



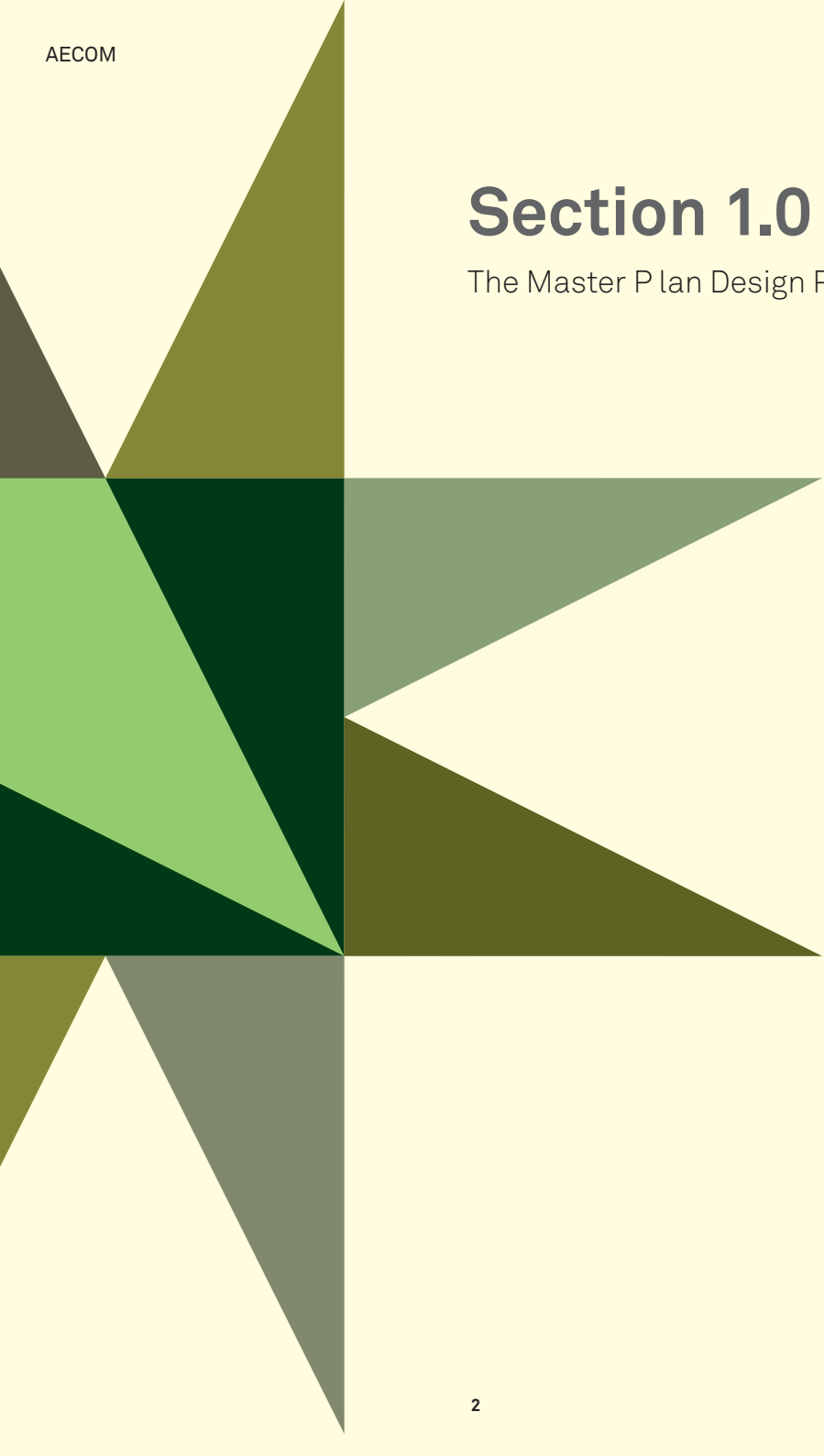
# Part B

## MASTER PLAN

Adopted 23 May 2012

# Section 1.0

The Master Plan Design Process



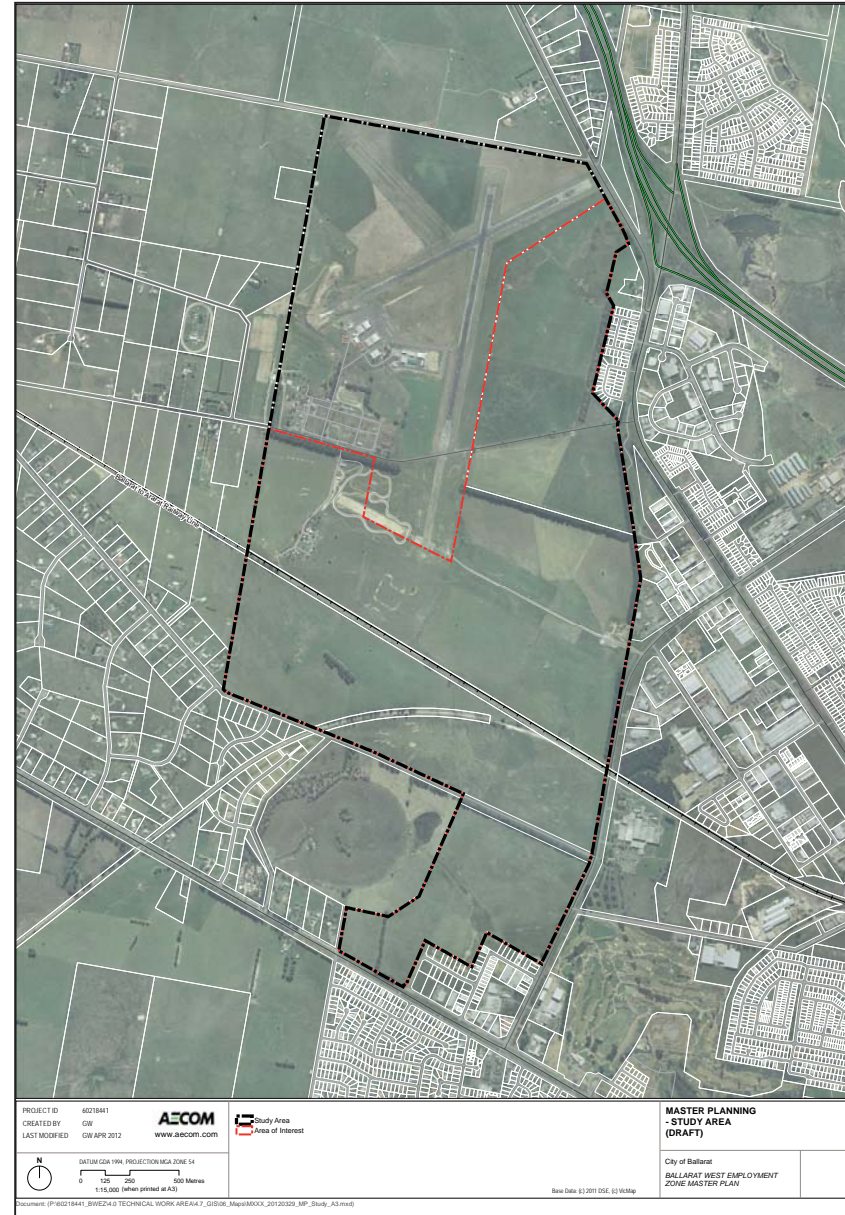
## 1.0 The Master Plan Design Process

### 1.1 Overview

The following series of design options were captured following analysis of the opportunities and constraints identified in the Technical Assessments (and consultation) for the BWEZ. Using this information, the following steps were undertaken in the evolution of the Master Plan:

- Step 1 - analysis of site structure, circulation, zoning, landform and development potential
- Step 2 - development and testing of three scenarios
- Step 3 - development of an optimal layout of a preferred scenario option.

The preliminary sketches are shown only for the purposes of understanding the process behind development of the Master Plan.



## 1.2 Stage 1: Site Analysis

In order to establish development potential of the land, critical site elements/features were assessed as constraints and opportunities to development as identified in the technical assessments.

The preliminary Master Plan sketches show the development of potential land use scenarios and the extent of developable land available.

Through the site analysis it is evident that the BWEZ has a complex set of constraints, particularly with the continued operation and expansion of Ballarat Airport and surrounding residential properties. There are also isolated precincts created with infrastructure barriers in the southern area of the site created by the Ballarat to Ararat Rail Line.

The land most readily available and least constrained is the eastern portion of the site adjoining the future Ballarat Western Link Road and north of the Ballarat to Ararat Rail Line. This section is also predominately flat and away from the natural drainage of the centre of the site. This is logically the first stage of development, and with the development of this portion, other areas can subsequently be opened up for development with better exposure and access.

## Stage 2: Development Scenarios

The development scenarios were the first exploration at establishing options for structuring future development.

- Scenario A – Includes a precinct for the Freight and Logistics Hub, an easterly alignment of the north, south hydrology and ecology link, a civil aviation terminal and a full industry build out of the site
- Scenario B – Includes a curved entrance road alignment from a service road accessed via the Western Link Road, a freight and logistics precinct, has a realignment of Blind Creek Road to separate industry and residential traffic with a full industry build out of the site.

A number of concepts have been both retained and excluded from the final proposed Master Plan.

The Master Plan provides the basis for a structural framework to guide the ongoing development and promotion of the BWEZ. In particular the Master Plan identifies three scenarios which outline different levels of development on the site, based on different underlying assumptions.

Note that the preferred scenario(s) have been established with an extended environmental corridor that will provide an ecological and hydrological link that is to be refined in the next phase of the project.

## Stage 3: Preferred Master Plan

The Preferred Master Plan combines the features and attributes of both the Development Scenario, and subsequent master plan options. The design paradigm informing this concept plan will ensure that BWEZ is the employment place of choice of regional, western Victoria. The plan strives to deliver a highly desirable working environment, and place for all people.

Also importantly, BWEZ will be the corporate HQ for emerging innovation, and R&D enterprises of the broader Ballarat region.

