|---|---|---|---|---|---|---|---|
| Industry Group | Males | Females | Persons | Males | Females | Persons | Males | Females | Persons | % |
| Motion Picture and Sound Recording Activities | 9 | 14 | 23 | 0 | 0 | 0 | 9 | 14 | 23 | 0.3 |
| Motor Vehicle and Motor Vehicle Parts Retailing | 61 | 16 | 77 | 17 | 4 | 21 | 78 | 20 | 98 | 1.4 |
| Motor Vehicle and Motor Vehicle Parts Wholesaling | 7 | 0 | 7 | 4 | 0 | 4 | 11 | 0 | 11 | 0.2 |
| Non-Metallic Mineral Mining and Quarrying | 0 | 0 | 0 | 5 | 0 | 5 | 5 | 0 | 5 | 0.1 |
| Non-Metallic Mineral Product Manufacturing | 22 | 5 | 27 | 10 | 0 | 10 | 32 | 5 | 37 | 0.5 |
| Non-Store Retailing and Retail Commission Based Buying and/or Selling | 4 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 4 | 0.1 |
| Oil and Gas Extraction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Other Goods Wholesaling | 0 | 10 | 10 | 0 | 0 | 0 | 0 | 10 | 10 | 0.1 |
| Other Services, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Other Store-Based Retailing | 154 | 239 | 393 | 23 | 76 | 99 | 177 | 315 | 492 | 7.2 |
| Other Transport | 5 | 5 | 10 | 5 | 0 | 5 | 10 | 5 | 15 | 0.2 |
| Personal Care and Other Services | 33 | 91 | 124 | 7 | 20 | 27 | 40 | 111 | 151 | 2.2 |
| Petroleum and Coal Product Manufacturing | 4 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 4 | 0.1 |
| Polymer Product and Rubber Product Manufacturing | 8 | 0 | 8 | 3 | 0 | 3 | 11 | 0 | 11 | 0.2 |
| Postal and Courier Pick-up and Delivery Services | 10 | 13 | 23 | 0 | 6 | 6 | 10 | 19 | 29 | 0.4 |
| Preschool and School Education | 104 | 244 | 348 | 13 | 44 | 57 | 117 | 288 | 405 | 5.9 |
| Primary Metal and Metal Product Manufacturing | 34 | 5 | 39 | 5 | 3 | 8 | 39 | 8 | 47 | 0.7 |
| Printing (including Reproduction of Recorded Media) | 8 | 5 | 13 | 0 | 0 | 0 | 8 | 5 | 13 | 0.2 |
| Private Households Employing Staff and Undifferentiated Goods and | | | | | | | 0 | 0 | 0 | 0.0 |
| Service-Producing Activities of Households for Own Use | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Professional, Scientific and Technical Services (except Computer | | | | | | | 0 | 0 | 0 | 0.0 |
| Systems Design and Related Services) | 74 | 87 | 161 | 14 | 23 | 37 | 88 | 110 | 198 | 2.9 |
| Professional, Scientific and Technical Services, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Property Operators and Real Estate Services | 35 | 35 | 70 | 10 | 13 | 23 | 45 | 48 | 93 | 1.4 |
| Public Administration | 66 | 121 | 187 | 17 | 17 | 34 | 83 | 138 | 221 | 3.2 |
| Public Administration and Safety, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Public Order, Safety and Regulatory Services | 29 | 9 | 38 | 12 | 0 | 12 | 41 | 9 | 50 | 0.7 |
| Publishing (except Internet and Music Publishing) | 5 | 15 | 20 | 0 | 3 | 3 | 5 | 18 | 23 | 0.3 |
| Pulp, Paper and Converted Paper Product Manufacturing | 0 | 4 | 4 | 0 | 0 | 0 | 0 | 4 | 4 | 0.1 |
| Rail Transport | 4 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 4 | 0.1 |
| Rental and Hiring Services (except Real Estate) | 21 | 13 | 34 | 0 | 0 | 0 | 21 | 13 | 34 | 0.5 |
| Rental, Hiring and Real Estate Services, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Repair and Maintenance | 78 | 21 | 99 | 21 | 0 | 21 | 99 | 21 | 120 | 1.8 |
| Residential Care Services | 5 | 62 | 67 | 6 | 23 | 29 | 11 | 85 | 96 | 1.4 |
| Retail Trade, nfd | 16 | 20 | 36 | 3 | 5 | 8 | 19 | 25 | 44 | 0.6 |
| Road Transport | 111 | 20 | 131 | 35 | 7 | 42 | 146 | 27 | 173 | 2.5 |
| Social Assistance Services | 25 | 134 | 159 | 3 | 35 | 38 | 28 | 169 | 197 | 2.9 |
| Sport and Recreation Activities | 25 | 59 | 84 | 14 | 16 | 30 | 39 | 75 | 114 | 1.7 |
| Telecommunications Services | 7 | 4 | 11 | 7 | 0 | 7 | 14 | 4 | 18 | 0.3 |
| Tertiary Education | 14 | 6 | 20 | 0 | 0 | 0 | 14 | 6 | 20 | 0.3 |
| Textile, Leather, Clothing and Footwear Manufacturing | 7 | 0 | 7 | 0 | 5 | 5 | 7 | 5 | 12 | 0.2 |
| Transport Equipment Manufacturing | 11 | 0 | 11 | 5 | 0 | 5 | 16 | 0 | 16 | 0.2 |
| Transport Support Services | 4 | 3 | 7 | 0 | 0 | 0 | 4 | 3 | 7 | 0.1 |
| Transport, Postal and Warehousing, nfd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| Warehousing and Storage Services | 6 | 7 | 13 | 5 | 0 | 5 | 11 | 7 | 18 | 0.3 |
| Waste Collection, Treatment and Disposal Services | 6 | 0 | 6 | 5 | 0 | 5 | 11 | 0 | 11 | 0.2 |
| Water Supply, Sewerage and Drainage Services | 18 | 0 | 18 | 3 | 0 | 3 | 21 | 0 | 21 | 0.3 |
| Water Transport | 5 | 4 | 9 | 0 | 0 | 0 | 5 | 4 | 9 | 0.1 |
| Wholesale Trade, nfd | 5 | 5 | 10 | 4 | 0 | 4 | 9 | 5 | 14 | 0.2 |
| Wood Product Manufacturing | 24 | 0 | 24 | 5 | 0 | 5 | 29 | 0 | 29 | 0.4 |
| Inadequately described | 25 | 18 | 43 | 5 | 8 | 13 | 30 | 26 | 56 | 0.8 |
| Not stated | 51 | 36 | 87 | 12 | 15 | 27 | 63 | 51 | 114 | 1.7 |
| **Total** | **2,827** | **2,598** | **5,425** | **748** | **641** | **1,389** | **3,575** | **3,239** | **6,814** | **100.0** |
| **Share (%)** | | | **79.6** | | | **20.4** | | | | |

Source: ABS Census 2006 (Resident Population Data)

Appendix C

# Regional Population Projections

## Appendix C: Regional Population Projections

| Year to June 30th | 2006 | 2011 | 2016 | 2021 | 2026 | Change 2006-2026 |
|---|---|---|---|---|---|---|
| Greater Geelong (C) | 205,929 | 221,633 | 237,297 | 253,487 | 269,653 | 63,724 |
| Surf Coast (S) | 22,802 | 25,761 | 28,768 | 31,811 | 34,781 | 11,979 |
| Colac-Otway (S) | 21,030 | 21,616 | 22,113 | 22,613 | 23,116 | 2,086 |
| Golden Plains (S) | 17,077 | 19,014 | 20,833 | 22,583 | 24,378 | 7,301 |
| Queenscliffe (B) | 3,150 | 3,157 | 3,191 | 3,258 | 3,349 | 199 |
| Warrnambool (C) | 31,501 | 33,321 | 35,223 | 37,267 | 39,229 | 7,728 |
| Glenelg (S) | 20,525 | 21,081 | 21,405 | 21,670 | 21,961 | 1,436 |
| Southern Grampians (S) | 17,187 | 17,348 | 17,423 | 17,563 | 17,709 | 522 |
| Corangamite (S) | 17,171 | 17,479 | 17,608 | 17,696 | 17,884 | 713 |
| Moyne (S) | 16,002 | 16,508 | 16,921 | 17,390 | 17,958 | 1,956 |
| Ballarat (C) | 88,437 | 95,922 | 103,474 | 111,270 | 118,752 | 30,315 |
| Moorabool (S) | 26,445 | 28,421 | 30,414 | 32,515 | 34,710 | 8,265 |
| Hepburn (S) | 14,235 | 14,965 | 15,690 | 16,406 | 17,159 | 2,924 |
| Ararat (RC) | 11,653 | 11,842 | 11,961 | 12,068 | 12,178 | 525 |
| Pyrenees (S) | 6,772 | 7,115 | 7,431 | 7,702 | 7,982 | 1,210 |
| Horsham (RC) | 19,098 | 19,620 | 20,044 | 20,459 | 20,829 | 1,731 |
| Northern Grampians (S) | 12,330 | 11,991 | 11,595 | 11,266 | 10,980 | -1,350 |
| Yarriambiack (S) | 7,742 | 7,382 | 6,954 | 6,578 | 6,310 | -1,432 |
| Hindmarsh (S) | 6,235 | 5,944 | 5,633 | 5,352 | 5,124 | -1,111 |
| West Wimmera (S) | 4,614 | 4,347 | 4,030 | 3,712 | 3,474 | -1,140 |
| Mildura (RC) | 51,824 | 53,351 | 54,135 | 54,820 | 55,523 | 3,699 |
| Swan Hill (RC) | 21,285 | 21,672 | 21,803 | 21,949 | 22,091 | 806 |
| Gannawarra (S) | 11,665 | 11,553 | 11,330 | 11,070 | 10,810 | -855 |
| Buloke (S) | 7,080 | 6,893 | 6,597 | 6,278 | 6,008 | -1,072 |
| Greater Bendigo (C) | 96,741 | 106,016 | 115,476 | 125,267 | 134,705 | 37,964 |
| Macedon Ranges (S) | 39,989 | 42,898 | 46,152 | 49,898 | 54,039 | 14,050 |
| Mount Alexander (S) | 17,656 | 18,914 | 20,172 | 21,468 | 22,756 | 5,100 |
| Central Goldfields (S) | 12,739 | 13,180 | 13,566 | 13,957 | 14,401 | 1,662 |
| Loddon (S) | 8,095 | 7,990 | 7,874 | 7,749 | 7,674 | -421 |
| Greater Shepparton (C) | 59,280 | 63,208 | 66,368 | 69,139 | 71,606 | 12,326 |
| **Campaspe (S)** | **37,486** | **39,051** | **40,305** | **41,490** | **42,648** | **5,162** |
| Mitchell (S) | 32,082 | 37,102 | 42,565 | 48,689 | 55,364 | 23,282 |
| Moira (S) | 27,983 | 29,516 | 30,728 | 31,859 | 32,964 | 4,981 |
| Murrindindi (S) | 14,198 | 14,334 | 14,685 | 15,264 | 15,965 | 1,767 |
| Benalla (RC) | 13,986 | 14,436 | 14,767 | 15,138 | 15,557 | 1,571 |
| Strathbogie (S) | 9,628 | 9,856 | 10,081 | 10,311 | 10,562 | 934 |
| Mansfield (S) | 7,455 | 8,261 | 9,083 | 9,971 | 10,929 | 3,474 |
| Wodonga (RC) | 34,646 | 37,527 | 39,918 | 42,330 | 44,543 | 9,897 |
| Wangaratta (RC) | 27,431 | 28,320 | 29,043 | 29,798 | 30,606 | 3,175 |
| Indigo (S) | 15,430 | 16,277 | 16,835 | 17,336 | 17,960 | 2,530 |
| Alpine (S) | 12,626 | 13,105 | 13,468 | 13,839 | 14,221 | 1,595 |
| Towong (S) | 6,273 | 6,295 | 6,219 | 6,128 | 6,060 | -213 |
| Wellington (S) | 41,591 | 43,007 | 44,317 | 45,762 | 47,283 | 5,692 |
| East Gippsland (S) | 41,361 | 44,637 | 47,769 | 50,997 | 54,224 | 12,863 |
| Latrobe (C) | 72,121 | 73,192 | 74,846 | 76,275 | 77,546 | 5,425 |
| Baw Baw (S) | 38,508 | 41,916 | 45,833 | 49,740 | 53,798 | 15,289 |
| Bass Coast (S) | 27,541 | 31,695 | 34,549 | 38,224 | 41,941 | 14,399 |
| South Gippsland (S) | 26,692 | 27,562 | 28,727 | 29,848 | 31,040 | 4,348 |
| Yarra Ranges (S) - Pt B | 609 | 705 | 780 | 800 | 803 | 194 |
| **Regional Victoria** | **1,383,937** | **1,466,939** | **1,545,995** | **1,628,058** | **1,711,142** | **327,205** |

Source: Department of Sustainability and Environment - Victoria in Future 2008

# PART B: THE MASTER PLAN

Report

# Echuca Aerodrome Master Plan - Part B: The Master Plan

**Prepared for Campaspe Shire Council**

**By Beca Pty Ltd (Beca)**
**ABN: 85 004 974 341**

Prepared in association with Airports Plus Pty Ltd and Buchan Consulting Pty Ltd

3 March 2010

## Revision History

| Revision Nº | Prepared By | Description | Date |
|---|---|---|---|
| A | Trent Kneebush, Ray Oakley, Michael Connell, Nina Abdul-Malek | Draft for Steering Committee review | 9-9-09 |
| B | Trent Kneebush, Ray Oakley, Michael Connell, Nina Abdul-Malek | Revised draft | 19-10-09 |
| C | Trent Kneebush, Ray Oakley, Michael Connell, Nina Abdul-Malek, Ian Gibb and Julia Guthrie | Final Master Plan | 2-3-10 |

## Document Acceptance

| Action | Name | Signed | Date |
|---|---|---|---|
| Prepared by | Ian Gibb/ Julia Guthrie | | |
| Reviewed by | Johanna Cannington | | |
| Approved by | Mark R Wilson | | |
| on behalf of | Beca Pty Ltd | | |

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# Appendices

**Appendix A - Land Use Concept Plan**

**Appendix B – Flora and Fauna Study**

**Appendix C - Terminal & Hangar Precinct Concept Plan**

**Appendix D - Concept Infrastructure Layout Plans**

# 1 Introduction

The Shire of Campaspe is located approximately 180 kilometres north of Melbourne's CBD, encompassing a total land area of approximately 4,525 square kilometres. Echuca is the Shire's largest and most diverse centre which serves local, regional and tourist purposes. Its catchment area is estimated to include 50,000 people within a 70 kilometre radius. Echuca is a vibrant and growing provincial city of around 12,000 people situated on the banks of the Murray River where it forms is an important industrial, community, health, recreational and transportation hub for northern Victoria and southern New South Wales.

The Echuca Aerodrome is located to the south-east of the Echuca CBD, adjacent to Echuca's main industrial area and east of the Melbourne-Murray River railway line. The aerodrome is owned and operated by Campaspe Shire Council. The aerodrome is currently used for "General Aviation" (GA) purposes and the site contains a number of hangars which accommodate light aircraft associated with GA activities.

## 1.1 The Site and Surrounds

The Echuca Aerodrome is located on the west side of Echuca-Kyabram Road (also known as Cornelia Creek Road and McKenzie Road), approximately 3km south of the Echuca CBD. The aerodrome site is generally bounded by the Cornelia Creek Industrial Estate to the north, Echuca-Kyabram Road to the east, agricultural land to the south and Old Aerodrome Road and the Echuca-Toolamba Railway to the west. This land, which contains the existing aerodrome facilities and associated hangars, has an area of approximately 165 hectares and is comprised of both Council owned land and a number of freehold allotments.

This study also includes a separate area of Council owned land located on the eastern side of Echuca-Kyabram Road opposite the southern end of the aerodrome site. This part of the subject land has an area of approximately 43 hectares and is generally bounded by Benson Road to the south, Echuca-Kyabram Road to the west, Mary Ann Road to the east and privately owned lots to the north. This land was originally set aside for a possible future east-west runway and is currently vacant.

The subject land is currently zoned Public Use Zone 4 – Transport (PUZ4) under the Campaspe Planning Scheme. Parts of the land are affected by the Land Subject to Inundation Overlay (LSIO) and Floodway Overlay (FO).

The land surrounding the Echuca Aerodrome is used and developed for a variety of purposes. The land to the north is used and developed for industrial purposes, specifically the Cornelia Creek Industrial Estate. The land east of the aerodrome is used for a variety of purposes, including industrial, farming and residential. To the west there is an unconstructed road reserve (Old Aerodrome Road) and the Melbourne-Murray River Railway. Further to the west the land is generally used and developed for residential or floodway purposes. The land south of the aerodrome is used for agricultural / farming purposes.

