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North and South Shepparton Growth Corridors

Outline Development Plan Report

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Integrated Services:
Engineering, Surveying, Urban Design
Planning, Landscape Architecture
Agricultural Engineering
Sustainable Design

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1.0 Introduction

1.1 Overview

The City of Greater Shepparton's Municipal Strategic Statement (MSS) sets the major strategic directions and objectives for land use and development within the municipality. In particular, it identifies major growth areas for residential development.

Two growth corridors for future residential development have been identified as follows (refer Figure 1):

- north of Ford Road, between the Goulburn Valley Highway and Verney Road (the northern corridor); and
- south of the Broken River to Bennetts Road between the west side of the Goulburn Valley Highway and Goulburn River (the southern corridor)

These corridors are subject to the provisions of a Development Plan Overlay (DPO) No.1. Accordingly an Outline Development Plan (ODP), which indicates the manner in which these corridors are to be developed, is required to be prepared for approval by the Greater Shepparton City Council.

An Outline Development Plan has been prepared for the northern corridor as it has been identified and described in the Greater Shepparton Planning Scheme. However given the existing patterns of rural living development, servicing constraints and environmental issues to the west of Seven Creeks within the southern corridor, it was determined the through site analysis process that the land east of Sevens Creeks forms a defensible boundary to urban style development. The ODP for the southern corridor includes land to the east of Seven Creeks, and south to the intersection of Seven Creeks and the Goulburn Valley Highway.

1.2 ODP Purpose

The purpose of this ODP is to provide the detailed structure of the proposed design of the corridors having regard to the principles and objectives of the Greater Shepparton Planning Scheme and other strategic documents. In this manner the ODP process seeks to ensure the co-ordinated development of this land over time.

The role of this ODP is as the master plan for the ongoing development of the corridors, against which the issue of planning permits for subdivision are considered. The ODPs are to be used as a guide for future development. Proposed developments within these areas must be generally consistent with the overall principles and layout of the ODPs in terms of open space allocation; road reserves, hierarchy and network; buffer zones; pedestrian/cycle movements; retarding basins; connections and densities. Each development application will be assessed on its merits and its general consistency with the ODP.

To this end the planning scheme requires that the ODP include sufficient information to demonstrate that subdivision of the land may proceed in an integrated manner both within the corridors themselves and with the surrounding area.

The ODP is required to indicate:

- The proposed development of each part of the land
- The relationship of the land to adjoining land
- The layout of the subdivision and development of the land, including roads and areas of public open space
- How the proposed development addresses any flood impacts on the subject land
- The provision of safe and efficient vehicle and pedestrian access to and from the land
- Infrastructure provision including sewerage, water, drainage and other utility services
- Open space facilities
- Landscaping, retention of existing vegetation and streetscape treatment
- Any intended contributions to community facilities and services
- The stages, if any, in which the land is to be subdivided and developed, and a timetable of any staged development of the land.

In the preparation of these ODPs, a comprehensive site analysis has been undertaken which has identified site features, site attributes, constraints and opportunities. This information has formed the basis of the design philosophy and the consequent preferred urban form proposed for the subdivision and development of these lands. This design framework will inform the subsequent subdivision applications in terms of Clause 56 of the Greater Shepparton planning Scheme.

1.3 Outline Development Plan Content

This report, together with the accompanying plans, comprises the North and South Growth Corridors Outline Development Plans. This report details background information and site assessments from which this ODP has been prepared. Matters addressed in this report include:

- Description of the site characteristics and site analysis
- Summary of strategic context
- Analysis of population trends
- Housing and market needs analysis
- Analysis of the transport network
- Summary of the infrastructure services and the general manner in which they are to be provided
- Description of the implementation and staging of the development of the corridors
- Discussion of the application of development levies and contributions

2.0 Planning Context

2.1 State Planning Policy Framework

The Victorian Government has developed programs and policies to enhance economic and infrastructure development, investment attraction, job creation and community development in regional and rural Victoria. *Melbourne 2030*, a State Government policy that sets the strategic direction for the growth and development of Melbourne to 2030, recognises the interdependence of metropolitan Melbourne and regional cities and towns. It also acknowledges that a small, but increasing proportion of the housing and population demands in metropolitan Melbourne has transferred to regional areas.

The *Linking Victoria* strategy includes objectives for improved road and rail linkages, and continuing advances in communications, which are opening up access between metropolitan Melbourne and regional markets and jobs. Government's regional development policies are bringing new growth to regional cities and towns, and widening people's choice of location for homes and businesses.

The State Planning Policy Framework includes seven general principles that build upon the objectives for planning in Victoria and aim to create net community benefit and sustainable development.

In regard to settlement throughout the State, the planning policy is to anticipate and respond to the needs of existing and future communities through provision of zoned and serviced land for housing, employment, recreation and open space, commercial and community facilities and infrastructure.

In addition to this policy, there are a number of State policies relating to the environment, management of resources, infrastructure, economic well-being, social needs and regional co-ordination, which have been referred to in the preparation of these ODPs.

2.2 Greater Shepparton Municipal Strategic Statement

The Greater Shepparton Municipal Strategic Statement (MSS) identifies the vision for the municipality as follows:

"The natural environment - Preserve the remaining natural environmental features of the municipality, especially the rivers and streams and their adjacent riparian corridors, remaining wetland areas and remnant native vegetation on public and private land. Appropriate management of both urban and rural development is also necessary in an area that is highly susceptible to flooding.