Essentially, the preferred vision and concept for BWEZ embraces the environmental qualities of the site and surrounds, and introduces a number of key ecological, and hydrological initiatives that underpin the physical components of the plan.

Furthermore, the Preferred Master Plan responds to the specific precinct attributes, including:

- the Ballarat Airport abuttal;
- The Ballart / Ararat Rail line;
- high exposure to and exceptional access from the proposed Western Link Road; and
- the established employment zones to the east.

At its core, the Preferred Master Plan comprises:

- A Primary Ecological Corridor, that supports the hydrology systems, and overland water flows, and fauna and flora preservation and enhancements of the precinct
- Perimeter buffers and transitions, providing an integrated and interconnected environmental network; which will include walking and cycling paths for the benefit of the worker

population, and broader community

- Appropriate and “significant” interfaces to existing “sensitive” uses, including the residential abuttal
- An adaptable and flexible mix of uses, based within 5 activity precincts
- The recommended Master Plan concept is built on the formulation and testing of a series of development options and scenarios.

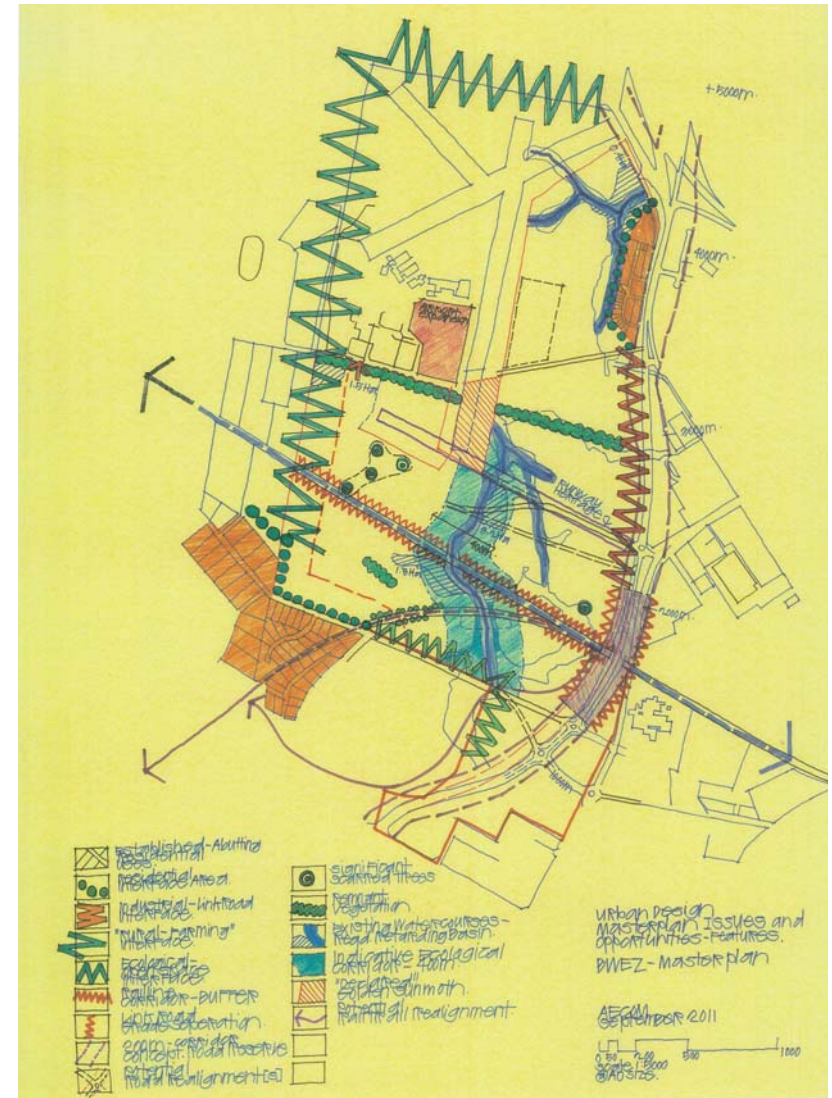


### 1.3 Features and Opportunities

The Features and Opportunities for BWEZ have been derived from the Part A Background component of the study which has uplifted important site characteristics.

The key issues and considerations are as follows:

- Environmental and hydrological characteristics of the site which include Winter Swamp and the overland flow paths of floodwaters north of the site through the airport
- Flowline from Flaxmill Swamp to Winter Swamp
- Transport and infrastructure considerations that provide high exposure and access to the site whilst the railway line provides an internal barrier within BWEZ
- Interface and buffer issues with both existing industrial development, residential development and areas of rural living
- The airport operations and proposed future expansions including heritage considerations of the former East-West runway and cypress windrows
- Internal and external linkages between land uses and the surrounding area
- Potential for alternative energy precinct, which adds to the environmental credentials of the site
- opportunity for large parcels to support catalyst developments
- Water re-use opportunities.

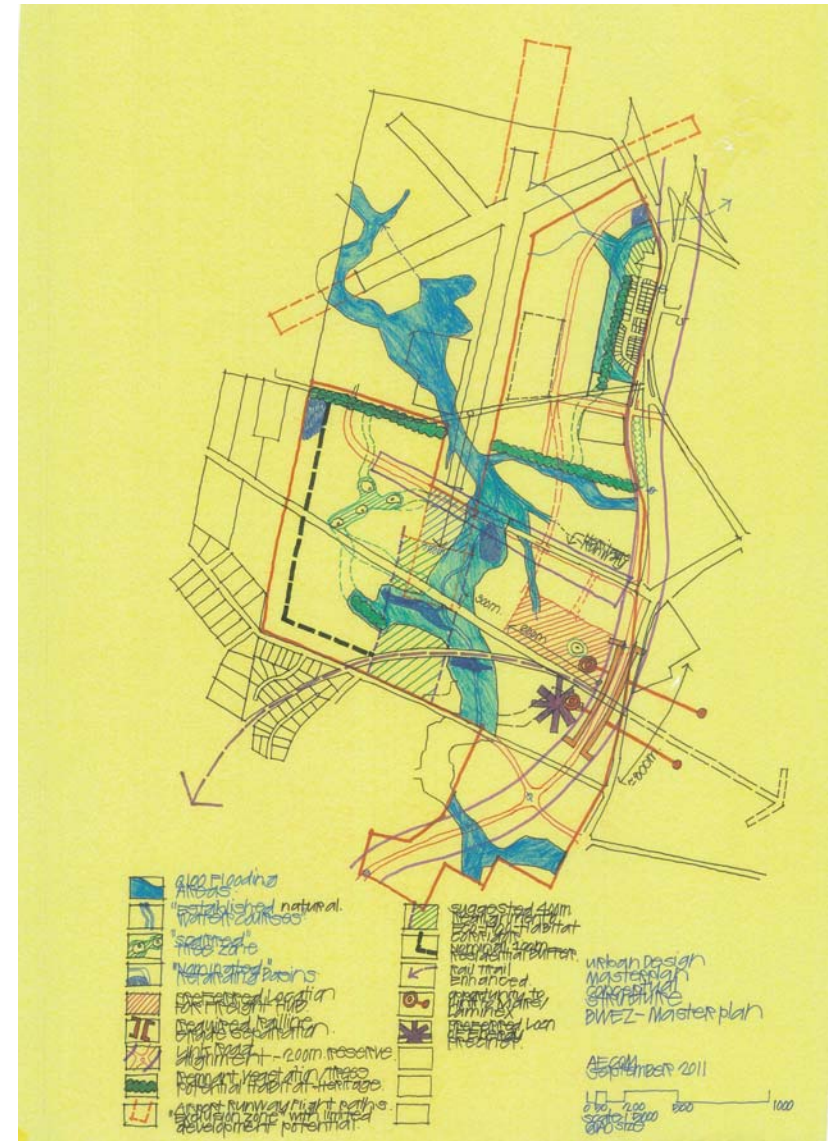


### 1.4 Development Attributes + Design Direction

These Development Attributes and Design Direction are a strategic 'high level' conceptual structure of the key attributes impacting development of the BWEZ.

The physical characteristics taken from the Features and Opportunities that progress through the Master Plan process and inform the design direction are as follows:

- The Major Infrastructure Upgrades that form the catalyst for this project are the Ballarat Western Link Road providing connectivity to the site at 3 locations, the Freight Hub which is an activity centre within BWEZ, R&D facility and the Energy Precinct on the southern side of the railway
- The runway reservation and ecological and hydrological environment link running north and south is seen as a creative solution and a competitive strength for BWEZ. This component has been retained to treat flooding, retain and enhance habitat, preserve the environmental qualities of the site as well as flight paths for the airport runways (existing and preserved)
- Hydrology links based on the topography of the land and at 1 in 100 year flooding
- The grade separation from the Ballarat Western Link Road and the Ballarat to Ararat Rail Line
- Visual landscape which acknowledges the heritage values of the former E-W Runway
- Cypress Windrows
- Skipton Rail Trail.



## 1.5 Development Scenarios

### Scenario A

Using the original E-W Runway as a base, Scenario A is based on two major infrastructure elements in the Ballarat Western Link Road and an increased land portion for the intermodal Freight Hub along the rail line.

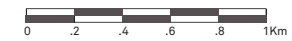
- This Scenario enables the development of land on both the south and north side of the rail line as well as the northern area of the site adjacent to the airport runway
- In addition to this, extensive land has been put aside to provide ecological and hydrological links from Winter Swamp to Flaxmil Swamp and Winter Swamp to the centre of the site
- Through market testing and ultimate use of the land, this scenario is not considered as the maximising utilisation of land.

This scenario includes the potential for residential land uses north of Blind Creek Road that form a buffer to existing residential areas to the south.

These areas abutting the Ballarat Western Link Road and centre of the site neighbouring the Freight Hub are constrained by access from the Link Road and the area put aside for Business Support Services is segregated from the main hub of employment activity.

- Similarly, there are areas of land that become segregated from the main areas of development by ecological linkages and hard land constraints such as the railway line which is not a highly functional outcome for the BWEZ.

