



East Bendigo Local Structure Plan

Final Report

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Executive Summary

Executive Summary

Maunsell Australia (Maunsell) has been engaged by the City of Greater Bendigo (Council) to prepare a Local Structure Plan (LSP) for the East Bendigo area to provide guidance and direction for future industrial development in this area.

The LSP preparation is also occurring at a time when the East Bendigo Link Road Study is being finalised. Given the linkages between these two strategic studies, part of the LSP work also includes selection of the preferred route alignment, undertaking a review of the route option assessment for the East Bendigo Link Road and developing a preferred route alignment best suited to facilitating access to and from this area.

This report provides:

- An overview of the planning undertaken to date as well as issues gleaned from initial consultation;
- Identifies the Preferred LSP for the East Bendigo Precinct identifying the main land uses, infrastructure needs, environmental areas to be retained and enhanced, layout and hierarchy of road, functional linkages with surrounding land and roads;
- Provision of a secure vision for the land and intent for the land for future developers, investors and land managers; and
- Preparation of an implementation framework for the East Bendigo LSP.

The impetus for the preparation of the LSP has come from the findings of the *Bendigo Industrial Land Strategy*, June 2002 prepared for the City of Greater Bendigo by Gutteridge Haskins and Davey Pty Ltd and Essential Economics Pty Ltd. This strategy makes a number of recommendations regarding land use planning, processes and opportunities related to the municipality's industrial land reserves and supply influences.

The purpose of this LSP is to investigate and provide recommendations for the future development of the East Bendigo area for industrial development, including road network, lot sizes, buffer distances/areas and locational analysis for different industrial uses.

The key challenge for this study is to identify how best to plan for future industrial development in the study area given the complex interplay of existing issues and changing nature of land uses. To address these issues and determine a way forward for planning in this area, the project objectives as outlined in the brief include:

- *Identification of the short, medium and long term desired subdivisions pattern for the precinct;*
- *Identification and securing of the long term plan form, lot layout, road alignment for the area having regard to the need to capitalise on the East Bendigo Link Road alignment and synergies that this will generate for the area;*
- *Identification of detailed geotechnical, development and servicing constraints that may hamper development interest in the market place, addressing a development plan that responds to these issues;*

Executive Summary

- *Provision of a secure vision and statement of intent for the land for future developers, investors and land managers;*
- *Identification of appropriate planning policy framework to guide the planning implementation tools; and*
- *Definition of a marketing focus for the precinct.*

This report also provides for the implementation of the Local Structure Plan to provide clear direction for the study area.

The preferred Local Structure is shown in Figure 12 and provides the opportunity to cluster specific industry types through the development of site specific precincts:

- Food Manufacturing/Technology Industries;
- Aviation Related Activities;
- Gravel Reserves and former tip site;
- Transport Logistics; and
- Horse Agistment activities.

The report also makes a series of recommendations relating to the implementation of this plan.

1 Introduction

Maunsell Australia (Maunsell) has been engaged by the City of Greater Bendigo (Council) to prepare a Local Structure Plan (LSP) for the East Bendigo area to provide guidance and direction for future industrial development in this area.

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1.1 Background and Impetus for Study

The impetus for the preparation of the LSP has come from the findings of the *Bendigo Industrial Land Strategy*, June 2002 prepared for the City of Greater Bendigo by Gutteridge Haskins and Davey Pty Ltd and Essential Economics Pty Ltd. This strategy makes a number of recommendations regarding land use planning, processes and opportunities related to the municipality's industrial land reserves and supply influences.

One of the key recommendations of the Industrial Land Strategy is the need to undertake a Local Structure Plan for East Bendigo. The report made the following comments regarding industrial development in East Bendigo:

East Bendigo Precinct and surrounds has been identified by the Strategy as the preferred location for industrial development investment, marketing and industrial expansion potential for Bendigo. Presently however, the area lacks a long-term development re-subdivision and infrastructure investment program and design strategy. The preparation of a detailed Local Structure Plan is required to articulate and document the future of the precinct (Essential Economics and GHD, East Bendigo Industrial Land Strategy, 2001:25)

The strategy also highlights that East Bendigo is considered to offer the most opportunities for the City of Greater Bendigo's future industrial development due to existing and proposed transport links including direct access to Calder Highway, McIvor Highway and the rail line, existing and proposed levels of servicing and surrounding land uses. The strategy indicates that the area has the capacity for approximately 110 hectares of new industrial development. However, any

intensification of industrial development must consider associated impacts on the surrounding road network and other land uses.

1.2 Aim of the Study

The purpose of this LSP is to investigate and provide recommendations for the future development of the East Bendigo area for industrial development, including road network, lot sizes, buffer distances/areas and locational analysis for different industrial uses.

The key challenge for this study is to identify how best to plan for future industrial development in the study area given the complex interplay of existing issues and changing nature of land uses. To address these issues and determine a way forward for planning in this area, the project objectives as outlined in the brief include:

- *Identification of the short, medium and long term desired subdivisions pattern for the precinct;*
- *Identification and securing of the long term plan form, lot layout, road alignment for the area having regard to the need to capitalise on the East Bendigo Link Road alignment and synergies that this will generate for the area;*
- *Identification of detailed geotechnical, development and servicing constraints that may hamper development interest in the market place, addressing a development plan that responds to these issues;*
- *Provision of a secure vision and statement of intent for the land for future developers, investors and land managers;*
- *Identification of appropriate planning policy framework to guide the planning implementation tools; and*
- *Definition of a marketing focus for the precinct.*

As stated earlier, the study will also identify the preferred route for the East Bendigo Link Road and undertake the tasks outlined below, addressing the project requirements for the Linking Road Study process as outlined by the Minister for Planning in correspondence to Council, dated 5 November 2001:

- Consultation with residents, business and landholders in study area;
- A value management public workshop;
- Consideration of the social impacts of the route options;
- A guarantee of protection of the historic Chinese and European gold mining sites;
- Management of any heritage items discovered; and
- Consideration of opportunities for further development of properties along the routes.

Other key issues that are influencing factors in this study area include:

- Appropriateness of residential and low density residential development within the study area and the need to ensure adequate buffering and separation between existing and proposed non-compatible land uses;

- The possible relocation of the aerodrome site, being considered by Council;
- The “Goninans” site located on the disused rail yard which offers a significant redevelopment opportunity for freight or transport related activities;
- The preferred route alignment for the East Bendigo Link Road; and
- Protection and management of the sites of cultural significance including the Chinese and European gold mining sites.

1.3 Study Area

The study area for the LSP relates to the East Bendigo Industrial Precinct. However, given the need to consider transport linkages and buffering needs, a broader “area of influence” has also been identified for consideration in regard to its impact on the study area.

The study area is generally bounded by Heinz Street to the north, the Bendigo Aerodrome and Pratts Park Road to the east, Lloyd Street, Lansell Street and Charleston Street to the south and the railway line to the west (refer Figure 1).

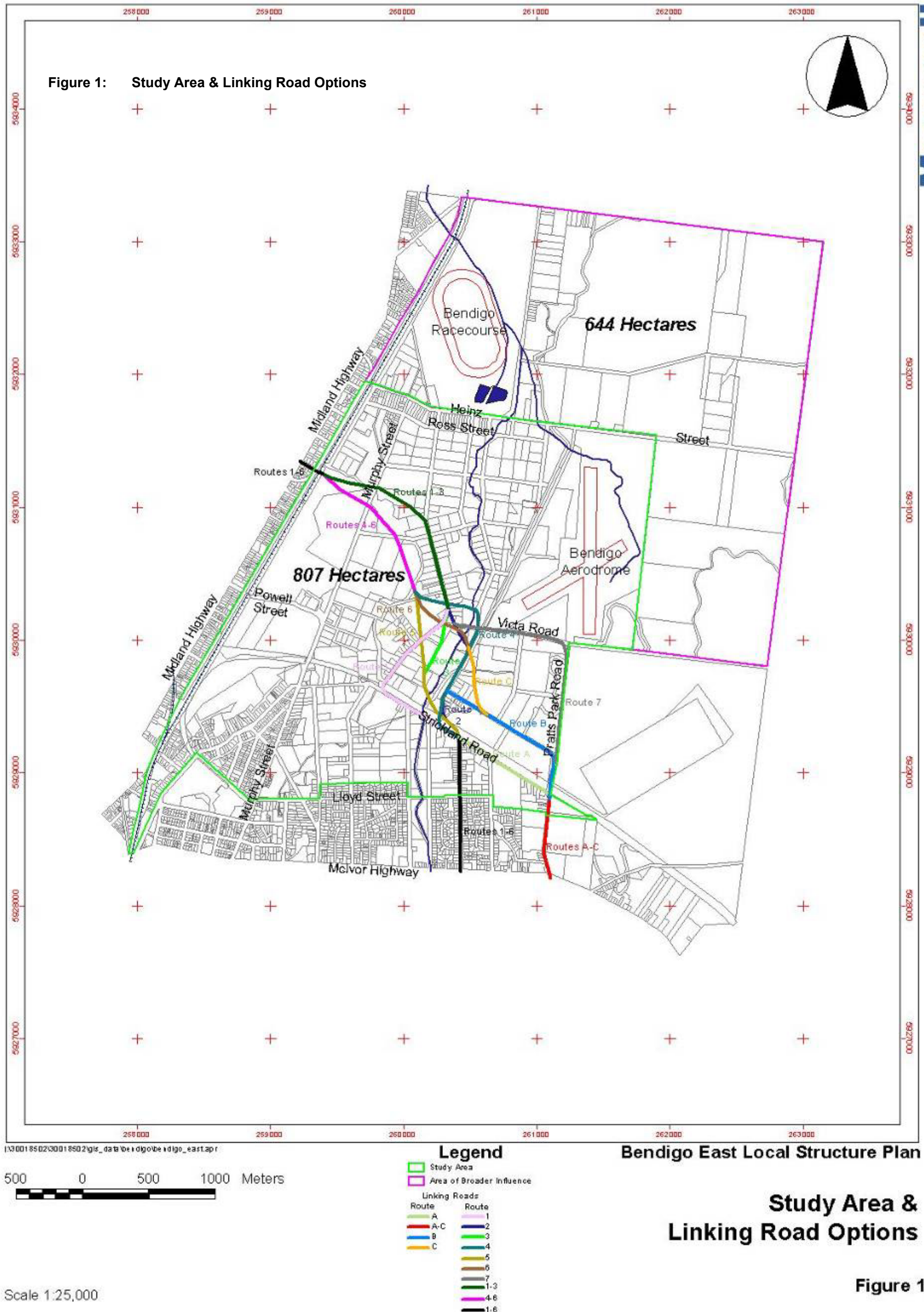
The area of influence is bounded by Victa Road to the south then continues approximately one (1) kilometre west of the Aerodrome, then diverts north to Golf Course Road which forms the north boundary and the railway line forms the boundary to the West.

The study area comprises a total area of 807 hectares whilst the broader area of influence comprises a total area of 644 hectares.

The study area is the largest and strongest cluster of industrial activities in Bendigo. It is typically well serviced and will provide for the long term expansion and consolidation on industrial activities in the city.

As Figure 1 illustrates, the options that have been considered as part of the Linking Road Study are located within the study area and are intrinsically linked to the future development and potential of the East Bendigo Industrial area.

Figure 1: Study Area & Linking Road Options



2 Stakeholder Consultation

An important input to this study has been and will continue to be, consultation with stakeholders. This has enabled a full understanding of the land use in the study area. The stakeholders consulted with thus far include state and local government authorities and agencies, landowners, developers, business owners, and real estate agents who are active in the study area.

Outlined below is an overview of the key issues raised during these initial consultation activities. Additional consultation activities were also undertaken to scope the Preferred East Bendigo Local Structure Plan from a series of options. This is detailed further in Section 7 of this report.

2.1 City of Greater Bendigo

Civil Infrastructure

- Council's Drainage Engineer has indicated that the area of broader influence may also experience drainage difficulties if developed. Any development would most likely require the provision of flood retarding basins to restrict the flows to current levels.

Transport Infrastructure

- Discussions have also been held with the City of Greater Bendigo's Traffic Engineer who has indicated that the ultimate Linking Road alignment should follow a route as direct as possible between the Midland and McIvor Highways. The Traffic Engineer was not as concerned as VicRoads in terms of utilising existing road reserves but more concerned at achieving an optimum road alignment in terms of continuity and safety. It was also pointed out that Powells Avenue is currently a popular section of the existing Outer Box route and therefore may continue in that role even if Pratts Park Road is selected as part of the Outer Box.

Economic Development

- Discussions have also been held with the City of Greater Bendigo's Industry Development Officer who highlighted that the establishment and development of the East Bendigo Industrial Precinct provides an exciting opportunity for Central Victoria to grow existing industries, to attract new enterprises and investors to the area plus generate significantly more employment. The Economic Development Officer also highlighted the importance of clustering specific industries and the need to adopt an innovative approach to energy.

2.2 State Government Agencies

- Department of Sustainability & Environment (DSE) Regional Office highlighted the need for an access route through the study area that separates the industrial and residential uses for buffering.

- Department of Sustainability & Environment (DSE) Regional Office indicated that Wellsford State Forest is located to the east of the study area. A roosting site for Swift Parrot has been recorded at the western tip of the forest. Part of the Wellsford State Forest has been incorporated into the Bendigo National Park, as a result of a recommendation of the Environment Conservation Council (ECC) Box-Iron Forests and Woodland Investigation.
- Environment Protection Authority (EPA) indicated that there is a lack of strategic development for the study area so far, however, any industrial development would need to comply with relevant legislation and policy.
- Heritage Victoria indicated that there are only two sites listed on the Heritage Inventory (Chinese Diggings Site and White Hills Reserve) within the study area. Clearly these are significant sites, which have been recognised by the Minister for Planning in their correspondence to Council which has highlighted the need to safeguard their existence.
- Discussions have been held with VicRoads in order to identify issues relevant to the selection of an optimum road alignment for the Outer Box, through the study area. These discussions have also been used to explore other traffic matters relevant to this study. The key points made by VicRoads are listed below:

Outer Box considerations:

- The ultimate alignment selected for the East Bendigo Linking Road should enable staged implementation. VicRoads considers that construction of the Linking Road in its entirety may be prohibitive from a cost perspective. In this regard VicRoads also favours options, which maximise use of existing road reservations, as this minimises costs for the acquisition of land and creation of new road reserves.
- VicRoads' preference is for the East Bendigo Linking Road to be constructed as a 4 lane divided road or at least an undivided road with exclusive protected right turn lanes of adequate capacity.
- Service roads are regarded as desirable as VicRoads considers that they are an effective mechanism to manage access. Service roads should also be provided outside of the 30 metre road reserve envisaged for the Linking Road. VicRoads ultimately prefers to limit, as much as possible, "direct" access onto the Linking Road.
- The Linking Road alignment should be well clear of either existing or possible future airport upgrade plans.
- Cyclists should be accommodated through the provision of wide kerbside lanes.
- Intersections need to be designed to cater for buses, which are envisaged to be the most likely form of public transport in the study area.

Other considerations:

- A northbound “rat run” exists along Bobs Street (north of Powell Street) as motorists use this section of road, rather than the Midland Highway, given the difficulty in performing right turns at the Powell Street / Midland Highway intersection. Motorists eventually rejoin the Midland Highway at the Plumridge Street / Midland Highway signalised intersection.
- There are existing problems for right turn movements at the Nolan Street / Midland Highway intersection. This could be an attractive entry point into the southern parts of the study area.

2.3 Servicing Authorities

Discussions were held with representatives from service authorities to identify their role and function for provision of infrastructure, payment for connection and augmentation fees. This is discussed in more detail in the Development Cost Report. Outlined below is a discussion of the key findings from the report.

- Coliban Water indicated that reticulated sewerage currently services the properties south of Strickland Road and properties within proximity of Rohs Road and McDowalls Road. Except for Bendigo Racecourse, no properties in the area of broader influence are sewered. Water mains would also need to be upgraded.
- TXU indicated that reticulated gas supply is available to the residential and industrial properties in the study area.
- Powercor indicated that electricity supply is available throughout established areas and generally across the remainder of the study area. However, expansion to industries would require the installation of additional infrastructure to service potential industrial expansion.
- Telstra indicated that conduits are located in road reserves along the length of Powells Road, and Strickland Road. Critical to have high quality communications infrastructure.

2.4 Business Owners, Operators and Real Estate Agencies

- Real Estate agents have highlighted strategic importance of the East Bendigo Precinct including proximity to Bendigo CBD and transport linkages to Melbourne. However, they also indicated that one of the shortfalls/limitations was that there was no overall planning framework within which development could take place.
- Discussions with business owners and operators within the study area highlighted a number of issues relating to the need to separate residential and industrial precincts, infrastructure improvement, and the need to avoid industrial traffic through residential precincts. The findings from a number of consultation activities is detailed in Section 6.

2.5 Other

- Bendigo Jockey Club would like to see the residential area along Heinz Road and low density residential precinct between Strathdale – White Hills Road and Dixon Road retained for horse agistment purposes. They indicated that it is preferable for land to be available for horse agistment within 600-800 metres of the study area.
- Harness Racing Club reiterated the concerns raised by the Bendigo Jockey Club.

3 Strategic Planning Context

This section considers the strategic planning policy context for the project starting at the state level with the *Agenda for New Manufacturing* and *Growing Victoria Together* policy, which is Government's overarching policy and governance framework.

3.1 Land Use Planning

3.1.1 State Planning Policy

Agenda for New Manufacturing

The *Agenda for New Manufacturing* is the State Government's policy for new manufacturers. It is founded on the Government's vision statement, *Growing Victoria Together* (November 2001), its business statement, *Building Tomorrow's Business Today* (April 2002), and industry input via the strategic Audit of Victorian Industry and the Manufacturing Industry Consultative Council.

The seven items on the agenda:

- Accelerating innovation;
- Growing exports;
- Championing manufacturing;
- Creating high-performance workplaces;
- Building skills;
- Attracting investment; and
- Achieving environmentally sustainable manufacturing.

This policy highlights the important role that government will play in supporting manufacturing.

Growing Victoria Together

Growing Victoria Together is the State Government's policy that outlines the government's principles for guiding all governance of the State.

Key elements of this policy relevant to this study include the following:

Growing and Linking all of Victoria

- Upgrading transportation systems, standardising rail gauges etc.
- Improving regional infrastructure, better linking Melbourne and regional ports to industry and agricultural centres across Victoria.

Promoting Sustainable Development

- Encouraging a better quality of life now, and for the future generations by ensuring a balanced approach to the economy, society and environment.

More Jobs and Thriving Innovative Industries Across Victoria

- Promoting the creation and use of new ideas and technologies to attract investment and employment in new and existing industries.

State Planning Policy Framework

The State Planning Policy Framework (SPPF) provides a context for spatial planning and decision making by planning and responsible authorities. It is comprised of a statement of general principles for land use and development planning and, specific policies dealing with sectorial issues.

The State Planning Policy seeks to ensure that the objectives of planning in Victoria (as set out in Section 4 of the *Planning and Environment Act 1987*) are fostered through appropriate land use and development planning policies and practices which integrate relevant environmental, social and economic factors in the interests of net community benefit and sustainable development.

State planning policies in the SPPF relevant to the assessment of land use issues for East Bendigo LSP and Linking Road relate to issues of:

- Settlement (clause 14) with respect to Planning for Urban Settlement (14.01),
- Environment (15) with respect to Floodplain Management (15.02),
- Air quality (15.04),
- Noise Abatement (15.05),
- Open Space (15.10),
- Economic Development (17) in relation to Mineral Resources (17.08),
- Business (17.02),
- Industry (17.03),
- Apiculture (17.10).

The objective of the **Clause 14.01 Planning for Urban Settlement** relates to ensuring a sufficient supply of land is available for residential, commercial, industrial, recreational, institutional and other public uses. In planning for urban growth, planning authorities should encourage the consolidation of existing urban areas and especially higher density and mixed-use development near public transport route. Bendigo township has been experiencing increased pressure for residential and rural residential development on the fringe. In particular, there has been some inappropriate residential subdivision within the East Bendigo precinct.