## 1.2 Objectives of the Master Plan

This is the first Master Plan to be prepared for the Echuca Aerodrome.

The overall objective of the Echuca Aerodrome Master Plan is to provide Campaspe Shire Council with a strategic long term planning framework for the safe, secure, efficient and sustainable use and development of the aerodrome site. It seeks to provide clear direction as to how future growth will be accommodated and how a balance can be achieved between aerodrome functions, non-aviation development and various forms of surrounding land use.

More specifically, the objectives of the Echuca Aerodrome Master Plan Project are to:

- Identify future needs and requirements for the aerodrome over the next 10-15 years;
- Identify the site's constraints and challenges;
- Review the planning controls applying to the site and surrounds;
- Identify current infrastructure inadequacies at the site;
- Identify potential opportunities for development of the site for aviation and non-aviation purposes;
- Prepare a land use strategy for the aerodrome; and
- Prepare a supporting business case.

## 1.3 Background

### 1.3.1 Methodology

The preparation of this Master Plan has been informed by:

- Discussions with the project Steering Committee;
- One-on-one consultation with various stakeholders;
- A workshop with relevant authorities on 23 July 2009;
- A workshop with aerodrome users and land owners on 23 July 2009;
- Review of various documents and other information provided by Campaspe Shire Council and obtained from other sources; and
- The *Echuca Aerodrome Master Plan - Issues and Opportunities Paper* (Beca, Airports Plus and Buchan Consulting, 2009).

### 1.3.2 Issues and Opportunities Paper

The *Echuca Aerodrome Master Plan - Issues and Opportunities Paper* provides a review and analysis of background information relevant to the Echuca Aerodrome as well as an overview of the key issues affecting the site and surrounds. In particular, this document includes:

- A detailed description of the site and surrounds;
- A detailed description and assessment of the existing aerodrome facilities;
- An outline of the master planning context and criteria, including the relevant aircraft planning criteria; and
- An analysis of the master planning issues and opportunities.

The *Echuca Aerodrome Master Plan – Issues and Opportunities Paper* forms Part A of the Master Plan. The Issues and Opportunities Paper should be read to understand the background to the Master Plan, as the background information will not be repeated in this document.

# 2 Land Use Strategy

After considering all of the issues and opportunities identified in the previous stages of this master planning study, the following land use strategy has been developed and is recommended for the subject site.

## 2.1 Vision and Objectives

In general, this study has determined that the existing aerodrome has adequate capacity for the life of this master plan, being 10-15 years, having regard to the existing and likely future aircraft operations. Use of the aerodrome on a regular basis by larger aircraft types or for passenger services is considered unlikely, at least during the life of this master plan. The capacity of the current runway and taxiway system is much greater than the number of aircraft movements forecast.

Aviation activity and the use of the Echuca Aerodrome have largely been driven by local, regional and some metropolitan demand by light aircraft owners and users. This demand has largely been for recreational or other specialist purposes, including the Echuca Aero Club and Antique Aeroplane Association. It is envisaged that there will be continued demand for light aircraft use of the aerodrome for these purposes from within the Echuca region and coming out of Melbourne and New South Wales. These General Aviation (GA) users will continue to be the major drivers of growth for aviation in the area and at Echuca Aerodrome specifically. The Echuca Aerodrome has capacity to accommodate this growth.

The Echuca Aerodrome is also regularly used by the emergency services (fire and ambulance). This important use of the aerodrome will continue.

Given the likely future demand for use of the aerodrome, and its capacity to accommodate that demand, any consideration of a new aerodrome facility is not warranted as part of this master plan. However, this question should be revisited every five years in accordance with standard master plan review processes.

In order to accommodate and facilitate aviation growth at the aerodrome, some airfield improvements and further hangar developments will be required. Future development of the site needs to respond to the planning and environmental constraints of the site. These are key elements of this master plan which are discussed in more detail later in this report.

The provision of further hangars at the aerodrome is central to this master plan. The demand for hangars for the storage and protection of aircraft is growing as Melbourne aerodromes are at capacity and are relatively expensive. The next ring of aerodromes such as Ballarat, Bendigo and Shepparton will reach capacity in the next 5-7 years and are also increasing charges. The Echuca Aerodrome site has the land available for future hangar development at a reasonable cost and this is provided for in the Master Plan. It is a recommendation of this Master Plan that the Council should retain ownership and control of any future hangar developments within the aviation zone.

Whilst the future of Echuca Aerodrome will generally be based around GA and light aircraft activities, it is considered that a strategic focus for Echuca Aerodrome should be on creating an active recreational/tourism facility for the local and regional community centered on aviation. The

aerodrome is already actively used by the Echuca Aero Club, Antique Aeroplane Association and other recreational owners and users of light aircraft. There should be continued support for use of the aerodrome for these purposes, including through the provision of hangars and facilities which accommodate these activities. Activities such as tourist charter flights and further aviation-related events should also be encouraged.

During the stakeholder consultation the potential establishment of both an "airpark" (houses with hangers) and an aircraft museum were mentioned as opportunities for future development of the site. Increased use of the aerodrome for pilot training purposes was also mentioned. Whilst these opportunities have not been investigated in any detail, they are all considered to be consistent with the vision for the aerodrome and worthy of consideration if proposed in the future. These opportunities have not been specifically included in the master plan, but land is available on the site for their potential establishment as will be outlined later.

The growth of GA activities at the aerodrome will increase the number of planes at the aerodrome which will in turn increase the demand for aviation engineering services and additional demand for hangar sites. An increase in these activities could lead to the development of a light aviation industry cluster at the site. As previously mentioned, the Master Plan provides for expansion of the hangar precinct to accommodate demand for more hangars.

Beyond the aviation zone, this Master Plan identifies several areas of surplus land which are not required for existing or future aviation purposes. There is scope to use and develop this land for non-aviation industrial or commercial purposes, provided the use does not prejudice the ongoing operation of the aerodrome. Importantly, the sale of this land could provide funds for the aerodrome improvements and ongoing maintenance of the aviation zone.

Given all of the above, the primary objectives of this master plan are:

- Protect the aerodrome's primary function for aviation activities and ensure that aviation associated activities are allowed to continue on the site.
- Recognise the role of the aerodrome as a regional community asset and its existing and potential contribution to the local economy.
- Focus on creating uses that will generate positive gains for the community and the economy.
- Provide for the growth of General Aviation activities on the site and allow flexibility for aviation-related development to expand as the need arises, particularly in terms of further hangar space.
- Promote the Echuca Aerodrome as a recreational/tourism facility for the local and regional community centered on aviation.
- Support the ongoing use of the aerodrome by the Echuca Aero Club, Antique Aeroplane Association and other recreational owners and users of light aircraft including through the provision of hangars and facilities which accommodate these activities.
- Allow the development of surplus land, not required for aviation purposes, provided the use does not prejudice the ongoing operation of the aerodrome.
- Ensure that future development of the site responds to the environmental and planning constraints of the site and the surrounding land uses.
- Ensure that future development of the site is provided with appropriate infrastructure services, particularly reticulated water and a water supply for fire fighting purposes that meets CFA requirements.

- Ensure that future development within the aviation zone, including any new hangar buildings, remain within the ownership and control of the Campaspe Shire Council.
- Achieve commercially acceptable revenue from development of the land in the context of the environmental and planning constraints of the site.

## 2.2 Land Use Concept Plan

To assist Campaspe Shire Council in planning future use and development of the aerodrome site, a Land Use Concept Plan has been prepared. This plan forms the basis of the Master Plan for the staged development of the site. The proposed Land Use Concept Plan for the aerodrome is attached at Appendix A.

There are three broad categories of land use shown on the Land Use Concept Plan. They are:

- Airfield Precinct: land set aside for airfield facilities, including runways, taxiways, aprons, fuel facilities and other related facilities;
- Terminal & Hangar Precinct: land set aside for the terminal, aircraft hangars and associated taxilanes, aprons, access roads and car parking; and
- Surplus Land Precinct: land not required for airfield, terminal or hangar purposes set aside for possible future aviation-related or non-aviation activities, such as industrial or commercial land uses.

Each of these precincts has different characteristics and objectives, and are further separated into functional areas. These details are discussed in the following Sections 2.3, 2.4 and 2.5 of this report. The subsequent sections 2.6 to 2.11 outline additional matters relating to the land use strategy, including environmental protection, staging and planning scheme amendments.

## 2.3 Airfield Precinct

This section outlines the key requirements relating to the airfield and is based on the preliminary findings in Sections 2.1.2 and 3.5 of the Issues and Opportunities Paper (Part A). These requirements should be confirmed through an Aerodrome Safety Inspection undertaken by an approved person.

### 2.3.1 Runway 17/35

The current runway layout is capable of handling the range of aircraft that operate into Echuca Aerodrome. The aerodrome site has the capability of allowing for a runway extension to the south of 180m as a minimum, taking into account the critical obstacles beyond the aerodrome boundary. The runway could be extended a total length of approximately 300m if the power lines and power poles, running at right angles to the runway in the road reserve south of the aerodrome, were placed underground. Some tree removal would also be required for this longer runway extension to take place.

Any runway extension over 100m changes the runway Code Number from 2 to 3. This has implications on the dimensions of the Obstacle Limitation Surfaces. An example of this change is that the inner width of the approach surface changes from 90m to 150m and therefore the base line survey, undertaken on an annual basis, has changed parameters. The OLS plans supplied by the Council were based on a Code 3 runway.

The runway is contained within a runway strip which is currently 90m wide. This runway strip should be widened to 150m wide if the runway Code Number changes from 2 to 3. The major reason why runway strips cannot be widened is that obstacles, ie. hangars, infringe the transitional surface associated with the edge of the runway strip. By protecting the 150m wide runway strip at Echuca Aerodrome there is no impact on the existing buildings as they are below the future transitional surface. Plans prepared for this Master Plan are showing a runway strip at 150m to ensure that the widening of the runway strip is protected.

If a runway extension was undertaken the width of the runway paved surface, currently 18m, would also require widening to a minimum of 23m to meet the standards in CASA MOS Part 139 - Aerodromes, Chapter 6. The current strength of the runway would need to be carefully determined. As part of any extension or widening of the existing pavement the strength should be increased if possible to cater for a greater range of aircraft types.

An extension and widening of the runway would only be undertaken if there was sufficient demand by aircraft operators, either based at Echuca Aerodrome or regularly operating into Echuca Aerodrome, which would be of benefit to the economic development of the area.

### 2.3.2 Runway 05/23

The grass runway is adequate for the current aircraft types that operate at Echuca Aerodrome. The feasibility of relocating the cross runway and reorienting the direction of the runway has been assessed. Due to the constraints of the existing site with regard to native vegetation, flood overlay, existing facilities and also the impact that relocating the runway would have on surrounding landholders, it has been determined that it would not be feasible to relocate this short runway within the existing site.

### 2.3.3 Taxiways

The primary bitumen sealed taxiway accessing the terminal apron is constructed to Code B aircraft standards. It is not envisaged that this taxiway would need to be upgraded to Code C aircraft standards during the life of this Master Plan. The bitumen sealed sections of the parallel taxiway that runs north-south and provides access to the bitumen sealed parking apron to the south and the refuelling apron to the north are also constructed to Code B aircraft standards and do not require upgrading.

**Table 1 – Table 6.3-1 from CASA MOS Part 139 - Aerodromes**

**Table 6.3-1: Minimum width for straight section of taxiway**

| Code letter | Minimum taxiway width (straight sections) |
|---|---|
| A | 7.5 m |
| B | 10.5 m |
| C | 18 m |
| D | 23 m |
| E | 23 m |
| F | 25 m |
| **Note:** Minimum widths are subject to exceptions, see paragraph 6.3.1.1A | |

The gravel taxiway located on the northern side of the refuelling apron, accessing runway 17 threshold and also runway 05/23, is constructed 9m wide. This taxiway does not meet Code B aircraft standards and there was little evidence that Code B aircraft use this taxiway regularly. If aircraft types operating into Echuca Aerodrome increase in size then this taxiway may require upgrading to 10.5m to comply with Code B aircraft standards. This upgrade could include bitumen sealing of the surface to allow for all weather operations to be undertaken.

The gravel taxiway located on the southern side of the parking apron is constructed at 5m wide. This taxiway does not comply with the minimum 7.5m width Code A aircraft standards. Therefore planning should commence to upgrade the width of this taxiway to a minimum of 7.5m or 10.5m. As part of any upgrade the surface of the taxiway could have a bitumen seal applied so as to allow for all weather operations. This taxiway provides access to the runway 35 threshold. If this taxiway was upgraded to Code B aircraft standards then the runway capacity would be increased. Larger aircraft would be able to access the runway without backtracking on the runway and therefore runway occupancy time would be reduced.

The strength of these taxiways, if upgraded, should be of similar strength to the runway and be able to support the range of aircraft types that may operate into Echuca Aerodrome in the future.

### 2.3.4 Hangar Taxilanes

The taxilanes that provide access to the hangar sites in the Terminal & Hangar Precinct of the aerodrome do not meet the minimum standards for taxilanes as outlined in MOS Part 139 - Aerodromes, Chapter 6. The current paved surfaces provided by the aerodrome operator are only 3.6m wide. The paved surfaces should be increased to 7.5m wide as a minimum requirement for aircraft operating with an undercarriage width of up to 4.5m. The widening of the pavement will be critical for the safety of aircraft using this taxilane when being towed or under power.

The separation distance between the centreline of the taxilane and any building, structure, fence, etc should be not less than 16.25m for Code A aircraft; therefore the taxilane between the Aero Club hangars and the hangars on Lots 3 and 4 do not comply with this requirement as they are currently only 22m apart. To overcome this non conformity with the CASA standards, all aircraft using this taxilane should not operate under power but should be towed from the hangars to the parallel taxiway. Appropriate signage should be placed at the entrance to the taxilane indicating to pilots that they should not taxi under power in this taxilane. If the occupants of the hangars prefer to taxi their aircraft under power to and from their hangars then the aerodrome operator will need to acquire either Lots 1 and 2 or Lots 3 and 4 and remove the buildings.

In order for the construction of hangars on Lots 5, 6 and 7 to take place, the aerodrome operator must ensure that there is a minimum clearance of 12m either side of the centreline for any code A (wingspan less than 15m) aircraft parked on the taxilane. This means that any proposed hangars on Lots 5, 6 and 7 will need to be located no closer than 24m from the existing building. Currently the centreline of the taxilane is 13m from the existing hangar.

The existing taxilane on the northern side of Lots 9, 10, 11 and 12 does not meet the minimum standards as the centreline of the taxilane is only 12.5m from the front of the hangars and the taxilane paved surface is only 3.6m wide. This Master Plan is proposing further development to the north of this taxilane and therefore the taxilane centreline needs to be moved 4m to the north

of its existing position and the taxilane paved surface needs to be increased to a minimum of 7.5m wide.

It is important that any future aviation development that occurs at Echuca Aerodrome meets the minimum requirements as set down by CASA in MOS Part 139 - Aerodromes.

### 2.3.5 Aprons

The terminal apron requires upgrading to increase the size of the apron. An Air Ambulance aircraft, parked in the southeast corner of the apron transferring patients, prevents other aircraft from taxiing to and from the runway using the primary taxiway. It is suggested that the apron be expanded 6m to the east towards the fence line so that the apron is no closer than 15m from the fence and expanded 10m to the north. This expansion would increase the size of the apron by 50% and would provide adequate space for taxiing aircraft to manoeuvre around a parked Air Ambulance aircraft.

The aircraft parking apron, south of the terminal apron, is currently capable of handling the majority of parking required by itinerant aircraft. A grass apron located further south of this paved apron area may be required to be established as an overflow during busy periods. The aerodrome operator should discourage any permanent aircraft from parking on the paved apron so that this apron can be utilised by itinerant aircraft.

## 2.4 Terminal & Hangar Precinct

Land in the Terminal & Hangar Precinct should only be used for aviation activities and activities directly related to aviation.

### 2.4.1 Existing Terminal

The existing terminal building is suitable for all current users and it is not envisaged that the building will require upgrading or expansion during the life of this Master Plan. The only trigger for expansion of the terminal building would be if Regular Public Transport (RPT) services with aircraft capable of carrying more than 30 passengers commenced.

There are no security requirements, issued by the Commonwealth Department of Infrastructure, for RPT passenger services utilising turbo-prop aircraft. The operation of passenger jet aircraft is the current trigger for implementing passenger screening and check-bag screening.