High quality agricultural land - Preserve high quality agricultural land for productive agricultural purposes and encourage sustainable agricultural and land management practices through the management of urban encroachment

and inappropriate subdivision and development into rural areas.

Pro-active Regional City - *Strengthen growth and be pro-active in attracting new industries and expanding industries to facilitate the continued evolution of Shepparton and Mooroopna as a growing, vibrant and prosperous provincial city. Strengthen and diversify its established role as a regional commercial and service centre, food production and processing centre and transport hub, and to provide continued opportunities for growth in population and employment.*

Smaller towns - *Enable Tatura and other smaller towns in the municipality to develop their own role and identity and for local communities to be involved in determining their own futures. The aim is to encourage population growth within the environmental and infrastructure constraints of each town in order to support the retention of existing services and facilities.*

Civic pride - *Retain and enhance the level of amenity within towns and throughout rural areas in terms of the quality of design and appearance of buildings, the landscaping of public and private areas and the maintenance of public areas. Build a sense of community and of belonging within the municipality, in order to foster a sense of civic pride associated with being part of the City of Greater Shepparton.*

Community services and facilities - *Encourage a broad range of services and facilities appropriate to the needs of residents, businesses and visitors to the municipality.”*

The vision provides the foundation for land use planning policy for the municipality and the key objectives that seek to guide future development.

2.3 Key Planning Policies

The MSS outlines a framework for the strategic planning and development of new growth areas in Greater Shepparton. Together with the State Planning Policy Framework, the MSS (in the form of local planning policies and strategies) provides a significance influence on the development of the corridors. Planning policies of relevance include:

Residential development

- To ensure that there is an adequate land supply for residential and rural residential purposes
- To encourage urban consolidation
- To manage environmental impacts such as flooding and contaminated land
- To promote choice and variety of housing
- To encourage new residential subdivisions to maximise opportunities for solar access.

Commercial development

- To reinforce the existing hierarchy of retail centres

- To provide local, small scale convenience shopping facilities for new residential areas
- To prevent the construction of free standing supermarkets
- To establish cultural and entertainment facilities within or on the periphery of existing or planned activity centres.

Agricultural land

- To protect high value agricultural land
- To minimise conflicts at the urban fringe/agricultural interface
- To encourage ecologically sustainable development (ESD) principles
- To manage development within flood plains
- To protect flood flows.

Open space management

- To provide appropriate facilities services to meet the needs of the community
- To develop recreational opportunities on land managed by other agencies
- To design parks and facilities to cater for a range of recreational facilities.

Infrastructure

- To protect existing irrigation infrastructure.
- To seek development contributions for infrastructure requirements
- To provide an easy and safe bicycle network
- To establish a second road crossing over the Goulburn River
- To maximise the utilisation of existing infrastructure wherever possible.

Community development

- To encourage better utilisation of existing facilities
- To create safe urban environments.

3.0 Strategic Influences

3.1 Regional context

Shepparton is located in the heart of the Goulburn Valley. It covers an area of approximately 2,422 square kilometres and is the fourth largest regional centre in Victoria.

The Goulburn Valley is often referred to as the 'Food Bowl of Australia' as around 25% of the total value of Victoria's agricultural production is generated in this area, with an estimated output value in the vicinity of \$2.5 billion. Major secondary industries in Greater Shepparton are mainly related to food processing, manufacturing and transport.

Greater Shepparton has a population of approximately 58,000 people. Approximately 70% of the population is concentrated in the main urban centres of Shepparton, Mooroopna and Tatura, with the balance of the population residing in the rural areas and surrounding smaller towns. Shepparton is the major regional commercial centre that serves a wider regional population of approximately 160,000.

In the year to June 2001, the population of Greater Shepparton grew at the rate of 1.9% per annum, which is higher than the state regional average growth of 1.2%, and Greater Shepparton experienced the second largest growth in total population of any regional municipality. The median age is around 34.3 years (based on 1998 figures).

Building activity is robust with a consistently high number of permit issued over the last five years.

3.2 Population Profile

3.2.1 Current population characteristics

The period 1991 to 1996 marked a deep recession in Victoria, reflected in the low overall growth rate for regional Victoria of 0.2% per annum. During this period Greater Shepparton continued to grow slowly but steadily with an annual increase of 0.5%.

Regional Victoria recovered from the recession of the early 1990's with employment growth in intensive agriculture, manufacturing and service industries. In 2001 the Estimated Resident Population (ERP) for the City of Greater Shepparton was 58,157, an increase from the 54,179 people in 1996. This population increase represents an annual growth rate of 1.4% over the five year period, higher than the Victorian average of 0.9% per annum.

Between 1996 and 2001, the regional centre of Shepparton itself (including Mooroopna) increased by 1.7% per annum, higher than the State average of 0.9% per annum.

3.2.2 Implications for housing in Shepparton

In the next five to ten years the changes in population composition and size will involve new and older families, and an increase in the number of aged people. The need for housing diversity and choice is advocated in State Planning Policy and is reflected in Clause 21.05-1 of Council's MSS:

"Choice and variety in housing is encouraged in terms of type, affordability and tenure".