- BWEZ Boundary excluding Airport Masterplan
- Investigation Area - use of land subject to detailed drainage design - potential for employment land uses
- Runway extension reservation
- BWEZ Boulevard - Primary airport access
- Heritage east/west runway
- Convenience uses / Service centre
- Innovation - R&D cluster Enterprise zone
- Freight Hub and ancillary area
- Energy precinct bio-energy plant
- Buffer transition areas (details subject to land use)
- Potential environmental corridors - 400m width (details subject to further assessment)
- Superlots over 6Ha - 8Ha Major development sites
- Conceptual buffer and open-space transitions including pedestrian & cycling network
- Significant trees
- Notional road / access layout
- Residential



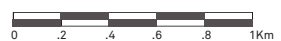
## 1.5 Development Scenarios

### Scenario B

Scenario B is primarily driven by the alignment of key access roads into the BWEZ from the Ballarat Western Link Road with the addition of a service road running approximately 1 kilometre along the Western Link Road frontage to offer benefited exposure and access for businesses located within this area.

- This Scenario presents great opportunity to maximise developable land however does provide the best solution in terms of land use buffers to the rural living land to the south as well as it requires alteration to the access within this area providing a separated industry and residential vehicular access
- The Freight Hub has been provided ample land to expand in the future however it is separated from other precincts within the BWEZ thus reducing its integration with surrounding land uses.

- BWEZ Boundary excluding Airport Masterplan
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- Runway extension reservation
- BWEZ Boulevard - Primary airport access
- Ballarat Western Link Road - service road
- Heritage east - west runway
- Convenience uses / Service centre
- Innovation - R&D cluster Enterprise zone
- Freight Hub & anchillary area
- Potential environmental corridors - 400m width (details subject to further assessment)
- Energy precinct bio-energy plant (options)
- Superlots over 6Ha - 8Ha Major development sites
- Conceptual buffer and open-space transitions including pedestrian and cycling network
- Significant trees
- Conceptual buffer transition areas (details subject to land use)
- Notional road / access layout
- Residential





# Section 2.0

Development Options

## 2.0 Development Options

This report section summarises a number of development options and associated development outcomes for the BWEZ site.

Various land use types, their locations, road framework, hydrology and environmental requirements were considered in this development options process.

The six development options on this page are used to refine scenarios A & B and identify the preferred option.





# Section 3.0

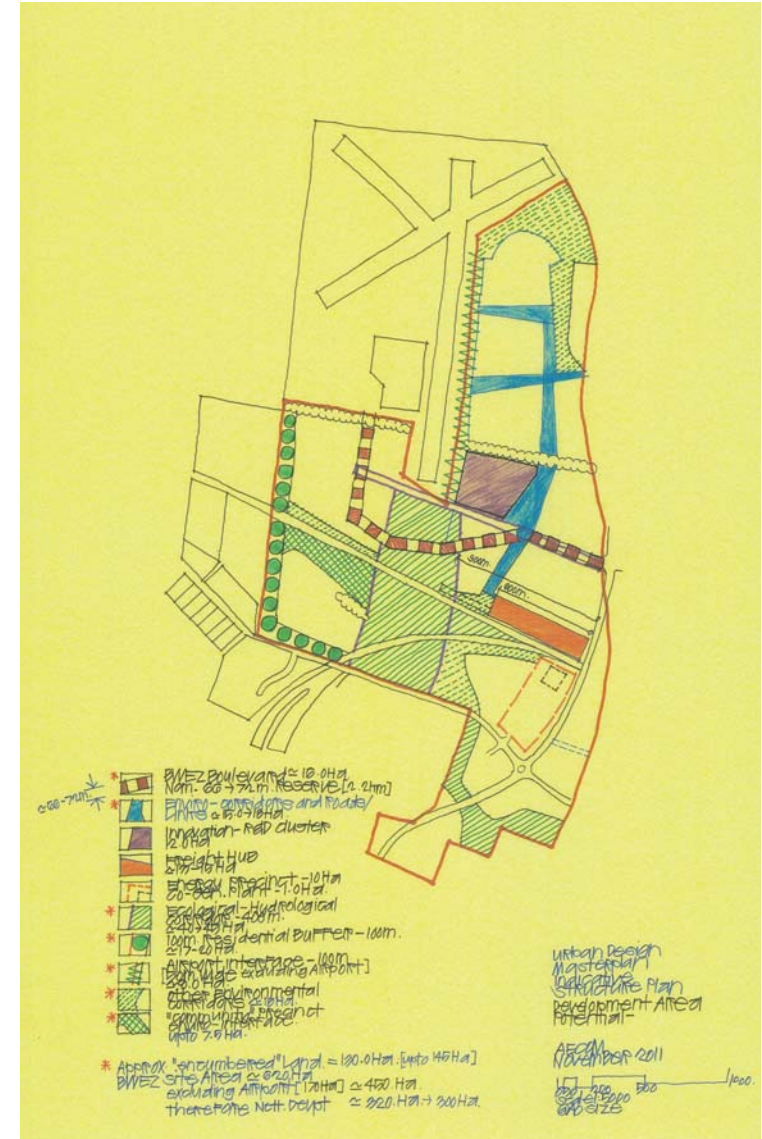
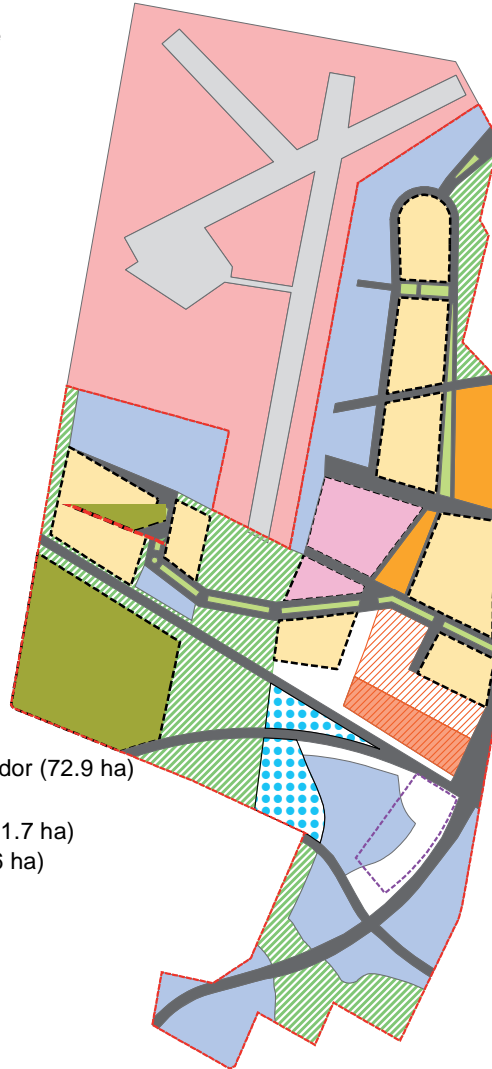
Scenario A&B - Land Budgets

### 3.0 Scenario A - Land Budgets

The following maps summarise the development scenarios and their respective land components and sizing.

**Legend**

- Study Area
- Energy Precinct
- Scenario A**
- Airport
- Airport Runway
- Ecological - Hydrological Corridor (72.9 ha)
- Freight Hub (8.2 ha)
- Freight Hub - Ancillary Uses (11.7 ha)
- Innovation - R&D Cluster (15.6 ha)
- Investigation Area (12.3 ha)
- Lots (104.3 ha)
- Service Centre (13.1 ha)
- Road (68 ha)
- Road - centre (6.7 ha)
- Residential (37 ha)
- Super Lots (67.1 ha)

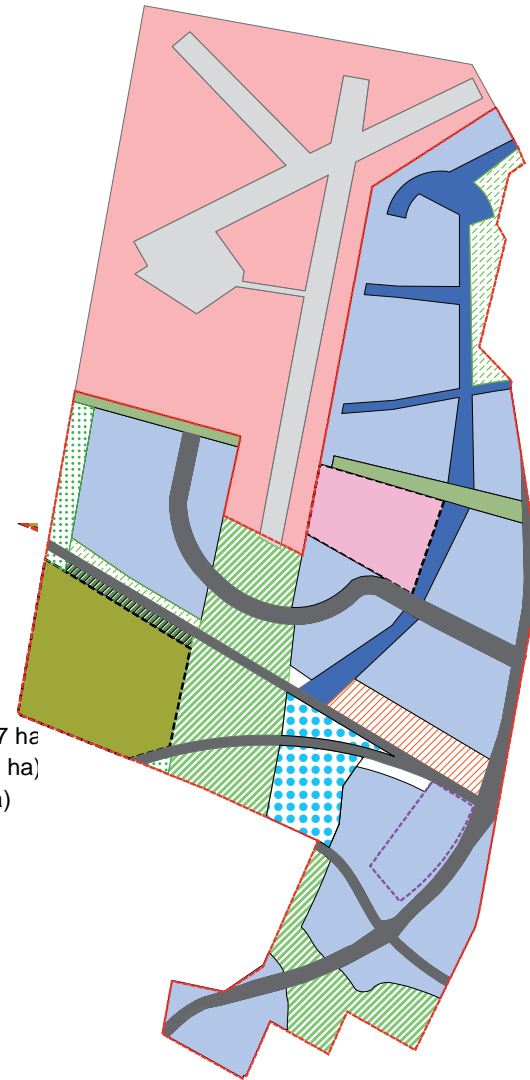


### 3.0 Scenario B - Land Budgets



**Legend**

- Study Area
- Energy Precinct
- Scenario B
- Airport
- Airport - Runway
- Community Precinct - Env Interface (2.7 ha)
- Ecological - Hydrological Corridor (55.3 ha)
- Enviro - Corridor & Road Links (25.9 ha)
- Other Environmental Corridors (11 ha)
- Residential Buffer (6.1 ha)
- Freight Hub (10.6 ha)
- Innovation - R&D Cluster (17.5 ha)
- Investigation Area (14.2 ha)
- Lots (202 ha)
- Road (46.6 ha)
- Remnant Vegetation
- Residential (37 ha)



## Section 4.0

Preferred Master Plan Scenario

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The Preferred Master Plan was derived during the Master Planning process. It establishes a gateway boulevard entrance to BWEZ from the proposed Western Link Road, a maintained vista between the Ballarat Western Link Road and the former E-W Runway heritage feature on the land, a north south environmental corridor, and a distinct 'loop' allotment layout in the northern area of the site. It is noted that there remain alternative options that include alternative boulevard alignments and various environmental corridor treatments.