The objective of **Clause 15.10 Open Space** is to assist the creation of a diverse and integrated network of public open space commensurate with the needs of urban communities and rural areas.

The objective of **Clause 17.02 Business** relates to encouraging developments, which meet the community's needs for retail, entertainment, office and other commercial services and provide net community benefits in relation to accessibility, efficient infrastructure use and aggregation and sustainability of commercial facilities.

Clause 17.03 relates to **Industry** and is aimed at ensuring the availability of land for industry, and facilitating the sustainable development and operation of industry and research and development activity.

Clause 17.3 states:

Existing industrial areas that include key manufacturing or processing industries; a major clustering of allied industries; key industrial infrastructure should be protected and carefully planned where possible to facilitate further industrial development (Victoria Planning Provisions, State Planning Policy, Clause 17.03)

The importance of economic development is expressed in **Clause 17.08 Mineral Resources** which is aimed at protecting identified mineral resources, encouraging mineral exploration and mining in accordance with acceptable environmental standards and providing a consistent planning approval process.

The objective of **Clause 17.05-2** relates to agriculture and aims to ensure that the State's agricultural land is protected from the unplanned loss of high quality productive agricultural land due to permanent changes of land use. It enables the protection of productive farmland, which is of high quality and strategic significance in the local or regional context.

Other State Policies

North Central Regional Catchment Management Strategy

The *North Central Regional Catchment Strategy, June 1997* provides an overarching strategic direction for natural resource management in the North Central region. The Strategy sets out a detailed description of the region, defines goals for the region, provides an assessment of the priority landcare and other issues to be addressed and details programs recommended for implementation.

Specific goals and programs relating to biodiversity, salinity, water, soil and regional development are included in this Strategy.

Linking Victoria – Victoria's Rural Arterial Road Network Strategy (VicRoads)

Linking Victoria sets out a clear and community-orientated strategy for developing and managing these important roads. It responds to the needs of users and presents a range of affordable and properly targeted initiatives to provide Victoria with a quality road network, now and in the future.

Overall, the strategy highlights the need for an integrated approach for future transport/land use development. The detailed inclusion in the structure plan of a road network will improve the safety, efficiency and capacity of the road network and the industrial area.

3.1.2 Regional and Local Planning Policies

There are a range of regional and local policies, strategies and reports that are relevant to the study area summarised as follows.

City of Greater Bendigo Council Plan

The City of Greater Bendigo Council Plan 2005-2009 sets out the vision, values and objectives in regard to providing civic leadership, natural environment, managing growth, our community and regional prosperity.

The Council Plan sets out the objectives for the next five years. The framework for the Council Plan has several key components:

- *Our Vision, which tells us where we want to be;*
- *Values which underlie all our activities;*
- *Corporate Objectives to achieve the Vision;*
- *Strategies to deliver the Objectives;*
- *Indicators against which Council's performance in achieving the objectives are measured.*

The Council Plan is used in conjunction with other strategic plans including Municipal Strategic Statement and the Municipal Public Health Plan to guide the community's development. Various strategic plans, consistent with Council's Corporate Objectives, are being implemented by Council.

The vision developed for the LSP will need to reflect the corporate direction of this document.

Bendigo Aerodrome Redevelopment Report

A study has been prepared by Airports Plus Pty Ltd for the City of Greater Bendigo to investigate future options for the Aerodrome. The report makes the following recommendations:

- *"Bendigo Aerodrome be redeveloped to Reference Code 3C by extending runway 17/35 450m to the south and widen the runway to 30m;*
- *Increase the runway centreline profile by approximately 1.5 metres to improve the pavement strength and runway drainage and to meet longitudinal grading requirements for Code 3C;*
- *Prepare a new engineering estimate based on the proposed runway redevelopment;*
- *Commence negotiations with DSE to purchase/lease the area of land required to accommodate the runway extension;*
- *Review the Greater Bendigo Planning Scheme to ensure that the runway extension does not require the Scheme to be amended;*
- *Apply for Commonwealth Government Regional Development Funding through the Department of Transport and Regional Services;*
- *Apply to the State Government for Regional Development Funding through the Minister for Regional Development, and*
- *Forward this report to the Regional Manager, Department of Sustainability & Environment for final assessment of whether an environmental effects statement is required for the aerodrome redevelopment."*

It appeared that at least one of the Concept Plans developed as part of Stage 3 will need to accommodate the future expansion of the airport runway to the south. Clarification from Council will be sought on this matter. However, it should be noted that Council has recently undertaken a study to scope the feasibility of the relocation of the aerodrome. This study is not expected to be completed for another few months.

Inland Port

A feasibility study was carried out in 1998 by the City of Greater Bendigo for the establishment of an inland port facility for the Bendigo region. The study found that Bendigo was an ideal position due to its central location in the region and its accessibility to existing major road and rail transport routes. The following three locations were considered (note, the initial site considered for the Inland port was Marong):

- Elmore;
- Myers Flat; and
- Former Railway Workshop Bendigo East.

Council has recently decided that the former Railway Workshop site is the most appropriate site for proposed inland port facility. A marketing document has been produced to attract a proponent to develop the facility at the former Railway Workshop site. Clearly the development of an inland port at this location has the potential to offer many synergies with the East Bendigo Industrial area.

It is important to note that a portion of the former Railway Workshop site is used by Empire Rubber.

Greater Bendigo Planning Scheme

The Local Planning Policy Framework (LPPF) of the Victoria Planning Provisions contains a Municipal Strategic Statement and local planning policies.

Municipal Strategic Statement

The Municipal Strategic Statement (MSS) is a statement of the key strategic planning, land use and development objectives for the municipality and strategies and actions for achieving the stated objectives. It is a summary of Council's strategic land use plan and provides advice and direction to developers and the community as to how this vision is to be achieved.

The vision for the City of Greater Bendigo is for it to be a vibrant municipality that builds on the outstanding opportunities available for housing, commerce, tourism and industry. These opportunities combined with excellent community services and facilities, a unique natural environment, built and cultural heritage and pleasant climate, will ensure that Greater Bendigo becomes a pre-eminent inland municipality in Victoria.

Relevant strategies for consideration include but are not limited to:

- *Ensure that an adequate supply of serviced industrial land is available.*
- *Ensure that existing and future industrial land is adequately protected from non-industrial uses.*
- *Promote key industrial areas in order to improve the diversification of the municipality's industrial base.*
- *Control development in proximity to important native vegetation reserves and linear linkages.*

Clause 21.04 outlines the City of Greater Bendigo's vision statement for land use planning and development across the Municipality.

Clause 21.07-1 Economic Development recognises Bendigo's potential as a major regional service centre, with a large portion of the region's labour force. Manufacturing is an important economic driver for the city and employment is concentrated in the following four key groups:

- Food processing;
- Textiles and clothing;
- Car components; and
- High technology engineering.

The industry objectives include:

- *To encourage diversification of the municipality's industrial base;*
- *To promote the expansion of existing industries*
- *To attract new industries to appropriate locations, particularly in the East Bendigo Food Manufacturing Precinct and the Goornong Industrial Estate,*

Local Planning Policy Framework

The following local planning policies are relevant to the East Bendigo LSP.

The policy basis for **Clause 22.04 Salinity and Erosion Risk** highlights that Greater Bendigo is committed to achieving healthy catchments, which protect and enhance the environment while supporting sustainable natural resource management. Sustainable resource management is recognised as being important to the economy and the community of the municipality and region.

This policy suggests that the natural environment of Greater Bendigo is worthy of protection and supports large areas of remnant and regrowth Box Ironbark forests of Local, State and International Significance.

Clause 22.05 Industrial Policy, applies to the use and development of land for industry. The policy basis highlights the City of Greater Bendigo's desire to encourage economic development through the growth of the industrial sector.

Facilitating economic development

- *To ensure that an adequate supply of land for industrial development is available and maintained to meet the changing needs of industry.*
- *To provide a range of industrial land and buildings to meet the needs of a broad range of industries.*
- *To facilitate new investment and redevelopment of Bendigo's existing industrial areas.*
- *To promote East Bendigo as the preferred location for industrial expansion, marketing and infrastructure.*
- *To facilitate and promote innovation and leadership within the various industrial sectors located in the municipality.*
- *To promote rural based industries to locate at identified sites such as the industrial precinct in Goornong.*

The Built Environment

- *To improve the image and quality of all industrial areas within the municipality.*
- *To facilitate improved infrastructure and communication services to industry, through the co-location of like businesses.*
- *To encourage new industrial development to be based on site responsive and sustainable design principles.*

Amenity

- *To ensure industrial development does not impact on the amenity and safety of adjoining land uses.*
- *To provide a pleasant work place and surrounds for employees of industry located in Bendigo.*
- *To ensure appropriate standards of health, safety and amenity are provided by new and existing industries.*

Of relevance specifically to the East Bendigo Industrial Area the Industrial Policy states:

It is policy to:

- *Provide a diversity of industrial locations to accommodate a range of industrial activities.*
- *Promote the opportunities and advantages of Greater Bendigo's industrial areas.*
- *Encourage the redevelopment of older and under utilised industrial areas for newer types of industry thereby making more effective use of existing infrastructure.*
- *Encourage the growth of existing industries and the attraction of new industries to the municipality, which have demonstrated they are environmentally compatible and ecologically sustainable.*
- *Protect existing industrial locations from encroachment by non-industrial uses.*
- *Encourage land in undeveloped areas to be retained in large holdings until it is required for development.*
- *Monitor industry and business investment trends to better understand and plan for changes in development and locational needs.*

Clause 22.06 Heritage outlines the City of Greater Bendigo's significant heritage buildings, streetscapes, sites and precincts, landscapes and natural features. Protecting cultural and natural heritage assets is important in maintaining the municipality's character and sense of place.

Bendigo Highway Entrances and Boulevards Study

The review and development framework for Bendigo's highway entrances and boulevards is designed to enable these major urban features to make a significant contribution to the enhancement of the character and overall presentation of Bendigo.

Bendigo Region Conservation Strategy – Environment Mapping Project

The Bendigo Region Conservation Strategy (BRCS) is a community-based committee established under the Bendigo Regional Organisation of Councils and subsequently, the City of Greater Bendigo. It was set up in response to community concerns over various environmental issues in the Bendigo region.

The aim of the Environmental Mapping Project is to develop a mapping database of environmental information over the administrative area of the City of Greater Bendigo. This mapping database will be used for the identification of the potential wildlife corridors and areas of environmental importance.

3.2 Transport Planning

The current transport strategy for the Bendigo region is based on the Bendigo 2020 Transportation Study (released in July 1993). This document provides the framework for transport network development in the study area. The need to undertake the 2020 Transportation Study was first identified in 1991 in response to:

- the Loddon-Campaspe Regional Planning Authority calling for a review of the transport implications of the draft Bendigo 2020 Land Use Strategy
- the 1972 Transportation Study reaching its intended 20 year horizon.

The Council's vision for the development of the transport network in the study area is now firmly based on the 2020 Transportation Study. This vision is also shared by VicRoads. This strategy identifies strategic and regional scale road, public transport, and non-motorised travel infrastructure projects and other initiatives designed to address the region's medium to long term transportation needs.

One of the key features of the 2020 Transportation Study is the identification of the strategic road network consistent with land use planning for the Greater Bendigo area for the year 2020. The "recommended option" for road network improvement represents a refinement of the existing declared road hierarchy (which is also defined in the 2020 Transportation Study). It should be noted that parts of this "recommended option" for road network improvement already exist, whereas some components will need to be progressively developed over coming years.

In simple terms, the existing strategic road network consists of a regular pattern of State Highways and Main Roads which define local precincts and from which local road networks are developed. Most of these State Highways and Main Roads radiate out from the centre of Bendigo but there are also distinct ring road patterns that exist. The State Highways include all the main radial arterials that connect Bendigo to outer regional centres (Melbourne to the south, Mildura to the north, etc). The Main Roads include secondary arterial roads, which supplement the State Highways and connect Bendigo with outlying towns. The Main Roads are also the building blocks for the system of interconnecting ring roads in the urban area, known as the Inner Box and the Outer Box.

Comparison of 2020 Road Hierarchy to 1972 Road Hierarchy

Interestingly, the existing road hierarchy identified in the 2020 Transportation Study is less extensive than the road network recommended in the 1972 Transportation Study.

This reflects the on-going process of review and adjustment that had occurred from the adoption of the 1972 Transportation Study onwards. Nonetheless, the key State Highway and Main Road components of the road hierarchy that were present in 1972 (those that provide the principal framework for the strategic road network) have all been retained. Between 1972 and 1991 (the commencement of the 2020 Transportation Study), a number of elements of the 1972 strategic road plan had been completed while others had been discarded or were still at “proposal” stage.

The 2020 Transportation Study reviewed conditions in the context of the new 2020 Land Use Strategy and those road hierarchy elements that had become redundant or superfluous were removed. In particular, the opportunity was taken, as part of the 2020 Transportation Study, to rationalise the system of main roads within the central activities area and surrounding urban zones. This culminated in the formal establishment of inner and outer “ring road” systems, known as the Inner Box and Outer Box.

The East Bendigo LSP will need to reflect and have regard to the 2020 Transportation Study. This is discussed in more detail in the following sections.

4 Study Area Context

4.1 Land Use/Buffer Requirements

Outlined below is an overview of the land use characteristics of the study area and identification of buffer purpose (hazard, residual and/or amenity) and distances.

Note, there are opportunities to reduce buffer distances through the development of Site Environment Management Plans (SEMP). Particular issues that can be addressed in the SEMP may include:

- the minimisation of impacts on air quality through the emissions of dust or other noxious gases;
- management of waste materials generated by the construction works;
- the need to minimise impacts on existing landscape and in particular, significant flora;
- the rehabilitation of existing creeks, waterways and drainage construction;
- controls on the spread of weeds and other noxious plants;
- the management of archaeological and heritage sites of significance and controls on the storage and use of fuels and other dangerous goods used during construction.

Outlined in the following sections are descriptions of different land use industries and **indicative** buffer requirements which are able to be reduced/modified based on intensity and nature of uses and the adoption of other onsite management processes to reduce potential off-site amenity impacts such as a Site Environmental Management Plan. Therefore, the buffer distances should be used as a guide only and a case by case assessment would be required to determine the exact distances.

Overview

Figure 2 illustrates the land uses in the study area. The land use survey was undertaken during April 2002. The land use survey is an extensive snapshot of the type of industries located in the area, however, not every industry located in the study area is included on the land use figure. The information for the land use survey was derived from the data collected from the following sources:

- Field visit; and
- The City of Greater Bendigo Business Register (crossed referenced with Council's GIS and rates systems);

4.1.1 Land Use Categories

The Australian and New Zealand Standard Industrial Classification (ANZSIC) has been used to classify the industrial uses in the study area.

Based on the ANZSIC the following uses located in the study area include the following:

- **Manufacturing**

Includes all lots in the study area mainly engaged in manufacturing. In this context manufacturing relates to the physical or chemical transformation of materials or components into new products, whether the work is performed by power driven machines or by hand. Manufacturing use has historically been the dominant development in the East Bendigo area and many industries contained within this category generally require a buffer distance ranging between 100 to 500 metres based on table to Clause 52.10. Figure 3 highlights the number of industries within the study area requiring buffers.

Manufacturing uses in the study area include:

- Empire Rubber, requiring a 300 metre buffer; and
- BMG Boral, producers of concrete and cement products, requiring a 300 metres buffer.

A subcategory that the study team has included in Manufacturing is Food, Beverage & Tobacco. Many of the Food, Beverage & Tobacco industries also require a buffer, these include:

- McCoys Bakery, requiring a 100 metre buffer; and
- Central Victorian Poultry Wholesalers, requiring a 100 metre buffer.

- **Miscellaneous**

Includes lots that did not fit into the broad ANZSIC categories identified for this study and most do not require a buffer. Miscellaneous uses include accommodation and property and business services, and education. Miscellaneous uses in the study area include:

- All Seasons International;
- The Wallara Chapel; and
- The East Bendigo School (Currently used and occupied by Future Connections).

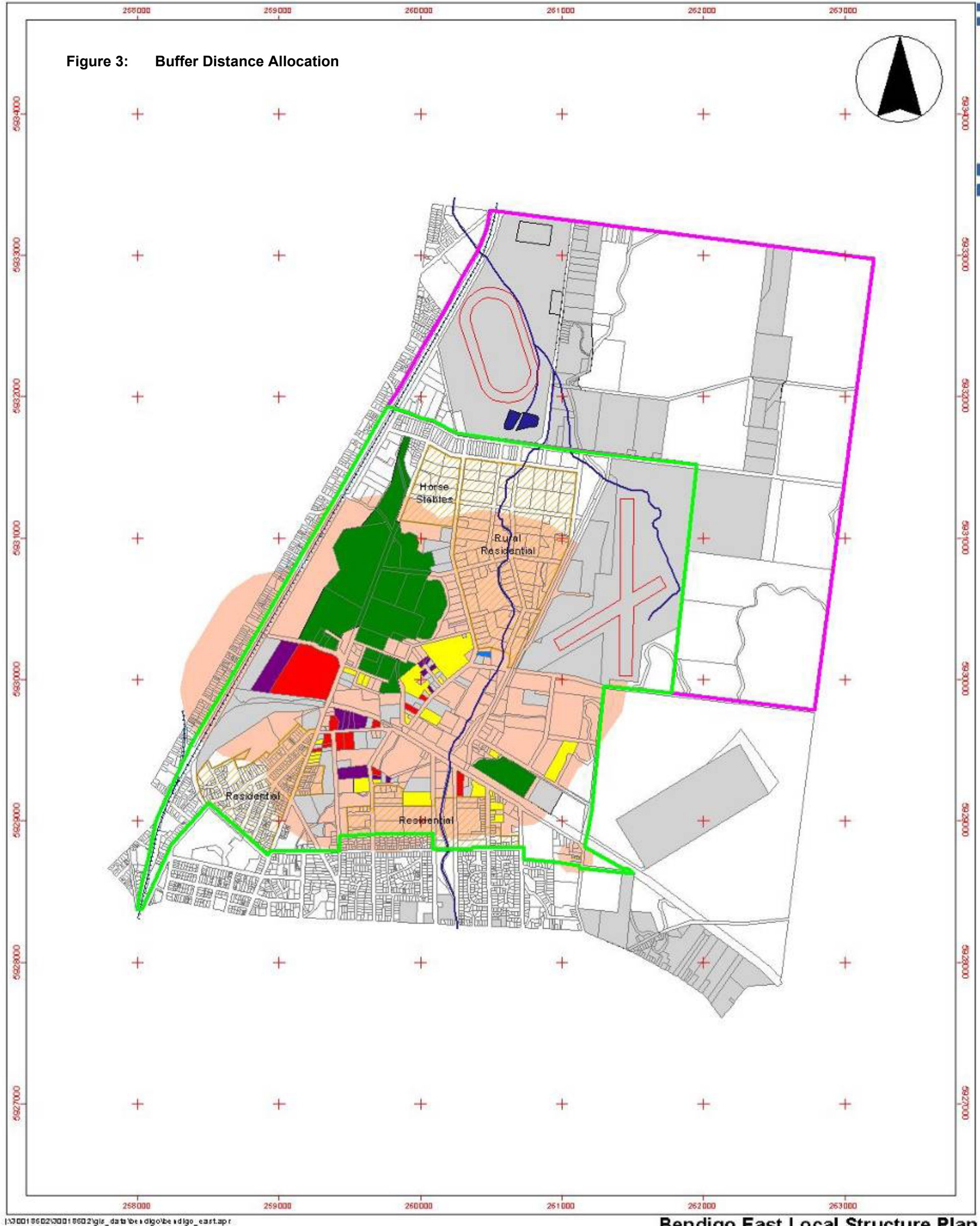
- **Retail**

Includes all lots in the study area mostly engaged in the resale of new and used goods to final consumers for personal or household consumption or in selected repair activities such as repair of household equipment or motor vehicles. Such uses in the study area include:

- Crawford Refrigeration and Air Conditioning, sales of Refrigerators and Air Conditioners; and
- Strathdale Used Cars, sales of cars.