The predominant form of housing in Shepparton is a detached 3-4 bedroom house on a larger lot. Anecdotal evidence from real estate agents suggests a preference for lots between 800m² – 950m², and whilst the market has not responded enthusiastically to lots less than 600m², agents indicate some demand for medium density housing.

Additional advice from agents indicates that approximately 70% of the annual take up rate for housing within Shepparton is for conventional residential lots (800m²) and 30% is for low density residential (4,000m²).

3.3 Residential land supply and demand

3.3.1 Estimating demand using population projections

In 2001 the regional centre of Shepparton/Mooroopna had an ERP of 44,850. In projecting a future population for this area an annual growth rate of 1.4% has been adopted. From this growth rate, lot yield and land area requirements for residential use have been projected as shown in the table over the page.

| Pop. in 2015 (based on 1.4% growth p.a.) | Pop. increase 2001-2015 (no. of persons) | No of lots (based on 2.6 persons per h/h) | No of lots required for residential devt | Area of land required for residential devt |
|--|--|---|--|---|
| 54,400 | 9,550 | 3,673 | 2,571 (70%) 1,102 (30%) 3,673 (total) | 273 ha (CR) 580 ha (LD) 853 ha (Total) |

CR = conventional residential LR = low density residential

The calculations in the above table are based on the following assumptions:

- The proportion of conventional residential and low density residential is 70% and 30% of the total respectively.
- The average lot sizes for conventional residential is 800m² and for low density residential is 4,000m²
- Conventional residential is based on 9.4 lots per hectare, and low density residential is based on 1.9 lots per hectare.
- Areas are gross developable areas less 25% allowance for roads.

3.3.2 Estimating demand using building approval information

Building approval data indicates that between 1995 and 2002 an average of 375 new dwellings were approved annually in the City of Greater Shepparton. As approximately 70% of the population live in Shepparton/Mooroopna, for the purposes of this exercise it is assumed that the building approval rate for the urban area of Shepparton/Mooroopna is 70% of 375, being 263 approvals per year. Based on this rate, lot yield and land requirements have been projected as shown in the table below.

| New dwellings required to 2015 (based on 263 new dwellings per annum.) | Area of land required for residential use |
|--|---|
| 3,682 | 274 ha (CR) 581 ha (LR) 855 ha (total) |

CR = conventional residential LR = low density residential

The calculations in the above table are based on the following assumptions:

- Building approvals based on 70% of the total for the municipality of Greater Shepparton
- The proportion of conventional residential and low density residential is 70% and 30% of the total respectively.
- The average lot sizes for conventional residential is 800m² and for low density residential is 4,000m²
- Conventional residential is based on 9.4 lots per hectare, and low density residential is based on 1.9 lots per hectare.
- Areas are gross developable areas less 25% allowance for roads.

3.3.3 Supply of residential land

The MSS identifies areas of Shepparton and Mooroopna for future residential, special investigation (future residential), long term residential potential and rural residential (special investigation area).

Current land supply of residential lots in Shepparton and Mooroopna is limited. Figures supplied by the Greater Shepparton City Council indicate there is approximately 151 hectares (based on 9.4 lots per hectare) of undeveloped Residential 1 Zone land in both Shepparton and Mooroopna. Based on take up rates of 263 dwellings per year there is approximately 2.3 years supply.

In analysing the supply of land within this area it must be recognised that the supply is subject to various constraints including flooding, the location of the Shepparton bypass, proximity to intensive agriculture and the intentions of landowners to develop their land.

| Projected Demand | Amount of land currently zoned Residential 1 | Length of time projected demand can be meet |
|--|---|--|
| Population projection (based on 1.4% growth pa) | 151 ha | 2.6 years |
| Building approvals projection (based on 263 lots pa) | 151 ha | 2.3 years |

The figures supplied from the Greater Shepparton City Council also indicate that of the areas identified in the MSS for potential future and long term residential development that are currently unzoned, there is approximately 576 hectares (also based on 9.4 lots per hectare). As stated above, the supply of this land is also subject to various constraints.

The table below indicates the area of potential land supply.

| Area | Zoned land | Unzoned land |
|--|-------------------|-------------------|
| Future residential | 982 | 1,500 |
| Future Residential (Special Investigation) | - | 1,565 |
| Long Term Residential | 440 | 2,355 |
| Rural Residential | - | - |
| Total lots | 1,422 lots | 5,420 lots |
| Total area | 151 ha | 5576 ha |

The calculations in the above table are based on the following assumptions:

- The north and south growth corridors have been included based on the area of developable land only.
- The number of lots in the Long Term Residential areas may be reduced as a result of the outcomes of the Shepparton-Mooroopna Floodplain Study and the location of the Shepparton bypass.
- Kialla Lakes (south) has not been included as most of the area is developed for rural residential purposes and is within close proximity to the Shepparton Airport.

Of this area of unzoned land the northern and southern growth corridors comprise a developable area of 355 hectares.

3.3.4 Supply and demand analysis

The table below shows the projected demand to 2015 based on both population growth and building approvals, and compares these to land currently zoned and land identified for future and long term residential development.

| Area required to meet demand projection | Supply of currently undeveloped & zoned land | Supply of undeveloped & unzoned land | Deficit by 2015 |
|---|--|--------------------------------------|-----------------|
| 853 ha (based on population growth of 1.4% pa) | 151 ha | 576 ha | 126 ha |
| 856 ha (based on building approval of 263 lots pa) | 151 ha | 576 ha | 129 ha |

The deficit in the above table has been calculated by subtracting the supply of zoned land and the supply of unzoned land from the area required for residential development.