### 4.0 Preferred Master Plan Scenario

This plan sets out the preferred masterplan.  
 This plan sets out the layout and strategic location of preferred land uses that make up the masterplan.

Residential		Ballarat Western Link Road - service road	
		Potential environmental corridors - 400m width (details subject to further assessment)	
		Conceptual buffer transition areas (details subject to land use)	
Convenience uses / Service centre		Freight hub and ancillary uses	
Investigation Area - use of land subject to detailed drainage design - potential for employment land uses		Enviro corridors and links. Including roads	
Innovation - R&D cluster Enterprise zone		BWEZ Boulevard - Precinct and Airport access	
Strategic development sites		Energy precinct bio-energy plant (options)	
"Signature" sites		Superlots over 6Ha - 8Ha Major development sites	
Gateways		Conceptual buffer and open-space transitions including pedestrian and cycling network	
"Boutique" development sites		Significant trees	
Ecological gateway		Runway extension reservation	
Precinct gateway entries		Notional road / access layout	



# Section 5.0

Preferred Land Budgets



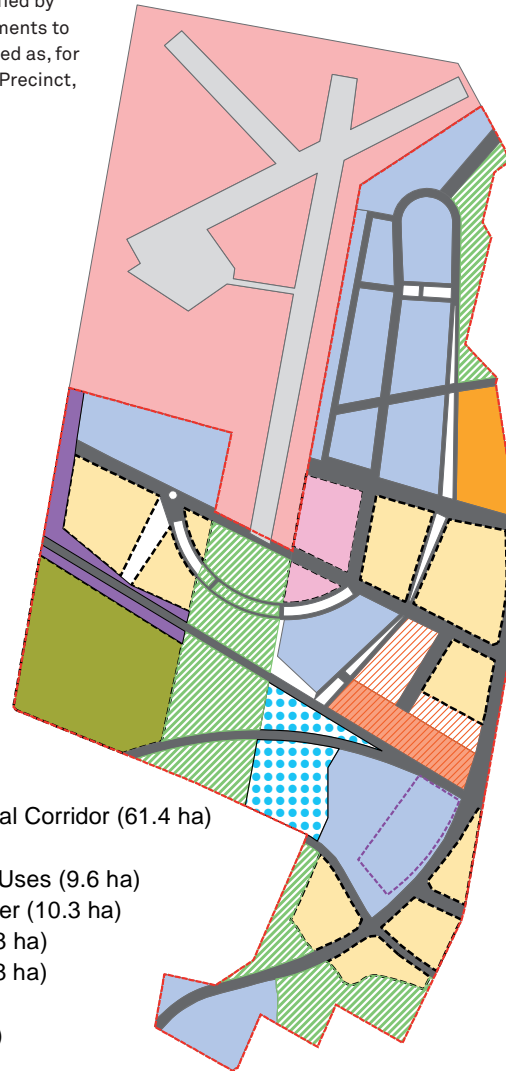


### 5.0 Preferred Land Budgets

The following land budget table summarises the land uses and activities identified by the preferred Master Plan. Refinements to the land use sizings can be expected as, for example, the land uses on the SW Precinct, are clear.

Summary of land uses	Sizing (Ha)
Airport (including runway / interface)	207.3
Ecological - Hydrology Corridors	110.1
Employment / industrial land	170.2
Freight centre (including freight Hub & Ancillary Uses)	19.4
R & D Centre	10.5
Convenience Uses / Neighbourhood Activity Centre	9.7
Residential	36.9
Roads	73.1
<b>TOTAL BWEZ AREA</b>	<b>823</b>
Less airport	207.3
Sub-total	415.7
Developable area	246.7 (59.3%)

- Study Area
- Energy Precinct
- Preferred Land Budgets**
- Airport
- Airport Runway
- Ecological - Hydrological Corridor (61.4 ha)
- Freight Hub (9.3 ha)
- Freight Hub - Ancillary Uses (9.6 ha)
- Innovation - R&D Cluster (10.3 ha)
- Investigation Area (15.8 ha)
- Conceptual Buffers (9.8 ha)
- Lots (116.9 ha)
- Service Centre (9.5 ha)
- Roads (76.9 ha)
- Residential (36.9 ha)
- Super Lots (66.5 ha)

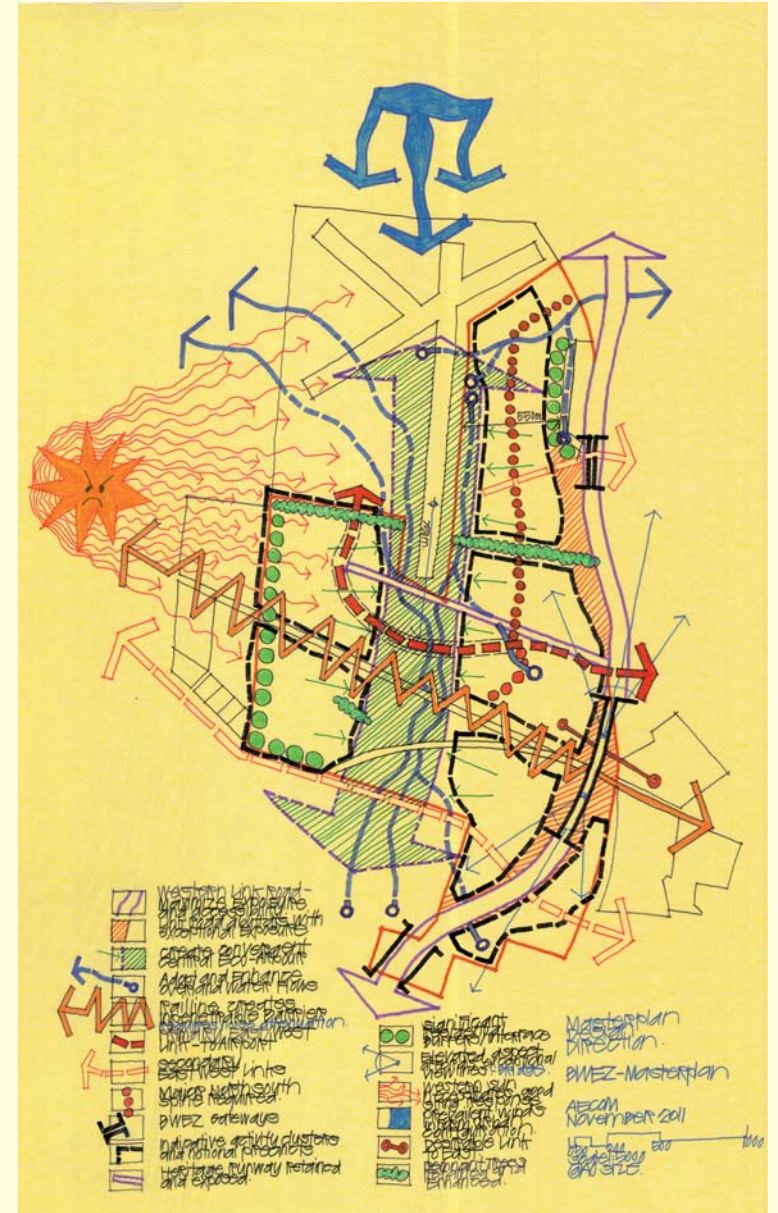


- BWEZ Boundary excluding Airport Masterplan
- Investigation Area - use of land subject to detailed drainage design - potential for employment land uses
- Runway extension reservation
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- Heritage east - west runway
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- Significant trees
- Conceptual buffer transition areas (details subject to land use)
- Notional road / access layout
- Residential



# Section 6.0

## The Development Framework Plan



## 6.0 The Development Framework Plan

### 6.1 Guiding Principles

The Framework Plan is the result of an iterative design methodology and process, based on detailed site analysis and identification of opportunities and constraints, and the exploration and testing of a variety of potential development scenarios and strategies.

The Framework Plan sets out the overall project vision and philosophy as well as the high order objectives and principles informing and guiding the development of the BWEZ. The key framework elements are:

- The site's strategically significant location and importance for the growth of Ballarat West
- The site's location within the broader industrial area and employment generating uses
- The site's proximity to existing transport infrastructure, the planned Western Link Road and rail infrastructure, the adjoining Ballarat Airport, providing the site with exceptional and outstanding accessibility and exposure
- The creation of an integrated employment generating land use composition, which provides economic viability, rigidity and flexibility for development implementation for both large and small scale industrial uses, building on government investment in infrastructure and the centralised freight hub. This is to ensure that minimal opportunities are lost through incorrect site layout and lot sizing
- A commitment to the attraction of new tenants to the area, to providing an improved environment for existing Ballarat industries and an opportunity for high profile tenants that will be compatible with, and complement, existing large scale operations within the site
- Staging of the development

- Allow opportunities for super lots on key sites
- Preserve development flexibility for future uses within the Master Plan framework
- An integrated mobility hierarchy and movement network within the site
- The retention and enhancement of important environmental, heritage, hydrological links and landscape features and attributes, particularly through the central north-south corridor of the site, and
- Safeguarding, and providing sufficient buffers and interfaces to minimise adverse amenity impacts and further residential encroachment.

### 6.2 Design Principles

The three primary design principles that have informed the development of the Master Plan are:

1. Market Tested Land Use Composition
2. Transport Accessibility
3. Environmental Enhancement.

The design principles, particularly through the planned Western Link Road along with the Colliers Market Consultation have created a base and strategic intent for the site development. The objective is to create an industrial concept with the potential to accommodate a diversity and range of general industrial uses, capable of responding to changing market trends, responding to the site and its context, and capable of supporting fully integrated environmental initiatives.