It is recommended that additional lighting and landscaping should be provided in and around the existing terminal and car parking areas to improve the usability and amenity of this area. Any landscaping should not be bird attracting, and any lighting should cause light spill that may interfere with aircraft operations.

### 2.4.2 Expansion of Terminal & Hangar Precinct

The existing Terminal & Hangar Precinct needs to be expanded to accommodate demand for further hangars. The proposed arrangement for expansion of this precinct is shown on the Terminal & Hangar Precinct Concept Plan attached at Appendix B. This concept plan proposes the expansion of the Terminal & Hangar Precinct to the north of the existing precinct.

The proposed layout comprises rows of hangars serviced by a taxilanes in front of the hangars and an access road at the rear, in an identical arrangement to the most recently constructed hangars located on the north side of Arrow Court (Nos. 9-12). This plan provides flexibility both in terms of hangar size and staging of construction. If there is demand for hangars larger than shown on the plan this could be accommodated by moving the later rows of hangars further north. Individual hangars or rows of hangars could be developed as the need arises.

Another advantage of this arrangement is the fact that the length of the existing service road (Piper Drive) will enable two new rows of hangars to be constructed (with a new access road in between) before the service road needs to be extended. However, VicRoads has advised that improvements are required to the intersection of the service road and Echuca-Kyabram Road in the form of widening and lighting.

A key issue for expansion of the Terminal & Hangar Precinct to the north of the existing precinct is the Land Subject to Inundation Overlay (LSIO) which covers all of the land concerned. Development of any new hangars in this location will require approval under the provisions of the LSIO. It is envisaged that prior to the development of this land, a stormwater / floodway management plan will need to be developed in conjunction with the North Central Catchment Management Authority.

If for any reason expansion of the Terminal & Hangar Precinct cannot occur to the north (due to the LSIO), it could alternatively occur within the Surplus Land Precinct (No. 3) which has been identified to the south of the existing Terminal & Hangar Precinct, south of the Non-Directional Beacon (NDB).

New buildings erected in the Terminal & Hangar Precinct must not exceed the heights specified in the Obstacle Limitation Surfaces (OLS) chart.

### 2.4.3 Hangar Taxilanes

As discussed in Section 2.3.4 of this Master Plan, construction of further taxilanes to service hangar development must meet the minimum standards found in MOS Part 139 - Aerodromes. It is recommended that all future taxilanes be constructed to cater for Code B aircraft standards, which includes a pavement width of 10.5m for the taxilane and the distance between the centreline of the taxilane and any hangar or other structure being set at 21.5m. This will then allow aircraft with a wingspan of up to 24m to be able to operate from any hangars that are constructed in the future.

The exception to this development guideline is that the first taxilane, located north of the existing hangars, has for expedience and cost effectiveness been proposed to be for the use of Code A aircraft only.

## 2.5 Surplus Land Precincts

The Land Use Concept Plan identifies six Surplus Land Precincts. These precincts are areas of land not required for airfield, terminal or hangar purposes and are set aside for possible future development. This could take the form of aviation-related development, for example an airpark or aviation engineering services, or non-aviation activities, such as general industrial or commercial land uses.

The future use and development of this land for industrial or commercial purposes will need to be considered in the context of the Echuca South East Industrial and Commercial Growth Corridor Land Strategy which is currently being prepared as a separate study. Although the masterplan has identified a range of potential future uses for this land, the land strategy will ultimately guide whether the surplus land should be developed for industrial and commercial uses. Furthermore the land strategy will also guide the timing of any release in the context of other industrial development in the corridor.

There are a number of other matters which also need to be addressed before these precincts can be developed including:

- Development of the surplus land on the west side of the site (Precincts 4 and 5) will require construction of a new road along the western boundary of the site (extension of Old Aerodrome Road). This road may need to be located within the subject land as it is understood that the unconstructed road reserve abutting the western boundary may contain native vegetation.
- Resolution of stormwater / floodway management issues due to the Land Subject to Inundation Overlay (LSIO) affecting parts of the site.
- Completion of native vegetation and cultural heritage investigations (refer to Section 2.6 of this report).
- Provision of infrastructure services (refer to Section 3 of this report).

Nevertheless, the following uses of the individual Surplus Land Precincts are proposed as a preliminary strategy subject to further detailed investigations.

### 2.5.1 Precinct 1

This precinct has potential to be used for industrial purposes. It abuts an existing industrial estate to the north and has ready access available from Echuca-Kyabram Road (subject to VicRoads' approval).

### 2.5.2 Precinct 2

This precinct has potential to be used for aviation-related or non-aviation purposes. This precinct could have access to the airfield, and has ready access available from Echuca-Kyabram Road (subject to VicRoads' approval). It is noted that most of this precinct is in private ownership.

### 2.5.3 Precinct 3

This precinct has potential to be used for aviation-related or non-aviation purposes. This precinct could have access to the airfield, and has ready access available from Echuca-Kyabram Road (subject to VicRoads' approval).

As discussed in Section 2.4.1, this precinct may be required for future expansion of the Terminal & Hangar Precinct, particularly if further hangars cannot be developed to the north of the existing hangars due to the LSIO. As a result, it may be prudent to reserve Precinct 3 for possible future expansion of the Terminal & Hangar Precinct and/or for the possible future development of an aircraft museum or a pilot training facility.

A small part of this precinct is also affected by the LSIO.

### 2.5.4 Precinct 4

This precinct has potential to be used for industrial purposes. It abuts an existing industrial estate to the north. Access to this precinct would require extension of Old Aerodrome Road.

### 2.5.5 Precinct 5

This precinct has potential to be used for aviation-related or non-aviation purposes. Access to this precinct would require extension of Old Aerodrome Road.

This precinct may be suitable for creation of an "airpark" zone.

### 2.5.6 Precinct 6

The land located on the east side of Echuca-Kyabram Road which has been set aside for a possible future east-west runway is separated from the main aerodrome site by the existing Echuca-Kyabram Road and reserve. Given the existence of the road, as well as potential noise sensitivity issues to the west and east, it is not considered feasible to use this land for a future east-west runway. This land is therefore recommended for disposal and possible future industrial use.

### 2.5.7 General Guidelines

Use and development of the Surplus Land Precincts should comply with the following general guidelines:

- Ensure that industrial activities do not produce air emissions that are likely to impact on aviation activities or nearby residential housing.
- Ensure that building lighting does not impact on aerodrome operations.
- Ensure that landscaping is not bird-attracting.
- Ensure that development does not impact on any significant environmental or cultural heritage values of the aerodrome site.
- Ensure that buildings do not exceed the heights specified in the Obstacle Limitation Surfaces (OLS) chart that will impact on flight paths or aerodrome operations.
- Ensure that industrial activities do not produce odorous air emissions that may impact on surrounding uses sensitive to odour.
- Ensure that land uses are not sensitive to aircraft noise (residential uses should be discouraged unless associated with an airpark).
- Ensure that convenient, safe and efficient vehicle access is provided within and to the site.

## 2.6 Environmental and Cultural Heritage Requirements

Sections 3.4 and 4.6 of the Issues and Opportunities Paper outline the environmental requirements and issues relating to the subject site.

### 2.6.1 Native Vegetation

There is existing protected native vegetation (grasses) known to occur on parts of the aerodrome site. Whilst a large portion of the land is or has been used for agriculture and will therefore likely

be devoid of any native vegetation, the protection of areas of remnant native vegetation will need to be taken into account prior to the development of the subject land.

Campaspe Shire Council commissioned a full flora and fauna investigation of the site in September 2009 in order to determine the exact extent of native vegetation on the subject land. A copy of this assessment is provided at Appendix B. The final Master Plan has considered the results of this study in order to provide for the protection of significant native grass areas.

If for any reason the removal of native vegetation on the site cannot be avoided, a planning permit will be required and the requirements of *Victoria's Native Vegetation Management – A Framework for Action* will apply. If clearing must occur, the clearing must be offset. A referral to the Commonwealth Government under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) may also be required.

### 2.6.2 Floodways / Waterways

Three parts of the site are affected by the Land Subject to Inundation Overlay (LSIO) or Floodway Overlay (FO). The Land Use Concept Plan identifies these areas. Development within these areas will require approval under the provisions of the LSIO or FO. This particularly relates to the proposed expansion of the Terminal & Hangar Precinct to the north of the existing hangars. As previously stated, it is envisaged that prior to the development of this land, a stormwater / floodway management plan will need to be developed in conjunction with the North Central Catchment Management Authority.

A waterway/creek traverses the south-west corner of the subject site. This land has been shown on the Land Use Concept Plan as an area of "Proposed Open Space" in order to protect its environmental values. This area may be a suitable location for environmental enhancements and native vegetation net gain offsets.

Goulburn-Murray Water has advised that a 30m building setback is required from waterways and a 60m setback is required for septic tank systems.

### 2.6.3 Cultural Heritage

Parts of the subject land may be defined as areas of cultural heritage sensitivity based on the presence of watercourses and waterbodies on or near the site. Areas of cultural heritage sensitivity are defined by Aboriginal Affairs Victoria (AAV) as areas within 200 metres of named watercourses and within 50 metres of recorded Aboriginal archaeological sites. An area that has been subject to past significant ground disturbance is not regarded as sensitive.

Within areas of cultural heritage sensitivity a Cultural Heritage Management Plan (CHMP) must be prepared prior to the commencement of any high impact activity under Division 3 of the Aboriginal Heritage Regulations 2007.

A cultural heritage study of the subject land should be undertaken prior to the development of any areas of cultural heritage sensitivity in order to determine whether a CHMP is required.

## 2.7 Development Staging

In general, the staging of development on the site will depend on demand for land and the ability to provide services in a cost effective manner.

## 2.8 The staging of expansion of the Terminal & Hangar Precinct was discussed in Section 2.4.1 of this report. For the Surplus Land Precincts, staging of development should generally commence with the land at the northern end of the site adjacent to the existing industrial estate (Surplus Land Precincts 1 and 4) and then proceed in a southerly direction.Land Budget

The following table sets out the approximate area of each proposed precinct shown on the Land Use Concept Plan.

**Table 2 - Land Budget**

| Precinct | Approximate Area* |
|---|---|
| Airfield Precinct | 100 hectares |
| Existing Terminal & Hangar Precinct | 3.5 hectares |
| Expansion of Terminal & Hangar Precinct | 3.8 hectares |
| Surplus Land Precinct 1 | 2.1 hectares |
| Surplus Land Precinct 2 | 4.1 hectares |
| Surplus Land Precinct 3 | 7.3 hectares |
| Surplus Land Precinct 4 | 15.9 hectares |
| Surplus Land Precinct 5 | 27.5 hectares |
| Surplus Land Precinct 6 (east side of Echuca-Kyabram Road) | 43 hectares |
| Proposed Open Space | 3.6 hectares |
| **TOTAL** | **210.8 hectares** |

* Approximate area only, subject to survey and detailed design.

## 2.9 Land Ownership

The Echuca Aerodrome currently comprises several privately owned subdivided lots. It is generally considered that the fragmentation of ownership of the Terminal & Hangar Precinct is not sensible or appropriate as this removes a level of control from the Council in a situation where the Council, as the aerodrome manager, should have total control. The fragmented land ownership complicates infrastructure provision and regulatory compliance issues because in order to address these matters a number of separate landowners need to be involved. If the Council controlled all of the land, it would simplify the management of these matters.

Accordingly, it is recommended that no further subdivision or sale of land should occur in the Terminal & Hangar Precinct, including the expansion of this precinct. Future hangars should be developed by the Council and leased to aviation operators instead of being developed on privately owned allotments. This will enable the Council to retain ultimate control over the land.

It would be desirable for Council to own all land associated with the aerodrome (in the Airfield and Terminal & Hangar Precincts). The aerodrome is a community asset and is subject to complex rules and regulations. Just as the Council owns many other community facilities, such as pools and sporting complexes, it should own the aerodrome. It is therefore recommended that Council consider buying back the privately owned allotments in the Terminal & Hangar Precinct. At a

minimum Council should seriously consider acquiring allotments where there is non-compliance with CASA standards (refer Section 2.3).

In the areas not required for aviation/aerodrome purposes, where the land could potentially be developed for non-aviation purposes such as industrial or commercial development, subdivision and sale of the land could be considered.

Any leasing or sale of the subject land needs to be undertaken in accordance with the terms of the transfer of the land from the Commonwealth to the Shire (dated 14 November 1972) and the Deed between the Echuca Aerodrome Committee of Management and the Commonwealth (dated 5 June 1992). The terms of these documents may place restrictions or requirements on any leasing or sale of the land, and as a result the Council should seek legal advice regarding this matter.

## 2.10 Surrounding Land

The key issue in relation to land surrounding the aerodrome is to ensure that its use and development does not prejudice the ongoing operation of the aerodrome. This primarily involves ensuring that:

- changes of land use near the aerodrome are not for land uses which may be sensitive to aircraft noise (e.g. residential land uses); and
- development proposals near the aerodrome do conflict with the aerodrome's Obstacle Limitation Surfaces (OLS).

There is residential land located west and north-west of the aerodrome, as well as rural living land to the east. It was reported during the consultation workshop with aerodrome users and landowners that the Aero Club has in the past received some complaints associated with aircraft noise from residents in these residential areas. As there is no current ANEF, and an ANEF was not part of this study, it is difficult to determine the exact extent of the off-site noise issue. However, it must be recognised that noise impacts will only increase as aircraft movements increase over time.

Importantly, however, the land to the north of the aerodrome is zoned for industrial purposes and the land to the south of the aerodrome is zoned for rural/farming purposes. This is advantageous given the fact that the main runway (17/35) runs in a north-south direction. For the long term protection of the aerodrome, these zonings should be maintained and any future residential rezonings or residential development elsewhere within the vicinity of the aerodrome should be very carefully considered. Any proposals for farm houses to the south the aerodrome should also be carefully considered in this context. Any proposals for industrial development to the north of the aerodrome must consider the OLS.

The Echuca South East Industrial and Commercial Growth Corridor Land Strategy is currently being prepared in parallel with this master plan. This project seeks to identify long term opportunities for the growth of industry and business in Echuca. The project's study area comprises the land located north, south and east of the Echuca Aerodrome. The above recommendations of this master plan should be incorporated into the Echuca South East Industrial and Commercial Growth Corridor Land Strategy.

## 2.11 Planning Scheme Amendments

The following amendments to the Campaspe Planning Scheme are recommended:

### 2.11.1 Municipal Strategic Statement

The Campaspe Municipal Strategic Statement (MSS) does not explicitly make reference to the Echuca Aerodrome. The MSS should be amended to highlight the role of the aerodrome and the importance of protecting its long term future as a community asset. The outcomes of the Echuca Aerodrome Master Plan should also be incorporated into the MSS, thereby providing strategic support for the recommended future use and development of the subject site.

### 2.11.2 Zoning Controls

Change zone which applies to the aerodrome site from Public Use Zone 4 – Transport (PUZ4) to a Special Use Zone (SUZ) similar to the Special Use Zones that apply to Mildura Airport, Ballarat Aerodrome and Bendigo Aerodrome. While the PUZ4 zoning supports the "public" and "transport" operations of the aerodrome itself, it is not appropriate for privately owned lots established on the subject site. Nor does the current zoning support the potential future development of non-aviation uses on the site (in the Surplus Land Precincts). A Special Use Zone can be tailored to the specific objectives and requirements for this site.

The future zoning of Surplus Land Precinct 6 will be subject to the outcomes of the Echuca South East Industrial and Commercial Growth Corridor Land Strategy.

### 2.11.3 Overlay Controls

The Design and Development Overlay (DDO) should be applied to protect the Obstacle Limitation Surfaces and thereby ensure that the height of future development on, and in proximity of, the subject site does not adversely impact on or constrain the future operations of the Echuca Aerodrome. This overlay is currently used at a number of aerodromes in Victoria to implement their OLS through planning scheme controls (e.g. Mildura Airport and Ballarat Aerodrome).

It may be prudent to apply the Environmental Significance Overlay to protect significant areas of native vegetation. It is recommended that the Shire of Campaspe prepare a planning scheme amendment, in consultation with the Department of Sustainability and Environment, to facilitate the appropriate protection and management of significant native flora occurring at the Echuca Aerodrome site.

As there is no current ANEF for Echuca Aerodrome, and an ANEF was not part of this study, it is not possible to apply the Airport Environs Overlay (AEO). Echuca Aerodrome is only used by light aircraft and due to the low number of aircraft movements these aircraft do not generate sufficient noise for an ANEF to be meaningful. It is considered that the contours produced by an ANEF model, if one was produced for Echuca Aerodrome, would all likely fall within the aerodrome property, or marginally outside the property, and would be difficult to decipher. Nevertheless, it is considered that an ANEF study would be beneficial to provide confirmation of the off-site noise impacts and whether application of the AEO is necessary.