The above analysis has updated the population projections as included in Clause 21.05-1 of the Greater Shepparton Planning Scheme. The projections within the MSS were based on an average of 300 lots per year to 2011, while the revised predictions are based on 375 new dwellings a year within the municipality (of which 70% is within Shepparton/Mooroopna) to 2015.

The supply and demand analysis indicates that by 2015 there will be a deficit in the amount of land either zoned or identified for residential development. The rezoning of the southern and northern growth corridors is therefore justified on the basis that there is a demand for this land to be used for residential purposes and both areas have been investigated and analysed in regard to their development potential.

3.4 Flooding

Flooding has a major influence on future urban development in Shepparton.

The City of Greater Shepparton comprises parts of the Goulburn River Basin and the Broken River Basin. The municipality is generally flat with much of the land having been cleared. Due to the nature of this topography, a significant proportion of the municipality is flood prone or subject to inundation and drainage will be a notable design issue in the development of the northern corridor.

Major floods since the commencement of recordings include September 1921, September 1924, December 1934, August 1939, July 1956, August 1958, May 1974, September 1975, July 1981 and October 1993.

The Shepparton Mooroopna Floodplain Management Study and Floodplain Management Plan (FMP), which covers the main urban districts of Shepparton and Mooroopna and the adjoining rural and semi-rural districts alongside the Goulburn River and its tributaries immediately upstream and downstream of these centres, was completed in October 2002.

The study included the development of a two dimensional hydraulic model and hydraulic investigations. The planning maps were prepared by modelling a dominant flood in the Goulburn River (100 year flood) with a lesser flood in the Broken River and Seven Creeks (50 year flood) and vice-versa.

The FMP includes the preparation of a comprehensive set of flood inundation maps. These maps have been used to determine land that will be within the Urban Floodway Zone, and land that will be subject to the Floodway Overlay or the Land Subject to Inundation Overlay.

Given the proximity to the Seven Creeks and Broken River, flooding has particular implications for the use and development of the south corridor. The corridor is included within the Goulburn River Precinct, and the development requirements of this precinct as outlined in the FMP have been incorporated into the Outline Development Plan.

3.5 Conservation of the remnant natural environment

The Goulburn and Broken Rivers, their tributaries and adjacent riparian corridors of open space and State forests provide the most significant environmental features of the municipality. Outside these areas flora and fauna habitats have been lost

due to extensive tree clearing and farming leaving only remnant areas along road reserves and on farming properties. The northern corridor is particularly characteristic of this condition.

The southern corridor is adjacent to the open space areas of the riverine grassy woodlands and bush that align the Goulburn River and Seven Creeks. The *Goulburn Broken Native Vegetation Management Strategy, 2000* identifies that, compared to pre-European settlement levels, native vegetation cover for these areas is reduced to 30% - 50% of its original cover.

Although the Seven Creeks is located adjacent to a proposed urban development, the designation of the corridor as an urban floodway prohibits residential development and therefore ensures the protection of this vegetation.

In addition to these areas, there are remnant stands of vegetation throughout the corridor and combined with the vegetated watercourse corridors, should be retained where practicably possible to provide an attractive bushland setting for residential development.

3.6 A context of highly productive agricultural land

The economy of the Shepparton region is dependent upon vibrant, profitable and sustainable rural activity. However, some rural areas are under threat from expansion and inappropriate residential subdivision and development. While the MSS clearly sets the direction to develop land within the corridors for urban development, there are existing rural uses within the corridors that should be encouraged to continue in the interim, particularly in the northern corridor where irrigation infrastructure bisects the land.

The ODPs must therefore manage the staging, interface and off-site impacts of rural and urban uses in a sensitive manner.

The prior use of land for farming purposes may have resulted in soil contamination through the use of pesticides and on-site storage of chemicals and fuel. The State Planning Policy Framework requires that responsible authorities consider whether or not the land has been used for purposes, which may have led to contamination and may have adverse impacts on future land uses.

3.7 Road network

The Goulburn Valley Highway forms part of the main traffic route from Melbourne to Shepparton, central New South Wales, Brisbane and other areas of Queensland. The highway is both a National and State highway and has an integral role in the movement of interstate freight.

The highway is nearing full duplication and provides excellent access to the Shepparton CBD. The maximum travelling times from the extremities of the north and south corridors to the CBD are 6 and 10 minutes respectively.

A planning study was commenced in 1995 to determine an alignment for the future bypass of Shepparton. The study involved the development of options for the construction of a dual freeway of approximately 30 kilometres in length.

Following extensive research and community consultation VicRoads has recently advised that the preferred location of the bypass is the 'western route', which crosses the Goulburn River near Toolamba (to the south of Shepparton) and bypasses both the Shepparton and Mooroopna townships to the west before joining up with the Goulburn Valley Highway to the north of Congupna.

In the interim however it is proposed that the bypass reconnect to the Goulburn Valley Highway along the current alignment of Wanganui Road prior to the full completion of the bypass to the north of Congupna. On the east side of the highway, Wanganui Road becomes Ford Road, which forms the southern boundary of the northern growth corridor. Therefore the intersection of Ford Road/Wanganui Road and the highway will have to be substantially upgraded. Preliminary advice from VicRoads suggests that traffic signals are likely to be required at this intersection.