Figure 3: Buffer Distance Allocation



Bendigo East Local Structure Plan

500 0 500 1000 Meters

Legend

- Study Area
- Area of Broader Influence
- Railway Lines
- Rivers
- Lakes
- Land Parcels
- Property Requires No Buffer
- Property Requires 100m Buffer
- Property Requires 200m Buffer
- Property Requires 300m Buffer
- Property Requires 500m Buffer
- Property Requires 1000m Buffer
- Buffer for Total Study Area

Buffer Distance Allocation

Figure 3

Scale 1:25,000

- **Transport and Storage**

Includes lots in the study area mainly engaged in providing passenger or freight transport by road, rail, water or air. Transport and storage can also be subcategorised into transport and service and, storage and warehousing. A number of transport and storage uses require buffers, however, not all transport and storage do require buffers. Examples of Transport and Storage uses not requiring a buffer in the study area include:

- Toll Ipec, transport and logistics; and
- Epsom Truck rentals

- **Wholesale**

Includes all lots in the study area mainly engaged in wholesale trade. The term 'wholesale trade' is used in a broad sense to include the resale of new or used goods to businesses or institutional users. Such uses include:

- Reg Holl Electrics wholesale of electrical household appliances to businesses, requiring no buffer.

- **Residential**

Includes any residential development in the study area. Figure 2 Land Use Plan shows the established residential developments in the study area. There are large pockets of low-density residential development east and west of Rohs Road which provide for horse agistment facilities to support the activities of the Bendigo Racecourse north of Heinz Road.

Also, residential development is located in the southern portion of the study area.

- **Rural**

Includes broadacre rural land which is either vacant or used for equestrian activities. Figure 2 illustrates that there is some rural land located east of Pratts Park Road and the Bendigo Racecourse is located north of Heinz Road.

4.2 Buffers

Clause 52.10 of the Victoria Planning Provisions defines those types of industries and warehouses which if not appropriately designed and located may cause offence or unacceptable risk to the neighbourhood.

The following table to Clause 52.10, Victoria Planning Provisions outlines the threshold distances for different types of production, use or storages which is the basis upon which the buffer distances have been assigned to land uses within the study area.

As outlined in the previous section these are intended as a guide only and may be reduced, and/or increased, based on case by case analysis.

Type of Production, Use or Storage (Purpose)	Threshold Distance (metres)	Notes
Food, Beverages and Tobacco		
Abattoir	500	
Smallgoods production	100	
Manufacturing of milk products	300	
Production of vegetable oils and fats using solvents	300	
Flour mill	300	
Bakery (other than one ancillary to a shop)	100	
Seafood processor	500	
Maltworks	300	
Tobacco and cigarette production	500	
Poultry processing works	100	
Freezing and cool storage	150	
Milk depot	100	
Food or beverage production other than above		Note 1
Textiles		
Dyeing or finishing of cotton, linen and woollen yarns and textiles	300	
Carpet backing with latex	300	
Production of artificial fibres and textiles		
▪ cellulose nitrate or viscose fibre, cellophane or artificial rubber	1,000	Note 2
▪ other synthetic fibres and textiles	500	Note 2
Treatment or production of textiles		
▪ using carbon disulphide	500	Note 2
▪ using other substances		Note 1
Rope, cordage and twine production	100	
Wool scouring	200	
Wood, Wood Products and Furniture		
Sawmill	500	
Charcoal production		
▪ by the retort process	500	
▪ other than by the retort process	1,000	
Wood preservation plant	100	
Wood-fibre or wood-chip products	1,500	
Joinery	100	
Paper and Paper Products		
Paper or paper pulp production:		
▪ involving combustion of sulphur or sulphur containing materials	5,000	Note 2
▪ from semi-processed materials	100	
▪ from prepared cellulose and rags	200	
▪ by other methods than above		Note 1
Chemical, Petroleum and Coal Products		
Chemical fertiliser production	1,000	Note 2
Industrial gases production	1,000	Note 2
Polyester resins production	1,000	Note 2
Synthetic resins and rubber production other than above	1,000	Note 2
Ammunition, explosives and fireworks production	1,000	Note 2
Formaldehyde production	300	Note 2
Paints and inks		
▪ manufacture	1,000	Note 2
▪ blending and mixing only	300	

Type of Production, Use or Storage (Purpose)	Threshold Distance (metres)	Notes
Pharmaceutical and veterinary production	1,000	
Biocides production and storage	1,000	
Soap and other detergents production	300	
Cosmetics and toilet preparations production	100	
Inks production	300	
Petroleum refinery	2,000	Note 2
Briquette production	300	
Other petroleum or coal production	500	Note 2
Organic industrial chemicals production other than above	1,000	Note 2
Inorganic industrial chemicals production other than above	1,000	Note 2
Chemical products other than above	300	Note 2
Non-metallic Mineral Products		
Glass and glass production including glass wool	500	
Rock wool manufacture	500	
Clay bricks, tiles and pipe refractories with a design production rate exceeding 10,000 tonnes a year	200	
Cement production in amounts:		
▪ up to 5,000 tonnes a year	300	
▪ between 5,000 and 150,000 tonnes a year	500	
▪ exceeding 150,000 tonnes a year	1,000	
Concrete batching plant	300	
Bitumen batching plant	500	
Concrete article or stone article production	100	
Plaster or plaster articles production	100	
Basic Metal Products		
Works producing iron or steel products in amounts:		
▪ up to 1,000,000 tonnes a year	100	
▪ exceeding 1,000,000 tonnes a year	1,000	
Production of non-ferrous metals as:		
▪ aluminium by electrolysis	2,000	
▪ other non-ferrous metals in amounts:		
▪ up to 100 tonnes a year	100	
▪ between 100 and 2,000 tonnes a year	300	
▪ exceeding 2,000 tonnes a year	500	
Fabricated Metal Products		
Structural or sheet metal production	500	
Works producing iron or steel products in amounts:		
▪ up to 1,000,000 tonnes per year	100	
▪ exceeding 1,000,000 tonnes per year	1,000	
Boiler makers	100	
Abrasive blast cleaning		Note 1
Miscellaneous Manufacturing		
Rendering and casings works	1,000	
Leather tanning and dressing	300	
Leather and artificial leather goods production	300	
Rubber production, using either organic solvents or carbon black	300	Note 2

4.3 Land Ownership/Tenure

The key land owners of industrial properties within the study area are listed as follows:

- Empire Rubber;
- Bendigo Bricks;
- Department of Energy and Resources; and
- other private landowners.

Key landowners of residential and low density residential properties within the study area mainly include private landowners and the Department of Human Services.

The majority of landholdings are freehold with the exception of those outlined above and listed below:

- Department of Primary Industries
- City of Greater Bendigo
- Salvation Army (residential); and
- Ministry of Education.

4.4 Zones and Overlays

As indicated on Figure 4, the study area is covered by the following zones, pursuant to the Greater Bendigo Planning Scheme:

- Low Density Residential Zone (LDRZ);
- Residential 1 Zone (R1Z);
- Special Use Zone 1 – Private Education (SUZ1);
- Special Use Zone 4 – Private Sport and Recreation Facilities (SUZ4);
- Special Use Zone 7 – Bendigo Aerodrome (SUZ7);
- Public use Zone 1 – Service and Utility (PUZ1);
- Public Use zone 2 – Education (PUZ2);
- Public Use zone 4 – Transport (PUZ4);
- Public Use Zone 7 – Other Public Use (PUZ7);
- Business 1 Zone (B1Z);
- Business 3 Zone (B3Z);
- Business 4 Zone (B4Z);
- Industrial 1 Zone (IN1Z);
- Industrial 3 Zone (IN3Z);
- Mixed Use Zone (MUZ);
- Road Zone – Category 1 (RDZ1);
- Road Zone – Category 2 (RDZ2); and
- Rural Living Zone (RLZ).

As illustrated in Figure 4, the majority of the study area is located within the Industrial 1 zone, there is large section of land zoned low density residential east of Rohs Road pursuant to the Bendigo Planning Scheme. The Bendigo Aerodrome is zoned Special Use – Schedule 7 pursuant to the Bendigo Planning Scheme.

It should be noted that a significant portion of land in the area of broader influence is zoned Public Park and Recreation Zone (PPRZ) pursuant to the Bendigo Planning

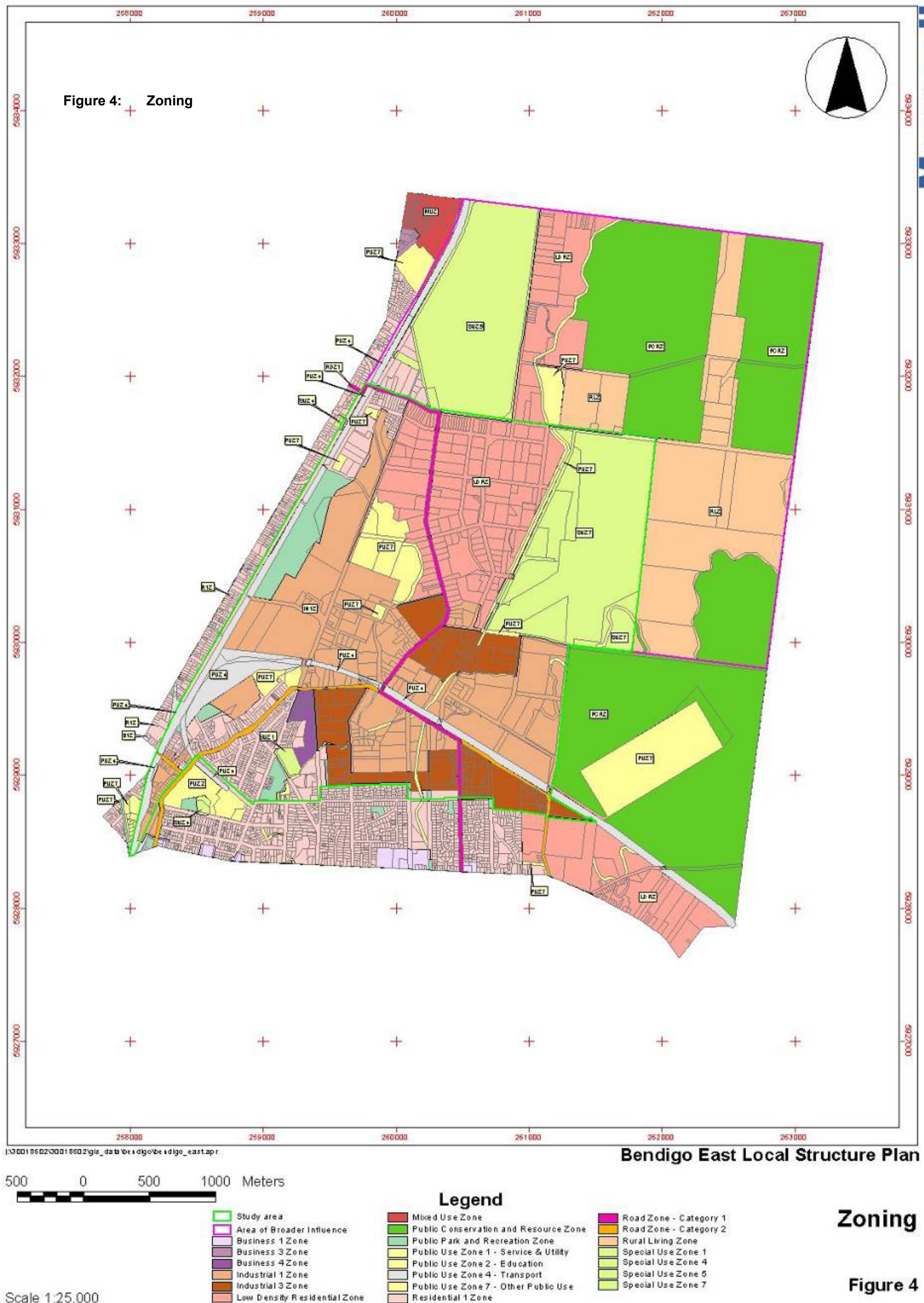
Scheme. There are also significant pockets of land zoned Rural Living (RLZ) and Bendigo Racecourse is zoned Special Use – Schedule 5 for Racing facilities pursuant to the Bendigo Planning Scheme.

It is important to identify the zones within the area of broader influence as they play a role in influencing activities within the study area.

The following is a summary of some of the zones that are relevant to the study area and area of broader influence:

- The **IN1Z** is the main zone to be applied in industrial areas and provides for manufacturing industry, storage and distribution of goods and associated uses in a manner, which does not affect the safety and amenity of local communities.
- The **IN3Z** is designed to be applied as both a buffer between the industrial 1 or 2 zones and residential areas, and to industrial areas where special consideration is required because of industrial traffic using residential roads, unusual noise or other emissions impacts or to avoid inter-industry conflict.
- The **SUZ1**, **SUZ4** **SUZ5** and **SUZ7** allow for the use and development of land for private education, private sport, recreation, racing facilities and the Bendigo Aerodrome.
- The **PUZ1**, **PUZ2**, **PUZ4** and **PUZ7** zones allow for the use of public land for service and utility, public education, transport and other public uses.
- The **MUZ** allows for the development of a mixture of residential, commercial and industrial uses that are complementary to the locality.
- The purpose of the **PPRZ** is to recognise areas for public recreation and open space and to protect and conserve areas of significance where appropriate whilst allowing for commercial uses where appropriate.
- The **LDRZ** allows for the development of low-density residential lots that, in the absence of reticulated sewerage, can treat and retain all wastewater.

Figure 4: Zoning



As well as the relevant zones, the study area is also affected by the following overlays as illustrated in Figure 6a) and b):

- Development Plan Overlay 1 (DPO1) – Environmental Management Plans;
- Development Plan Overlay 3 (DPO3) – Residential Density Management Areas;
- Development Plan Overlay 4 (DPO4) – Low Density Residential Zone – Density Management Areas;
- Development Plan Overlay 13 (DPO13) – East Bendigo Food Manufacturing Precinct – Victa Road, Wellsford
- Land Subject to Inundation Overlay (LSIO);
- Vegetation Protection Overlay 2 (VPO2) – Significant Vegetation;
- Environmental Significance Overlay 1 – Watercourse Protection;
- Airport Environs Overlay (AEO); and
- Salinity Management Overlay (SMO).

A search of the Victorian Heritage Register, National Trust Register and Register of National Estate indicates that there are two sites of heritage significance within the study area: White Hills Reserve; and White Hills Chinese Diggings.

Note, there is no heritage overlay identifying Chinese Diggings and White Hills Reserve in the current Greater Bendigo Planning Scheme.

The following is a summary of some of the overlays that are relevant to the study area:

- ***The Environmental Significance Overlay 1 – Watercourse Protection*** statement of significance highlights that the municipality contains a number of important streams and watercourses, which maintain clean water, soil stability and habitat for flora and fauna. Bendigo's potable and agricultural water supply is dependent on these streams and watercourses. The management of land adjacent to streams and watercourses is necessary to reduce erosion, maintain vegetation and habitat and improve water quality.

A planning permit is required for building and works affected by this overlay.

- **The Development Plan Overlays** identify areas, which require the form and conditions of future use and development to be shown on a development plan before a permit can be granted to use or develop the land. **DPO1** covers all land within the Environmental Rural and Rural Zones. **DPO3** and **DPO4** covers low-density residential areas. **DPO13** covers the land known as the Food Manufacturing Precinct.
- **The Vegetation Protection Overlay 2 – Significant vegetation.** This overlay highlights that the vegetation of the City of Greater Bendigo has been extensively cleared due to European settlement, agricultural land uses and exploitation of forests during the gold-rush era. The remaining vegetation is significant for its diversity and environmental value in providing habitat areas of state, national and international significance. In particular, large areas of remnant and regrowth box-ironbark forests surround Bendigo and Heathcote.

Figure 5: Overlays



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Bendigo East Local Structure Plan

500 0 500 1000 Meters

Legend

- Study area
- Area of Broader Influence
- Environmental Significance Overlay 1 - Watercourse Protection
- Salinity Management Overlay
- Vegetation Protection Overlay 2 - Significant Vegetation
- Development Plan Overlay 1 - Environmental Management Plans
- Development Plan Overlay 3 - Residential 1 Zone - Density Management Areas
- Development Plan Overlay 4 - Low Density Residential Zone - Density Management Areas

Overlays

Figure 5a

Scale 1:25,000



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500 0 500 1000 Meters

Legend

- Study area
- Area of Broader Influence
- Land Subject to Inundation Overlay
- Design and Development Overlay
- Airport Exclusion Overlay
- Heritage Overlay 107 - Tomlin & Simm's Flour Mill
- Heritage Overlay 14 - Tomlin Street Precinct
- Heritage Overlay 144 - Bendigo Tram Sheds, Offices and Power Station (1906)
- Heritage Overlay 163 - Electric Supply House (former)
- Heritage Overlay 2 - Baxter Street Precinct
- Heritage Overlay 414 - Fleece Inn
- Heritage Overlay 415 - Building
- Heritage Overlay 682 - Langley Hall
- Heritage Overlay 683 - St. Luke's Anglican Church

Bendigo East Local Structure Plan

Overlays

Figure 5b

Scale 1:25,000

4 Study Area Context

- The purpose of the **Land Subject to Inundation 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 and 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.
- The purpose of the **Salinity Management Overlay** relates to the insurance that development is compatible with site capability and the retention of vegetation, and complies with the objectives of any salinity management plan for the area.
- The purpose of the **Airport Environs Overlay** is 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.
- The **Design and Development Overlay** relates to the identification of areas which are affected by specific requirements relating to the design and built form of new development.
- The purpose of the **Heritage Overlay** is to conserve heritage places of natural or cultural significance and elements, which contribute to the significance of heritage places. It is also to ensure that development does not adversely affect the significance of heritage places.

The following areas are affected by a heritage overlay within the study area:

- HO107 – Tomlins & Simmie Flour Mill;
- HO415 – Building;
- HO14 – Tomlins Street Precinct;
- HO414 – Fleece Inn;

The following sites on the boundary to the study area are affected by heritage overlay:

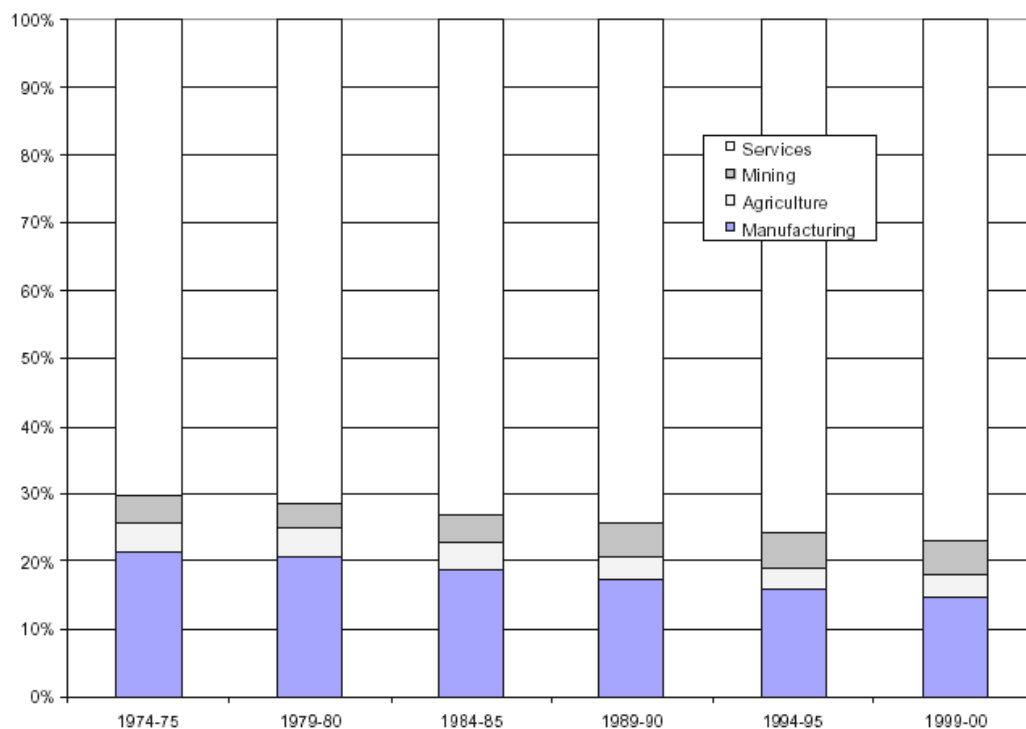
- HO144 – Bendigo Tram Sheds, Offices and Power Station (1906)
- HO163 – Electric Supply House (former)
- HO2 – Baxter Street Precinct
- HO682 – Langley Hall
- HO683 – St Luke's Anglican Church

4.5 Economic Analysis

Over the past two decades there has been extensive change in most of the economies of the industrialised nations. These changes have been structural, rather than cyclical, and are reflected in shifts in output, productivity, employment and trade.