# 3 Future Infrastructure and Access Requirements

The following infrastructure requirements have been determined for the proposed development at the Echuca Aerodrome. The proposed development comprises the construction of 20 new hangars by extending the existing Terminal & Hangar Precinct. Each hangar will measure approximately 18m x 28m. This section summarises the requirements and the assumptions made.

Concept Infrastructure Layout Plans for the future infrastructure at the Echuca Aerodrome are provided at Appendix D. It is highlighted that the provision of services, including power, gas, water and sewerage to the site and the reticulation within the Echuca Aerodrome must address the three-step approach to net gain. Moreover, the location and installation methods used to provide these services must avoid the removal of native vegetation wherever possible, both along the roadside and within the aerodrome site itself.

## 3.1 Sewerage

Plans received from Coliban Water indicate that the sewerage network currently terminates in the industrial area surrounding Despatch Street, north of the Aerodrome.

The total wastewater load generated from the proposed development has been calculated at approximately 8.85 kL/day. To reach this calculated loading, it is assumed that in each hangar sewerage contributions are from a sink, toilet and the washing of planes in each hangar. Given the relatively flat topography, it is likely that a sewer pump station and rising main system will be required. Gravity mains are estimated to be approximately 300mm diameter (conservative). The diameter of the rising main is expected to be in the order of 50mm.

Coliban Water has advised that the extension of sewerage services to the Aerodrome would need to be carried out through the developer installed works process.

## 3.2 Water

Plans received from Coliban Water indicate that there is a 100mm diameter water main currently running along Echuca-Kyabram Road which terminates 50m past the Scott Road intersection.

The total water load generated from the proposed development has been calculated as approximately 110% of the sewerage load, therefore totalling 9.74 kL/day. To reach this calculated loading, it is assumed that in each hangar water is only required for use in a sink, a toilet, drinking water and the washing of planes. For these loads, Coliban Water advise that a water main extension will need to be in the order of 200mm diameter (conservative). The scope of the extension/upgrade works is subject to detailed design.

Coliban Water has advised that the extension of water services to the Aerodrome would need to be carried out through the developer installed works process.

## 3.3 Fire Fighting Water Supply

The CFA requirements for fire fighting are adopted from the Building Code of Australia and Australian Standards. Advice received from the CFA included the following fire fighting water supply requirements which will need to be met as a condition of any further development:

- A static water storage supply in two tanks totalling 144kL allowing 10L/s for four hours;
- Connections from the tanks to a fully reticulated water system with hydrants providing coverage of no more than 90m to every part of all building envelopes;
- A pump set, booster assembly, ancillary equipment and signage installed in accordance with AS 2419.1-2005 (Australian Standard for Fire Hydrant Installations - System design, installation and commissioning).

Any future development in the Surplus Land Precincts will require its own fire fighting water supply.

## 3.4 Power

Plans received from Powercor indicate that there are areas surrounding the site where underground high voltage cable can be found, including Despatch Street to the north of the site.

The loading for the proposed development is expected to be in the order of 400kW. To reach this calculated loading, it is assumed that power supply will only be used for lighting, ventilation and aircraft maintenance (e.g. the use of power tools). High demand uses have not been considered.

Powercor advised that either a 200-300kVA transformer will be required or an existing substation will require upgrade.

The installation of power cabling is assumed to be underground.

## 3.5 Stormwater Management

The Land Subject to Inundation Overlay indicates that the proposed development is on land which is subject to inundation. Beca is currently awaiting advice from NCCMA regarding this issue.

10 year average recurrence interval events should be mitigated by the construction of an underground drain. This underground drain is to begin at Echuca-Kyabram Road and will carry stormwater past the proposed hangars where it will flow towards the west of the site and discharge through the railway reserve as per the current arrangement. During a large flood event, it is proposed that the taxiways, apron areas and access roads could act as flood paths if required.

As it is unknown what the flood profile at the site will be at this stage, it would be prudent to allow for the construction of a retarding basin adjacent to the proposed development.

It is recommended that a flood study be completed to take into account other factors and areas upstream of the Aerodrome. The Land Subject to Inundation Overlay and Floodway Overlay indicates that the floodway within the site continues further upstream to the east of the site boundary.

Any planned development within the aerodrome in non-aviation precincts will also need to take into account the drainage constraints of the site.

## 3.6 Telecommunications

Any additional telecommunications hard wired capacity is assumed to be laid in the road reserve in a common trench with other services.

It has been assumed that optical fibre is not required.

## 3.7 Gas

There are no gas easements or assets located within the Aerodrome. However Envestra, the owners of gas infrastructure, has a number of assets surrounding the study area including a 150mm diameter steel main running at pressures between 200kPa and 515kPa along Cornelia Creek Road which increases to 200mm diameter south of the Denmark Road intersection. It continues south past Benson Road. The new development would be serviced by this existing gas infrastructure.

The loading for the new development will be in the order of 1000 gigajoules a year. To reach this calculated loading, it is assumed that gas supply will be used for hot water (tap) only. The gas requirements for each new hangar has therefore been assumed to be equivalent to that of a household (conservative). The type of hot water system to be used is not known.

The calculated gas supply loading is based on APA records for the average house usage of approximately 50 gigajoules of gas per year.

## 3.8 Vehicular Access

Aerodrome access is presently via two access points off Echuca-Kyabram Road with a small service road adjoining the main carriageway. The intersection treatment of the access points is limited in terms of traffic management measures. Passing and waiting space is limited and there is currently no street lighting or other features to visually enhance these intersections (Council is responsible for installation cost of lighting).

Echuca-Kyabram Road is a Road Zone Category 1 controlled by VicRoads. VicRoads has advised that the existing access points on Echuca-Kyabram Road require upgrading in the form of widening and lighting. VicRoads has also advised that the relocation of the existing access would be accepted if the design added to increased safety. The existing access points should be used to provide access to any expansion of the Terminal & Hangar Precinct (i.e. no new access points) and that limited access will be allowed along Echuca-Kyabram Road in general.

In relation to service road usage, VicRoads will not accept two way vehicle movements in service lanes. The direction of travel in the service road must correspond to the closest land of the main carriageway.

The existing service road is currently not connected to Cessna Court (see Terminal & Hangar Precinct Concept Plan at Appendix C). It is understood that this is due to the presence of native grasslands. The connection of the service road to Cessna Court would significantly enhance access to and within the Terminal & Hangar Precinct. It is therefore recommended the extension of the service road to Cessna Court be pursued and that any native vegetation affected by these works be subject to the three-step approach to net gain.

There is potential to provide access to the western side of the site via the extension of Old Aerodrome Road. The development of this road would allow access to Surplus Land Precincts 4 & 5. The extension of Old Aerodrome Road will need to consider the potential impact on any existing native vegetation within the road reserve. The road may need to be constructed inside the aerodrome property rather than in the existing road reserve.

Prior to any significant development on the site a Traffic Impact Assessment would be required.

# 4 Outline Business Case

## 4.1 Overview

The future development of the Echuca Aerodrome needs to be based on an assessment of current and future aviation uses. It is a major regional community asset, which should be retained for aviation use and subject to staged development. There is some potential for expansion of the hangar precinct to accommodate more light aircraft that could lead to the development of aviation support services on the site. The scope of future demand and the timing of development should be the subject of a detailed demand study and market development strategy, which goes beyond the scope of the investigation associated with the preparation of this master plan.

This section provides an overview of current aerodrome use, outlines the directions of future growth and provides some indicative cost estimates associated with upgrades of the aerodrome and the development of hangars. It also provides an outline business case, which is based on the recommended model in the master plan, that Council retain ownership of the airfield and hangar precincts. It should be noted that the cost estimates are indicative only and are based on benchmark data.

## 4.2 Current Use

The aerodrome's current use is for General Aviation purposes (GA), with the predominant use being for recreational flying and light aircraft purposes. It is also is used for flight charters, some light freight use and for the air ambulance.

The analysis of flight movements in the Issues and Opportunities Paper (Part A) shows that the current runway configuration has the capacity for handling over 60,000 movements per annum; and it is handling between 9,000 and 11,000 movements per annum currently (estimates).[8] Applying a growth factor (1.5% compound) for increases in general aviation and some charter activity, movements in 2023 would be expected to be in the range of 11,000 to 13,500 movements per annum.[9]

Aviation activity and the use of the aerodrome have been driven by specialist local, regional and some metropolitan demand by light aircraft owners and users. It has not been generated by the major regional drivers of population growth or tourism growth.[10]

## 4.3 Future Use

The local aviation sector sees conditions as favourable for continued demand for light aircraft use coming out of both Melbourne and border areas of New South Wales. These users will continue

[8] Echuca Aerodrome Master Plan – Issues and Opportunities Paper, Section 4.7

[9] This is based on a compound rate of growth of 1.5%. Echuca Aerodrome Master Plan – Issues and Opportunities Paper, Section 4.7

[10] Echuca Aerodrome Master Plan – Issues and Opportunities Paper, Section 4.8

to be the major drivers of growth of aviation activity in the area and at Echuca Aerodrome specifically.

### 4.3.1 Commuter Services

While there was discussion of commuter air services at the workshop for aerodrome users, there are a number of issues which affect the economics of any such service. Demand factors are the major issue. Echuca is readily accessible from Melbourne by car and rail, and Melbourne currently provides the major tourist market for Echuca/Moama. The opportunities to broaden this market through providing commuter flights and connections for interstate and international tourists should be examined.

Melbourne is also the main business connection for Echuca businesses (e.g. suppliers, head offices etc.). Travel time from Echuca to Melbourne Airport is around 2.5 hours for a 193 km trip via the Northern Highway. The upgrades to Calder Highway are also reducing travel times substantially, for access via Bendigo. Rail provides an alternative to car travel and upgrades to the fast rail network, will see increased usage in future. In addition, the broader region does not provide a large and expanding population catchment that could support a regional commuter service. There are also no major businesses to underwrite flight demand through travel by executives or maintenance contractors.[11]

Locations like Mildura and Albury sustain flights due to a combination of factors: the scale of industry in the area; the broader population catchment areas and the longer travel times by car.

It is recognised that the Echuca Aerodrome can handle commuter aircraft like Dash 8s, however larger commuter aircraft would require runway extensions and strengthening. There is not the consumer and business demand to support a business case for such an upgrade to take these larger aircraft at this time. Our market analysis has shown that there is no current market demand for a Dash 8 service. It is recommended Tourism Victoria and/or Tourism New South Wales consider undertaking a separate study investigating tourism opportunities associated with a commuter service and connections for international and interstate visitors.

### 4.3.2 General Aviation Use

There is potential to develop the aerodrome further for General Aviation use. This was identified in consultations with aerodrome users, who indicated that there was a demand for more general aviation hangar space, the potential to develop an air museum for the Antique Aircraft Association; and ideas for an “airpark”, pilot training facilities and further aviation events. The longer term expansion of aviation use would also generate the potential for aircraft servicing activity to be conducted on site.

[11] For example commuter flights (Qantaslink) were established between Melbourne and Albion Park Aerodrome (Shellharbour LGA) to service Wollongong. BlueScope initially provided significant business travel guarantees through executives and specialist contractors, which was supplemented by local residents travelling to Melbourne to visit friends and relatives. While this sustained flights for the first two years, they were discontinued because of declining demand and issues of convenience of flight times. The Wollongong region provides a large catchment area, but residents could travel to Sydney airport by car or train within 90 minutes.

As stated in Section 2.1, the demand for hangars for the storage and protection of aircraft is growing as Melbourne aerodromes are at capacity and are relatively expensive. The next ring of aerodromes such as Ballarat, Bendigo and Shepparton will reach capacity in the next 5-7 years and are also increasing charges. Echuca has the land available for future hangar development at a reasonable cost.

The local aviation sector has identified scope for creating an active tourism facility by establishing the aerodrome as a base for the Antique Aircraft Association through the provision of hangars and facilities, the establishment of an aircraft museum and further aviation events.[12]

Other potential uses include: further development of other activities including tourist charter flights, and pilot training; and creation of an "airpark" zone (homes and hangar) on the west side of aerodrome. One potential user indicated that he saw future scope to develop the site for air freighting of premium food products to Melbourne or Sydney for international exports. However this would be one-way freight, as there is unlikely to be a demand for any back-fill inbound freight into the region.

The increase in the numbers of planes at the aerodrome would boost the demand for aviation engineering services, and would generate additional demand for sites. An increase in these activities could lead to the longer term development of on-site services and the creation of a light aviation industry cluster.

The business case for active involvement by Council in developing the land associated with the aerodrome revolves around the potential in the medium term to build it is as a light aviation hub, with a cluster of services covering: aircraft servicing, charter operations, some specialised light freight activities, and flight training activity.

While this demand has been identified by the current aviation users, it needs to be further assessed as part of a more detailed demand study to underpin staging of hangar development and attraction of users. This study should be commissioned as part of the development of a detailed business case and development plan for the aerodrome site.

The master plan provides for the separation of the Terminal & Hangar Precinct from the other zones/precincts. It will be important that the zones with runway access and in proximity to the terminal building be retained for aviation uses, if Echuca is to develop a General Aviation Precinct. This also includes restrictions on the use of hangars, to avoid potential land use conflicts with hangars in the core precinct being used for non aviation purposes. Therefore the implementation of the master plan through statutory regulation is critical to the future success of the Echuca Aerodrome for general aviation purposes.

The master plan has also identified surplus land not required for aviation purposes and which could potentially be developed for industrial or commercial uses. These areas are in distinct precincts and could be sold off to provide funds for the development of the aerodrome. These areas identified as surplus should be considered in the separate industrial land study being undertaken for Council. There are however, a number of issues which will need to be considered. These include: the pricing of industrial land; the timing of any sales; and the

[12] Echuca Aerodrome Master Plan – Issues and Opportunities Paper, Section 4.8.

relationship to the development of the Echuca Industrial Estate. These issues are important as they will influence the funds that are potentially available for the upgrades of the aerodrome.

## 4.4 Development Models for the Aerodrome

There are a number of development models that have been utilised in relation to aerodromes and associated aviation precincts. These have included:

- Retention of ownership by Councils, who act as the developer and lease facilities to aviation related operators;
- Joint venture arrangements between a Council and a developer to jointly develop a facility or precinct (with lots available for lease or sale); and
- The sale or lease of sites/precinct to a developer, who then develops and manages the aviation precinct/facilities and sells or leases the land and facilities.

In the latter cases of private ownership there is a need for strong planning regulations to ensure that other non-aviation activities do not move into the precinct. There is also a need for body corporate arrangements in relation to common facilities, aerodrome access and contributions for maintenance of common facilities.

The Echuca Aerodrome currently comprises a mix of land holdings. Council has ownership of the aerodrome facilities and “common property”. In the past it developed and sold several lots, which are now in private ownership. This took place from 2002/03, when Council made some improvements to the aerodrome, developed several of the hangar sites in the precinct and sold them.[13]

The master plan recommends that the current private ownership arrangements not be pursued in the future for a number of reasons. These include: fragmented land ownership which complicates infrastructure development and regulatory compliance; and the possibility of other industrial uses occurring within the aviation precinct. It also introduces complications in terms of the future development of land and contributions for common infrastructure; and may reduce the capacity for Council to facilitate the overall redevelopment of the area, including the development of an aviation cluster. There are examples at other aerodromes, where earlier sales of land can impede overall redevelopment of an aerodrome.

The master plan recommends that future development in the aviation precinct, including new hangars remain in the ownership and control of Campaspe Shire Council.

The master plan also identifies excess land around the aerodrome that is not needed for aviation uses and which could be sold for private development for industrial or commercial uses. A land valuation would be required to assess the potential revenues to Council from this.

There are social benefits in addition to the economic benefits of the future development and leasing of the aerodrome lots and the creation of an aviation precinct. These social benefits for the community relate to the increase in light aircraft uses, including recreational uses, and the availability of the aerodrome for use by the air ambulance and other emergency services.

[13] Data provided by Campaspe Council indicates that lots 10 and 12 were sold in 2002, and lots 9 and 11 in 2003.

## 4.5 Indicative Development Costs

The following section identifies broad costs of developing the aerodrome. It should be noted that these are broad estimates only, based on identified requirements for capital works and benchmark costs. They are indicative costs only, could vary substantially (+/- 30%) and should not be taken as a development budget. A cost study would need to be undertaken to accurately estimate costs and to develop capital investment budgets.

### 4.5.1 Airfield Precinct Upgrades

The following are indicative costs for the upgrade of the airfield precinct. It covers development of the runway, taxiway and taxi lanes. The total indicative cost of the airfield precinct upgrades as specified is $1.097 million. It should be noted that this does not include all items (eg. lighting, runway pavement). An aerodrome safety inspection would be needed to determine the full extent of the upgrades required.