The Shepparton bypass is anticipated to substantially reduce traffic volumes using the Goulburn Valley Highway through the corridors.

In order to maintain travel times, safety and accessibility, there is a need to ensure that direct access onto the Goulburn Valley Highway is limited to collector roads.

3.8 City structure and activity centres

Urban development in Shepparton is predominantly concentrated along the central spine of the Goulburn Valley Highway resulting in the city developing in a predominantly north-south direction over an 8 kilometres distance.

The average lot sizes for residential development within the municipality are 850m² - 950m² for conventional residential development and 4,000m² for rural residential development. To a limited extent there is some medium density development concentrated around the more established areas of Shepparton.

The Shepparton CBD is the major regional centre for shopping and business within the municipality. Historically housing has developed around the centre and in recent years has spread in a linear fashion to the south-east and north-west.

In addition to the CBD, residential areas are serviced by a hierarchy of other lower order activity centres including:-

- Community centres such as the Shepparton Marketplace and the Shepparton Shopping Plaza. Both centres are characterised by having a freestanding supermarket and speciality shops. The Shepparton Marketplace also contains a discount department store. This centre has a floor area limit of 15,000m².
- Neighbourhood centres, including the IGA Supermarket Centre on the northern edge of Shepparton and along the Goulburn Valley Highway, south of Shepparton.
- Local centres including milk bars, and/or a small number of speciality shops that are scattered throughout the city.

The north and south corridors are 4 kilometres and 2.75 kilometres respectively from the CBD. If the corridors are fully developed, the maximum distance from the CBD will be 5.75 kilometres for the north corridor and 8.75 kilometres for the south corridor. If the local communities are to have convenient access to local services then new local convenience centres will need to be established in the corridors.

4.0 The North Corridor - Existing Conditions and Analysis

4.1 Description

Commencing approximately 3 kilometres north of the Shepparton Post Office, the north corridor is generally regular in shape, save for the north western boundary, which follows the north east alignment of the Goulburn Valley Highway.

The total area of the corridor is approximately 200.6 hectares and it is bound by Goulburn Valley Highway to the west (1.8 kilometres), by Ford Road to the south (1.2 kilometres), by Verney Road to the east (1.65 kilometres) and by the No. 14 GMW irrigation channel to the north (900 metres).

Within the corridor area the primary land uses are grazing and intensive agriculture in the form of orcharding and vineyards. However to the south-west, there is a small strip of commercial/light industrial activity located along the Goulburn Valley Highway frontage. The No. 12 GMW irrigation channel flows east west through the middle of the corridor, and the No.14 channel defines the northern boundary.

The north Shepparton sub-station is located within the corridor. The 66kv and 220Kv transmission lines, pylons and associated easement traverse the corridor on an east west alignment, and the substation is located on Verney Road.

4.2 Surrounding land uses

Located within a designated residential growth area, the north corridor is situated at the interface between urban development to the south, rural residential development to the north and rural uses to the east and west.

The rural uses to the east and west generally comprise grazing and intensive agriculture. The urban land uses to the south comprise conventional residential allotments, and also some commercial and industrial uses.

To the immediate north, land is used for rural residential purposes, and beyond this development is the Goulburn Valley Grammar School and Radio Australia.

Land to the west of the corridor, and along the Goulburn Valley Highway is used predominantly for highway business and light commercial purposes.

A range of community, commercial and recreational facilities are located to the south of the corridor.

4.3 Zoning and Encumbrances

In accordance with the Greater Shepparton Planning Scheme the majority of the land within the corridor is zoned Rural (RUZ). Land in the north east corner is zoned Low Density Residential (LDRZ) and the substation is included within the Public Use Zone (PUZ) No. 1 – Service and Utility.

The Development Plan Overlay (DPO) No. 1 applies to the whole corridor. Small areas to the north of the corridor are included within Environmental Significance Overlays (ESO) No. 1 – Radio Australia Environmental Significance Area and No. 2 – Shepparton Waste Water Treatment Complex Environmental Significance Area which recognise and protect the operations of Radio Australia and the Shepparton Wastewater Management Facility respectively.

4.4 Landscape characteristics

The landscape characteristics of the corridor are:

- a flat landscape with no significant variation in elevation.
- the clearance of all pre-European settlement vegetation to create the appearance of dry open pasture.
- 66Kv and 220Kv transmission lines that cross the corridor in an east-west direction.
- the Goulburn Murray Water irrigation channels which both cross the mid section of the corridor and generally follow the southern and northern boundaries.

4.5 Opportunities and Constraints

The opportunities and constraints presented by the north corridor area may be summarised as follows:

Location:

- Its relative isolated location away from the facilities provided in the established urban areas of Shepparton. There is however the opportunity to provide a framework for land use and development which enhances community living by a planned location of local facilities within reasonable walking distance to most houses within the corridor.

Existing land use activities:

- The presence of activities within and adjacent to the corridor (such as the north Shepparton sub-station, the 66 Kv transmission line and Radio Australia), impose or constrain use and development of land in the corridor. In particular, the 66 Kv transmission line detrimentally affects the visual quality and amenity of the area. The restrictions on developing land affected by the electricity easement however provides an opportunity to create a major area of open space and improved amenity including an east west pedestrian linkage across the site.