Further, the Master Plan generally preserves opportunities for innovation by future occupants of the precinct, by being flexible enough to allow for amendment to allotment boundaries to suit individual business needs, without requiring amendments to the proposed

location and design of key transport and utility infrastructure. Identified key, or landmark sites, are designed to preserve the opportunity to attract key catalyst developments.

### 6.3 Function and Land Use Composition

The function and land use composition of BWEZ is largely defined by the site following site conditions:

- Transport Infrastructure: including the Ballarat Western Link Road, Ballarat Airport, Ballarat to Ararat Rail Line, the Ballarat to Skipton Rail Reserve and other existing roads used that provide access as well as ridged barriers between precincts
- The retention and enhancement of the natural drainage corridor which moves south to north through the site from the Winter Swamp through the Airport land; and
- Visual and land use buffers from future industry development to sensitive uses including residential areas at the north and southern ends of the site as well as to established industry uses in close proximity such as Mars Chocolate.

The Master Plan identifies these constraints and synthesises these with the commercial market assessment undertaken to provide a range of development lot sizes that respond to site constraints and market conditions. Thus, a mixture of small and large lots sizes has been provided as follows:

- Small lots = 1 - 2ha
- Medium lots = 2 - 12ha
- Large lots = 12+ha

Through the consideration of the site characteristics and constraints such as land use buffers and access and industry land use site location, areas to the west and south of the site provide vegetated fringes put aside for later stages of development as well as yet to be determined potential alternative uses

### 6.4 Transport Access and Movement

The design elements for transport access and movement within BWEZ have largely been driven by the proposed Ballarat Western Link Road alignment and the proposed Freight and Logistics Hub location along the Ballarat to Ararat Rail Line. These elements seek to ensure the integration and upgrade of the existing transport network within the site within an efficient and functional multimodal movement network, capable of accommodating a variety of industry vehicles, and with the potential for staged implementation.

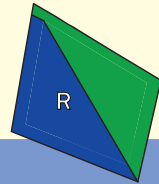
The Master Plan responds to this integration requirement by providing an access and movement network which achieves the following:

- The opportunity for individual allotments to have good access (not direct) and exposure to the Western Link Road
- Connectivity of BWEZ uses to the Freight and Logistics Hub and Western Link Road
- A road pattern which encourages large industry but services all users
- Ensuring existing industrial and residential user access
- Protecting residential areas from industrial traffic
- Improved connectivity via the Blind Creek road realignment.

# Section 7.0

## Framework Plan

Residential



Investigation Area - use of land subject to detailed drainage design - potential for employment land uses



Runway extension reservation



Buffer transition area



Ballarat Western Link Road alignment



Principal Ecological - Hydrological corridor



Integrated environmental corridors



Primary - Interconnected Enviro-Way Finding About



Heritage runway with activated frontages



BWEZ - Airport Boulevard



Comprehensive streetscape design - with showcase frontages



Landmark sites



Animated frontages and articulated built form



"Signature" sites with design controls applied



Remnant heritage trees groves - habitats and links



Western facades - energy rated builtform and innovation



Open space landscape employee respites



Convenience link road uses



Freight Hub - railline interface



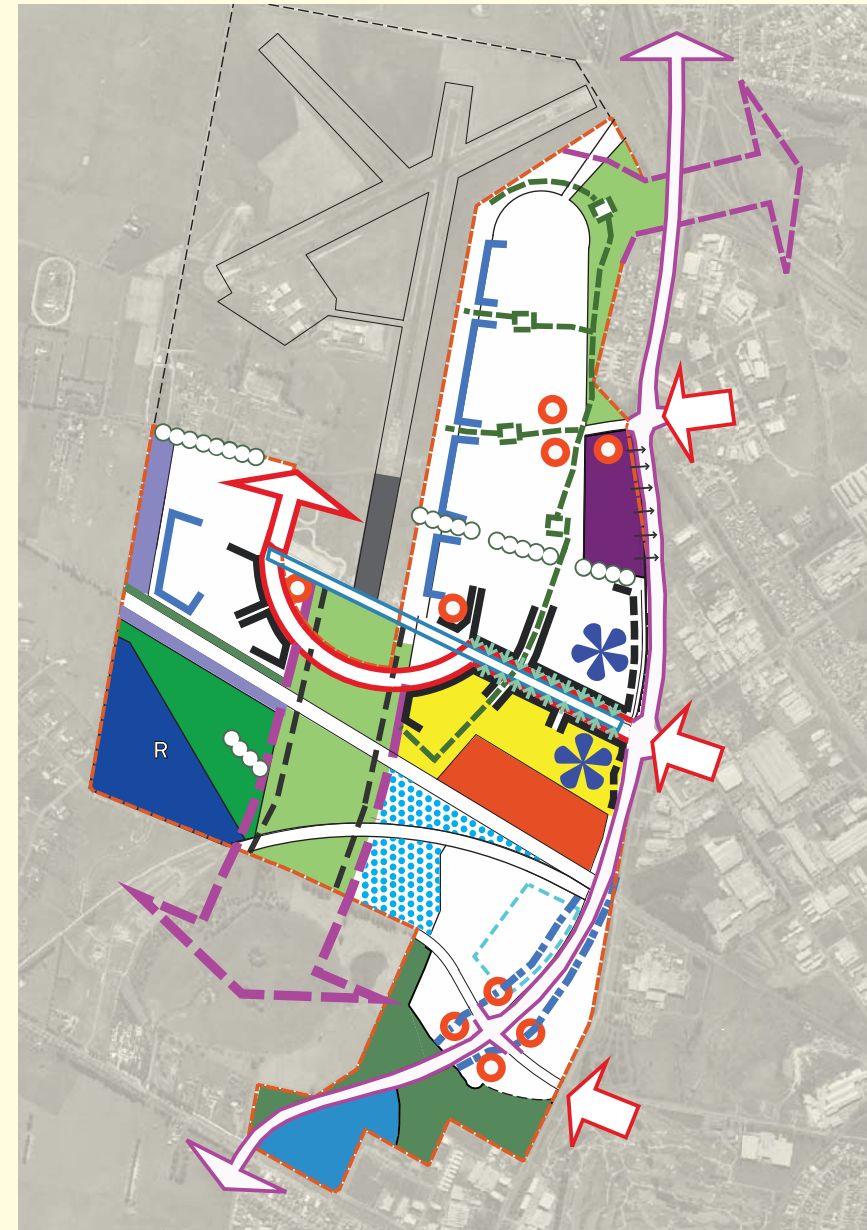
Boutique BWEZ Development sites



Energy precinct



Precinct gateway entries














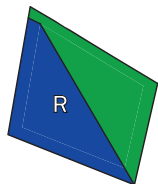


## 7.0 Component Plans

The purpose of the Component Plan is to provide, where possible, greater level of detail within discrete categories of the Framework Plan including:

### 7.1 Land Uses

The Land Uses Plan delineates the key uses and integration of each within the BWEZ including industry and employment uses, complementary business services uses, ecological buffer areas, transition zones and the proposed Ballarat Western Link Road alignment corridor.

- BWEZ Boundary excluding Airport Masterplan 
- Investigation Area - use of land subject to detailed drainage design - potential for employment land uses 
- Runway extension reservation 
- Buffer transition area 
- Aviation and complementary employment uses 
- Small and medium enterprise 
- Innovation / R&D precinct 
- Freight hub related 
- Energy Precinct bio-energy (options) 
- Boutique gateway 
- Ecological gateway 
- Key employment sites 
- High exposure uses 
- Residential 



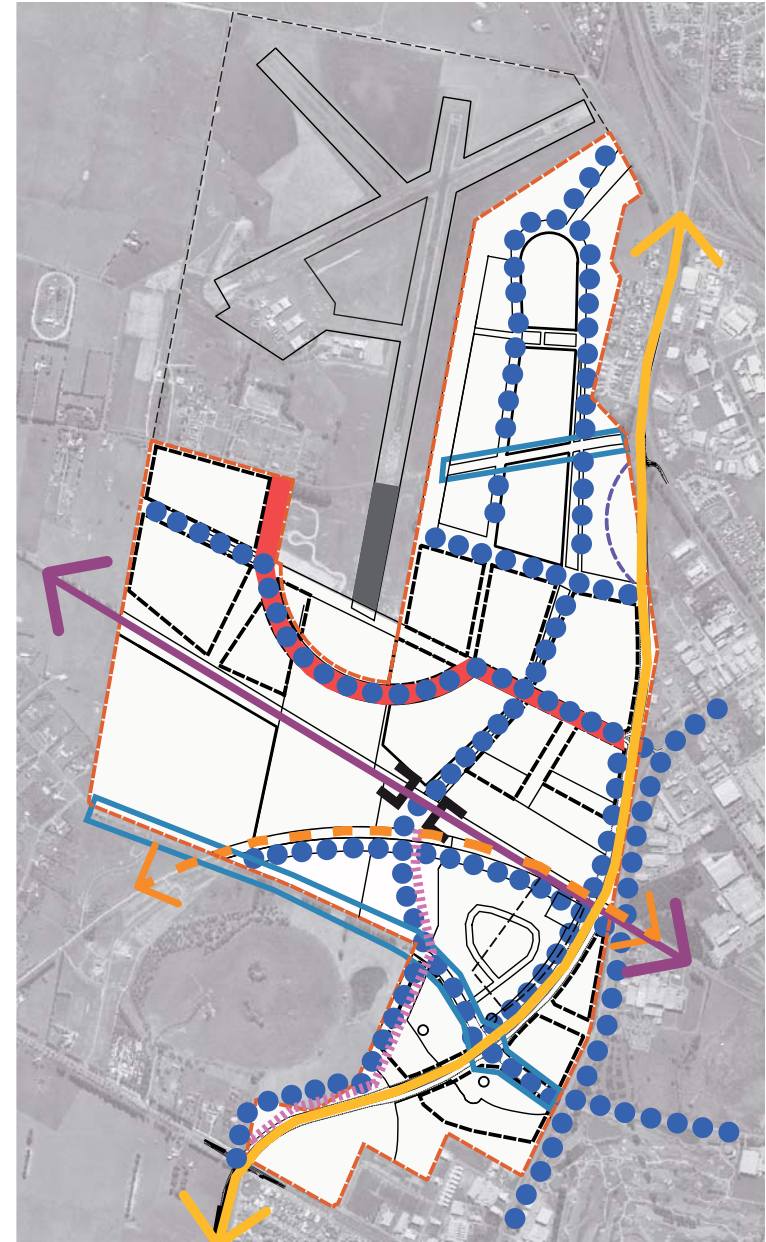
## 7.2 Mobility and Movement

Mobility and movement within BWEZ are critically important particularly with the relationship between intermodal travel, freight and logistical movement and public open space, pedestrian and bicycle movement.