The following are indicative costs for the airfield upgrades.

**Table 3 - Indicative Costs for Airfield Upgrades**

| Item | Estimated Quantity | Indicative Rate | Indicative Cost |
|---|---|---|---|
| **Runway 17/35** | | | |
| Runway extension - 300 m x 23 m includes earthworks | 6,900m2 | $55/m2 | $379,500 |
| Runway widening 23 m - existing runway | 5,510m2 | $45/m2 | $247,950 |
| Double coat bitumen seal 14 mm & 7 mm aggregate | 5510m2 | $10/m2 | $55,100 |
| Runway lighting changes | | $10,000 | $10,000 |
| **Total Runway 17/35** | | | **$692,550** |
| **Taxiway and Taxilanes** | | | |
| South gravel taxiway widening to 10.5 m (300 mm depth) | 1,000m2 | $30/m2 | $30,000 |
| North gravel taxiway widening to 10.5 m (300 mm depth) | 760m2 | $30/m2 | $22,800 |
| Bitumen sealing south taxiway | 2,100m2 | $10/m2 | $21,000 |
| Bitumen sealing north taxiway | 5,300m2 | $10/m2 | $53,000 |
| Existing taxilanes widen to 7.5 m | 1300m2 | $22/m2 | $28,600 |
| **Total Taxiway and Taxilanes** | | | **$155,400** |
| **Aprons** | | | |
| Terminal apron | 735m2 | $30/m2 | $22,050 |
| Bitumen Sealing | 735m2 | $10/m2 | $7,350 |
| Total Aprons | | | $29,400 |
| **Total Runway, Taxiway, Taxilane & Aprons** | | | **$877,350** |
| **Other Costs** | | | |
| Contingencies | | 15% of cost | $131,602 |
| Design and consultancy | | 10% of cost | $87,735 |
| **Total (including other costs)** | | | **$1,096,687** |

Source: Buchan Consulting Analysis. Note: Unit costs are based on indicative costs supplied by Campaspe Shire Council.

### 4.5.2 Expansion of Terminal & Hangar Precinct

Table 4 provides an indicative estimate of the costs of developing additional hangar sites in the proposed expansion of the Terminal & Hangar Precinct. It excludes the airfield upgrade costs. Again these costs are indicative only, and final costs would need to be the subject of further studies, which are outside the scope of the master plan brief.

The master plan allows for the development of up to 20 new hangar sites in the Terminal and Hangar Precinct Expansion Area. This is in addition to the existing 12 sites (9 hangars and 3 vacant sites). It is based on 20 standard new hangars at 375m2 each [14]. The cost estimates include water and sewerage costs to sites, but does not include an allocation of airfield upgrade costs or the costs of drainage solutions for the site and some other utilities. [15]

The development of the new hangar sites can be staged in line with demand, with those sites adjacent to the existing hangars being developed first.

**Table 4 – Summary of Indicative Costs for Developing New Hangar Sites**

| Item | Estimated Quantity | Indicative Rate | Indicative Cost |
|---|---|---|---|
| New hangar buildings (x20) – refer to Terminal & Hangar Precinct Concept Plan at Appendix B. Earthworks & site preparation plus construction costs. 20 hangars with a building size of 375m2. Excludes land cost. | 20 | $15/m2 earthworks & site preparation<br><br>$250/m2 hangar construction | $112,500<br><br>$1,875,000 |
| New taxilanes (x3 @ 10.5m wide) – refer to Terminal & Hangar Precinct Concept Plan. New aprons – refer to Terminal & Hangar Precinct Concept Plan | 13,975m2 | $40/m2 | $559,000 |
| New access roads (x3) – refer to Terminal & Hangar Precinct Concept Plan. <Hangar Access Roads (3 sections: each approx 125m x 7m)> | 2800m2 | $20.5/m2 | $57,400 |
| Service road extensions (x2) – refer to Terminal & Hangar Precinct Concept Plan.<Service Road Extensions (2 sections: each approx 200m x 7m)> | 2625m2 | $20.5/m2 | $53,813 |
| Reticulated sewerage – refer section 3.1 and Appendix D | 1200m | $350/m | $420,000 |
| Reticulated water – refer section 3.2 and Appendix D | 500m | $350/m | $175,000 |
| Fire fighting water tanks, pumps and hydrants etc – refer section 3.3 | | | $572,000 |
| Power – refer section 3.4 and Appendix D | | | Not included |
| Drainage / stormwater management – refer section 3.5 | | | Not included |

14 The actual configuration may include sites of equal size or the consolidation of sites into larger sites to accommodate specific users.

15 Some other costs are not included – telecommunications, gas, power, and upgrade of two existing access points on Echuca-Kyabram Road (widening and lighting).

| | | | |
|---|---|---|---|
| Telecommunications – refer section 3.6 | | | Not included |
| Gas – refer section 3.7 and Appendix D | | | Not included |
| Upgrade two existing access points on Echuca-Kybram Road (widening and lighting) – refer to section 3.8 | | | Not included |

Source: Buchan Consulting analysis. Note: Unit costs are based on indicative costs supplied by Campaspe Shire Council and industry benchmarks. Costs are indicative costs only and are subject to more detailed cost studies. Fire fighting costs from C&C Fire Protection – CMR Fire Systems quote to Campaspe Shire Council March 6 2008.

In order to estimate development costs for individual hangar sites, the following assumptions were used (see Table 5).

**Table 5 - Assumptions Used in Analysis of Terminal and Hangar Precinct Development**

| Component | Assumption |
|---|---|
| **Sites** | |
| Existing Sites (12) | 9 existing hangars, 3 vacant sites |
| New Sites (20) | Standard Size = 500m2 (18x28) |
| Building Footprint | Assumed to be approx 75% of the site. Building Footprint = 375m2 for all 20 sites |
| **Site Development** | |
| Unimproved land cost | $20 per m2 – based on unimproved value of land in the area (indicative only). Site: 500m2 = $10,000 |
| Earthworks & site preparation | $15 per m2 - indicative estimate |
| Hangar construction cost | $250 per m2 (includes slab and building) – indicative estimate |
| Utility Costs – water/sewer/waste | Allocated across all 32 sites (12 existing and 20 new) |
| Hangar Access Roads (new) | Allocated across all 20 new sites |
| Service Road Extension (new) | Allocated across all 20 new sites |
| Taxilanes and Aprons (hangar are) | Allocated across all 20 new sites |
| Fire Protection Costs | Allocated across 32 sites (12 existing and 20 new) |

Source: Buchan Consulting analysis. Note: Costs are indicative costs only and are subject to more detailed cost studies.

Table 6 below provides a summary of cost estimates per site excluding the cost of hangar construction (ie. the cost to create a site ready for a hangar development). Once again, these cost estimates are indicative only. Final costs would need to be the subject of other engineering studies, a cost study and land valuations, which are outside the scope of the master plan brief. These additional studies would include obtaining a current valuation of the land proposed for the aviation precinct and accurate cost estimates of all site development costs and building costs based on specific hangar types and requirements.

**Table 6 - Summary of Site Development Costs (Per Site) Excluding Hangar Construction**

| Item | Standard Site 500m2 $ |
|---|---|
| **Utilities to Site** | |
| Water (extension of mains to site) (all sites =32) | $5,469 |
| Extension of sewer/waste (all sites =32) | $13,125 |
| Note: does not include: power, telecoms, gas | |
| **Connections** | |
| Water connections per site | $1,200 |
| Sewer/Waste per site | $3,500 |
| Stormwater and Drainage | Not Included |
| **Fire Protection** | |
| Fire Protection (all sites =32) | $17,875 |
| **Total Utilities (include fire)** | **$41,169** |
| **Hangar Development Sites (new sites, excluding hangar)** | |
| Base Land Cost ($20 per m2) | $10,000 |
| Earthworks & site preparation ($15 per m2) | $7,500 |
| Hangar Access Roads (share per hangar) | $2,691 |
| Service Road Extension (share per hangar) | $2,870 |
| Taxilanes and Aprons (share per hangar) $559,000 – allocated to 20 sites | $27,950 |
| **Site Development Cost** | **$92,179** |
| Profit (25% of cost) | $23,045 |
| **Indicative Developed Land Price (per site)** | **$115,224** |

Source: Buchan Consulting analysis. Note: Costs are indicative costs only and are subject to more detailed cost studies.

It should be noted that the inclusion of taxilanes and aprons in the costs for the hangar development adds a total of $27,950 per site (a total of $559,000 allocated over 20 new sites).

## 4.6 Hangar Construction and Leasing

The business model that is recommended in this master plan is for Council to retain ownership of the sites and that these are leased to users on long term leases. The following table (Table 7) provides an indicative costing that includes basic hangar construction and estimates of revenues from the leasing of hangars.

### Construction Costs

The development and construction costs are as follows:

- The hangar construction is based on an average construction cost of $250 per m2 (which includes concrete slab and building: materials, construction labour and basic fit out as a hangar).[16]

16 Construction cost is for hangars for light aircraft. These can vary substantially depending on the type of construction. These can range from $160 per m2 to over $300 per m2. We have assumed a figure of $250 based on buildings of good quality, which would set a standard for the aerodrome.

- The site development costs are based on the estimates above, which include an allocation of a share of: utility capital costs and connection costs; access road and service road costs; taxilanes and aprons; land and site development costs; and fire protection capital costs.
- The development cost of each site (including development profit) is $115,224. [17]
- The value of hangar construction is estimated at $93,750 for a building of 375m2 (75% of the 500m2 site).
- The combined land and hangar cost is therefore estimated at $208,974.

It should be noted that the costs of upgrading the airfield and associated main taxiways and aprons have not been allocated to the hangar sites and this totals $1.097 million.

**Table 7 – Indicative Development Costs and Lease Revenues (Per Site)**

| Item | Lot Size | Developed Land Cost Per site | Building Size | Hangar Construct Cost Per site | Site Develop + Hangar Cost Per site | Gross Lease Revenue Per year | Gross Lease Revenue Per year <land+hangar> | Gross Lease Revenue Per year <site only> |
|---|---|---|---|---|---|---|---|---|
| | m2 | $ | m2 | Per m2 | $ | At lease of $40 per m2 | at 8.0% of cost | at 8.0% of cost |
| Development Cost | | | | $250 | | $40 | 0.08 | 0.08 |
| Standard Allotment (18x28) | 500 | $115,224 (Includes profit) | 375 | $93,750 | $209,349 | $16,875 | $16,748 | $9,218 |

Source: Buchan Consulting analysis. Note: Costs and revenues are indicative only and are subject to more detailed studies.

### Leasing of Sites

The above table shows estimates of lease revenues and these cover two options:

- Option 1 - Council developing the site and building the hangar building and leasing it to users: the estimated annual gross lease revenue is around $16,800 based on an 8% return. To achieve this return a lease charge of $40 per m2 would be required, which is above the average for hangars at rural airfields. By way of example at $30 per metre the sites would be leased for $11,250 generating a return of 5.4%.
- Option 2 - Council developing the site and leasing it on a long term lease, with the site user building the hangar. The annual lease revenue for the site only would be $9200 per site.[18] The lease periods would need to be sufficiently long for users to cover their construction costs.

17 It should be noted that utilities capital costs and fire protection systems have been allocated across the total 32 sites (12 existing and 20 new).

18 It should be noted that hangar related development costs have been shared equally across all of the 20 sites.

The following table (Table 8) shows the possible revenues when all 20 sites are developed. It shows annual lease revenue of $334,959 from hangars and sites and $184,359 for sites only.

**Table 8 - Indicative Annual Lease Revenue from Hangar Sites**

| Site Type | # of Sites | Site + Hangar | | Site Only | |
|---|---|---|---|---|---|
| | | Annual Lease Revenue per hangar | Total Annual Lease Revenue Site + Hangar | Annual Lease Revenue per site | Total Annual Lease Revenue Site Only |
| | | <at 8.0% of cost> | | <at 8.0% of cost> | |
| Standard Allotment (18x28) | 20 | $16,748 | $334,959 | $9,218 | $184,359 |

Source: Buchan Consulting analysis. Note: Revenues are indicative only and are subject to more detailed studies.

The following table examines the issues and risks associated with each of the options.

In order for Council to actively develop the aerodrome, it is recommended that Option 1 be pursued, subject to the appropriate risk minimisation strategies being implemented.[19]

It should be noted that there is also potential for Council to pursue a hybrid strategy, where it develops both initial sites and hangars in order to kick start the development of the aerodrome and then focuses on site development and leasing for other sites in the later stages.

[19] This is based on the additional studies identified being undertaken .

## Assessment of Options

| Option | Issues | Risk | Risk Minimisation Strategies |
|---|---|---|---|
| **Option 1** | | | |
| Council developing the site and building the hangars then leasing them to users. | -Council becomes owner and developer of all future hangars at the aerodrome.<br>-Council is able to control development of the aerodrome and the quality of buildings on the site.<br>-Council is able to kick start next stage of development of aerodrome through developing several new hangars.<br>-Council is able to stage development by developing sites in proximity to the terminal and the aero club.<br>- This arrangement avoids current situation where sites have been acquired and remain vacant.<br>-Council maximises revenue generated from the site.<br>- Council able to actively seek tenants for developed sites as part of strategy to develop aviation activity at the aerodrome. | R1.1 Council is exposed to market risk on development of initial hangar sites.<br><br>R1.2 Council exposed to market risk if tenants do not renew leases.<br><br>R1.3 Council not fully aware of size of the market (a market study of potential tenants and future demand has not been completed).<br><br>R1.4 Council needs to fund both site development and hangar construction.<br><br>R1.5 Competition from other aerodromes, offering lower lease costs. | Secure tenants before developing initial hangars.<br>Develop hangars to tenant specifications.<br>Active program of attraction of aviation industry to the site.<br><br>Develop long term leases for all hangar tenants.<br><br>Conduct a market study to underpin hangar development and for tenant attraction.<br><br>Stage construction in line with market demand.<br><br>Assess activities being planned/undertaken by other aerodromes. |

| Option | Issues | Risk | Risk Minimisation Strategies |
|---|---|---|---|
| **Option 2** | | | |
| Council developing the site and leasing sites on a long term leases, with the site user building the hangar. | - Council only needs to develop sites, with tenants constructing the hangars.<br>-Generates lower level of revenue, but Council is not exposed to hangar construction costs.<br>- Users able to construct hangars to their own requirements.<br>- May limit scope for Council to actively develop the aerodrome. | R2.1Council not exposed to full market risk compared with Option 1.<br><br>R2.2 May lead to piecemeal development as leased sites built on at different times.<br><br>R2.3 May delay the development of the aerodrome as not able to construct hangars on "spec" and find tenants.<br><br>R2.4 Limits control over the type of hangars developed.<br><br>R2.5 Council not fully aware of size of the market (a market study of potential tenants and future demand has not been completed).<br><br>R2.6 Competition from other aerodromes, offering lower lease costs. | Council can develop and lease sites in a stage approach.<br><br>Council able to stage development of sites and focus initial site preparation in area near terminal and aero club.<br>Ensure that development of initial leases takes place in a designated period.<br><br>Develop a plan for tenant attraction to sites.<br><br>Use planning controls to ensure quality of development.<br><br>Conduct a market study to underpin hangar development and for tenant attraction.<br><br>Assess activities being planned/undertaken by other aerodromes. |

### Capital Requirements and Funding

General aviation remains important to the Echuca/Moama economy, with the potential to see future growth in activity with an upgraded aerodrome. This upgrade would recognise the aerodrome's importance as a community asset and also provide the foundations for the further development of the tourism market, as outlined in Section 4.3.1.

There are a number of issues in terms of capital funding requirements:

- Council would need to secure funding for the upgrades to the airfield, which are an estimated $1.096 million. This would need to be recovered over time by user charges for aerodrome users. Due to the strategic importance of the aerodrome for future development of light aviation, and the social benefits from air ambulance and other emergency services access, some funding for the upgrade should be sought from the Victorian Government.
- While the construction of hangars could be staged in line with the demand for new hangars, some of the major development costs (for infrastructure) need to be undertaken up front. These relate to bringing utilities into the precinct (water, sewer, waste) and the construction of fire services (tanks, mains and hydrants).

The following table (Table 9) shows the total development costs for the hangar sites and hangars. The site development cost excludes the profit on site development, which amounts to a total of $460,900 from the 20 sites ($23,045 for each site).

The development costs for the 20 sites total $3.718 million comprising: site development and infrastructure costs of $1.843 million and hangar construction costs of $1.875 million.