- The irrigation channels present both constraints and opportunities. They constrain contiguous development and north-south access. They are a potential safety risk. Concurrently they represent a unique landscape feature, offering the visual benefits of large water bodies in new development areas.
- Orchards and vineyards remain an isolated feature within the corridor but are a focus of land use to the immediate east of Verney Road. Boundary, spray and amenity issues will therefore be an important consideration in the short term.

Vegetation:

- Existing vegetation is limited to the remnant native vegetation that is located either along property boundaries or around farm buildings. There are however opportunities to retain and revegetate the remnant vegetation to contain spaces, provide shade and create links to the original landscape. Local provenance vegetation could be used in the revegetation of areas.

Goulburn Valley Highway:

- Smaller lot properties should not have individual direct access to the Goulburn Valley Highway. Access via service roads as proposed with openings at desired locations will address the safe and orderly function of the Highway. The use of 'Plantation Reserves' or landscaping of 'outer separators' will enhance the amenity of the developments and provide the City of Greater Shepparton with an urban design opportunity to provide for a 'northern gateway' treatment.
- The commitment of industrial uses to a small part of the land with a Goulburn Valley Highway frontage, north east of its intersection with Ford Road, is both a constraint and opportunity. It provides a buffer and limited access to the highway, but poses interface issues with any future residential development of the land to the east.
- The section of the Goulburn Valley Highway north of Ford Road is the northern gateway entrance to Shepparton. There is an opportunity for land along the west boundary of the corridor to become part of this northern gateway entrance.
- The intersection between Ford Road and the Goulburn Valley Highway will need to be upgraded to cater for increased traffic resulting from the interim connection of the Shepparton bypass to the highway (which will occur at the Wanganui/Ford Roads intersection, and the role of Ford Road as a major east west link between the industrial areas and the bypass. Road design and lot layout along Ford Road should have regard to its potential future widening and may include some limitation on direct lot access.

Road network and public transport:

- Southdown Street to the south of Ford Road offers an important mid block access within the corridor to areas to the

south. Consideration might be given to extending that north as a mid block collector access and corridor, particularly given the comments above about public transport accessibility.

- Public transport is presently limited to bus routes along the Goulburn Valley Highway to the Goulburn Valley Base Hospital to the south. In order to make public transport accessible to all dwellings within the corridor, there should be strategies to enable the service to be provided midway between the two roads.

Physical services:

- The existing drainage capacity is limited and this combined with the strict requirements of Goulburn Murray Water necessitate the provision of retarding basins to reduce flows to an allowable discharge rate if urban development is to occur. The open space corridor along the transmission corridor is one option in an expanded role and network of irrigation/drainage corridors that bring a water feature further within the residential estates.
- Land south of the transmission line can be serviced relatively easily given the location of existing services within or along the adjacent road frontages. For land situated north of the transmission line, the provision of services is more expensive to supply given the lack of gas and sewer and the need to upgrade the existing electricity and water supply.
- The location of the Shepparton Wastewater Management Facility results in some limitation to dwelling development along a narrow strip of land in the north west corner of the corridor as recognised by the Environment Significance Overlay ESO No. 2 in the planning scheme.

5.0 The Southern Corridor - Existing Conditions and Analysis

5.1 Description

The southern corridor commences some 2.75 km south of the Shepparton Post Office. It is elongated and irregular in shape with its western and southern boundaries shaped by Seven Creeks, its northern boundary being the Broken River, and the Goulburn Valley Highway defining the eastern boundary.

The corridor length is approximately 6 kilometres with its width varying between 1.3 kilometres at Riverview Drive and 400 metres south of River Road West.

The total area of the corridor is approximately 490 hectares.

Access from the corridor to Shepparton is via the Goulburn Valley Highway. Raftery Road and Riverview Dive provide access to the Goulburn Valley Highway in an east-west direction.

Land uses within the corridor are varied and include:

- Areas of existing residential development, including land on the southern side of Riverview Drive, Kialla Park Estate (north of Raftery Road), and Seven Creeks Estate (south of Raftery Road).
- Highway business and commercial uses along the highway frontage within the north of the corridor.
- Emerald Bank Nursery, Heritage Farm and Paradise Motel north of River Road West.
- A roadhouse on the south west corner of Goulburn Valley Highway and River Road West.
- The primary non-urban land use is grazing.

The riparian environs of Seven Creeks also form a significant part of the corridor.

5.2 Surrounding land uses

A variety of land uses surround the corridor, characteristic of its location south of the Shepparton CBD and along the Goulburn Valley Highway.

Alongside both the Broken River and Seven Creeks are the riparian environs associated with these waterways. To the north of the Broken River is conventional residential development.

The land to the west and south of Seven Creeks is used for rural purposes and is zoned Rural Living. Arcadia Downs low density residential subdivision is located to the west of this area, accessed via Raftery Road.

To the east of the Goulburn Valley Highway are also a variety of uses including Kialla Lakes residential development, industrial development and highway business and commercial development on the highway frontage.

The corridor is also characterised by being located adjacent or close to some special uses which include the Shepparton Airport and the Shepparton Trotting Track to the east. The corridor also contains the former drive-in site (corner Riverview Drive and Goulburn Valley Highway), which is a major redevelopment site, with a potential retail or community services role.