In this period the most dramatic change has occurred in manufacturing which has seen a reduction in the share of value added as the following Figure 6 illustrates.

Figure 6: Sector Share of Gross Value



Source: Department of Industry Services & Research, 2001

Manufacturing has also shown the lowest annual average growth rate of all Australian industry sectors from 1979 to 2000 Table 2.

Table 1:

Industry	Value added 1999-2000 (\$ million)	Avg Growth 1979- 80 to 1989-90 (percent a year)	Avg growth 1989- 90 to 1999-2000 (percent a year)	Avg growth 1979- 80 to 1999-2000 (percent a year)
Communication services	19 349	8.1	10.0	9.0
Finance and insurance	41 504	6.7	4.9	5.8
Property and business	73,100	6.2	5.2	5.7
Mining	26,131	6.1	4.1	5.1
Transport and storage	34,497	3.6	3.5	3.6
Cultural and recreational	10,066	4.1	2.5	3.3
Accommodation, cafes etc	12,613	3.2	3.3	3.2
Electricity, gas and water	11,323	4.4	2.0	3.2

Industry	Value added 1999-2000 (\$ million)	Avg Growth 1979- 80 to 1989-90 (percent a year)	Avg growth 1989- 90 to 1999-2000 (percent a year)	Avg growth 1979- 80 to 1999-2000 (percent a year)
Health and community	32,876	4.1	2.2	3.1
Construction	34,628	3.0	3.2	3.1
Retail trade	32,732	2.9	3.2	3.1
Personal and other	13,857	3.2	2.6	2.9
Wholesale trade	33,914	2.2	3.5	2.8
Education	26,389	3.1	2.3	2.7
Agriculture, forestry etc	18,754	2.0	3.1	2.5
Government and defence	22,792	2.9	1.5	2.2
Manufacturing	75,594	1.7	1.6	1.6
Total all industries*	520,119	3.6	3.3	3.5

Note: These figures are based on the total value added of the industries shown and not on total GDP

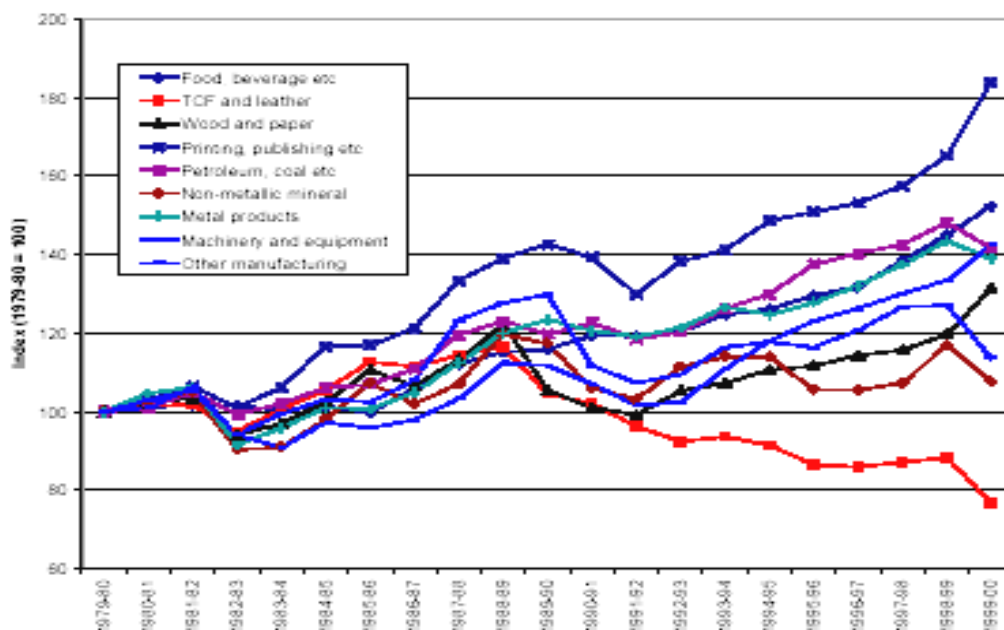
Source: Department of Industry Services & Research, 2001

However for the period 1999/2000 manufacturing had the highest value added (\$75,594 billion). As such manufacturing remains the largest activity in terms of size, which is consistent with other developed economies.

An examination of national trends within the manufacturing sector also reveals some important differences in the relative size and growth of its component industries (Figure 7). The manufacturing sector is dominated by four industries: machinery and equipment; food, beverages and tobacco; metal products; and petroleum, coal and chemicals. Australia's strong raw materials base is a significant factor in ensuring the last three of these industries plays a significant role, through adding value to agricultural and mining products. The machinery and equipment industry accounts for a smaller proportion of manufacturing in Australia than in many other countries, but is growing relatively quickly and its share of total manufacturing activity is increasing (Department of Industry Services & Research, 2001).

The cyclical nature of manufacturing activity is evident from Figure 8, which clearly indicates the impact of the recessions of the early 1980s and early 1990s on manufacturing output growth. Several industries (food, beverages and tobacco; metal products; and petroleum, coal and chemicals) have more stable growth patterns than the others, with production falling less in times of economic downturn and not growing as quickly in times of economic expansion. By contrast, industries such as printing, publishing and other recorded media; machinery and equipment; and other manufacturing are sharply cyclical, with pronounced falls in output during general economic downturns.

Figure 7: Growth in Value Added in the Manufacturing Industrial



Source: ABS 5206

Industrial development and industrial land has greater economic significance for Victoria than any other Australian state. In Victoria, manufacturing employs around 340,000 people with approximately 15% of all Victorian jobs and generates around 16% of the state's economic activity. Manufacturing accounts for 25% of production in over 50% of local government areas.

Victoria's industrial and manufacturing sector plays an important role within the Victorian economy. Industrial land is an important resource for the economic development of Victoria and requires management so the servicing and viability of the resource is not diminished.

The way industrial land is used has important implications for future levels of manufacturing activity within Victoria and the economic growth and development in this sector.

The City of Greater Bendigo is a significant regional centre in Central Victoria. Manufacturing provides employment for just over 4,500 people or 12% of the labour force (Table 3). Related activities such as construction (2,558 people or 7%), transport and storage (1,020 people or 2.8%) and wholesaling (1,505 people or 4.2%) account for a total of 9,586 people or 27% of the labour force.

Table 2: Employment by Industry – 2001 Census

	Total	
	Number	%
Agriculture, Forestry and Fishing	1297	3.65%
Mining	138	0.39%
Manufacturing	4505	12.67%

	Total	
	Number	%
Electricity, Gas and Water Supply	296	0.83%
Construction	2558	7.20%
Wholesale Trade	1505	4.23%
Retail Trade	6286	17.96%
Accommodation, Cafes and Restaurants	1585	4.46%
Transport and Storage	1020	2.87%
Communication Services	927	2.61%
Finance and Insurance	1111	3.13%
Property and Business Services	2445	6.88%
Government Administration and Defence	1184	3.33%
Education	2892	8.14%
Health and Community Services	4750	13.36%
Cultural and Recreational Services	823	2.32%
Personal and Other Services	1403	3.95%
Non-classifiable economic units	597	1.68%
Not stated	129	0.36%
Total	35549	100.00%

Source: ABS 2001 Census

Bendigo has undergone a similar process of restructuring that has been evident at the national level with manufacturing employment declining from 18% of employed persons to 12% of employed persons in 2001. Nevertheless manufacturing remains significant in value-adding and multiplier effects.

Trends identified in the Bendigo Industrial Land Strategy include:

- Between 1996 and 2001 total employment in manufacturing, transport/storage, wholesaling and construction increased by 4% while employment in all other sectors increased by 15%.
- The loss of employment generally occurred from 1986 to 1991, with most sectors showing an increase from 1991 to 2001.
- From 1990 to 1999 the City of Greater Bendigo area recorded a total of 169 industrial property sales
- There was an increase in the number of sales particularly in the period 1994 to 1999 and the majority of these sales have been vacant industrial land (41%)
- Median block size was in the range 1000 m² to 3000 m²
- Most of these sales occurred in urban Bendigo

Table 3 displays data on parcel size by selected category and land use zoning. Some of the parcels (indicated by brackets) are Crown Land. For example, in the East Bendigo area there are 104 parcels in the 0-1000m² range and seven of these are crown land. Some potential difficulties exist where crown land is zoned for industrial purposes. This combination of zoning and ownership may restrict the availability of industrial land. As a consequence the figures presented in Table 5 need to be tempered with the knowledge that some of the parcels are not in private ownership and may not be available.

Table 3: Parcel Sizes, East Bendigo

Land Zoned	0-1000 m ²	1000-3000 m ²	3000-5000 m ³	5000-10000 m ²	Over 10000 m ²	Total
Business	26	19	6	1	5	57
Industrial	104(7)	96(2)	50(2)	51(1)	62(6)	363(18)
Mixed	43	3	1	0	4	51
Residential	1648(4)	446(2)	75(3)	61(3)	104(1)	2334(13)
Special Use	1	4	0	2	12	19
Public	0	3	3	3	11	20
Public Use	20	19	9	11	35	94
Total	1842	590	144	129	233	2938
Business	45.61%	33.33%	10.53%	1.75%	8.77%	100.00%
Industrial	28.65%	26.45%	13.77%	14.05%	17.08%	100.00%
Mixed	84.31%	5.88%	1.96%	0.00%	7.84%	100.00%
Residential	70.61%	19.11%	3.21%	2.61%	4.46%	100.00%
Special Use	5.26%	21.05%	0.00%	10.53%	63.16%	100.00%
Public	0.00%	15.00%	15.00%	15.00%	55.00%	100.00%
Public Use	21.28%	20.21%	9.57%	11.70%	37.23%	100.00%
Total	62.70%	20.08%	4.90%	4.39%	7.93%	100.00%

However the figures above indicate that the majority (54%) of the industrial zoned parcels are under 3,000m² and just over one quarter (26%) are within the 1,000m² to 3,000m² range.

The Bendigo Industrial Land Strategy found that most demand for industrial land is within the 1,000 to 3,000m² range. This preference for industrial land of this size in the East Bendigo was confirmed by discussions with real estate agents and members of the Industrial Reference Group.

The Bendigo Industrial Land Strategy found that the median size of all vacant allotments was 6,000m², with 40% of all lots over 10,000m². Whilst there is a total of 96 of the industrial zoned parcels in East Bendigo within the 1,000 to 3,000m² range, only 15 appear vacant (Table 4). From the 1998 Bendigo Register of Vacant Land, this is little over half the vacant lots in the 1,000 to 3,000m² size range and represents around three to four years supply given past levels of demand.

In total around 20% of the industrial parcels within the East Bendigo area are vacant.

Table 4: Vacant Industrial Land, Bendigo East

	0-1000 m ²	1000-5000 m ²	3000-5000 m ³	5000-10000 m ²	Over 10000 m ²	Total
Parcels	1	15	17	13	25	71
Percentage	1.41%	21.13%	23.94%	18.31%	35.21%	100.00%

Because land is undeveloped does not mean that it is available to the market. Land owners may hold land to meet their own long term needs, or as an asset for investment and realisation at some future date. Hence the number of vacant parcels tends to overstate the land that is probably available for sale.

In addition a parcel is the smallest unit of land for which separate ownership can exist. But a number of parcels may be in the same ownership to make up a single property. Under these circumstances some of the parcels may be vacant while other parts of the property are being used.

In effect the availability of suitable size lots is limited in the study area. Given that over a third of vacant land is over 10,000m² area, subdivision of these parcels will be necessary to meet potential demand. Simply put there is an over supply of large parcels in the area. Furthermore over 50% of the vacant industrial zoned parcels are over 5,000m² in size. Further subdivision of this land should be encouraged.

However in addition to the availability of land of a suitable size within the study area there are also issues that need to be addressed in terms of the attractiveness of the area to prospective purchasers. The Bendigo East area appears to have developed in a very haphazard manner leading to:

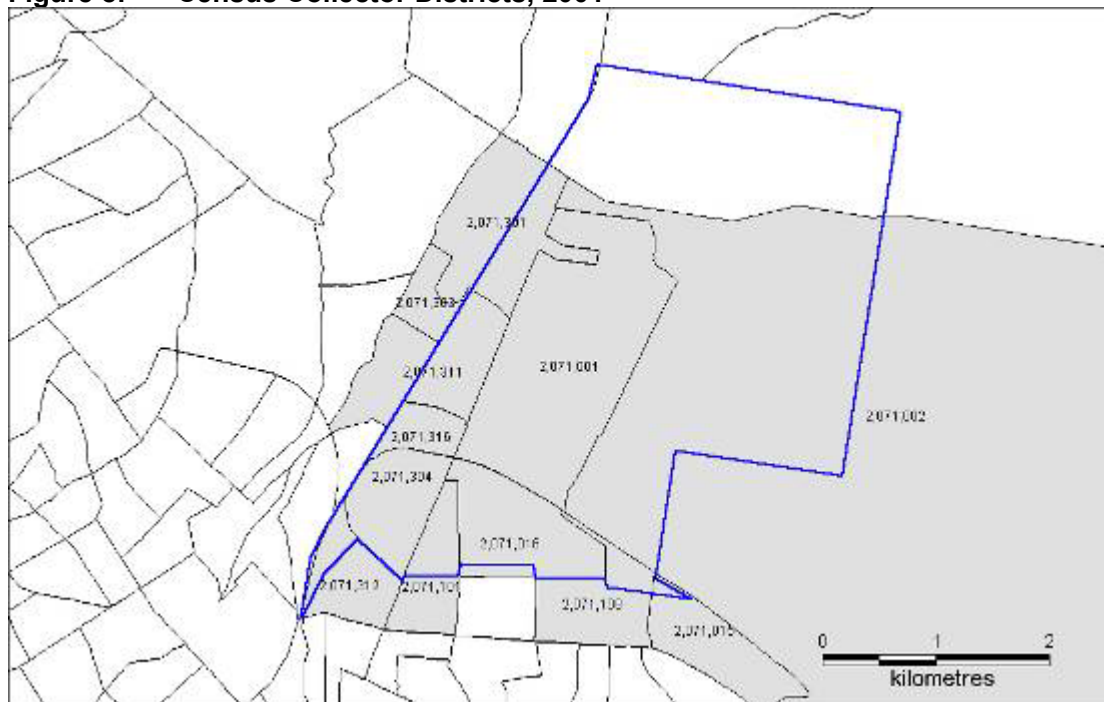
- A complex and in parts non-existent road network which makes access difficult.
- A lack of any consistent landscaping to soften the hard edge of the industrial buildings.
- Lack of high profile locations suitable for developing major industries.

These factors will also need to be addressed to improve the attractiveness of the area as a preferred location for industrial activities.

4.6 Social Impact Analysis

The study area and the seven (7) route options for the East Bendigo Link Road is comprised of eleven Census Collection Districts (CCD). Neither the East Bendigo study area nor any of the seven (7) options fit well with the CCD boundaries. In addition CCDs in rural and regional areas can be quite large in the areas covered which leads to a distortion in the appearance of the area for which Census can be retrieved. Whilst CCD 2071015 is partially within the study area, it has been excluded because of the small proportion that is within the study area boundary.

Figure 8: Census Collector Districts, 2001



The age of the study area population is relatively young with 29% of the population under the age of 19 (Table 5), which is slightly less than the City of Greater Bendigo average (31%). In fact the selected CCDs closely match the age/sex break up for Bendigo.

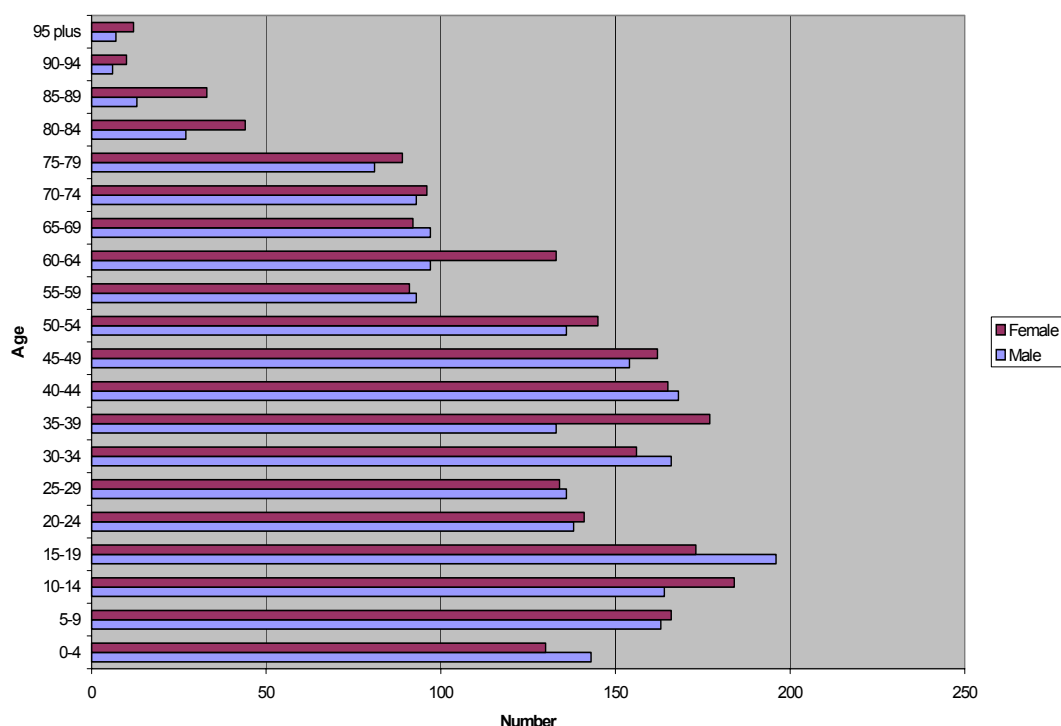
Table 5: Table Age Sex

	Male	Female	Persons	%
0-4	143	130	273	6.01%
5-9	163	166	329	7.24%
10-14	164	184	348	7.66%
15-19	196	173	369	8.12%
20-24	138	141	279	6.14%
25-29	136	134	270	5.94%
30-34	166	156	322	7.09%
35-39	133	177	310	6.82%
40-44	168	165	333	7.33%
45-49	154	162	316	6.95%
50-54	136	145	281	6.18%
55-59	93	91	184	4.05%
60-64	97	133	230	5.06%
65-69	97	92	189	4.16%
70-74	93	96	189	4.16%
75-79	81	89	170	3.74%
80-84	27	44	71	1.56%
85-89	13	33	46	1.01%

	Male	Female	Persons	%
90-94	6	10	16	0.35%
95 plus	7	12	19	0.42%
Total	2211	2333	4544	100.00%

Figure 9: Age/Sex – 2001 Census

The majority of the population are Australian born (Table 6), with less than 5% of the



population coming from other countries. These figures are generally in line with those of Bendigo as a whole.