The movement network and circulation pattern for BWEZ has been fundamental in establishing the structure for linkages both internally and externally to the BWEZ site, and in consolidating and linking the various components including nearby activity centres, community facilities, open space and neighbourhoods.

The design of the road network has been responsive to these elements as well as defining in nature. The mobility, accessibility and movement systems are outlined in the Mobility and Movement Plan which describes the structure and hierarchy, "way finding", accessibility efficiencies and study areas "legibility":

- Existing Ballarat - Ararat Rail line
- Existing Skipton Rail Trail
- Emergency access path
- Integrated Pedestrian / cycle path
- Potential pedestrian and cyclist rail bridge/overpass
- BWEZ Boulevard
- Secondary Avenues
- Proposed Western Link Road
- Ballarat Western Link Road - service road
- Runway extension reservation



### 7.3 Ecology and Environment

The response to the provision of ecological and environmental open space within BWEZ has sought to achieve a balance between conservation, hydrological function and environmental protection.

Together the various open spaces aim to provide for an interconnected, diverse and equitable network of open space which covers the spectrum from conservation to urban, without compromising the objectives of traditional industrial and commercial precinct design.

The proposed road layout takes into account the significant features (including heritage) of the site.

Superlots - major development sites

Investigation Area - use of land subject to detailed drainage design - potential for employment land uses

Heritage runway arbour

Significant trees

BWEZ Boulevard

Enviro - Road arbours

Buffer transition areas

Principal eco - corridor

Other eco - corridors

Runway extension reservation



### 7.4 Place Making & Public Realm

Activated place, imaginative and responsive design, and a priority for people provides a platform for successful place making, an essential ingredient for successful urban development outcomes for people who will live and work in or near, or who visit the BWEZ.

Place making within the urban environment, the ability to harness and enhance a quality of place for its users, is key in providing strategic planning thinking and design solutions when creating sustainable, viable and equitable new communities, particularly for employment based uses and creating a sense of place. The quality and uniqueness of these places must reflect the community's as well as economic values in order to create a sense of identity and purpose.

At this early stage of the BWEZ project, place making is a powerful and holistic process of understanding, facilitation, innovation and activation resulting in unique, resilient and vibrant economies. In bringing the BWEZ vision to life, the CoB should consider:

- Understand the uniqueness of the BWEZ local economy, environment, built form, urban fabric, cultural heritage, global trends and needs that inform place
- Facilitate the vision and collaborative cross-sector partnerships between the government departments, the community, stakeholders and businesses to achieve the best outcome for all
- Provide innovation through applied research, strategic analysis and galvanized creative process we will facilitate fresh response and opportunity, and
- Activate the area and thus inspiring the people who make places, bringing ideas to life, providing program frameworks and creating tangible outcomes.

Runway extension reservation



"Signature" sites



BWEZ precinct gateway



Principal eco-corridor



Heritage runway arbour



Buffer transition area (subject to land use)



Key enviro - corridors



Precinct beacons (indicative locations)



Innovation - R&D clusters



Landmark sites



Enviro - Road Arbour



BWEZ Boulevard



Ecological gateway





## 7.5 Urban Composition and Built Form

The Urban Composition and Built Form within BWEZ defines the overarching form composition, lot sizes and orientation of the Employment land in comparison to internal land uses such as the airport and environmental link as well as the business services area and nearby industrial and activity generating uses.

BWEZ Boulevard streetscape

Ballarat Western Link Road - Animated frontages

Airport interface

Secondary streetscapes

Signature corner buildings

Articulated 'feathered' edge to development

Runway extension reservation



# Section 8.0

## Innovation Planning

## 8.0 Innovation Planning

The most challenging part of the Master Plan is to incorporate innovation and flexibility for future technologies. This means 'future proofing' the design and policies for BWEZ to enable a seamless transition into new technologies for sustainability, alternative energies, water reuse, telecommunications, transportation, design, building systems and urban planning.

### 8.1 Long Term Development

#### 8.1.1 Key Landmark and Strategic Sites

The BWEZ Master Plan is a long term project for the CoB and has been identified as a key location for large employment generating uses for Ballarat's increasing population. To enable this long term vision, large strategic sites have been identified to ensure that BWEZ can attract large, strategic, regional or even national tenants once the land use and market conditions become suitable.

#### 8.1.2 Planning Flexibility

Beyond producing a static Master Plan and rigid controls, the CoB is highly cognisant that the design and the framework needs to be adaptable over time in line with changing market conditions and core development principles. The Master Plan should undergo testing, refinement and most importantly stakeholder dialogue over time to ensure the Master Plan vision, design framework and basic layout remain respectful to the current body of work whilst also being robust to future refinement and evolution.

It is important to note that key landmark sites have been identified. These are considered commercially significant to the successful development of BWEZ. It is not intended that these sites be allowed to be subdivided.

#### 8.1.3 Design Flexibility

The BWEZ delivery is a staged process built on a combination of local organic growth and larger catalyst tenants in a mix of small boutique and large landmark allotments. Within the Master Plan layout, final allotment boundaries, sizes and composition remain flexible to permit a range of end tenants with various site requirements. Basically the configuration and subdivision of the site

remains flexible based on the tenant mix and end users of the site.

### 8.2 Sustainability

#### 8.2.1 Sustainable Precinct Planning

Urban development across Australia is striving to create and deliver integrated and sustainable development outcomes. Through the commercial market testing and consultation approach, the success of the BWEZ could be influenced by the provisions of sustainable precincts and the impacts of sustainability on development viability.

In order to achieve a sustainable place, the BWEZ should establish a balance between: Liveability, Economics, Environment, Design, Leadership and Governance, all of which are informed by the Green Buildings Council of Australia.

### 8.3 Education and Training

#### 8.3.1 Innovation Centre, Research and Development

As part of the catalytic, staged and innovation development of BWEZ, an Innovation Centre / Research and Development Precinct is proposed to be located within the core of the site. Within close proximity to the proposed Business Service Precinct, Freight Precinct, Airport and areas of environmental significance, the Innovation Centre / Research and Development Precinct will be integrated into the BWEZ land uses and an integral part of the innovation planning for the area.

#### 8.3.2 Telecommunications

With the introduction of the NBN Co. Network along with fibre optic infrastructure, the telecommunications and network opportunities for BWEZ should be adequately recognised.

### 8.4 Sustainable Services and Alternative Energy

#### 8.4.1 Alternative Energy Opportunities

Sources of energy supply and the cost of energy were identified in the strategic market research undertaken by CoB as key barriers to the growth of industry and manufacturing

in Ballarat. Accordingly, an Alternative Energy Opportunities Feasibility Assessment has been undertaken to identify opportunities for alternative and renewable energy sources for BWEZ.

The 3 key energy opportunities identified are mainly centred around gas fired co-generation mainly:

- Natural-gas fired co-generation
- Biogas fired co-generation with anaerobic digestion, and
- Bio-mas fuel stock for co-generation

Natural-gas fired co-generation is the preferred 2011 alternative energy solution for the site however there remain opportunities for Bio-mas fuel stock for co-generation, utilising the Ballarat to Ararat Rail connection through the Freight Hub which are unproved technologies today however remain possibilities for the future.

#### 8.4.2 Water Reuse

The low lying areas of BWEZ and close proximity to water bodies including Winter and Flaxil Swamp means, in addition the level of non-pervious surfaces offering opportunities for water harvesting means the water reuse opportunities within BWEZ are exceptional.

Existing policy within the Ballarat Planning Scheme has nominal provisions for Water Reuse, however this Master Plan encourages water harvesting and other water reuse methods identified in Part A of the Master Plan to ensure availability of water long-term.

### 8.5 Integrated Transport Solutions

#### 8.5.1 Freight and Logistics Precinct

As a key hub of activity for BWEZ, the Freight and Logistics Precinct is envisaged to begin as a relatively small hub of approximately 10 hectares to reflect demand. To enable unencumbered expansion, suitable land surrounding the Ballarat to Ararat Rail line and the Ballarat Western Link Road is provided to enable this precinct to grow beyond servicing BWEZ and the local area of Ballarat, to providing freight and logistical services to the surrounding region and capital cities such as Melbourne and Adelaide with an integration of

all 3 modes of transportation including road, rail and air based freight.

### 8.6 An Integrated and Holistic Masterplan

BWEZ is a key employment project that supports Ballarat growth strategy and responds to its projected population growth. The Master Plan is designed to maximise the development potential of the subject site and its important employment opportunities.

The BWEZ Master Plan applies an integrated sustainability and commercial reality approach to ensure robust assessment including:

- Conservation and enhancement of Winter Swamp will be a key outcome of the BWEZ Master Plan and has resulted from early community engagement to identify high value assets in and around the precinct
- BWEZ provides the opportunity to unlock employment land for future industry allowing planned industrial areas to be relocated from the residential areas of Delacombe and Alfredton to one strategic consolidated site, protecting the lifestyles of residents
- The commercial market analysis is based on robust market consultation and market analysis, has highlighted a range of master plan design and staging inputs.