5.3 Zoning and Encumbrances

In accordance with the Greater Shepparton Planning Scheme the majority of the land within the corridor is zoned Rural (RUZ). Other zonings include the Urban Floodway Zone (UFZ), which generally follows the alignment of the Seven Creeks, several pockets of Residential 1 Zone (R1Z), a Rural Living Zone (RLZ) to the south and Public Park and Recreation Zone (PPRZ) for Kialla Park.

The Development Plan Overlay (DPO) No. 1 applies to the whole corridor, as does the Land Subject to Inundation Overlay (LSIO). Parts of the corridor are subject to the Airport Environs Overlay (AEO) due to proximity to the Shepparton Airport.

5.4 Landscape character

The landscape features of the corridor are:

- The Seven Creeks, which meanders along the eastern boundary of the corridor in a north-south direction. The creek's shallow banks are wooded to create the only significant natural landscape feature.
- The bushland areas adjacent to the Goulburn and Broken Rivers, which provide a backdrop of eucalypts and shrubs along the western and northern boundaries of the north corridor.
- The mixed use strip development along the east side of the corridor, which follows the alignment of the Goulburn Valley Highway.
- Sporadic residential and commercial development interspersed amongst rural land uses.
- A generally flat landscape that, with the exception of a small depression for the Seven Creeks, has no significant variation in elevation.
- The clearance of all pre-European settlement vegetation in most areas to create the appearance of dry open pasture.

5.5 Opportunities and Constraints

The opportunities and constraints presented by the north corridor area may be summarised as follows:

Location:

- The elongated form of the corridor results in some areas being isolated from local services and facilities that would normally be found in the established urban areas of Shepparton. There is however the opportunity to build upon the existing facilities and provide a framework for land use and development that includes the location of local facilities within reasonable walking distance of most dwellings within the corridor.

Existing land use activities:

- The south corridor has established areas of residential development, which contain dwellings that are either in conventional or low density subdivisions. There is opportunity to:
 - create housing choice in both location and housing type by identifying new areas for development and suitable sites for medium density.
 - integrate with the established communities by having regard to the existing subdivision patterns, road layout and form and appearance of development.
 - to open up multiple fronts of residential development that build upon, infill and consolidated the sporadic and ribbon development that has occurred to date.
- Given the amount of land available and the existing patterns of development, the developable land east of Seven Creeks forms a defensible boundary to urban style development.
- The airport environs overlay may affect the use of a wedge of land to the south of Raftery Road and west of the airport.

Vegetation:

- The bushland and wooded areas of the Broken and Goulburn Rivers and the Seven Creeks create attractive views and a backdrop to living environments. While, there is the opportunity to maximise views and access to these areas, care should be taken to manage the interface between urban development and river/creek corridors to protect the remnant vegetation and water catchment systems and maximise community and environmental benefits. Larger low-density residential lots are a response to this problem, but there is a preference to progressively secure these areas that are subject to flooding within the public domain. This will assist in developments blending in with the riparian corridors.

Flooding:

- A significant proportion of land within the corridor area is likely to be either in an Urban Floodway Zone and the Floodway or Land Subject to Inundation Overlays. The floodway designation prohibits development of land. While development can occur within areas subject to inundation, preference should be given to developing areas not subject to the constraint of inundation.

Goulburn Valley Highway:

- The extent of strip development along the Goulburn Valley Highway should be managed so that it does not dominate this entrance to Shepparton. Strip development should therefore be contained by zoning and identifying preferred areas along the highway for residential development.

Road network and public transport:

- North-south access along and within the corridor area is limited to the Goulburn Valley Highway. There is an opportunity to increase permeability within the corridor area by identifying an alternate north south route adjacent to Seven Creeks.
- Public transport is limited to bus routes along the Goulburn Valley Highway. In order to make public transport accessible to pedestrians within the residential areas, collector roads should ideally be provided at every 800 metres along the Goulburn Valley Highway on an east-west alignment.

Physical services:

- The drainage capacity of the corridor is affected by the Goulburn Broken Catchment Management Authority requirements to attenuate the developed flows back to equivalent rural flows. Drainage of the corridor to the critical 100 year event is considered impractical and ineffective. Agreement needs to be sought with the Authority to attenuate the developed flows back to the 20 year ARI event. Initiatives to improve drainage include aligning the roads and lots in the direction of major drainage flows, and the creation of dry and wet retardation and wetland systems.
- The Goulburn Valley Highway provides an easement for most services including water, gas, sewerage and power to River Road West. The capacity of these services to accommodate future urban development is generally described below.

Power – there is limited spare capacity to support the full development of the corridor, particularly south of Raftery Road. Upgrades will be required.

Gas – the existing 100mm main along the Goulburn Valley Highway to Emerald Bank Heritage Farm can support the future development of the corridor. The 50mm main along Raftery Road does not however have spare capacity and an upgrade will be required.

Water – the existing water main along the Goulburn Valley Highway to River Road together with distribution system augmentation works proposed for the southern portion of the water supply system will support conventional residential development to River Road.

Sewer- Development of infill areas between the Broken River and Raftery Road west of the Goulburn Valley Highway can generally be serviced by extending reticulated system in this area.