Table 6: Birthplace – 2001 Census

	Male	Female	Persons	%
Australian Born	2155	2280	4435	95.25%
Born Overseas	111	110	221	4.75%
Total	2266	2390	4656	100.00%

Household income for the study area (Table 7) is relatively low by state standards. Around 56% of individuals have an income less than \$399. The figure is similar for Bendigo (54%) but around 47% for Victoria as a whole. This pattern is repeated throughout most of the income groups with the study area and Bendigo exhibiting similar household income patterns, which are generally lower than those of the state.

Table 7: Average individual Income – 2001 Census

	Neg/Nil income	\$1-\$39	\$40-\$79	\$80-\$119	\$120-\$159	\$160-\$199	\$200-\$299	\$300-\$399
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	Neg/Nil income	\$1-\$39	\$40-\$79	\$80-\$119	\$120- \$159	\$160- \$199	\$200- \$299	\$300- \$399
Study area	179	57	136	114	193	395	564	425
	4.88%	1.55%	3.71%	3.11%	5.26%	10.77%	15.38%	11.59%
Bendigo	3550	998	1894	2322	3927	7036	10209	6690
	5.27%	1.48%	2.81%	3.44%	5.82%	10.44%	15.14%	9.92%
Victoria	232321	56408	91391	107180	181991	327040	440674	308451
	6.28%	1.53%	2.47%	2.90%	4.92%	8.85%	11.92%	8.34%

	\$400-\$499	\$500-\$599	\$600-\$699	\$700-\$799	\$800- \$999	\$1000- \$1499	\$1500 Plus	Total
Study area	344	320	222	139	180	151	39	3667
	9.38%	8.73%	6.05%	3.79%	4.91%	4.12%	1.06%	100.00%
Bendigo	6181	5543	3853	2957	3611	2988	1038	67420
	9.17%	8.22%	5.71%	4.39%	5.36%	4.43%	1.54%	100.00%
Victoria	299739	285079	220903	186791	246867	244588	144129	3696657

The study area is comprised of a mix of low density industrial and residential land uses. The demographic characteristics of the population of the area are generally similar to those of the Greater Bendigo area. Therefore, it is unlikely that any of the seven (7) route options will have a greater social impact. However, route options that follow existing road reserves are likely to minimise the impact in terms of fragmentation of existing communities and networks. From this perspective the likely impacts are:

- Loss of amenity due to the visual intrusion during construction;
- Noise during construction and operation of the link road;
- Dust generation during construction;
- Road safety matters; and
- Changes in traffic access into and out of the area

4.6.1 Implications on Properties

The following table examines the social impact associated with each option on properties along the route.

Table 8:

	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7
Property acquisition	Minimal	Small	Small	Substantial	Substantial	Substantial	Minimal
Residential impact	Existing road	Existing road	Existing road	Existing road	Existing road	Existing road	Existing road
Industrial impacts	Existing roads	Predominantly existing roads	New roads	New roads	New roads	New roads	Predominantly existing road
Creek crossing	Existing	New	New	New	New	New	New

4.7 Environmental

A desktop review of environmental constraints and opportunities in the study area has been undertaken based on the following environmental aspects:

- Flora and Fauna (Biodiversity)
- Heritage/Archaeology
- Native Title
- Landscape and Noise.

The findings of the desktop review are detailed below.

4.7.1 Flora and Fauna

The following relevant reports were reviewed as part of the flora and fauna desktop study:

- East Bendigo Linking Road Study - Flora and Fauna Assessment (Brett Land & Associates 2001)
- East Bendigo Linking Road Study – Strickland Road to Rohs Road Flora and Fauna Assessment (Brett Land & Associates 2002)
- Correspondence from DSE (Dated 18 April 2001) in response to the East Bendigo Linking Road Study – Issues Report – Summary.
- Bendigo Industrial Land Strategy Report (GHD, 2001)
- Native Vegetation Plan for the North Central Catchment Management Authority Region (NCCMA 2000).
- City of Greater Bendigo Green Plan – A Natural Environment Management Strategy (2001).
- City of Greater Bendigo Roadside Management Plan (date).

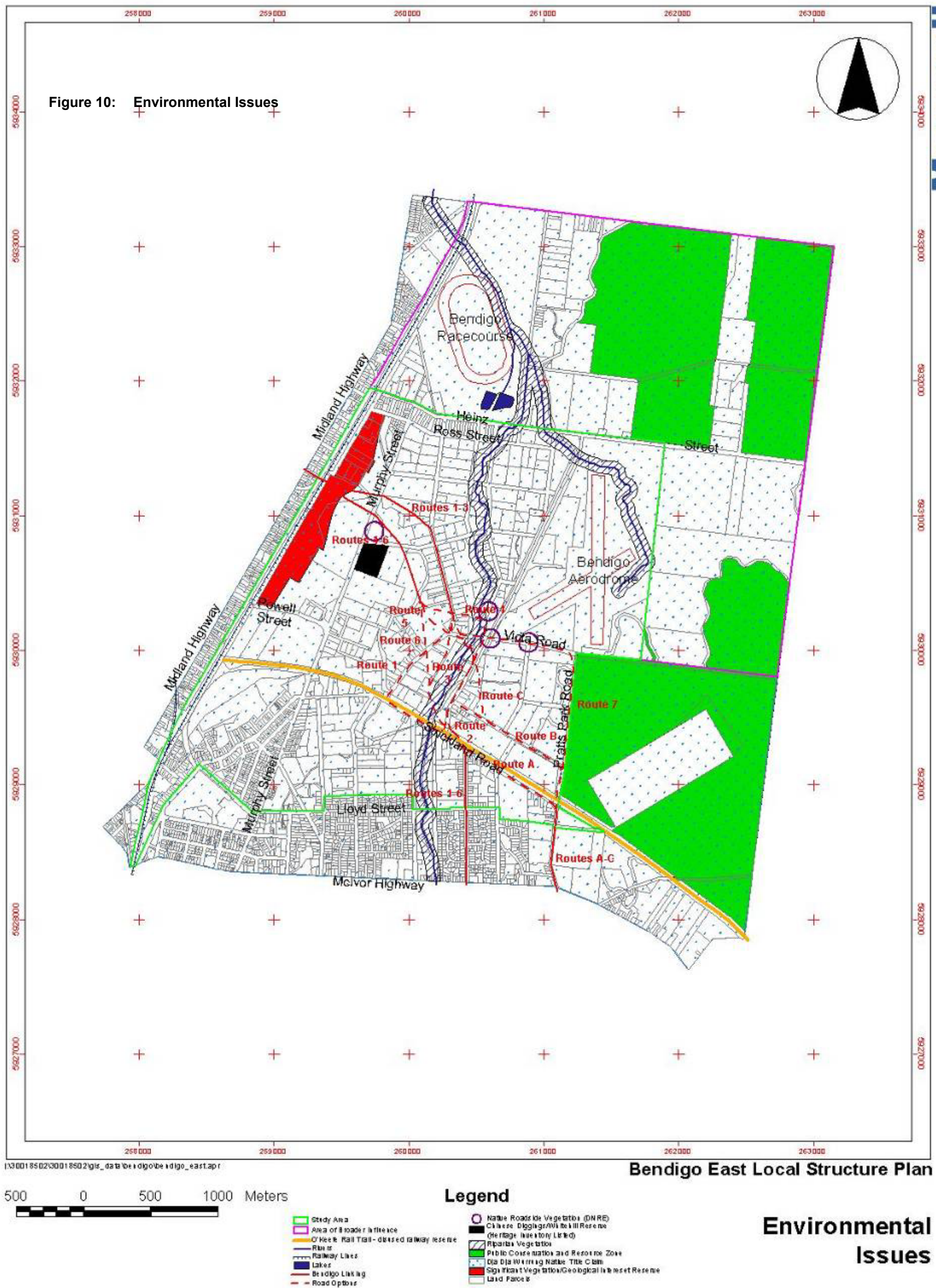
Flora

The study area comprises the following principal vegetation types:

- Rural-residential farmland generally in the northern portion of the study area – used mostly for grazing (particularly for horses), with scattered pioneering native species and small scattered patches of remnant vegetation.
- Historical/current mining and quarrying areas in the eastern portion of the study area including the Chinese Diggings Reserve – that support secondary regrowth of eucalypt woodland in places, mostly disturbed and subject to erosion and significant weed invasion.
- Riparian vegetation associated with Spring Creek and smaller tributaries that run through the study area.
- Remnant indigenous vegetation associated with the disused railway reserve running between Bendigo and Axedale along Strickland Road (O’Keefe Rail Trail).
- Remnant indigenous vegetation associated with road reserves within the study area.

Figure 10 indicates the location of these vegetation types.

Figure 10: Environmental Issues



DSE (correspondence to PPK dated 18 April 2001) also identified the following specific vegetated areas within the study area:

- Vegetated roadsides and remnant vegetation patches on private land in the area around Victa Road and Strathdale White Hills Road.
- Vegetation in sections along the east end of Heywood Street extension.
- Large patches of Box Ironbark vegetation at the Victa Road and McDowalls Road intersection and the Victa Road and Strathdale White Hills Road intersection.
- Native vegetation near Rowena Street.

The Biomap for the area will be reviewed to identify whether any threatened species or threatened communities have been recorded in these areas.

In terms of roadside vegetation, all rural roadsides throughout the Bendigo municipality have been assessed for their conservation value (City of Greater Bendigo Roadside Management Plan). Roadside vegetation has been given a High, Medium or Low conservation value based on the proportion of native vegetation, weed cover, habitat potential, site disturbance, width of road reserve and the presence of threatened species. A review of the Flora Information System undertaken for the East Bendigo Linking Road Study indicates that a number of threatened flora species have been recorded in the north-eastern suburbs of Bendigo. It is suggested a number of these species may occur within the study area. These species are listed in Table 10.

Table 9: Threatened flora species potentially occurring within the study area

Common Name	Latin Name	Conservation Status in Victoria (DSE)	Conservation Status in Australia (ANZECC)	Status under FFG Act
Ausfel's Wattle	<i>Acacia ausfeldii</i>	v	R	I
Williamson's Wattle	<i>Acacia willamsoni</i>	r	R	I
Whipstick Westringia	<i>Westringia crassifolia</i>	e	E	L

e	Endangered in Victoria
v	Vulnerable in Victoria
r	Rare in Victoria
E	Endangered in Australia
R	Rare in Australia
I	Rare or threatened in Victoria but rejected for listing as threatened
L	Rare or threatened in Victoria and listed as threatened under the FFG Act

Vegetation Communities

Mapping for the Native Vegetation Plan for the North Central Catchment Management Authority (2000) indicates that up to three vegetation communities previously occurred in the study area. These include Box Ironbark Forest, Inland Slopes Woodland and Plains Grassy Woodland.

- Box Ironbark Forest – characterised by Grey Box (*Eucalyptus microcarpa*), Red Ironbark (*E. tricarpa*) and Yellow Gum (*E. leucoxylon*), with occurrences of Red Stringy Bark (*E. macrorhyncha*) and Long Leaf Box (*E. gonicalyx*). DSE suggest that large patches of Box Ironbark vegetation occur at the Victa Road and

McDowalls Road intersection and the Victa Road and Strathdale White Hills Road intersection.

- Inland Slopes Woodland – dominated by Grey Box, Long Leaf Box and, in places Yellow Gum. The remaining Inland Slopes Woodland within the study area is dominated by Long Leaf Box and occurs mostly in the Chinese Diggings Reserve.
- Plains Grassy Woodland – characterised by scattered trees, particularly Yellow Gum and Grey Box. Remnant vegetation along roadsides in the eastern part of the study area appear to be derived from this vegetation type.

The Biomap for the area will be reviewed to identify vegetation communities recorded within the study area.

Existing Fauna

Fauna habitats within the study area include:

- Open pasture and grazing;
- Disturbed mining and quarrying land;
- Remnant or secondary woodland in roadside and rail reserves; and
- Riparian vegetation.

A review of the Atlas of Victoria Wildlife undertaken as part of the East Bendigo Linking Road Study indicates that the eastern suburbs of Bendigo support a high species richness of fauna, some of which are listed as threatened. The following threatened species have been reported several kilometres from the study area:

Table 10: Threatened fauna species potentially occurring within the study area

Common Name	Latin Name	Status in Victoria	Status under FFG Act	Conservation Status in Australia (ANZECC)
Powerful Owl	<i>Ninox strenua</i>	Endangered	L	
Swift Parrot	<i>Lathamus discolor</i>	Endangered	L	E
Chestnut-rumped Heathwren	<i>Hylacola pyrrhopygia</i>	Data deficient		
Specked Warbler	<i>Chthonicola sagittata</i>	Vulnerable		
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Vulnerable	L	
L	Listed	E	Endangered	

Discussions with representatives from DSE have indicated that it is unlikely that threatened fauna species will occur in the study area as the area is located in a highly modified environment.

Route Option Assessment

Preliminary assessment of the various road link options in terms of flora and fauna raises the following issues:

- Route A and Route 1 cross the O'Keefe Rail Trail which may provide habitat for native vegetation (as well as providing a horse and recreational trail).
- Route 4 traverses native vegetation in the vicinity of Rowena Street.
- Routes 4-6 traverse to the north of the White Hills Chinese Diggings Site/ White Hills Reserve listed on the Heritage Inventory.

- Routes 1-3 and 4-6 traverse a Vegetation Protection Overlay – Significant Vegetation. This protected area is also known as a site of Geological Interest.
- With the exception of Route 1, all routes will require the construction of new creek crossings which may impact on riparian vegetation.

4.7.2 Cultural Heritage/Archaeology

The following relevant reports were reviewed as part of the cultural heritage desktop study:

- East Bendigo Linking Road Study – Cultural Heritage Desktop Assessment (Tardis Enterprises Ltd 2000)
- East Bendigo Linking Road Study – Pratt Road Option Supplementary Cultural Heritage Desktop Assessment (Tardis Enterprises Ltd 2001)

A search of the online Victorian Heritage Register, National Trust Register and Register of National Estate was also conducted. Discussions were also held with Mr David Bannear of Heritage Victoria.

European Heritage

The study area is well known as a former gold mining region, with gold having been first discovered in the area in 1851. The study area was extensively mined in the late 1850s and early 1900s resulting in a number of changes to the topography of the area. These changes occurred as a result of extensive vegetation clearance and surface sluicing activities.

A search of the Victorian Heritage Register, National Trust Register and Register of National Estate indicates that there are two sites of heritage significance within the study area: White Hills Reserve; and White Hills Chinese Diggings. These sites are located at the corner of Murphy Street and Heywood Street as indicated in Figure 10.

Details of the two historic sites are provided in Tables 13 and 14. The two sites have been assessed as being of regional significance in the East Bendigo Linking Road Study (PPK 2002). The East Bendigo Linking Road Study recommended that no disturbance to these two sites should be permitted.

Table 11: White Hills Chinese Diggings Site

HV Number	H7724-0247
Heritage Act Category	Heritage Inventory Site
Location	Corner of Murphy Street and Heywood Street, White Hills
Description	Gold mining site worked from 1850s-1930s. Historic reserve, approx 150x130m, containing 14 identified round shafts & 17 rectangular shafts.
Condition	Fair
Integrity	Partially excavated
Significance	Historic, Social and Scientific Significance on a Regional level
Source:	East Bendigo Linking Road Study – Cultural Heritage Desktop Assessment (PPK 2002), and Victorian Heritage Register.

Table 12: White Hills Reserve Site

HV Number	H 7724-0001
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Heritage Act Category	Heritage Inventory Site
Location	No address included in registration. Suggested as same location as H0247.
Description	Chinese and European mine shafts (round and rectangular), shallow mine diggings over an area of about 80x110m.
Condition	Good
Integrity	Intact
Significance	Not specifically assessed. Considered as 'best remaining examples of early Chinese and European mine shafts in Bendigo area'.

Source: East Bendigo Linking Road Study – Cultural Heritage Desktop Assessment (PPK 2002), and Victorian Heritage Register.

Aboriginal Heritage

A review of recorded Aboriginal archaeological sites surrounding the study area (5km) conducted as part of the East Bendigo Linking Road Study indicated that there are nine Aboriginal archaeological sites and two historic Aboriginal sites in the Bendigo region. However, no previously recorded Aboriginal archaeological or post-contact sites have been located within the study area. The extensive past land use activities predominately associated with vegetation clearance and gold mining activities within the study area are expected to have destroyed any evidence of Aboriginal archaeology. As such no opportunities or constraints have been identified in relation to the East Bendigo Local Structural Plan in terms of Aboriginal heritage. However, it is suggested that the relevant Aboriginal community (Bendigo & District Aboriginal Co-operative) be consulted in relation to the study. This would occur during the next phase of the project as Aboriginal Affairs Victoria would be notified through the formal public exhibition process.

4.7.3 Native Title

Crown Land (including Crown Land reserved for roads) within the study area is subject to a Native Title Claim that covers a large part of the City of Bendigo. The boundary of the Native Title Claim is presented in Appendix 2. The Native Title Claim was registered on 15 August 2000 by the Bendigo Aboriginal Co-operative's (Claim No V6001/2000 (VC00/1)). The claim covers the whole of the study area.

Notification and procedural requirements may be required for works, such as the proposed linking road, within the study area under the *Native Title Act 1993*. Further investigation is required to confirm the correct process to be applied. Consultation with the Bendigo & District Aboriginal Co-operative in relation to the study will also be required.

4.7.4 Landscape

The northern portion of the study area is characterised by relatively flat land vegetated with scrubby vegetation. A golf course and Bendigo Racecourse are located in the north-western corner of the study area. Two lakes surrounded by scrubby vegetation are situated to the south of the racecourse.

The central area of the study area is characterised by low density rural residential development (eg along Rohs Road) and open pasture in a relatively flat landscape. To the west, the area has been considerably modified by mining and quarrying activities. Ongoing quarrying activities and industrial development characterise the

landscape in the vicinity of Murphy Street. Bendigo airfield is located to the east of McDowall's Road.

The southern portion of the study area is characterised by residential and industrial development, and a small amount of commercial development. The south-eastern portion of the study area is generally rural in nature. A rifle range is located to the east of Strickland Road, with low density rural residential land close to Markovich Lane.

Spring Creek traverses the study area in a north south direction. A number of smaller tributaries also traverse the northern portion of the study area.

In general, the northern and eastern portions of the study area are characterised by an open, rural landscape. In comparison, the southern and central western portions of the study area are characterised by higher density residential, commercial and industrial development.

Route Option Assessment

Preliminary assessment of the various road link options in terms of landscape aspects raises the following issues:

- In the central and southern section of the study area, Options 1, 2, 4, 6, B and C will predominately use existing road alignments and reserves – upgrading of the roads will increase visual prominence of the roads to some degree.
- In the central section, Options, 3, 5 and C will require construction of a new section of road and associated road reserves, adding a new linear feature to the landscape.
- To the west, Options 1-3 and 4-6 will require the construction of a new section of road and associated road reserves through the landfill site, adding a new linear feature to the landscape.

4.7.5 Noise

Industrial Development

Noise emissions from industrial and commercial facilities within the Melbourne Metropolitan area are controlled by *SEPP No. N-1 Control of Noise from Commerce, Industry and Trade* (SEPP N-1). However, the study area is outside the defined Melbourne Metropolitan area, and is therefore outside the domain of SEPP N-1.

Since 1989, noise issues in country Victoria have been dealt with according to the *Interim Guidelines for Control of Noise from Industry in Country Victoria* (N3/89) (EPA 1989). These guidelines recommend the use of SEPP N-1 in provincial cities and rural areas where background sound levels are comparable to Metropolitan Melbourne, and provide a separate set of guideline noise limits where background sound levels are typically low.

The EPA has been reviewing these guidelines for some time, and in October 2000 released *Draft Recommended Maximum Community Noise Levels for Commerce, Industry and Trade Premises in Regional Victoria* (EPA 2000) for public comment. The draft guidelines are based on the planning scheme zoning at the noise source and at the noise sensitive receiver location. The guidelines are based on a presumption of low background sound levels in non-metropolitan areas.