**Table 9 - Total Development Costs - Hangar Sites (20 new sites)**

| Site Type | # of Sites | Site Development Cost <less profit> | Total Site Development Cost | Hangar Construction Per Hangar | Total Construction Hangars Cost | Total Develop + Construction Cost |
|---|---|---|---|---|---|---|
| Standard Allotment (18x28) | 20 | $92,179 | $1,843,588 | $93,750 | $1,875,000 | $3,718,588 |

Source: Buchan Consulting analysis. Note: Costs are indicative costs only and are subject to more detailed cost studies.

The master plan identifies land that will not be required for aviation related activities and which could potentially be developed for industrial and commercial uses. The plan also identifies land that could be used for an aero park development.

Revenue secured from these areas, could be invested in the development of the airfield and aerodrome. The industrial land assessment needs to be part of the broader study of industrial land being undertaken for Council. An aero park and other options for development would need to be the subject of a separate demand study, which is outside the scope of the master plan brief.

## 4.7 Next Steps

This section of the report has provided an outline business case for the development of the aerodrome, which is based on the potential for the development of Echuca Aerodrome as a general aviation hub for light aircraft (recreational flying, charter, training etc) and the development of associated servicing activities on the site.

A business case cannot be sustained currently for regular commuter flights due to location (accessibility to Melbourne, which is the major business link and tourist catchment), limited demand

levels (from business travellers, residents and tourists) and the costs of upgrades required for large aircraft.

Some indicative estimates of development costs associated with the aviation precinct and up to 20 new hangar sites are provided.

Additional research and analysis needs to be commissioned to support the implementation of the master plan. This would involve:

- The conduct of a full market assessment of growth potential of aviation use, the demand for hangar space and the potential staging of development.
- A full costing study of the aerodrome upgrades and development of hangars in the proposed Terminal & Hangar Precinct.
- A valuation study of land in the aviation precinct and of surplus land that can be sold.

# 5 Conclusion and Next Steps

This Master Plan provides Campaspe Shire Council with a strategic direction for future development of the Echuca Aerodrome. It is a broad strategic document that aims to assist Council in planning for the next 10-15 years. Implementation of this plan will require a number of actions to be undertaken. It is therefore recommended that:

1 Council adopt this Master Plan.

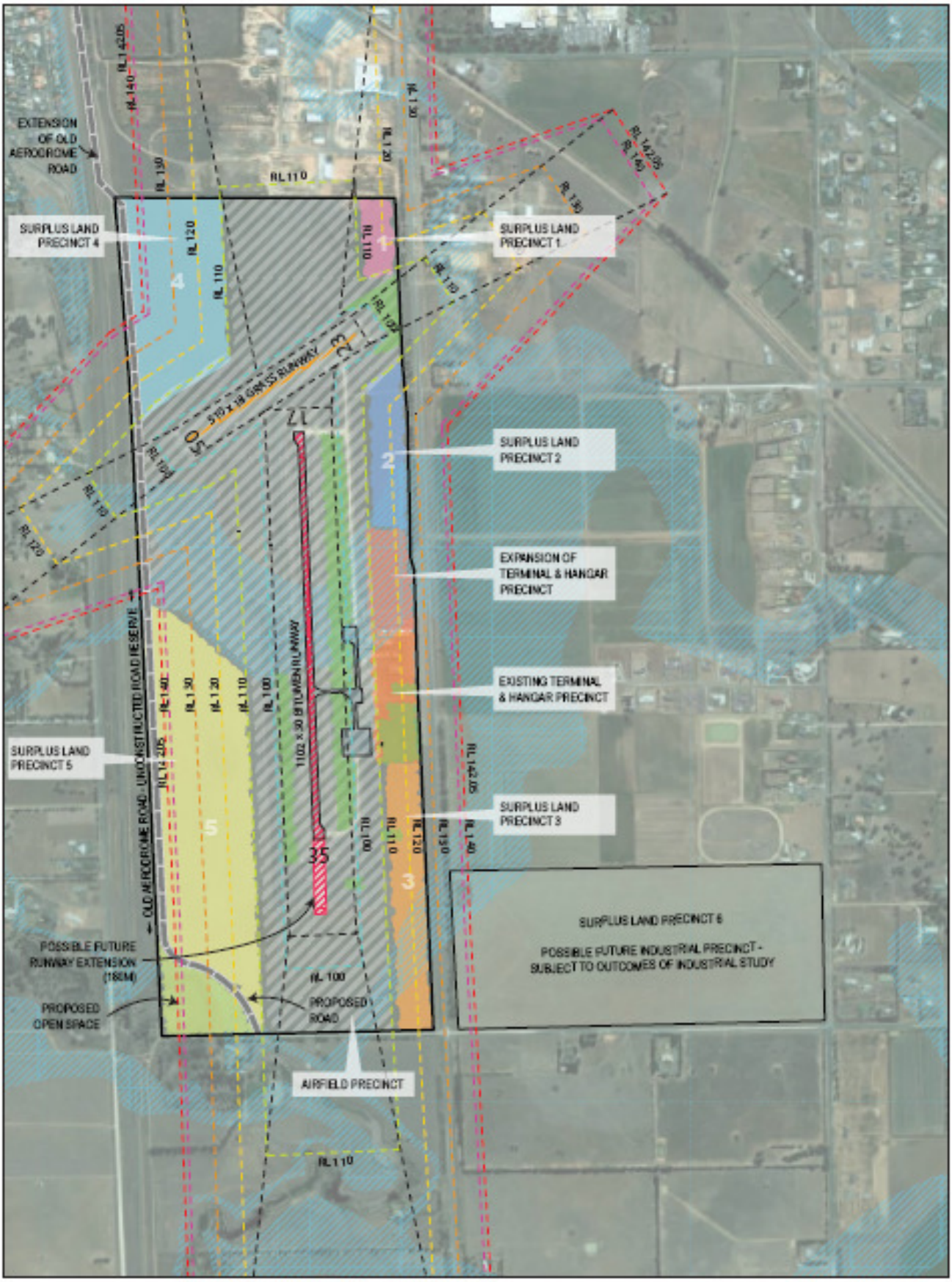
2 Council to commission an Aerodrome Safety Inspection, as outlined in Section 2.3.

3 Prepare and implement a Planning Scheme Amendment as outlined in Section 2.11.

4 Incorporate the outcomes and recommendations of this Master Plan into the Echuca South East Industrial and Commercial Growth Corridor Land Strategy.

Appendix A

# Land Use Concept Plan




Echuca Aerodrome Master Plan

Land Use

Concept Plan

Study Area
Main Runway
Proposed Main Runway Extension
Secondary Runway
LSO (Land Subject to Inundation Overlay)
OLS
Airfield Precinct
Terminal & Hangar Precinct
Surplus Land Precincts
Proposed Road
Existing Native Grasses
Proposed Open Space

0 250 500m

Beca

Appendix B

# Flora and Fauna Study

# *Ecological Assessment with Net Gain Available*

# *Echuca Airport*

## Echuca

**Garry and Brenda Cheers**
**Flora & Fauna Consultants**
**54612970**

***November 2009***

# 1 INTRODUCTION

## 1.1 Project Background

Garry and Brenda Cheers, Flora & Fauna Consultants, were commissioned by the Shire of Campaspe, to assess the vegetation on the Echuca airport in relation to available offset on site.

## 1.2 Objectives

The objectives of this assessment were to:

- Describe the flora, fauna and habitat values
- Assess the conservation significance of the habitat
- Map the extent, type and condition of the native vegetation
- Assess and quantify the offset available on site

## 1.3 Study Area

The study area was in the Shire of Campaspe and within the Riverina Bioregion. All assessed vegetation was on land managed by the Shire of Campaspe (refer to Map 9.1 for site locations).
One Ecological Vegetation Class (EVC) – Plains Grassland - was identified in the study area.

# 2 DESCRIPTION OF METHODS

Both the Flora Information System and the Atlas of Victorian Wildlife were checked for species found within a 5km radius of the study area. The Australian Governments Environment Protection and Biodiversity Conservation Act (the 'EPBC Act') on line Environmental Reporting Tool was also checked for possible occurrence of threatened species within a 5km radius of the area.

## 2.1 Field Survey

The vegetation on site was assessed using the Department of Sustainability and Environment (DSE) Vegetation Quality Field Assessment Method (Habitat Hectares Version 1.3 October 2004). This assessment method generates a score between zero and one hundred for each site. The DSE Vegetation Quality Field Assessment Method takes the following features into account: large trees; tree canopy cover; under-storey; cover of weeds; regeneration; organic litter; logs (condition score); block size; neighbourhood; distance to core area (viability score). The Ecological Vegetation Class (EVC) benchmarks developed by DSE were used to provide the basis for this assessment.

In addition to the assessment, a plant species list was compiled for each site giving an indication of biodiversity. This list is incidental sightings only.
The EVC was identified using state wide EVC mapping and then ground truthed.

## 2.2 Special Considerations

The survey was done in late spring when the majority of native species you would expect to be found in the EVC should have been present. The same applied to annual weeds.
The previous 11-12 dry years have also taken a toll on the native vegetation including shrub species. Bryophytes were considered in the habitat hectares assessments but a species list was not compiled.

# 3 FLORA STUDY OUTCOMES

## 3.1 Flora Information System (FIS)

Fourteen rare or threatened species are recorded within a 5km radius surrounding the study area. Ausfeld's Wattle, Buloke, Slender Darling-pea, Yellow-tongue Daisy and Buloke Mistletoe would not occur in the EVC on site.

**The sites were searched for the remaining species and Turnip Copperburr and Red Swainson-pea were found.**
**Sites 1, 3 & 6 are considered the best 50% of habitat for Turnip Copperburr.**

**Table 1 Flora recorded within 5 km of study area**

| Year Last recorded | *Scientific Name* | Common Name, | AROTS | VROTS | FFG | EPBC |
|---|---|---|---|---|---|---|
| 1971 | *Amaranthus macrocarpus* | Dwarf Amaranth | | v | | |
| 1933 | *Amyema linophylla* | Buloke Mistletoe | | v | | |
| 1988 | *Acacia ausfeldii* | Ausfeld's Wattle | | v | | |
| 1886 | *Cullen parvum* | Small Scurf-pea | E | e | L | E |
| 1888 | *Bromus arenarius* | Sand Brome | | r | | |
| 1903 | *Swainsona microphylla* | Small-leaf Swainson-pea | | r | | |
| 1999 | *Swainsona murrayana* | Slender Darling-pea | V | e | L | V |
| 1999 | *Brachyscome chrysoglossa* | Yellow-tongue Daisy | | v | L | |
| 1999 | *Sclerolaena napiformis* | Turnip Copperburr | E | e | L | E |
| 1999 | *Swainsona sericea* | Silky Swainson-pea | | v | | |
| 1999 | *Haloragis glauca f. glauca* | Bluish Raspwort | | k | | |
| 1999 | *Swainsona plagiotropis* | Red Swainson-pea | V | e | L | V |
| 1991 | *Podolepis sp. 1* | Basalt Podolepis | | e | | |
| 1994 | *Allocasuarina luehmannii* | Buloke | | | L | |

E = endangered V = vulnerable d = depleted x = extinct
Red found on site **L = listed as protected under the Victorian Flora and Fauna Guarantee Act 1988**

## 3.2 Environment Protection and Biodiversity Conservation Listed Species

The EPBC Environmental Reporting Tool lists three species or likely habitat for these species within a 5km radius of the study area.

1. River Swamp Wallaby-grass (*Amphibromus fluitans*) is confined to permanent swamps principally along the Murray River between Wodonga and Echuca; it is also uncommon to rare in the south (eg Casterton, Moe, Yarram). There is no suitable habitat on site for River Swamp Wallaby-grass
2. Turnip Copper-burr (*Scleroleana napiformis*) is found on site
3. Red Swainson-pea (*Swainsonia plagiotropis*) is found on site

Red Swainson-pea and Turnip Copper-burr are also found on the rail reserve to the west of the study area.

## 3.3 Species Found by Survey

Forty-eight native and 18 introduced vascular plant species were recorded in the study area. These species were recorded as incidental sightings (see appendix 8.2, page 16).

## 3.4 EVC 1 - Plains Grassland EVC #132

Defining characteristic: Tussock grassland rich in a wide variety of (mostly perennial) forbs, particularly Asteraceae, geophytes and small chenopods. Woody plants are absent.
Habitat: Moderately poorly drained quaternary alluvial and paleo-lacustrine clay deposits in areas with less than 500mm/pa rainfall. Poor drainage characteristics of the substrates are attributed as the principal reason for the absence of trees and larger shrubs.
Floristics: As so few examples remain, it is difficult to assemble the true floristic nature of this EVC. Remnants are often dominated by *Austrostipa scabra* and/or *Austrodanthonia caespitosa*, although a number of other dominants may be encountered, and there is little confidence that the above species are the true dominants of pre-European vegetation.

On the heaviest soils, often demonstrating a 'gilgai' nature, *Austrostipa aristiglumis* and *Austrodanthonia duttoniana* are the dominant tussocks. *Wahalleya proluta* and *Poa labillardierei* may also be present (the latter less so). A range of forbs adapted to an edaphic environment which may experience both seasonal water logging and summer moisture deficit occur in the inter-tussock spaces. Such forbs include *Cressa cretica, Calocephalus sonderi, Calocephalus lacteus, Rhodanthe corymbiflora, Alternanthera spp., Calotis scabiosifolia, Brachyscome basaltica, Asperula scoparia, Pratia concolor, Swainsona procumbens, Eryngium vesiculosum,* and *Eryngium paludosum*.

In areas experiencing less water logging, the original dominants are thought to be (variously) *Themeda triandra* or *Enteropogon acicularis*, with the latter dominating in slightly wetter areas. Geophytes are prevalent in this vegetation and include lilies such as

*Bulbine bulbosa, Burchardia umbellata, Caesia calliantha, Arthropodium minus, Arthropodium strictus, Wurmbea dioica* and *Hypoxis glabella*. Other forbs include *Oxalis perennans, Convolvulus angustissima, Calocephalus citreus, Calotis anthemoides, Eryngium ovinum, Goodenia pinnatifida, Sida corrugata, Chenopodium desertorum, Maireana enchylaenoides, Maireana excavata, Maireana pentagona, Maireana decalvans, Microseris scapigera spp. agg., Vittadinia gracilis, Einadia nutans, Atriplex semibaccata,* and *Ptilotus exaltatus*.

Distribution: Formerly on heavy soil plains north of Horsham and around Marnoo in the Wimmera, with smaller occurences around Kaniva. Also found around Birchip, Mitiamo and west of Echuca (Patho Plains) in the North-Central CMA.

Some high quality examples exist on the Mitiamo Plains (e.g. Terricks Terricks N. P.) and Patho Plains.

# 4 FAUNA STUDY OUTCOMES

## 4.1 Atlas of Victorian Fauna

There are no threatened species recorded within the study area. The Atlas of Victorian Fauna lists 12 threatened or vulnerable species within a 5km radius of the study area. Seven of these species require water and Rufous Bettong is extinct. The Brown Treecreeper and Bush Stone-curlew require woodlands. The Black Falcon may forage over the site and the sites are too small for Plains Wanderer.

It is considered that none of the above species is likely to use this site on a regular basis. **The site is not considered the best 50% or the remaining 50% of habitat for any of the above species.**

**Table 2 Fauna recorded within 5 km of study area**

| Year Last recorded | Common Name | *Scientific Name* | FFG | EPBC | AROTS | VROTS |
|---|---|---|---|---|---|---|
| 2000 | Intermediate Egret | *Ardea intermedia* | L | | | e |
| 1982 | Whiskered Tern | *Chlidonias hybridus* | | | | r |
| 2001 | Great Egret | *Ardea alba* | L | | | v |
| 2000 | Azure Kingfisher | *Alcedo azurea* | | | | r |
| 1991 | Hardhead | *Aythya australis* | | | | v |
| 2000 | Brown Treecreeper | *Climacteris picumnus* | | | | r |
| 1857 | Rufous Bettong | *Aepyprymnus rufescens* | L | | | x |
| 1994 | Black Falcon | *Falco subniger* | | | | v |
| 1989 | Blue-billed Duck | *Oxyura australis* | L | | | e |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1999 | Bush Stone-curlew | *Burhinus grallarius* | L | | | e |
| 1954 | Plains-wanderer | *Pedionomus torquatus* | L | V | V | e |
| 1989 | Musk Duck | *Biziura lobata* | | | | v |

E = endangered V = vulnerable d = depleted x = extinct

Blue requires wetlands **L = listed as protected under the Victorian Flora and Fauna Guarantee Act 1998**

## 4.2 Environment Protection and Biodiversity Conservation Listed species

The EPBC Environmental Reporting Tool lists 12 species or likely habitat for these species within a 5km radius of the study area:

1. Murray Cod (*Maccullochella peelii*), require permanent water. This habitat is not on site.
2. Murray Hardhead (*Craterocephalus fluviatilis*) require permanent water. This habitat is not on site.
3. Macquarie Perch (*Macquria australasica*) require permanent water. This habitat is not on site.
4. The Australian Painted Snipe (*Rostratula australis*) requires wetlands, as this habitat is not present on site this species will not be present.
5. The Striped Legless Lizard (*Delma impar*) habitat is native grassland. As there are no Atlas records for the area it is highly unlikely that this species would be present.
6. Plains Wanderer (*Pedionomus torquatas*). Sites are considered to be too small for this species.
7. Regent Honeyeater (*Xanthomyza pyrygia*) is considered extinct or, at the least, a very rare visitor to this part of Victoria. It also requires forested or woodland habitat.
8. The Spot-tailed Quoll (*Dasyurus maculates*) is presumed extinct in the area.
9. Swift Parrot (*Lathamus discolor*) requires forested or woodland habitat.
10. The Southern Bell Frog (*Litoria raniformis*) can be found in permanent lakes and waterholes. This habitat is not available on site.
11. The Golden Sun Moth (*Synemon plana*) occurs in small colonies in native grasslands dominated by species from the genus Austrodanthonia (Wallaby Grasses). Habitat on site is not suitable for this species.
12. The Eastern Long-eared Bat (*Nyctophilus timoriensis*) dens in hollows, under loose bark and fissures in trunks or branches. There are no trees on site.