The master plan also identifies the inclusion of a number of key projects to achieve the 20 year vision to BWEZ including:

- The Freight hub
- Western Link Road
- Innovation / RD Centre
- Bio Energy Plant
- Recognition of the master planning for the Ballarat Airport

The Master Plan applies an innovative response in integrating a range of environmental, hydrology, transport, energy, activity impacts and commercial form factors across this large 623 Ha site.

Additionally, the understanding of the site's opportunities and constraints is not only built on various technical analysis, but importantly, wide ranging public consultation.



# Section 9.0

Infrastructure

## 9.0 Infrastructure

### 9.1 Infrastructure Upgrades

The BWEZ Master Plan facilitates the future development of the subject area for a range of industry and business service uses totalling approximately 350 hectares or approximately 1,000,000m<sup>2</sup> of additional floor space. On this basis, the road infrastructure both internally and externally to BWEZ must be upgraded to accommodate the additional generation of traffic in the area.

In accordance with the principles of traditional neighbourhood design the movement network has been deliberately designed with a high level of internal and external connectivity and potential to distribute trips on a number of routes rather than focusing the majority of trips on a small number of higher order roads. Notwithstanding this the LSP area has five categories of roads/streets including arterial roads, boulevard entrance and connector streets, key internal and external streets, public transport and shared paths.

### 9.2 Movement Network and Road Hierarchy

The key Movement Network and Road Hierarchy will be framed on the main infrastructure in the Ballarat Western Link Road and Ballarat to Ararat Rail Line.

The micro Movement Network and Road Hierarchy will be finalised based on the agreed final Master Plan scenario and refined as part of the Part C: Delivery Strategy.

### 9.3 Infrastructure

#### 9.3.1 Natural Gas

Gas demand has been calculated on the basis of low use industry with average site coverage of 40% which equates to a total of 1,000,000m<sup>2</sup> useable floor space has been

assumed. On this basis, a consumption rate for the development is estimated to be approximately 0.7MJ/m<sup>2</sup>/day. This equates to a use of 700,000MJ/day or a peak demand of 50GJ/Hr.

#### 9.3.2 Electrical

Electrical demand has been calculated on the basis of average use industry with average site coverage of 40% that equates to a total of 1,000,000m<sup>2</sup> useable floor space has been assumed. A consumption rate for the development is estimated to be approximately 40W/m<sup>2</sup>. This equates to a total peak demand of 40MW for the total site.

The supply of peak demand 40MW will require a new substation to be built adjoining the BWEZ. A 66kv sub transmission line from Ballarat South Zone Substation and a similar connection from the Ballarat North Zone Substation will supply the substation.

There is a requirement for a new substation within the BWEZ. The preferred location is on the corner of Ballarat Ring Road and Blind Creek Road.

#### 9.3.3 Telecommunications

As per industry standard, every lot will be supplied with a fibre optic cable to the premises (FTP) that will provide telephony and broadband internet services. This arrangement will be sufficient for the majority of customers expected to occupy lots at BWEZ.

It is assumed that there will be no telecommunication intensive industries within the development, such as a Data Centre. In the event that such an industry is present, any alteration to the proposed arrangement will be at the discretion of NBN Co.

#### 9.3.4 Environment

The environmental considerations for the site are critical in particular relating to hydrology and drainage during heightened rain events

as well as the ecological values of the site, in particular in and around the Winter Swamp.

The preferred Master Plan Scenario provides a combined drainage and habitat link from the Winter Swamp area, incorporating the natural environmental and drainage channel for the site through the central spine linking the airport and further north.

The final preliminary design and parameters for this area will be provided in the Delivery Strategy following refined analysis and in particular targeted surveys for threatened species.

#### 9.3.5 Water and Sewerage

The surrounding land uses are currently serviced by water and sewerage except for areas to the south west which incorporate areas of rural and low density residential adjoining BWEZ.

BWEZ can be serviced with water via the extension of existing water mains and the construction of new water mains and storage tanks within the zone.

As advised by Central Highlands Water, the sewer network can be extended to service the BWEZ. These mains will need to follow, where possible, the natural drainage lines as the aim is to have the network operating on a gravity fed basis.

It was identified by CHW, that the new rising main will need to be constructed to connect to the BNWWTP depending on the demand, capacity upgrades to this point may be required in the future.

Refer to Section 4.3 of this document and to the supporting Civil Infrastructure Technical Report for further information.



# Section 10.0

## Design Principles



## 10.0 Design Principles

The following design principles have been produced to guide the future development of BWEZ in a manner that is sympathetic to site constraints, consistent with existing development and surrounding environments, and importantly, consistent with delivering the vision for the BWEZ.

Future development should try to introduce an innovative development model that creates a distinctive character in response to contextual and site attributes, taking advantage of the excellent visual exposure of the site. The site has no immediate built form context and therefore key landmark sites and catalyst development has the opportunity to instil robust and contemporary architectural form within a high quality landscape setting.

### 10.1 Site Planning

#### 10.1.1 Subdivision Layout

##### Design Objectives

- With exception of the key landmark sites, provide flexibility to end users and for the economically sound development of the site
- Protect and enhance ecologically significant areas and provide for the appropriate interface of conservation areas with development
- Ensure the meaningful integration of Water Sensitive Urban Design within the subdivision layout
- Ensure the provision of sufficient space for parking, loading and unloading of vehicles and landscaping.

##### Design Requirements

- Lots are to be sized and orientated with regard to slope (albeit minor) and site aspect in order to maximise opportunities for solar access and prevailing winds.

#### 10.1.2 Internal Road Network

##### Design Objectives

- Provide legible, convenient and safe roads and pathways for all modes of transport and pedestrians.
- Priority design for freight vehicles

##### Design Requirements

- Interchanges of minor access roads with collector roads should be designed to allow articulated vehicles to turn into the collector road without crossing the centre line of the collector road.
- Encourage the use of sustainable transport modes including public transport and cycling through the integration of safe pedestrian pathways from transport stops to key destinations, designated cycle lanes and bike storage facilities.
- Provision for HPFV (high performance freight vehicles)

#### 10.1.3 Site Coverage

##### Design Objectives

- Ensure that adequate area is available to accommodate landscaping, open space for employees and screening of loading and storage areas
- Ensure that adequate area is available for driveways and accessways, onsite parking and manoeuvring of vehicles
- Achieve appropriate building setbacks that are landscaped to ensure integration with streetscape and road tree plantings
- Ensure that adequate area is available and that use of the site is carried out to allow the continued and safe operation of service easements (where relevant).

##### Design Requirements

- Maximum and minimum site coverage permitted should be considered by Council in the context of each

development

- Front setbacks are sufficient to enable landscaping to screen large footprint buildings and create an integrated and coherent public / private interface
- Car parking, water tanks, structures and storage areas are not encouraged within front setback areas and should be non-visible from the street
- Outdoor storage areas are to be screened from the public realm through the siting of buildings and landscaping, rather than fencing.

#### 10.1.4 Building Height and Built Form

##### Design Objectives

- Ensure that buildings are of suitable scale and built form
- Ensure that built form contributes to the visual amenity of the area, particularly at sensitive interfaces.

##### Design Requirements

- Building heights are to be in keeping with the scale and land use type of adjoining land
- The height of buildings and works should take into account the proximity of the structure to roads, airport uses, conservation areas and any adjoining sensitive land uses
- Warehouse building heights should be considered in the context of the visual amenity of the precinct and proximity to sensitive land uses
- Office/commercial components are permitted to exceed the maximum building height in order to provide visual interest and articulation of heights
- Variation to the maximum height may be considered in order to provide visual

interest and articulation provided the proposed building height is compatible with the scale, bulk and height of surrounding buildings and will not generate excessive overshadowing of adjacent properties and / or impact to sensitive nearby uses.

## 10.2 Access, Movement and Car Parking

### 10.2.1 Site Access and Manoeuvring

#### Design Objectives

- Ensure that access and manoeuvring arrangements to/ from and within the site cater for large vehicles, are safe and do not cause detriment to other road users.

#### Design Requirements

- Truck access, manoeuvring and loading areas are to be separated from car parking areas
- Consider separating truck and small vehicle access points to reduce vehicle conflicts
- It is preferred that vehicles be able to enter and leave the site in a forward direction
- Pedestrian access through car parking areas should be clearly marked, and where possible emphasised by the use of raised and textured surfaces and articulated through landscaping where feasible
- As far as possible, pedestrian access through car parks should be kept separate from vehicle access ways

- Buildings shall be designed to allow loading / unloading of vehicles within the building
- Loading docks should be situated to the side or rear of buildings
- Where not subdivided, all driveways are to satisfy AS2890.1 and AS2890.2.

#### 10.2.2 Car Parking

- Ensure that on-site car parking is adequate, safe and convenient
- Ensure that the layout of parking areas are visually attractive and integrated.

##### Design Requirements

- Sufficient car parking is provided on each lot to satisfy the likely peak parking demands of the development
- Required car parking shall be located behind the required minimum building front setback area, however visitor car parking may be permitted forward of the building line where it can be demonstrated that the landscape quality of the streetscape can be maintained
- Access routes to car parking areas for each lot are to be clearly signposted
- All car parking spaces are to be constructed of hardstand, all weather material, adequately drained, marked and designated
- Sufficient spaces are to be provided for disabled car parking
- Landscaping shall be integrated into the design of car parks and hardstand areas to allow for canopy and shade planting to reduce the 'heat island effect'.

### 10.3 Building Configuration

#### 10.3.1 Sustainable Building Design

##### Design Objectives

- Reduce greenhouse emissions through appropriately designed buildings and best practice energy management
- Adopt economically viable energy efficient design initiatives.

##### Design Requirements

- Building orientation and design should be such that they maximise northern exposure and shade east and west facing windows and openings
- Windows and openings should be positioned to maximise natural cross ventilation
- Minimise winter heat loads through the arrangement of glazed parts of buildings to face north and east
- Use light coloured materials in hardstand areas to minimise heat absorption
- External shading devices (e.g. awnings, shutters, canopy trees) are to be used to protect east, north and west facing windows from summer heat
- Use skylights and light wells to capture natural light for internal building areas
- Maximise insulation and thermal mass and minimise air building leakages
- Capture and store rainwater from roofs and other impervious surfaces within tanks for reuse. Drain hardstand / car park areas to appropriate stormwater treatment devices prior to discharge from the site
- Place trees and buildings along the south western fringes of the site to reduce the

effects of hot westerly summer breezes.