Achievement of the relevant noise criteria for new development within the study area will involve land-use planning, including the application of buffering, and noise control methods to abate noise emissions. The draft guidelines suggest that the threshold distances specified in clause 52.10 of the Victorian Planning provisions are an appropriate guide to buffering.

Proposed Linking Road

In terms of the construction of a linking road through the study area, noise is covered by the *Noise Control Guidelines TG302* (EPA 1989), which provides general guidance on minimisation of noise due to construction work. The *Noise Control Guidelines TG302* (EPA 1989) place no limit on the resultant construction noise level at dwellings during the period 7am to 6pm, Monday to Friday and 7am to 1pm Saturday. For typical construction working hours of 6am to 6pm, the guidelines imply that the activities normally carried out between 6am and 7am should not result in audible noise at dwellings.

In terms of noise from road traffic, there is currently no legislation limiting traffic noise in Victoria. However, VicRoads has an internal policy on traffic noise. The VicRoads Traffic Noise Reduction Policy (October 1997) applies to new roads or to roads that are widened by two or more lanes and that require the demolition of existing buildings.

VicRoads policy has specific provisions for residences affected by noise from existing roads that may also be further affected by noise from a new or proposed road. This policy usually means that residences near existing roads that are affected by noise from the new road will be entitled to noise barriers.

Route Option Assessment

Preliminary assessment of the various road link options in terms of noise raises the following issues:

- Options 4, 5 and 6 pass close to residential areas in the vicinity of Rowena Street and Rohs Road.

4.8 Infrastructure Services

Enquiries have been made to the relevant authorities for an indication of the serviceability constraints in relation to the provision of their services. The relevant authorities are:

City of Greater Bendigo	Drainage
Coliban Water	Water supply, sewerage & irrigation
TXU Network	Gas
Powercor	Electricity
Telstra	Telecommunications

Discussions have been held with the Council representatives, Coliban Water, Powercor, Telstra and TXU Network.

Section 7.3 presents the findings of the Development Cost Report.

Drainage

The City of Greater Bendigo is responsible for stormwater drainage in the municipality. There are a number of underground pipes, retention basins, dams and surface drainage lines throughout the study area.

The land within the study area, generally south of Bachelor Street, Rowena Street and Victa Road, except most of that portion west of Murphy Street that is south of Bendigo North Primary School, was the subject of the 1996 East Bendigo Drainage Study. The Drainage Study determined works required for a piped drainage system with overland flow paths where required.

A Land Subject to Inundation Overlay indicates the flood prone land abutting Racecourse Creek.

The City of Greater Bendigo's Drainage Engineer has indicated that the land in the northern area of the study area, east of Rohs Road and south of Heinz Street is difficult to drain. The Land Subject to Inundation Overlay supports this, which is at its greatest width of approx. 225m in this region.

The City's Drainage Engineer has also noted that the area of broader influence may also experience drainage difficulties if developed. Any development would most likely require the provision of flood retarding basins to restrict the flows to their current levels.

Irrigation Channels

The study area includes open unlined irrigation channels located in reserves and easements. These are assets owned and maintained by Coliban Water.

The Malmsbury Reservoir delivers untreated irrigation water through the channels predominantly to farmers in Huntly and Goornong.

The channels operate on a demand basis with peak demand during growing season from late October to May. Coliban Water's Manager of Infrastructure Development has indicated that no flow is provided off-season and that it is unlikely that flow would be provided in the future during the off-season. Accordingly it is unlikely that the channels could provide a year round untreated water supply for any appropriate industrial use.

The main irrigation channel through the study area is the Ascot Channel, which runs generally south to north through the centre of the study area.

The other channels include the White Hills Channel, Ellesmere Channel and Huntly Channel, which all branch off the Ascot Channel.

Water Supply & Sewerage

Coliban Water is the responsible authority for water supply and sewerage services to the study area.

The main water supply through the study area is provided from a 375mm water main in Strickland Road. The majority of the reticulation mains within the study area are 150mm and 100mm, which would be unlikely to have sufficient capacity for an industry requiring processing water.

The area of broad influence has a short, 160m, section of 150mm main along the western end of Golf Course Road and 100mm mains in the balance of Golf Course Road to Huntly Channel and 870m of 100mm main in Racecourse Road, running south from Golf Course Road. These mains would most likely require augmentation to serve any industrial development in the area.

Reticulated sewerage currently serves the properties south of Strickland Road and the properties within proximity of Rohs Road and McDowalls Road. Except for Bendigo Racecourse, no properties in the area of broad influence are seweraged.

Sewerage could be made available, as required, to unsewered areas of the study area. The area of influence could also be seweraged with a pumped outfall.

Gas

Reticulated gas supply is available to the residential and industrial properties in the study area. The gas service retailer is TXU Networks Pty Ltd.

Gas pipelines are located in the road reserves of Powells Avenue, Strickland Road, Rohs Road and many of their intersecting streets. However, not all intersecting streets have gas services. In particular, McDowalls Road, Victa Road and Heywood Street do not have reticulated gas services.

Electricity

Electricity supply is available throughout the established areas and generally across the remainder of the study area. Powercor Australia Ltd is the service provider.

Telecommunications

Telstra telecommunications conduits are located in the road reserves along the lengths of Powells Road, Strickland Road, Rohs Road, McDowalls Road and Victa Road. Optic fibre cables are located in the road reserves of both Strickland Road and Rohs Road.

A telecommunications tower is erected on Crown land on the southern side of Heywood Street, east of Dundas Street. The tower was originally built in the 1970s by Telecom as a microwave telecommunications link. The microwave function of the tower was discontinued, however, when optic fibre cables were introduced to provide the necessary network links.

For more detailed discussion on the infrastructure component relating to contributions and possible staging, refer to section 8 which discusses the implementation framework.

Geology/Erosion

Geology

The study area lies across three surface geology units; Quaternary aged Shepparton Formation (clay, silt, sand and gravel), Tertiary aged White Hills Gravel unit (gravel, sand and clay possibly laterised cap) and Ordovician aged sedimentary bedrock comprising a mix of shale and sandstone. The Bendigo 1:250,000 geological sheet notes that the Omd unit includes characteristic soft shale, which most likely accounts for the Bendigo Brick pit. All three units typically develop sandy and clay soil types, with some surface gravel or ironstone.

The quarry operations in this area appear to be focused predominantly on the White Hills Gravel unit, although as noted above the Bendigo Brick pit is recovering shale.

The quarry operations to the west of the unmade portion of Murphy Street appear to have either ceased or nearing cessation. These areas are noted as Mining Numbers 14 & 15 on the plan "Mining and Exploration Licenses". The area between these two quarries was the site of the former White Hills Tip. The area noted, as Mining Number 20 is understood to be commencing quarry operations shortly.

The area abutting the north end of Racecourse Road and extending east along Golf Course Road is geologically similar to the existing gravel areas and may provide a future resource.

Mines

The location of mines and mineshafts have yet to be determined. Their location could be critical in the selection of building sites and may require the adoption of building envelopes to ensure safe clearances from any potential land subsidence due to underground mining activities. It will be the responsibility of the land owners and developers to investigate the location of mine and mine shafts before developing any sites within the study area.

Erosion

The Bendigo region lies within the land management unit of the Great Dividing Range Northern hills and foot-slopes. Soil associations of this land management unit and geology are typically duplex and gradational clay soils. The soils in this area are indicated to be dispersive but do not generally slake. In duplex soils, dispersion generally occurs in the lower "B" horizon or subsoil when wet. Exposure of the "B" horizon can therefore result in the action of rain developing rill, sheet and gully erosion. Clay surface soils of gradational soil types that are dispersive will similarly erode when surface cover is lost.

Dispersive soils are also prone to loss of structure and breakdown into fine particles, which are susceptible to wind erosion and the generation of raised dust when disturbed.

The aerial photographs inspected show a number of dams in the study area containing coloured water. This is typical of dams constructed in dispersive ground materials, confirming the dispersive nature of the local soils. A cursory inspection of Racecourse Creek and the unlined earthen irrigation channels that traverse the study area did not indicate any active head erosion. Changes to the flow regime may

however generate bank instability and active bank or head erosion may be induced. As noted under 'Drainage' it is likely that flows will be limited to the existing conditions by providing for the construction of retarding basins. This will limit any changes to the flow regimes.

It can be concluded that there is a moderate to high risk of the following issues arising from construction activities when soils are exposed:

- Rill and sheet erosion from rainfall generating turbid stormwater runoff;
- Diversion of construction site stormwater runoff into the drainage lines without treatment will result in increased turbidity loads;
- Uncontrolled discharge of surface water into the drainage lines may result in bank erosion and active erosion along the drainage lines;
- Raised dust may occur during construction activities and from wind action on exposed soils.

Groundwater

Saline soil and shallow water table conditions may present geotechnical difficulties in the construction and maintenance of stable bitumen roads and structure foundations. Investigation of the potential for saline discharge in the study area is recommended.

4.9 Traffic

Road Layout/Hierarchy

The existing and proposed elements of the road hierarchy that are relevant to the study area are shown in Figure 11 and include:

Two State Highways

Midland Highway – this connects Bendigo with Echuca and Shepparton. Midland Highway to the north and Calder Highway to the south form a continuous north/south route through the centre of Bendigo.

Mclvor Highway – this is the second main link between Melbourne and Bendigo (together with the Northern Highway and the Hume Highway). Mclvor Highway and Calder Highway to Marong forms an important east/west route through Bendigo.

- *Part of the existing Outer Box circumferential road system*
The north/eastern part of the Outer Box is located within the study area and includes Heinz Street, Rohs Road, Strickland Road and Powells Avenue.
- *Proposed Outer Box circumferential road system in East Bendigo*
The northern extremity of the preferred conceptual route alignment for the Outer Box through East Bendigo is located further south than the existing alignment and connects to the Midland Highway at Lyons Street rather than Heinz Street.

Preferred Road Hierarchy

The East Bendigo area is strategically located to capitalise on the unique advantage of being highly accessible to the surrounding region through road, rail, and airport. In particular, the existing Outer Box route acts as a link to the major north/south and east/west highway corridors serving Bendigo and is easily accessed from within the study area. The future Outer Box improvement options (first identified in the Bendigo 2020 Transportation Study and subsequently explored by PPK in the 2002 East Bendigo Linking Road Study) build on this advantage by improving connectivity with the Outer Box west of Midland Highway and exploring more direct routes between the

Melvor and Midland Highways. A more detailed discussion of the preferred road hierarchy for the East Bendigo LSP is discussed in Section 6.2.

The layout of roads must be designed to provide for businesses, which require maximum exposure.

It is considered that the future road layout for the East Bendigo area needs to be able to take advantage of the opportunities provided by the presence of the Outer Box route. This depends largely on the provision of adequate and efficient road connections to link existing and future local road networks with the Outer Box. In this context it is also considered unnecessary to alter the road hierarchy envisaged for the East Bendigo area under the 2020 Transportation Study. This hierarchy provides a sufficiently robust structure of highways and main roads with significant spare capacity, capable of sustaining the traffic generated by future population increases and land use development in East Bendigo. The key challenge is to develop a finer grain of local streets that can integrate with the Outer Box in a safe and effective manner. In addition, within the strategic grid of highways and main roads, the local streets must be able to cater for traffic movements generated within individual industrial or other subdivisions to ensure their viability. It is also important for new industrial subdivisions to intersect the Outer Box in a manner that facilitates the movement of large vehicles to and from the highway network and minimises the need for potentially hazardous manoeuvres such as right turn and U-turn movements. In this regard, it is important to appreciate that the "Road Network Improvement" strategy in the 2020 Transportation Study, envisages that the Outer Box will consist of a 4 lane undivided arterial (2 lanes in each direction). This cross section has been adopted in the recent PPK Study. While from one perspective, an undivided road provides maximum flexibility in terms of access and manoeuvrability, the design of abutting development also has to be carefully managed in order to avoid creating possible traffic hazards.

The existing Inner Box and Outer Box systems provide a two-tiered circumferential ring road arrangement to relieve traffic pressure on Bendigo's central activities area and enhance access and circulation through the broader Bendigo township. One of the key objectives of these systems is to attract trucks away from the city centre. The Bendigo Heavy Vehicle Study (VicRoads 1994) also supported the idea of the Outer Box and Inner Box road systems. The existing routes for the two systems are described below:

Inner Box

- A system of interconnecting roads close to and "around" the central activities area which includes Don, Myrtle, Wills, Myers, Chapel, Arnold and Barnard Streets.
- The system is not readily understood by the unfamiliar motorist. The local bypass function of this system is penalised by the alignments lacking continuity and with right angle turns at intersections. The staggered intersection of Wills/Myers/Mitchell Streets is an example of such discontinuity.
- The Inner Box is partly developed to a four lane divided standard.

Outer Box

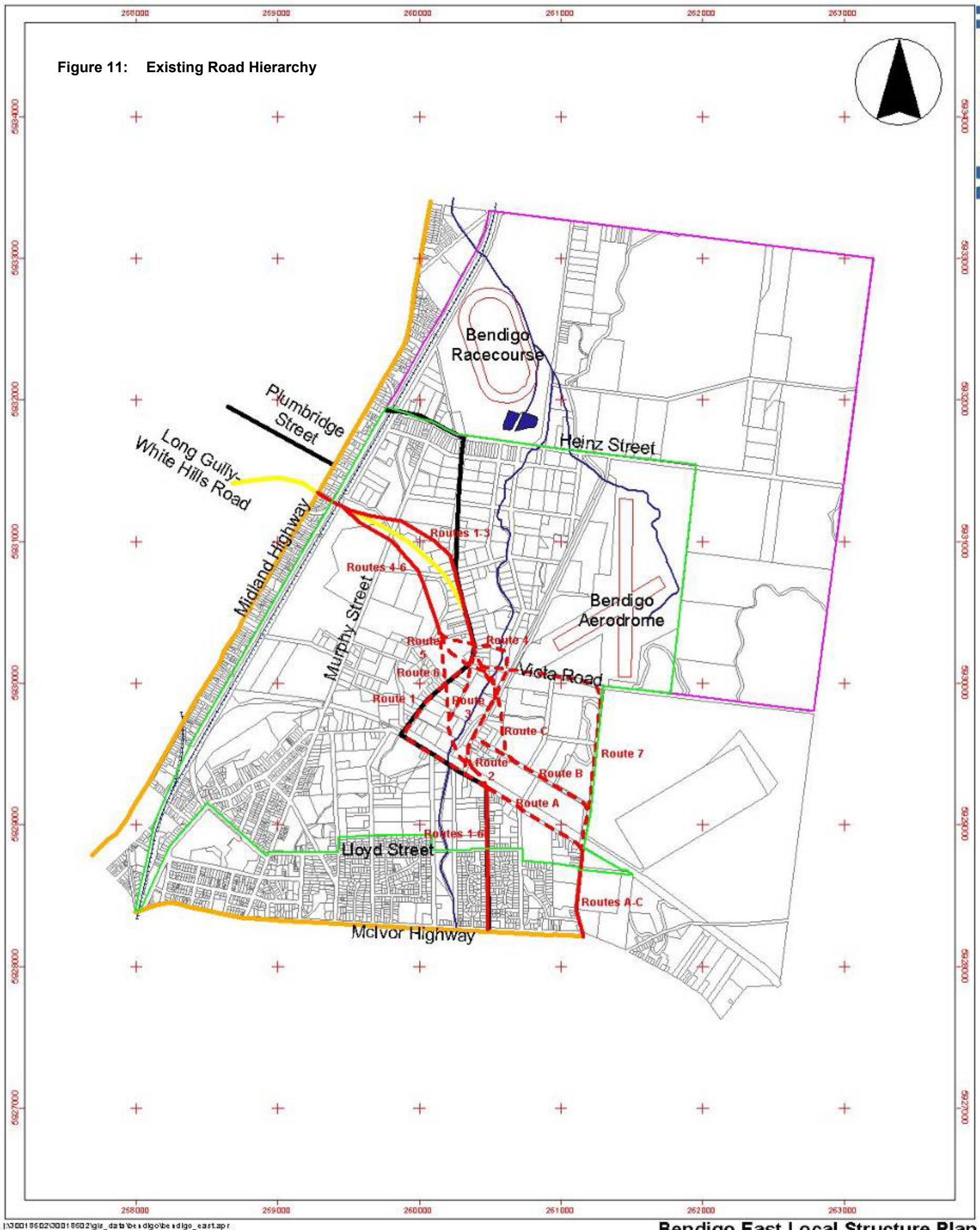
- A system of interconnecting roads forming a box "around" a larger portion of the urban area of Bendigo. It comprises Heinz Street, Rohs Road, Strickland Road,

Powells Avenue, Reservoir Road, Condon, Townsend, Miller, Pyke, Russell, Adam, Hattam, Oak, Mackenzie Streets, Specimen Hill Road, Inglis, Stray, Creeth Streets, Eaglehawk, Holdsworth Roads, Plumridge Street and Midland Highway.

- The Outer Box is largely a two lane two way road which provides connections between the major radial roads. As with the Inner Box, the Outer Box is also affected from lack of continuity.
- The function of the Outer Box is not to provide a bypass of the wider urban area of Bendigo but rather to provide for effective access and circulation within Bendigo whilst avoiding the need to travel through the central activities area and discouraging through traffic from using sensitive local streets.

Under the preferred “road network improvement” option outlined in the 2020 Transportation Study the Inner Box system is unaltered. However, it is proposed to alter the north/eastern section of the Outer Box by the provision of a more direct connection between the McIvor Highway and Holdsworth Road. This improvement action has been the subject of the recent 2002 East Bendigo Linking Road Study undertaken by PPK Environment and Infrastructure. The preferred Link Road option is discussed in Section 6.2.2 Preferred Road Hierarchy.

Figure 11: Existing Road Hierarchy



J:\30018602\30018602\gis_data\be\idgo\be\idgo_east.apr

Bendigo East Local Structure Plan

500 0 500 1000 Meters

Legend

- | | |
|---|---------------------------|
| Existing Road Classification | Study Area |
| State Highway | Area of Broader Influence |
| Main Road | Railway Lines |
| 2020 Transportation Study Proposed Road Improvement | Rivers |
| | Lakes |
| | Land Parcels |
| | Bendigo Linking |
| | Road Options |

Existing Road Hierarchy

Figure 11

Scale 1:25,000

5 Key Issues

Outlined below is a summary of the key issues emerging for the study area based on the desktop review outlined in section 4 and consultation activities which included a number of discussions with state government agencies, business operators, owners and servicing authorities and Council representatives.

Further consideration was given to these issues in Stage 3 of the Study, which includes the development of three (3) concept plans for the study area including the selection of a preferred route alignment for the East Bendigo Link Road.

5.1 Land Use Compatibility

Consultation with representatives from Council and EPA has not revealed any significant land use compatibility issues, other than those detailed below.

As illustrated in Figure 3, there are a number of different types of industry, some requiring buffer thresholds and some not requiring any buffers that are co-existing in close proximity. Although there is little evidence of interrelated industry conflict, it would appear that some uses are incompatibly located. Outlined below is a description of how buffer threshold distances for industrial uses impact on sensitive land uses to the north east and south of the study area.

Note, it is possible to reduce these buffer distances through the adoption of onsite management measures which reduce potential offsite amenity impacts such as an Environmental Management Plan.

- Empire Rubber and Keech Castings buffer requirements of 300 and 500 metres to sensitive land uses respectively which affects the residential precinct to the south, and west of Midland Highway and the Goninans site to the south;
- Rocla Extractive industries requires a buffer of 200 metres to sensitive land which affects the low density residential to the north and north west which is predominantly used for both residential and horse agistment to support the Bendigo Racecourse north of Heinz Road.
- Boral Asphalt, and BOC Gases located on the south side of Strickland Road all require buffer distances of 500 metres to sensitive land uses which affects the residential areas to the south.
- BMG Boral Concrete and East End Engineering also located on the south side of Strickland Road east Hesling Court require a buffer distance of 300 and 100 metres respectively to sensitive land uses, which affects the residential area to the south.