## 4.3 Species found by survey

No fauna species was recorded on site.

# 5 CONSERVATION SIGNIFICANCE

## 5.1 Ecological Vegetation Classes and Quality Zones

Refer to Map 2, page 18.

## 5.2 Site Assessments

Site 1 Plains Grassland (EVC 132) (habitat Hectare assessment)
**Habitat Hectare score = 54 and Conservation significance Very High**
The EVC is Endangered and the habitat hectare score is between 40 and 100 making the Conservation significances of this site **Very High**

Site 2 Plains Grassland (EVC 132) (habitat Hectare assessment)
**Habitat Hectare score = 45 and Conservation significance Very High**
The EVC is Endangered and the habitat hectare score is between >0 and 40 making the Conservation significances of this site **Very High**

Site 3 Plains Grassland (EVC 132) (habitat Hectare assessment)
**Habitat Hectare score = 51 and Conservation significance Very High**
The EVC is Endangered and the habitat hectare score is between >0 and 40 making the Conservation significances of this site **Very High**

Site 4 Plains Grassland (EVC 132) (habitat Hectare assessment)
**Habitat Hectare score = 40 and Conservation significance Very High**
The EVC is Endangered and the habitat hectare score is between 40 and 100 making the Conservation significances of this site **Very High**

Site 5 Plains Grassland (EVC 132) (habitat Hectare assessment)
**Habitat Hectare score = 55 and Conservation significance Very High**
The EVC is Endangered and the habitat hectare score is between 40 and 100 making the Conservation significances of this site **Very High**

Site 6 Plains Grassland (EVC 132) (habitat Hectare assessment)
**Habitat Hectare score = 53 and Conservation significance Very High**
The EVC is Endangered and the habitat hectare score is between 40 and 100 making the Conservation significances of this site **Very High**

## 5.3 Sites that may be suitable for future offset

The site colored blue on map 2 should be managed to improve the native vegetation cover. At the time of assessments the native cover of this site was below 25% of the vegetation cover and the native diversity was low. Management may improve native cover which in time may make it assessable for offset. Even if the native cover and diversity doesn't improve enough for offset it will form a good buffer to the Very High conservation significance grasslands on site.

Management of this site would be slashing to prevent seeding of the exotic annual grasses that are present.

**Table 3– Quantification and Significance of Patches of Native Vegetation –**

| Habitat Zone | | | Site 1 | Site 2 | Site 3 |
|---|---|---|---|---|---|
| **EVC Name (initials)** | | | **PG** | **PG** | **PG** |
| **EVC Number** | | | **132** | **132** | **132** |
| | | **Max Score** | **Score** | **Score** | **Score** |
| Site Condition | Large Old Trees | 10 | N/A | N/A | N/A |
| | Canopy Cover | 5 | N/A | N/A | N/A |
| | Under storey | 25 | 15 | 15 | 15 |
| | Lack of Weeds | 15 | 15 | 9 | 13 |
| | Recruitment | 10 | 6 | 6 | 6 |
| | Organic Matter | 5 | 3 | 4 | 3 |
| | Logs | 5 | N/A | N/A | N/A |
| | **Site condition score x Standardisation multiplier** | 1.36 | 53 | 46 | 50 |
| Landscape value | Patch Size | 10 | 1 | 1 | 1 |
| | Neighbourhood | 10 | 0 | 0 | 0 |
| | Distance to Core | 5 | 0 | 0 | 0 |
| **Habitat points out of 100** | | **100** | **54** | **45** | **51** |
| **Habitat Score (hab points/100)** | | **0.##** | **0.54** | **0.45** | **0.51** |
| Area of zone to be cleared (ha) | | (#.#) | n/a | n/a | n/a |
| **Habitat Hectares of loss** | | (#.##) | n/a | n/a | n/a |
| **Total area of the Zone Ha)** | | (#.##) | 0.03 | 0.65 | 0.78 |
| **Total HHA in the zone** | | (#.##) | 0.02 | 0.29 | 0.40 |
| **Bioregion** | | | VR | VR | VR |
| **EVC Conservation Status** | | | E | E | E |
| **Conservation Significance** | **BCS x Habitat Score** | | VH | VH | VH |
| | **Threatened Species** | | H | L | H |
| | **Other Site Attributes** | | L | L | L |
| | **Overal Conservation Status** | | VH | VH | VH |
| **Large old trees to be removed** | | | N/A | N/A | N/A |

**Table 4 Quantification and Significance of Patches of Native Vegetation –**

| Habitat Zone | | | Site 4 | Site 5 | Site 6 |
|---|---|---|---|---|---|
| **EVC Name (initials)** | | | **PG** | **PG** | **PG** |
| **EVC Number** | | | **132** | **132** | **132** |
| | | **Score** | | **Score** | **Score** |
| Site Condition | Large Old Trees | 10 | N/A | N/A | N/A |
| | Canopy Cover | 5 | N/A | N/A | N/A |
| | Under storey | 25 | 10 | 15 | 15 |
| | Lack of Weeds | 15 | 9 | 11 | 13 |
| | Recruitment | 6 | 6 | 10 | 6 |
| | Organic Matter | 5 | 4 | 4 | 5 |
| | Logs | N/A | | N/A | N/A |
| | **Site condition score x Standardisation multiplier** | 1.36 | 39 | 54 | 52 |
| Landscape value | Patch Size | 1 | 1 | 1 | 1 |
| | Neighbourhood | 10 | 0 | 0 | 0 |
| | Distance to Core | 5 | 0 | 0 | 0 |
| **Habitat points out of 100** | | **100** | **40** | **55** | **53** |
| **Habitat Score (hab points/100)** | | **0.##** | **0.40** | **0.55** | **0.53** |
| Area of zone to be cleared (ha) | | (#.#) | n/a | n/a | n/a |
| **Habitat Hectares of loss** | | (#.##) | n/a | n/a | n/a |
| **Total area of the Zone Ha)** | | (#.##) | 0.38 | 0.3 | 0.42 |
| **Total HHA in the zone** | | (#.##) | 0.15 | 0.17 | 0.22 |
| **Bioregion** | | | VR | VR | VR |
| **EVC Conservation Status** | | | E | E | E |
| **Conservation Significance** | **BCS x Habitat Score** | | VH | VH | VH |
| | **Threatened Species** | | L | L | H |
| | **Other Site Attributes** | | L | L | L |
| | **Overal Conservation Status** | | VH | VH | VH |
| **Large old trees to be removed** | | | N/A | N/A | N/A |

**Table 5 - Gains available from management of a remnant patch**

| OFFSET IDENTIFIER | | | Site 1 | | | Site 2 | | | Site 3 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EVC Number | | | 132 | | | 132 | | | 132 | | |
| EVC name (Initials) | | | PG | | | PG | | | PG | | |
| | Current habitat score of zone [1] | 0.## | 0.54 | | | 0.47 | | | 0.51 | | |
| | Conservation Significance [2] | | E | | | E | | | E | | |
| | | Possible Score | Current Score | Maintenance | Improvement | Current Score | Maintenance | Improvement | Current Score | Maintenance | Improvement |
| Site Condition [3] | Large Old Trees | 10 | n/a | n/a | | n/a | 0.0 | | n/a | 0.0 | |
| | Canopy Cover | 5 | n/a | 0.0 | 0.0 | n/a | 0.0 | 0.0 | n/a | 0.0 | 0.0 |
| | Understorey | 25 | 15 | 7.5 | 2.5 | 15 | 7.5 | 2.5 | 15 | 7.5 | 2.5 |
| | Lack of Weeds | 15 | 15 | | 2 | 15 | | 2 | 13 | | 2 |
| | Recruitment | 10 | 6 | 3 | 2 | 6 | 3 | 2 | 6 | 3 | 2 |
| | Organic Matter | 5 | 3 | 2 | 1 | 4 | 1.5 | 1 | 3 | 2 | 1 |
| | Logs | 5 | n/a | 0.0 | 0.0 | n/a | 0.4 | 0.0 | n/a | 0 | 0 |
| Maintenance & improvement totals | | #.# | | 12.5 | 7.5 | | 12 | 7.5 | | 12.5 | 7.5 |
| Total unadjusted site condition gain | | ##.# | | 27.2 | | | 26.5 | | | 27 | |
| Prior Management Gain [6] | | #.# | | 5.4 | | | 4.7 | | | 5.1 | |
| Improved Security Gain* [7] | | #.# | | 5.4 | | | 4.7 | | | 5.1 | |
| Total habitat gain points out of 100 [8] | | ##.# | | 37.8 | | | 35.9 | | | 37.2 | |
| Rate of gain per hectare - HHA/ha [9] | | 0.## | | 0.378 | | | 0.359 | | | 0.372 | |
| Area of the offset zone (ha) | | #.# | | 0.3 | | | 0.65 | | | 0.78 | |
| Gain available (in HHA) [10] | | #.## | | 0.11 | | | 0.23 | | | 0.29 | |
| Very large old trees available for protection | | # | | n/a | | | n/a | | | n/a | |
| Large old trees available for protection | | # | | n/a | | | n/a | | | n/a | |
| Medium old trees available for protection | | # | | n/a | | | n/a | | | n/a | |

**Table 6 - Gains available from management of a remnant patch**

| OFFSET IDENTIFIER | | | Site 4 | | | Site 5 | | | Site 6 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EVC Number** | | | 132 | | | 132 | | | 132 | | |
| **EVC name (Initials)** | | | PG | | | PG | | | PG | | |
| | Current habitat score of zone [1] | 0.## | 0.40 | | | 0.55 | | | 0.53 | | |
| | Conservation Significance [2] | | E | | | E | | | E | | |
| | | Possible Score | Current Score | Maintenance | Improvement | Current Score | Maintenance | Improvement | Current Score | Maintenance | Improvement |
| Site Condition [3] | Large Old Trees | 10 | n/a | 0.0 | | n/a | 0.0 | | n/a | 0.0 | |
| | Canopy Cover | 5 | n/a | 0.0 | 0.0 | n/a | 0.0 | 0.0 | n/a | 0.0 | 0.0 |
| | Understorey | 25 | 10 | 5 | 2.5 | 15 | 7.5 | 2.5 | 15 | 7.5 | 2.5 |
| | Lack of Weeds | 15 | 9 | | 2 | 11 | | 2 | 13 | | 2 |
| | Recruitment | 10 | 6 | 3 | 2 | 10 | 5.0 | 2 | 6 | 3 | 2 |
| | Organic Matter | 5 | 4 | 2 | 1 | 4 | 2 | 1 | 5 | 2.5 | 0 |
| | Logs | 5 | n/a | 0.0 | 0.0 | n/a | 0 | 0.0 | n/a | 0 | 0 |
| Maintenance & improvement totals | | #.# | | 10 | 7.5 | | 14.5 | 7.5 | | 13 | 6.5 |
| **Total unadjusted site condition gain** | | ##.# | | **23.8** | | | **30.0** | | | **26.5** | |
| Prior Management Gain [6] | | #.# | | 4.0 | | | 5.5 | | | 5.3 | |
| Improved Security Gain* [7] | | #.# | | 4.0 | | | 5.5 | | | 5.3 | |
| **Total habitat gain points out of 100** [8] | | ##.# | | **31.8** | | | **41.0** | | | **37.1** | |
| **Rate of gain per hectare - HHA/ha** [9] | | 0.## | | **0.318** | | | **0.410** | | | **0.371** | |
| **Area of the offset zone (ha)** | | #.# | | **0.4** | | | **0.3** | | | **0.4** | |
| **Gain available (in HHA)** [10] | | #.## | | **0.13** | | | **0.12** | | | **0.15** | |
| **Very large old trees available for protection** | | # | | n/a | | | n/a | | | n/a | |
| **Large old trees available for protection** | | # | | n/a | | | n/a | | | n/a | |
| **Medium old trees available for protection** | | # | | n/a | | | n/a | | | n/a | |

# 6 OFFSETS AVAILABLE

- **1.03HHa of Very High Conservation Significance Plains Grassland is available on site.**

Offsets are calculated on

1. An on title agreement
2. Controlling all high threat weeds to <1% cover
3. Controlling all weeds to current cover
4. Controlling all grazing threats (e.g. rabbits)
5. No grazing of site.
6. No slashing of sites

# 7 RECOMMENDATIONS

The following recommendations have been made:

- that DSE be contacted about condition of the site to the south of Cessna Rd and if they agree that this site cannot be assessed as Plains Grassland that the sign be moved to site 5 of this report;
- that a management plan for sites 1 to 6 be prepared for net gain; and
- that sites 1 to 6 be registered on title.

APPENDICIES

## 7.1 References

DSE. EVC/Bioregional Benchmarks for Vegetation Assessment Riverina Bioregion

DSE. (2002). Victoria's Native Vegetation Management – A Framework for Action

DSE. (2007). Advisory List of Rare or Threatened Fauna.

DSE. (2005). Advisory List of Rare or Threatened Plants.

Walsh, N.G. & Entwisle, T.J. (1994). Flora of Victoria. Volume 2. Ferns and Allied Plants, Conifers and Monocotyledons. Inkata Press.

Walsh, N.G. & Entwisle, T.J. (1996). Flora of Victoria. Volume 3. Dicotyledons, Winteraceae to Myrtaceae. Inkata Press.