#### 10.3.2 Sustainable Building Materials

##### Design Objectives

- Minimise the total material resources used
- Minimise the environmental impacts of material used.
- Encourage the use of environmentally sustainable materials, with low embodied energy content
- Encourage high quality architect designed buildings within areas of high visibility.

##### Design Requirements

- Consider materials with recycled content. Examples include: recycled concrete, brick, timber, steel etc.
- Consider using certified plantation (Forest Stewardship Council) or engineered timber materials, and avoid unsustainable imported timber from old growth forests
- Choose low volatile organic compound (VOC) materials, including low/no VOC paints and coatings, floor coverings and underlays.
- Source local materials to reduce transportation impacts.

#### 10.3.3 Building Appearance

##### Design Objectives

- Promote industrial development that is both functional and attractive in the context of its local environment through appropriate design.

##### Design Requirements

- Built form and facades visible from the street or from public open space should

be modulated and articulated to provide visual interest. Long blank walls will not generally be supported. Articulation of walls can be achieved by variations in setback, the use of glazing and differing architectural materials, finishes and colours

- Buildings should be designed with regard to site topography and step back and step down to help break up masses and 'box' style development. Consider breaking large buildings into sub-units or modules to reduce perceived scale
- Office areas sited in front of buildings can be designed to help reduce building mass and increase visual interest. Setbacks may be reduced to improve building articulation
- Buildings are to address the street and provide surveillance to streetscape
- Entries and building bases should be articulated through the use of colour, material change and texture, and strengthened through landscape design
- Built form within lots which lend themselves to 'landmark' or 'gateway' treatment should have a contemporary style and incorporate high quality architectural detail and visibility
- Large areas of smooth finish concrete wall panels should be enhanced with some form of texture. Consider using heavy textured paint or forming textures into selected areas of wall panels to avoid a glossy/high glare building surface
- Hardstand, loading, storage, rubbish disposal, plant and equipment areas should be softened from the front, side and rear through landscaping or integrated building form.





## 10.4 Landscaping

### 10.4.1 Landscape Design

#### 10.4.1.1 Design Objectives

- Encourage a well-designed, legible and cohesive landscape framework for development
- Encourage a relationship between public and private landscape through a consistent language of plant material and planting styles
- Encourage the use of species that will increase the biodiversity of the site.
- Low maintenance
- Provide a visual buffer between neighbouring land uses and proposed development
- Encourage the design of both hard and soft landscape to assist in creating comfortable micro climatic conditions and minimise the 'heat Island effect' of development.

#### 10.4.1.2 Design Requirements

- Retain significant existing trees or groups of trees wherever feasible in setbacks, medians, reserves and stormwater detention areas
- Create a legible, clearly defined streetscape that provides the structure within which a more naturalised planting style can be contained
- Utilise high canopy trees and low grasses generally within verge and median planting to ensure sightlines are maintained
- Provide private landscape setbacks frontages that are distinctive but well integrated with, and contributing positively to the public streetscape character.

- Use native grasses and groundcovers as lawn alternatives where possible to reduce irrigation demands
- Create well integrated stormwater detention and treatment areas which provide open space amenity and visual interest
- Integrate stormwater treatment into the road reserve where possible
- Promote passive irrigation of landscapes by directing nearby hardstand areas to vegetated areas
- Use side and front boundary landscape setbacks to create windbreaks and provide shade to westerly sun and winter winds
- Design well integrated shade planting within car park areas
- Use endemic species suited to the environment that have low water requirements and are low maintenance
- Use light coloured paving materials and surfaces and non-impervious surfaces where practical to reduce heat absorption
- Locate hard stand areas within the southerly side of lots to reduce their heat absorption.

### 10.4.2 Site Topography and Management of Level Change

#### 10.4.2.1 Design Objectives

- Encourage design that minimises cut and fill requirements
- Encourage well considered interfaces between lots and roads/setbacks/conservation areas
- Ensure that cut and fill requirements do not adversely impact upon adjoining land uses

#### 10.4.2.2 Design Requirements

- Landscaped batters are preferable to retaining walls and should be considered where space permits. Slopes should be no greater than 1 in 3 and suitably planted to provide screening or buffer as required by its location
- Retaining walls and batters should be well integrated into the design of the building and its envelope.

## 10.5 Environmental Management Objectives

### 10.5.1 Stormwater Management

- Reduce demands on potable water
- wherever possible, reuse water through identified methods
- Improve the quality of stormwater that is discharged from the site in order to protect the ecosystem health of the receiving waterways
- Attenuate the velocity and magnitude of flows that is discharged from the site in order to protect the stability of the receiving waterways.

### 10.5.2 Noise and Vibration

- Provide for the mitigation and management of noise and vibration impacts from all proposed development construction and operation within built form and landscaping.

### 10.5.3 Air Emissions

- Provide for the mitigation and management of odour, dust and stack emissions from construction and proposed operations.

### 10.5.4 Risky and Hazardous Material

- Ensure that all proposed development

operates at acceptable levels of risk and hazard to ensure the safety of persons or property on within the development area, or in surrounding areas.

### 10.5.5 Soil Contamination

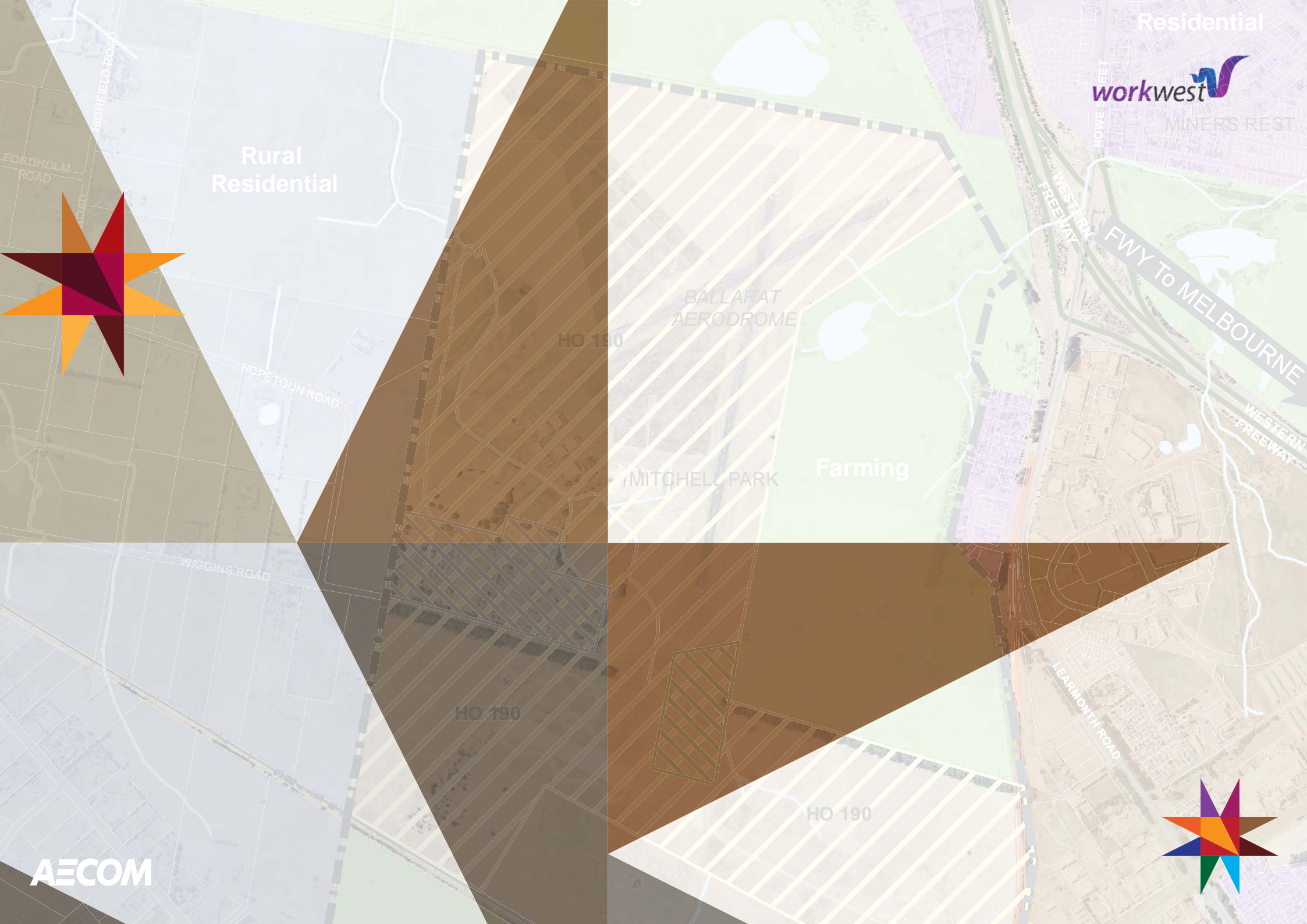
- Ensure that all development operates in accordance with EPA and WorkSafe Guidelines.

### 10.5.6 Native Vegetation

- Ensure that all development within sensitive areas follows the requirements of Native Vegetation Precinct Plan for the BWEZ.
- Land to the south of the runway extension is to be set aside as an hydrological and environmental 'corridor'. This land is already encumbered by the limitations of aircraft landing and taking off.

### 10.5.7 Water Reuse

- Ensure the integration of water reuse opportunities, such as those identified, including rainwater and stormwater harvesting for industry uses.



Rural Residential

BALLARAT AERODROME

MITCHELL PARK

Farming

Residential



MINERS REST

FWY To MELBOURNE

WESTERN FREEWAY

HOPETOUN ROAD

WIGGINS ROAD

JEARMONTH ROAD

HO 190

HO 190

HO 190

AECOM