In relation to orderly and proper planning of the area, it is not appropriate for residential land to be directly adjacent to industrial 1 uses as it limits the opportunity to attract a wide scope industrial activities.

Note, further land use compatibility issues will arise in the study area unless there is clearly defined buffer areas between the main industrial precinct and the residential areas or rationalisation of some of the residential areas as a number of the industrial uses are no longer able to achieve their required buffer threshold buffer distances from sensitive land uses.

There is a need to identify a “core” within the study area where industries which require significant buffer threshold distances to sensitive land uses are to locate. If a “core” area is clearly defined it would be possible to avoid the potential for inter industry conflict and conflict with sensitive uses.

5.2 Consistency of Planning Controls

There are some clear inconsistencies with some of the planning zones within the study area which are described below.

- The residential zone affecting the recently constructed residential development in the north west corner of the study area is not consistent with the Industrial 1 zoned land. The proximity of the residential zone severely compromises the development opportunity of the Industrial 1 zone already a number of existing uses are no longer able to achieve their respective buffer distances to sensitive land uses.
- The portion of the low density residential land between Murphy Street and Rohs Road in the north of the study area is not consistent with the Industrial 1 zoning located to the west of Murphy Street as it compromises the type of industrial activities.

It should be noted that a number of stakeholders have highlighted the important role and function of land in the low density zone which provides for horse agistment facilities to support the Bendigo Racecourse to the north of the study area. Therefore a decision may need to be made regarding the rationalisation of either some portion of the Industrial 1 or the low density residential zoned land.

- Any extension of the Bendigo Aerodrome in relation to a new runway to the south will require a rationalisation of the Public Conservation and Resource Zone. It also would place height limits on developments in the existing Industrial 1 Zone land that would be affected by an overlay.
- The residential zoned land located in the south east portion of the study is not consistent with the Industrial 1 zone land to the north and east.
- The Industrial 3 zone located at the south boundary of the study area provides a buffer/interface to the Residential 1 zone to the south.

In summary, the Industrial 1 zone has been compromised by the encroachment of sensitive land uses namely, residential development in the northern and south portion of the study area as a result of planning scheme amendments that have been permitted.

It is imperative that no more ad hoc residential rezonings occur within the study area until a clear strategic framework which guides the location of future industrial development within the study area is developed.

Furthermore, there is a need to clearly define a “core” for the industrial 1 zone, as discussed in the previous section.

5.3 Infrastructure/Geology Requirements

Key infrastructure considerations for the development of Concept Plans included:

- The location of overland drainage flow paths and retarding basins within the study area;
- expansion of infrastructure to accommodate future high power and water using businesses;
- Industries requiring significant amounts of water for processing activities should be encouraged to locate near Strickland Road to reduce the need for large water mains. Sewerage requirements should also be considered in conjunction with water requirements;
- Not disturbing the former White Hills Tip site. The tip finished some 5 years ago and is poorly compacted putrescible rubbish, which is emitting methane gas;
- Assess existing gravel resources and investigate the potential for gravel extraction south of Golf Course Road (Outer Study area);
- The location of old mines and shafts to determine safe building locations;
- Determine site rehabilitation plans/requirements for exhausted quarries. Determine future end use for the old Tip Site.

5.4 Environmental

Key flora and fauna considerations for the development of Concept Plans included:

- The quantity and nature of vegetation/habitat that would be affected by any proposed development.
- The existence of any threatened or endangered species as listed under the *Flora and Fauna Guarantee Act 1988* (FFG Act) or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in the proposed development area.
- The need for permit applications under the FFG Act.
- The likelihood that the proposed development would trigger a referral under the EPBC Act.
- The likelihood that a permit under the *Planning and Environment Act 1987* for the removal of native vegetation on a landholding of more than 0.4 hectares is required.

- The need for permits under the Native Vegetation Retention Controls to remove native vegetation for road construction works.
- The need for a permit under the *Wildlife Act 1975* for the trapping or handling of any protected fauna.
- The potential for habitat fragmentation to occur as a result of proposed development.
- The potential for weed invasion to occur as a result of proposed development.
- Requirements for the development and implementation of environmental management plans for new development.
- Opportunities for vegetation/habitat enhancement as a result of any proposed development.
- Relevant environmental strategies identified as part of the City of Greater Bendigo Green Plan – A Natural Environment Management Strategy (2001).
- Guidelines for the management of roadside vegetation as detailed in the City of Greater Bendigo Roadside Management Plan.

Key landscape considerations for the development of Concept Plans included:

- Changes to the existing landscape values as a result of proposed development.
- Opportunities for visual enhancement of the study area.

Key noise considerations for the development of Concept Plans included:

- The need for appropriate land use planning to ensure that buffers are provided to assist in the achievement of relevant noise criteria for industrial development.
- The adoption of EPA Noise Control Guidelines and VicRoads Traffic Noise Reduction Policy for new roads.
- Requirements for the development and implementation of environmental management plans for new development.

The East Bendigo LSP must ensure that there is no disturbance to the White Hills Reserve and White Hills Chinese Diggings as a result of proposed development within the study area.

Although searches of the Victorian Heritage Register, National Trust Register and Register of National Estate indicate only two records of heritage significance within the study area, it is probable that a number of additional historic archaeological features may exist within the study area, given the historic mining activity in the region.

In order to ensure that any heritage items discovered during the implementation of the East Bendigo Local Strategy Plan be appropriately managed and protected appropriate measures would need to be adopted. These measures may include:

- Prior to the commencement of any construction works, a cultural heritage ground survey shall be conducted in areas of potential archaeological sensitivity by a suitably qualified archaeologist.
- Application to Heritage Victoria for consent to disturb or destroy any site of cultural heritage under the Heritage Act (1995) (whether they are included on the Heritage Inventory or not) would be required.

6 Local Structure Plan

This section outlines the future strategic framework for the study area. It suggests clear strategic directions for the area. Three (3) options for future development were scoped after the study area analysis, which were used to facilitate discussions with one on one stakeholders.

The main differences among the options are summarised below.

Option One

- Provides for the relocation of the Bendigo Aerodrome for future industrial purposes;
- Provides for rationalisation of the residential precinct in the south of the study area to light industrial;
- Linking Road will utilise existing road alignments including Rohs Road, Victa Road and Pratts Park Road; and
- Provides for future Linking Road alignment through the Bendigo Aerodrome.

Option Two

- Provides for retention of Bendigo Aerodrome;
- Provides for rationalisation of the residential precinct in the south of study area to light industrial; and
- Linking Road will utilise existing road alignments including Rohs Road, Strickland Road and Pratts Park Road to the south

Option Three

- Provides for retention of the Bendigo Aerodrome;
- Retains the residential precinct to the south; and
- Linking Road will utilise existing road alignments including Rohs Road, Strickland Road and Powells Avenue.

Note; all three (3) options provide for:

- a horse agistment precinct which consolidates an area to cater for support activities for Bendigo Racecourse and Bendigo Harness Racing;
- an industrial precinct east of the aerodrome;
- rationalisation of low density residential precinct to Industrial;
- an inland port;
- an open space link running north-south through the precinct;
- protection of existing Chinese Diggings;
- development of light industrial precinct between residential and industrial areas;
- protection of the site of significant vegetation/geological reserve;
- development of future drainage reserve through the study area; and
- development of two gateways at White Hills and McIvor Highway.

The East Bendigo LSP has been developed in conjunction with members of the Steering Committee after considering the key issues outlined below from the following consultation activities regarding the three options for future development:

- **Focus Group Session** with representatives from the Industrial Reference Committee and Bendigo Manufacturing Group
- **Value Management Workshop** with representatives from Government Agencies and Servicing authorities
- **SWOT Analysis Workshop** with Council officers

- **Two (2) Information sessions** with representative's from local communities.
- **Additional two (2) Information sessions** with representatives from local communities.

The key issues, which have emerged, from the consultation activities outlined above include:

Land Use

- Relocation of Bendigo Aerodrome would provide opportunity for future eastward expansion of industrial precinct;
- Residential encroachment has compromised the role and function of industrial precinct;
- Need to separate the residential and industrial precincts;
- Opportunity to consolidate Bendigo Harness Racing activities and Horse agistment activities;
- Opportunity to develop a commercial/business precinct to service the industrial area.
- Opportunity to investigate clustering of different industrial activities and site-specific redevelopment.
- Development of Inland Port

Traffic Management

- Considerable support (resident/community groups) for the use of Pratts Park Road for the southern extension of the link road however there are limitations with the Outer Box connection;
- Limitations with using Powells Avenue for the southern extension of the link road as it will traverse through a highly populated and intensely developed residential precinct;
- Road network needs to be designed to accommodate B-triples;
- Need to avoid industrial traffic through residential precincts;
- Requirement for intersection treatment with Murphy Street and Strickland Road due to current restraints;
- Investigate opportunity for a new east-west link (extending east of Powell Street);
- Requirement for intersection treatment with Powell Street and Midland Highway;
- Important to maintain opportunity for future railway access into study area.

Environmental

- Protection of Chinese Diggings site (listed on the heritage inventory);
- Opportunity to use the exhausted gravel site in the north west corner of the study area as parkland;
- Investigate opportunities for future end use of existing gravel reserve;
- Significant vegetation/geological reserve function as buffer between residential and industrial precincts.

Infrastructure

- Investigate opportunities for location of future drainage reserves;
- Potential to locate a Waste Energy site to area;
- Any future infrastructure plans will accommodate the needs of existing industries/business operators

6.1 Preferred Concept Plan

Vision

East Bendigo Industrial Precinct has been identified as the preferred location for industrial investment, marketing and industrial expansion for Bendigo in the *Industrial Land Strategy (2002)*.

The East Bendigo Industrial Precinct provides a range of industries with the opportunity to capitalise on existing and proposed transport links, infrastructure services and nearby support services. Significant investment has been undertaken in recent years further enhancing its status as one of regional Victoria's most prominent and expanding industrial precincts.

The Local Structure Plan (LSP) as shown in Figure 12 provides Council, developers, business owners and operators and other stakeholders with clear guidance for future development of this area, including road network, lot sizes, land uses and appropriate buffers from sensitive land uses. The LSP will provide Council with a sustainable industrial precinct to accommodate future expansion of the Bendigo industrial sector.

The East Bendigo Industrial Precinct will be marketed and promoted through the introduction of appropriate signage at key gateways.

The following section should be read in conjunction with Figure 12.

6.1.1 Land Use

The LSP provides the opportunity to cluster specific industry types through the development of the following site specific precincts:

Food Manufacturing/Technology Industries

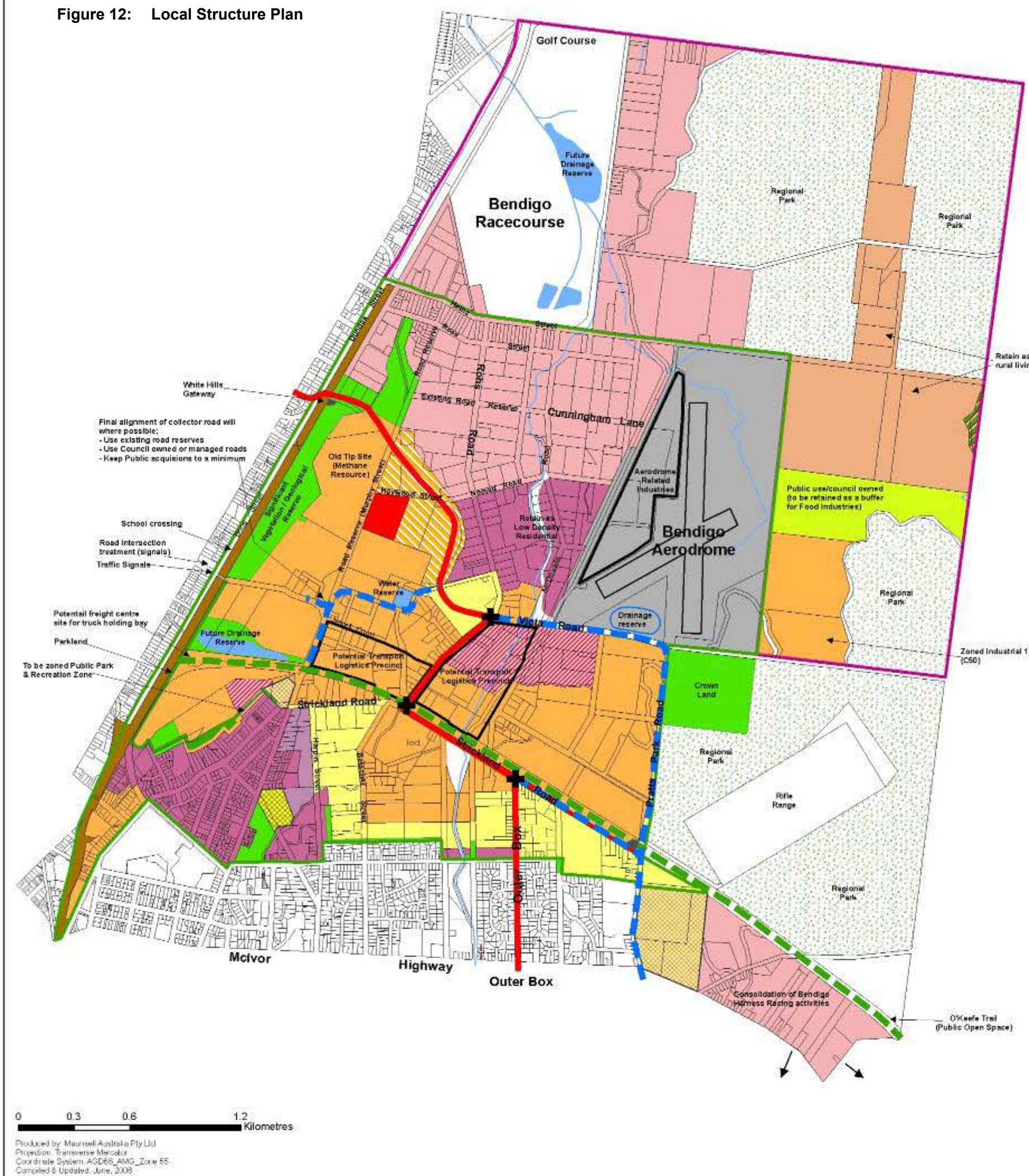
The precinct located to the east of Bendigo Aerodrome provides for opportunity for redevelopment of 27.5 hectares of land.

The advantage of locating the food manufacturing precinct in this location is that it is a greenfields site which is not affected by existing industries.

The challenge for Council will be to ensure that this area is not compromised by inappropriate industries locating on the land to the north which may jeopardise the role and function of the local manufacturing precinct.



Figure 12: Local Structure Plan



Local Structure Plan
East Bendigo

Note, the land immediately to the north is owned by Council and will function as a buffer to the food industry precinct. It is imperative that Council retain ownership of this land to ensure that the buffer is maintained and food industry precinct is not compromised.

Aviation Related Industries

This precinct located on the west side of the Bendigo Aerodrome provides the opportunity to promote this area for aviation related industries to support the Bendigo Aerodrome.

Provision has been made within the south portion of this precinct for a Truck Holding Bay for the entire study area or at the Inland Port site.

Gravel Reserves & former Tip Site

The exhausted gravel reserve generally north and south of Cunningham Lane reserve has been identified for parkland.

Note, the existing gravel reserve (as shown in Figure 12) has been recommended in the Environment Conservation Council (ECC) Final Report prepared by DSE for inclusion in the uncategorised public land and earth resources categories. The recommendations for uncategorised public land and for mining sites includes the opportunity to dispose of the land if it is deemed surplus and/or investigate the opportunities for alternative uses.

Therefore, the recommendation of this report is that the existing gravel reserve should be identified as future industrial purposes. Council would need to undertake discussions with DSE to facilitate this process.

Bendigo Brick has a 10 year license to extract methane from the Old Tip Site. The future end use of this site after the methane extraction could be industrial.

Transport Logistics

The southern portion of the study area capitalising on the proximity of the Inland Port are two potential transport logistics precincts. The role and function of these two precincts is to attract freight, warehouse, storage and other transport related industries.

It is important that the transport logistics be located in close proximity to the inland port to take advantage of rail.

Horse Agistment Activities

The horse agistment activities precinct highlights the importance of ensuring that both residential and low-density residential areas are provided for in the north section of the study area to support the Bendigo Racecourse activities. Discussions with representatives from the Bendigo Racecourse and Bendigo Jockey Club have highlighted the importance of the racing industry to Bendigo and the need to provide for adequate support facilities.

Further discussions with the horse industry representatives has identified the need for horse agistment activities to be promoted further south of Cunningham Lane to Nomad Road.

Note, the area to the south of the horse agistment precinct will be retained as low density residential. However, it will be important to try and discourage additional residential development within this precinct to avoid any further potential land use conflicts with surrounding industrial uses.

Other

The LSP provides for a Commercial Centre which will service the East Bendigo Precinct. The City of Greater Bendigo would need to investigate opportunities to acquire this parcel of land.

6.1.2 Traffic Management

Strategic Context

The development of a new road network for the East Bendigo Local Structure Plan has been firmly based on the broad objectives of the Bendigo 2020 Transportation Study (released in July 1993). This document provides the framework for transport network development in the study area and its objectives were also shared by VicRoads.

The transportation objectives outlined in Bendigo 2020 reflect how Council, for many years, has been playing an active role in influencing road freight movement through its responsibilities for management of the road network.

The Council's vision for the development of the transport network in the East Bendigo industrial area recognises the economic imperative to provide adequate and efficient routes for the movement of freight and the need for this to be balanced against protecting the amenity of surrounding sensitive land uses. This should be pursued by collectively enhancing road, public transport, and non-motorised travel in the East Bendigo precinct.

Preferred Road Hierarchy

The management of the road network in Bendigo is characterised by the *Inner Box* and *Outer Box* systems, which provide a two-tiered circumferential ring road arrangement to relieve traffic pressure on Bendigo's central activities area and enhance access and circulation through the broader Bendigo township. One of the key objectives of these systems is to attract trucks away from the city centre. The Outer Box is currently affected by a certain lack of continuity through the East Bendigo area.

In response to this lack of continuity, a key "road network improvement" option outlined in the Bendigo 2020 Transportation Study was the proposal to alter the north/eastern section of the Outer Box by the provision of a more direct connection between the Mclvor Highway and Holdsworth Road. This improvement action was the subject of the recent 2002 East Bendigo Linking Road Study undertaken by PPK Environment and Infrastructure.

This Local Structure Plan builds on the PPK study and recommends that a new Outer Box route be adopted as shown in drawing No 8750PREF. This new route will:

- commence at the Midland Highway / Lyons Street intersection (where it meets the existing Outer Box west of Midland Highway);
- follow a new east/west alignment, which requires the construction of a portion of Heywood Road and then diverts south;
- continue in a southerly direction through the Gravel Reserve to the intersection of Victa Road;
- from the point utilise the existing Outer Box network by heading south along Rohs Road to Strickland Road, east to Powells Avenue and south to McIvor Road.

It should be noted that the existing north/eastern part of the Outer Box that includes Heinz Street and part of Rohs Road will become redundant as the new Outer Box is progressively implemented and would therefore need to be reclassified, in due course.

It became evident during the development of the new Outer Box route through East Bendigo that in order to fully take advantage of the opportunities provided by the presence of this new route, and optimise its catchment of the East Bendigo industrial zone, there would be a need for a “feeder” network. This will help to ensure that a large volume of commercial traffic generated by the East Bendigo industrial zone can conveniently access and benefit from the Outer Box and not be tempted to use alternate routes through residential precincts.