## 7.2 Incidental Flora recorded on development site

| *Scientific name* | Common Name | Origin | AROTS | VROTS | S1 | S2 | S3 | S4 | S5 | S6 |
|---|---|---|---|---|---|---|---|---|---|---|
| *Poa bulbosa* | Bulbous Meadow-grass | * | | | | X | X | X | X | X |
| *Austrodanthonia caespitosa* | Common Wallaby-grass | | | | X | X | X | X | X | X |
| *Austrodanthonia duttoniana* | Brown-back Wallaby-grass | | | | | | X | | | X |
| *Austrodanthonia setacea* | Bristly Wallaby-grass | | | | | | X | | | X |
| *Austrostipa scabra* | Rough Spear Grass | | | | X | | | | | X |
| *Austrostipa spp.* | Spear Grass | | | | X | X | X | X | X | X |
| *Avena fatua* | Wild Oat | * | | | | | X | | | X |
| *Chloris truncata* | Windmill Grass | | | | | X | X | | | |
| *Critesion spp.* | Barley Grass | * | | | | | X | X | | X |
| *Enteropogon acicularis* | Spider Grass | | | | | X | X | | | X |
| *Lolium rigidum* | Wimmera Rye-grass | * | | | X | X | X | X | | X |
| *Vulpia spp.* | Fescue | * | | | | | X | X | X | X |
| *Whalleya proluta* | Rigid Panic | | | | | | X | | | X |
| *Moraea setifolia* | Thread Iris | * | | | | X | | X | X | X |
| *Romulea rosea* | Onion Grass | * | | | X | X | X | X | X | X |
| *Arthropodium fimbriatum* | Nodding Chocolate-lily | | | | X | | | | | X |
| *Arthropodium minus* | Small Vanilla Lily | | | | X | | X | | | X |
| *Bulbine bulbosa* | Bulbine Lily | | | | X | | X | | | X |
| *Wurmbea dioica* | Common Early Nancy | | | | X | | | | | |
| *Ptilotus exaltatus* | Mulla Mulla | | | | X | | X | | | X |
| *Echium plantagineum* | Paterson's Curse | * | | | | | | X | | |
| *Wahlenbergia spp.* | Bluebell | | | | X | | | | | X |
| *Spergula spp.* | Corn Spurrey | * | | | | | | | | X |
| *Cerastium vulgare* | Common Mouse-ear Chickweed | * | | | | | | X | | |
| *Sclerolaena muricata* | Black Roly-poly | | | | | | X | | | |
| *Sclerolaena napiformis* | Turnip Copperburr | | E | e | X | X | X | | | X |
| *Atriplex semibaccata* | Berry Saltbush | | | | X | X | X | X | X | X |
| *Chenopodium desertorum* | Frosted Goosefoot | | | | | | | | | X |
| *Maireana decalvans* | Black Cotton-bush | | | | X | X | X | X | X | X |
| *Maireana enchylaenoides* | Wingless Bluebush | | | | | X | X | | | X |
| *Maireana pentagona* | Hairy Bluebush | | | | X | X | X | | X | X |
| *Microseris sp.* | Yam Daisy | | | | X | | | | | |
| *Minuria spp.* | Minuria | | | | X | | | | | |
| *Pycnosorus globosus* | Drumsticks | | | | X | X | X | X | X | X |
| | | | | | | | | | | |

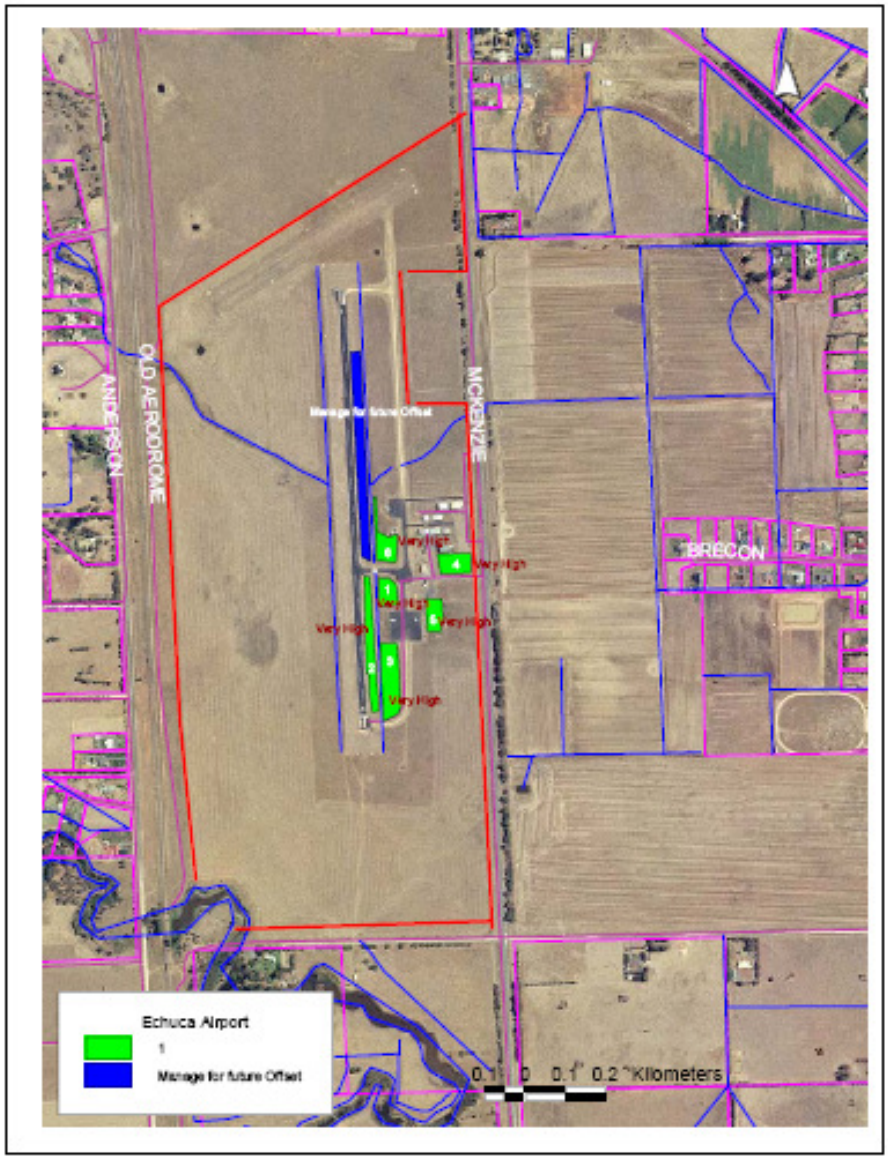
| *Scientific name* | **Common Name** | **Origin** | **AROTS** | **VROTS** | **S1** | **S2** | **S3** | **S4** | **S5** | **S6** |
|---|---|---|---|---|---|---|---|---|---|---|
| *Rhodanthe corymbiflora* | Paper Sunray | | | | X | X | X | X | X | X |
| *Arctotheca calendula* | Cape Weed | * | | | X | X | | X | X | |
| *Calotis scabiosifolia* | Rough Burr-daisy | | | | X | | | | | X |
| *Chrysocephalum apiculatum s.s.* | Common Everlasting | | | | X | | X | | | X |
| *Cotula bipinnata* | Ferny Cotula | * | | | X | X | X | X | | X |
| *Gazania spp.* | Gazania | * | | | | X | | | | |
| *Helminthotheca echioides* | Ox-tongue | * | | | | | X | X | | |
| *Hyalosperma glutinosum ssp. glutinosum* | Golden Sunray | | | | X | | X | | | |
| *Leiocarpa leptolepis* | Pale Plover-daisy | | | e | | X | | | | X |
| *Leptorhynchos squamatus* | Scaly Buttons | | | | X | | X | | | X |
| *Vittadinia cuneata* | Fuzzy New Holland Daisy | | | | | | X | | | X |
| *Convolvulus spp.* | Bindweed | | | | | | X | | | X |
| *Crassula colorata* | Dense Crassula | | | | | X | | | | X |
| *Crassula decumbens var. decumbens* | Spreading Crassula | | | | X | | X | | | |
| *Chamaesyce drummondii* | Flat Spurge | | | | X | | X | | X | |
| *Erodium botrys* | Big Heron's-bill | * | | | | X | X | X | X | X |
| *Goodenia spp.* | Goodenia | | | | | | X | | | X |
| *Teucrium racemosum .* | Grey Germander | | | | X | | | | | X |
| *Sida corrugata* | Variable Sida | | | | X | | X | | | X |
| *Oxalis perennans* | Grassland Wood-sorrel | | | | X | X | X | | | X |
| *Swainsona murrayana* | Slender Darling-pea | | V | e | | | | | | |
| *Swainsona plagiotropis* | Red Swainson-pea | | V | e | X | | X | X | | X |
| *Plantago lanceolata* | Ribwort | * | | | | | X | | | X |
| *Plantago spp.* | Plantain | | | | X | | X | | | X |
| *Rumex brownii* | Slender Dock | | | | | | X | X | X | X |
| *Rumex dumosus* | Wiry Dock | | | | | | | | X | |
| *Asperula conferta* | Common Woodruff | | | | X | | X | | | X |

* Weed species

**Weed species in red are species to be maintained at less than <1% cover**

# 8 MAPS AND PHOTOS

Map 1 - Sites



Map 2 - Sites


N
Manage for future Offset
PIPER
McKENZIE
CESSNA
6
Very High
4
Very High
1
Very High
5
Very High
Very High
2
3
Very High
0.1
0
0.1
0.2 Kilometers

Photo 1 Site 1

Photo 2 Site 2

Photo 3 Site 3

Photo 4 Site 4

Photo 5 Site 5

Photo 6 Site 6

Photo 7 - area to be managed

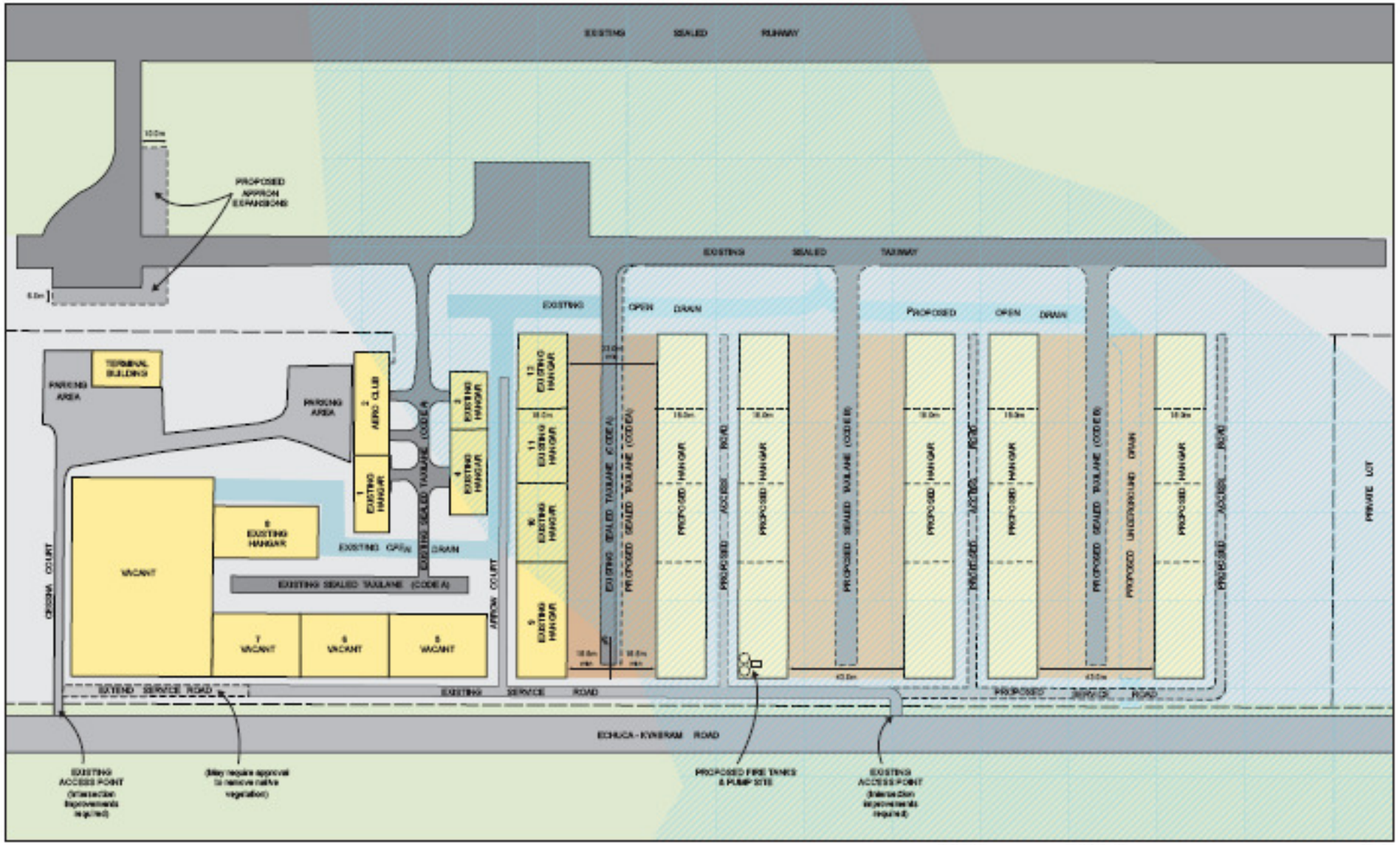
Photo 8 - this area to the south of Cessna Rd has little native cover (it has a Significant Native Vegetation Sign)

September 2009

November 2009

Appendix C

# Terminal & Hangar Precinct Concept Plan




Echuca Aerodrome Master Plan

## Terminal & Hangar Precinct Concept Plan

NOTE:
Development of the new hangars, taxiways and access roads shown on this plan is subject to approval under the provisions of the Land Subject to Inundation Overlay (LSIO).

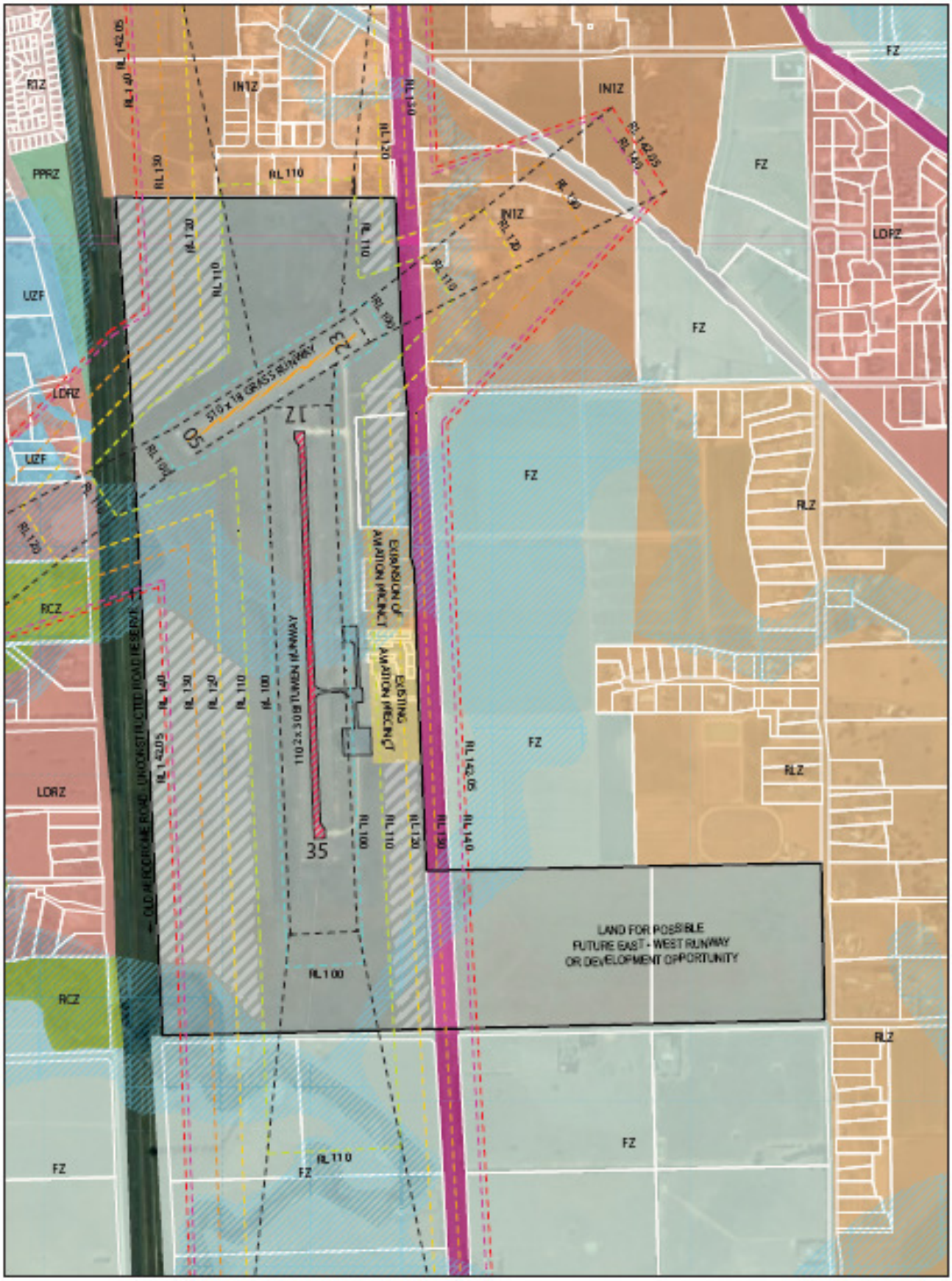
| EXISTING | PROPOSED |
|---|---|
| Hangar | Hangar |
| Apron | Apron |
| Taxiway | Taxiway |
| Drain | Drain |
| Access Road | Access Road |
| LSIO | |

CODE A - Taxiway = A/C wingspan up to 15m
CODE B - Taxiway = A/C wingspan up to 24m

Beca

Appendix D

# Concept Infrastructure Layout Plans




Echuca Aerodrome Master Plan

Constraints and Opportunities

Study Area
Main Runway
Secondary Runway
LSIO (Land Subject to Inundation Overlay)
FO (Flood Overlay)
Industrial 1 Zone
Public Park and Recreation Zone
Public Use Zone - Transport
Road Zone - Category 1
Residential 1 Zone
Low Density Residential Zone
Farming Zone
Rural Living Zone
Rural Conservation Zone
Urban Floodway Zone
Native Grasses
OLS
Development Opportunity

0 250 500m

beca