The development of a “feeder” network has been achieved through the designation of several collector roads on both new and existing road reserves. These are shown on Figure 12 – Local Structure Plan and include:

- Victa Road from the Rohs Road intersection, east to Pratts Park Road and south to McIvor Road
- Strickland Road, between Powells Avenue and Pratts Park Road
- Murphy Street and Rowena Street, between the rail reserve and Rohs Road

The establishment of this collector road network provides an efficient way to link existing and future local road networks with the Outer Box. The framework provided by the Outer Box and collector roads effectively defines preferred access locations for each of the precincts in the East Bendigo area. Importantly, the numerous access options and travel choices that are offered by the combined network will help to protect sensitive precincts, particularly residential areas south and north of the industrial zone. In this regard a number of strategic traffic management treatments can be incorporated in the Local Structure Plan to reinforce and help achieve this preferred outcome. These treatments include:

- .
- Road closure of Cambridge Crescent at Dundas Street. This treatment also provides a significant urban design opportunity. The closure is suggested in order to dissuade motorists from short-cutting via Cambridge Street once the proposed

collector road is constructed intersecting Dundas Street a short distance to the north.

Implementation

The Outer Box and collector alignments selected for the East Bendigo Local Structure Plan will enable implementation to be staged. This is desirable, as construction of the roads in their entirety may be prohibitive from a cost perspective. Both the Outer Box and collector networks make good use of existing road reservations and this minimises costs for the acquisition of land and creation of new road reserves. Importantly, the existing Outer Box will not be compromised by the staged implementation and can continue to function.

6.1.3 Environmental

The Local Structure Plan provides for the retention and promotion of the following environmental areas:

- The protection of the Chinese Diggings and White Hills reserve sites which is currently listed on the Victorian Heritage Inventory.
-
- The protection and retention of significant vegetation/geological reserve along the western boundary of the study area. This vegetation/geological reserve also provides a good buffer between the industrial activities to the east and residential areas to the west.

7 Implementation

The Implementation Framework for the East Bendigo LSP focuses on:

- the development of a **planning framework** which will ensure a secure vision for and statement of intent for the land for future developers, owners, investors and land managers;
- the development of a **marketing focus** for ongoing promotion of the precinct;
- the development of a **Development Cost Report** which presents the potential associated with the redevelopment of this area.

7.1 Planning Framework

This section identifies the preferred planning framework for the Bendigo LSP. The objectives of the planning framework is to be able to provide all stakeholders including developers, business owners/operators, residents, state government agencies with clear strategic direction for the future development of the precinct.

Also, it is anticipated that the planning framework will provide the appropriate guidance to all stakeholders to encourage and promote sustainable industrial development within the precinct.

The following table summarises the planning framework for implementation of the East Bendigo LSP.

7 Implementation

Table 13: Implementation Framework for Bendigo LSP

Planning Framework	Implementation of the East Bendigo LSP	Comments
State Planning Policy Framework	No change	The East Bendigo Industrial Precinct is not of state significance.
Local Planning Policy Framework		
Municipal Strategic Statement	<p>The MSS is currently being refined to implement the recommendation of the <i>Industrial Land Strategy</i> as part of Amendment C41. The following modifications are proposed:</p> <ul style="list-style-type: none"> Clause 21.06-6 Industry – expand on the role and function of the East Bendigo Precinct. Clause 21.06 – Strategic Framework – identify the East Bendigo Industrial precinct. Clause 21.05-4 Economic Development specifically refer to the East Bendigo Industrial Precinct under heading <i>Creation of the Economic Opportunities and Employment</i>. <p>The following additional change will also need to be made to the MSS (not as part of Amendment C41)</p> <ul style="list-style-type: none"> Clause 21.05-4 – the zoning and overlay changes outlined below should be incorporated under the <i>Implementation</i> section. 	<p>The changes to the MSS proposed as part of Amendment C41 provide the strategic basis to support the East Bendigo Industrial Precinct and for the introduction of LPP to implement the East Bendigo LSP.</p> <p>The only other modification to the MSS includes the description of the proposed zones and overlay changes required to implement the East Bendigo LSP under the <i>Implementation</i> heading of clause 21.05-4.</p>

7 Implementation

Planning Framework	Implementation of the East Bendigo LSP	Comments
Local Planning Policy	<p>Clause 22.06 is currently being refined as part of Amendment C41 to incorporate the findings of the <i>Industrial Land Strategy</i>. This revised policy will be in a format that accommodates the additional policy to implement the East Bendigo LSP.</p> <p>The LPP will state the overall strategic direction for the East Bendigo Industrial Precinct and provides direction for Council officers when assessing applications.</p> <p>The East Bendigo Precinct LPP meets the seven tests to verify whether an LPP is justified:</p> <ul style="list-style-type: none"> It responds to a demonstrated need (Bendigo Industrial Land Strategy); will implement objectives and strategies in the MSS; it will provide direction for permit requirements for building and works in relation to industrial uses in the industrial 1 zone; will guide Council officers and provide help in establishing whether a proposal is likely to be supported (site specific precincts) The LPP will be consistent with the Practice Note. 	<p>VPP Practices Note – Writing a LPP -states that an LPP has defined role in planning schemes. Discretion is provided by Section 2 uses or by permit requirements for buildings and works in a zone or overlay. An LPP gives a planning authority an opportunity to state its view of a planning issue and its intentions for an area affected by exercise of discretion.</p> <p>The Practice Note requires that a new LPP must meet the seven tests to verify whether it is justified:</p> <ul style="list-style-type: none"> Does the LPP respond to a demonstrated need? Does the LPP implement an objective or strategy in the MSS? Does the LPP relate to a specific discretion or group of discretions in the scheme? Does the LPP help responsible authority to make a decision? Does the LPP help any other person to understand whether a proposal is likely to be supported or not? Does the LPP add to other planning tools in the scheme, especially the relevant zone or overlay. Does the LPP address the format, content and language guidance in this Practice Note?
Zones		
Industrial 1	No change to the industrial 1 zoned land.	
Low Density Residential	<ul style="list-style-type: none"> Retain as Low Density Residential Ensure that the local planning policy encourages horse agistment activities north of Nomad Road and discourages additional residential uses south of Nomad Road 	<ul style="list-style-type: none"> Reflects the requirements of the East Bendigo LSP.
Rural Living	Some rationalisation of the Rural Living Zone north east and east of the aerodrome.	<ul style="list-style-type: none"> Reflect the requirements of the East Bendigo LSP and provides the appropriate zoning to: <ul style="list-style-type: none"> Attract industries requiring larger buffer; Industries requiring large land holdings; and Food industries.
Residential	No change to the residential zoned land.	

7 Implementation

Planning Framework	Implementation of the East Bendigo LSP	Comments
Overlays		
Development Plan Overlay	<p>Introduce Development Plan Overlay for Aerodrome land that seeks to promote the use of this land for aerodrome related uses.</p> <p>This Development Plan Overlay could be supported by the preferred subdivision layout <u>OR</u> set a series of development principles that would guide the preparation of the development plan.</p>	<p>Given that the details of a subdivision lot layout has not been finalised, a series of development principles to give the preparation of a development plan will be prepared.</p>

7 Implementation

Planning Framework	Implementation of the East Bendigo LSP	Comments
Other	<p>Council should investigate the opportunity to acquire the land identified for Commercial Centre.</p> <p>Council should investigate opportunities to obtain funding for land acquisition through the Regional Infrastructure Development Fund administered by Department of Innovation, Industry and Regional Development.</p>	<p>If Council is to submit an application for funding for land acquisition to the Regional Infrastructure Development Fund the application will need to demonstrate:</p> <ul style="list-style-type: none"> ▪ Project benefits related to sustainability, new employment, investment and exports; ▪ State or regional priority; ▪ Maximise funding support from a range of sources; and ▪ Are ready to be implemented. <p>(Refer to Regional Infrastructure Development Fund Guidelines).</p> <p>Generally acquisition and intervention is only considered necessary when: (refer to Case Study – Department of State and Regional Development in Queensland)</p> <ul style="list-style-type: none"> ▪ There is a market failure; ▪ Strategic planning failure; and ▪ A specific strategic value of a site.

7 Implementation

Following consultation with the Steering Committee it was agreed that a local planning policy should be developed for the East Bendigo precinct to state the overall strategic direction for the East Bendigo Industrial Precinct and also provide direction for Council officers when assessing applications.

In addition, there was general support from the Steering Committee to adopt the alternative options outlined in the table above in relation to the Development Plan Overlay. The alternative options relate to the aerodrome related activities precinct and requires the form and conditions of the future use and development to be shown on plan before a planning permit can be granted to use or develop land. Therefore the indicative subdivision would need to be modified to only show the proposed road network.

7.1.1 Local Planning Policy

A draft local planning policy has been developed for those areas within the East Bendigo precinct. This draft policy would form part of the clause 22.06 Industrial policy. Clause 22.06 is currently been modified by Council officers as part of the recommendations of the *Industrial Land Strategy* recently prepared by Gutteridge, Davey and Haskins and Essential Economics. The policy basis for the draft local planning policy states:

East Bendigo Industrial Precinct has been identified as the preferred location for industrial investment, marketing and industrial expansion for Bendigo in the Industrial Land Strategy 2002.

*The **East Bendigo Industrial Precinct** provides for a range of industries with the opportunity to capitalise on existing and proposed transport links, infrastructure services and nearby support services. Significant investment has been undertaken in recent years further enhancing its status as one of regional Victoria's most prominent and expanding industrial precincts.*

This policy implements the East Bendigo Local Structure Plan (LSP), which articulates the future of the precinct.

The objectives of the local planning policy include:

- *To facilitate the growth and development of both new and existing local, regional and international industries to locate within the East Bendigo Precinct.*
- *To promote sustainable industrial development within the precinct.*
- *In considering planning permit applications, the responsible authority must have regard to the East Bendigo Industrial Precinct (LSP).*
- *To promote the clustering of specific industry types through the development of site specific precincts.*

The draft local planning policy states that it is policy to:

Amenity and Built Environment

- *Require submitted permit applications to be consistent with East Bendigo LSP.*

7 Implementation

- *Encourage new industrial activities to locate where possible within the following appropriate site specific precincts:*
 - *food manufacturing/technology industries*
 - *aviation related activities*
 - *light industry;*
 - *transport logistics; and*
 - *horse agistment activities*
- *Encourage industries which require large threshold buffer distances to locate in the core of site-specific precincts*
- *Protect existing industrial locations from encroachment by non-industrial uses particularly residential development from the south.*
- *Encourage the redevelopment of older and under utilized industrial areas for newer types of industry*
- *Provide for the future development of a Commercial Centre (to service the existing and future industrial/business activities).*
- *Require the preparation of an On-Site Environmental Management Plan (EMP) for all permit applications.*
- *Discourage additional residential development south of Nomad Road in the Low Density Residential Zone to avoid potential land use conflicts with neighbouring residential properties.*

Environmental

- *Protect the heritage significance of the White Hills Chinese Diggings and White Hills Reserve from inappropriate development.*
- *Encourage the protection and management of any sites identified with cultural significance discovered during development.*

Infrastructure

- *Provide for a Truck Holding Bay within the aerodrome related industries precinct or at the Inland Port site.*
- *Protect the alignment identified for the proposed Bendigo Link Road*
- *Protect the alignment identified for the proposed Collector Roads.*
- *Encourage the redevelopment of the “former Railway Workshop Site” for freight or transport related activities (eg. Inland Port).*
- *Ensure infrastructure development is consistent with the principles of orderly infrastructure development.*

Other

- *Monitor industry and business investment trends to identify whether the East Bendigo LSP is meeting the key objectives.*

This local planning policy will need to be incorporated into the Bendigo Planning Scheme with the East Bendigo LSP through a planning scheme amendment. The planning scheme amendment would include all rezonings.

A copy of the local planning policy is located in Appendix C.

7 Implementation

7.2 Marketing Focus

The marketing focus identifies and then builds on the advantages of Bendigo as a premier regional location. In order to maximise the benefits for the future development of the East Bendigo Precinct, an active strategic marketing approach is recognised as a critical element to:

- promote Greater Bendigo's competitive advantages;
- promote opportunities for business growth;
- promote opportunities for the relocation of existing and/or attraction of new enterprises; and
- promote investment in the region (ie investment in the East Bendigo Industrial Precinct).

It is recommended that an information kit for the industrial area be developed which may include but is not limited to:

- Marketing strategy;
- Brochure; and
- General information brochures about the City of Greater Bendigo.

This information kit would be generally available to local real estate agents, City of Greater Bendigo Council, DIIRD and would be used to promote the advantages of locating in Bendigo.

A key component to the success of marketing the East Bendigo Industrial precinct will depend on the level of commitment from Council and other support agencies including State Government, business community and related networks.

Outlined below is a description of the different components to be incorporated into the marketing kit.

Marketing Strategy

The City of Greater Bendigo has developed a *Draft East Bendigo Industrial Precinct Marketing Plan*, which is intended to establish the East Bendigo Industrial Precinct as regional Victoria's premier industrial precinct for business development and growth.

Elements of the East Bendigo Industrial Precinct marketing strategy will involve liaison and provision of data from relevant State and Federal Government Departments/Agencies plus targeted aggressive direct marketing activities, based on key strengths and opportunities.

The objective of this plan is to promote and market East Bendigo Industrial Precinct competitive advantages and strategic opportunities on a regional, state, national and international basis.

7 Implementation

The aims and strategies for the plan focus on the following:

- Production and launch of East Bendigo Industrial Precinct including professionally developed marketing and promotional materials;
- Liaison and partnering with Government/Agencies;
- Direct promotion and marketing of City of Greater Bendigo and East Bendigo Industrial Precinct;
- Supporting Initiatives to promotional and Marketing Strategy; and
- Marketing Strategy Cost.

Refer to Appendix D for a copy of the Draft East Bendigo Industrial Precinct Marketing Plan.

Brochure

A marketing brochure has been developed for the East Bendigo Industrial Precinct. The marketing brochure emphasises the following:

- Advantages of locating in City of Greater Bendigo;
- Key Attractors to the East Bendigo Industrial Precinct;
- High profile industries;
- City of Greater Bendigo's commitment to promoting economic development; and
- List of key contacts.

It is envisaged that the marketing brochure will be incorporated in the information kit.

Refer to Appendix E for a copy of the marketing brochure.

General Information

The information kit will also contain a series of two-page information brochures/leaflets about the municipality.

In addition, urban design and landscaping will play a vital role in promoting and enhancing the viability of the industrial precinct.

Other

The City of Greater Bendigo will investigate opportunity to obtain Pride of Place funding through the Department of Sustainability & Environment for the project.

Pride of Place supports initiatives that assist communities across Victoria, working with skilled urban designers to attract investment and to make Victoria's towns, suburbs and cities preferred places to live and work. The initiatives include urban design studies and advice, and seek funding for capital works.

7 Implementation

Pride of Place grants enable the State Government to work together with Councils, residents and traders to develop urban design solutions that assist individual communities to prosper. The Program encourages communities to strive for excellence in urban design, working with skilled designers to build on local character and heritage, attract further investment and activity and contribute to a greater sense of local pride.

The grants continue to transform and revitalise many of Victoria's rural and urban centres. As more projects across the state are developing from strategic plans into physical realities, the benefits are being realised. Preliminary evaluation and feedback from communities that have completed projects indicate many benefits. These include improved amenity, vitality and attractiveness, and measurable outcomes such as increased property values, more employment, increased visitation and tourism, new private investment, reduced crime and improved safety

7.3 Development Cost Report

A Development Cost Report has been prepared to provide indicative development costs. The opinions and findings are based upon the investigations and discussions conducted with the various authorities.

Refer to Appendix F for a copy of the Development Cost Report.

Outlined below is a discussion of the developments costs for the precinct and external development costs.

Precinct Development

At this stage it is premature to prepare detailed layout plans for all the individual precincts. A subdivisional layout plan has however been prepared for a precinct within the aerodrome site. The cost per hectare determined for this precinct site has been applied to the whole study area to determine the internal development cost for the study area.

Drawing No. 8750AIR-WATER shows the proposed water layout, Drawing No. 8750AIR-SEWER shows the proposed sewer layout and Drawing No. 8750AIR-DRAINAGE shows the proposed drainage layout.

Based on these layouts, the estimated internal development costs are:

Table 14

	Item	Cost
1	Roadworks & Drainage	\$2,188,235
2	Landscaping	\$34,200
3	Sewerage Reticulation	\$457,320
4	Water Reticulation	\$361,950
5	Engineering Design & Construction Monitoring	\$258,545
6	Surveying	\$79,800

7 Implementation

Item		Cost
7	Geotechnical Investigation	\$9,563
8	Council plan Checking & Supervision Fees	\$72,229
Total – excluding development levies		\$3,461,842
	Sewerage Levy 54 Lots @ \$2,450 / Lot	\$139,650
	Water Levy 54 Lots @ \$2,000 / Lot	\$114,000
	Drainage Levy 54 Lots @ \$1,000 /Lot	\$57,000
Total		\$3,772,492
Total / Lot – 54 Lots		\$66,184
Total / ha – 23 ha		\$209,583

The redevelopment of precincts already receiving water supply and sewerage services may attract levy credits for each existing lot served and may result in lower development costs where existing roads and services can be utilised. The application of the above precinct development cost to areas outside the aerodrome may therefore result in high development cost estimates in such areas.

External Development Costs

The following is a summary of the potential external development costs for main roads and trunk services through the study area:

- Road Network
Estimated cost of construction: \$6,005,000.
- Drainage – Trunk
Potential drainage works of \$1,337,000.
- Water – Trunk
Potential trunk water works of \$1,800,000.
- Sewerage – Trunk
Potential trunk sewerage works of \$nil
- Electricity – to be negotiated with service provider.
- Gas – to be negotiated with service provider.
- Telecommunications – to be negotiated with service provider.

The following are to be noted:

- This estimate relates to Preliminary Concepts referred to in this report only.
- The estimate is prepared from preliminary information obtained from Service Authorities and Council.
- Actual costs may vary on receipt of detailed requirements and development conditions.
- No allowance has been made for land costs, legal, finance or selling costs.

7 Implementation

- No allowance has been made for non-engineering fees such as planning or landscaping design.
- No allowance has been made for contributions to Council street schemes or upgrading of existing roads, other than where specifically identified.
- Construction costs assume normal commercial access to materials and equipment.
- No warranty can be given to the accuracy or completeness of the estimate.

It should be noted, that it is recommended that a detailed drainage study be undertaken for the northern section of the study area. However, with limited available information, it is envisaged that the following trunk works may be required:

- Storage basin in the area of the aerodrome (if aerodrome developed);
- Construction of some overland flow channels;
- Some enhancement works undertaken on Racecourse Creek.

8 Recommendations

8 Recommendations

Outlined below is a recommended process for implementation of the East Bendigo LSP:

1. Council will need to meet with representatives from VicRoads to seek agreement that there is a need to review the Outer Box alignment south of McIvor Highway as this impacts on the Outer Box alignment in the southern portion of the study area between Strickland and McIvor Highway.

It is imperative that the Outer Box review be undertaken as soon as possible to ensure greatest opportunity for investigation of a suitable alignment that does not compromise residential areas, parkland etc.

2. Council investigate the opportunities to make application/s to Regional Infrastructure Development Fund for potential land acquisition and infrastructure works.
3. Council will need to prepare a planning scheme amendment to:
 - incorporate the East Bendigo Local Planning Policy including the East Bendigo LSP;
 - introduce rezoning as described in Table 15; and
 - introduce a Development Plan Overlay to the Aerodrome Related Activities Precinct.
4. Council should also investigate the opportunity to receive funding through the Pride of Place administered by the Department of Sustainability & Environment for urban design/landscape such as signage, roadside furniture, tree planting, linear park, potentials of Racecourse Creek and O'Keefe Trail, treatment to assist in the promotion and marketing of the precinct.
5. Council will need to implement the Draft Marketing Strategy and also develop the Information Kit to ensure the greatest opportunity for promotion of the East Bendigo Industrial Precinct.
6. The next stage of the detailed Drainage Study should be undertaken to the north up to Heinz Street and east of the Aerodrome.
7. Council should consult with the relevant Aboriginal community (Bendigo Aboriginal Co-operative) in relation to the study. This could be undertaken as part of the planning scheme amendment.
8. Council will need to develop a concept and implementation plan for the establishment of a north-south open space link/spine within the study area to complement existing O'Keefe Trail and Harcourt Park development.