The existing sewerage system south of Raftery Road (to River Road) is limited to a small sewage pump station at the entrance to the Paradise Lakes Motel and 100mm diameter rising main discharging to the north. This infrastructure will need to be augmented.

All sewage and wastewater collected within Shepparton is currently conveyed to the Shepparton Wastewater Management Facility located north of Shepparton via the central trunk sewer system. Augmentation of this central trunk sewer system to support continued growth in the south will be required.

Tenure expectation and staging of development:

- Several landowners have considerable land holdings (over 50 hectares) and are in position to subdivide their land immediately should it be rezoned.

6.0 Principles for the preparation of outline development plans

In the preparation of ODPs for the north and south corridors it is desirable to identify and apply a series of important principles and concepts that will influence decision making and urban design features.

It is the vision for these ODPs that vibrant, attractive and sustainable new residential communities are created. The principles of the ODPs include;

- Containment and consolidation of the urban form
- Enhancing community convenience and accessibility
- Establishing a distinctive neighbourhood character
- Provide for housing choice and diversity
- Build safe and sustainable communities
- Providing pedestrian friendly environments
- Easy walking distance to facilities and open space
- Appropriate solar orientation of lots
- Recognition and protection of cultural, environmental and heritage values, including the riparian environs of Seven Creeks.
- Open space areas which link urban development activity and provide for a variety of experiences

7.0 Features of the Outline Development Plans

The designs for the north and south corridor ODPs have been developed using the principles articulated in Section 6. Underlying these principles is the primary objective that the development of land in the corridors be undertaken in an orderly and progressive manner.

The plans for the ODPs are provided in Figures 2 and 3 (a & b) and the features are described below.

The following overview of the Outline Development Plans is structured around the elements critical to the development of new residential areas. These elements include subdivision design and lot layout, public open space, and the road network and hierarchy. Combined together the elements provide a framework for subdivision design that creates neighbourhoods, which are sustainable, safe and stimulating.

7.1 Land Budget

The north and south growth corridors have a gross land area of approximately 690 hectares. Existing residential, commercial and tourism development, existing open space and landscape buffers and land within easements and the urban floodway reduce the overall area that can be developed to approximately 355 hectares as shown in the tables below:

| | |
|---|-----------------|
| Gross ODP area | 688.96ha |
| Less existing developed land | |
| • Existing residential | 51.91ha |
| • Existing commercial | 16.42ha |
| • Existing buffers | 3.33ha |
| • Existing open space | 14.66ha |
| • Emerald Bank Heritage Farm | 18.54ha |
| Less undevelopable land | |
| • Urban floodway | 202.63ha |
| • Channels | 12.75ha |
| • Substation | 4.94ha |
| • Power easement | 8.45ha |
| Total developed and undevelopable land | 333.63ha |
| Total Developable Area | 355.33ha |

The developable area will comprise as follows:

| | |
|---|--------------------------|
| Gross developable area | 355.33ha |
| Conventional residential development (average lot size of 800m ²) | 222.11ha (2,088 lots) |
| Lower density residential development (minimum lot size of 2,000m ²) | 77.31ha (294 lots) |
| Low density residential development (minimum lot size of 4,000m ²) | 41.79ha (79 lots) |
| Open space area | 14.12ha |

NB: The number of lots should be used as a guide only as they have been based on the minimum subdivision size for each area.

*Conventional residential development based on 9.4 lots/ha
Low density 2000m² based on 3.8 lots/ha
Low density 4000m² based on 1.9 lots/ha*

7.1.1 Land Budget for the Northern Corridor

The northern corridor comprises 200.68 hectares of land, comprising the following:

| | |
|---|------------------|
| Gross ODP area | 200.68 ha |
| Less existing developed land | |
| • Existing buffers | 0.64ha |
| Less undevelopable land | |
| • Channels | 12.75ha |
| • Substation | 4.94ha |
| • Transmission easement | 8.45ha |
| Total developed and undevelopable land | 26.78ha |
| Total Developable Area | 173.90ha |

The developable area will comprise as follows:

| | |
|---|-----------------------|
| Gross developable area | 173.90ha |
| Conventional residential development (average lot size of 800m ²) | 88.54ha (832 lots) |
| Low density residential development (minimum lot size of 2,000m ²) | 35.79ha (136 lots) |
| Low density residential development (minimum lot size of 4,000m ²) | 41.79ha (79 lots) |
| Open space area | 7.78ha |

NB: The number of lots should be used as a guide only as they have been based on the minimum subdivision size for each area.

*Conventional residential development based on 9.4 lots/ha
Low density 2000m² based on 3.8 lots/ha
Low density 4000m² based on 1.9 lots/ha*

The fully developed capacity of the northern corridor ODP area is expected to provide for a resident population of 2,722 based

on a total lot yield of approximately 1,047 (at 2.6 persons per household).

7.1.2 Land Budget for the Southern Corridor

The southern corridor comprises 488.3 hectares of land, comprising the following:

| | |
|---|------------------|
| Gross ODP area | 488.30 ha |
| Less existing developed land | |
| • Existing residential | 51.92ha |
| • Existing commercial | 16.43ha |
| • Existing buffers | 2.69ha |
| • Existing open space | 14.66ha |
| • Emerald Bank Heritage Farm | 18.54ha |
| Less undevelopable land | |
| • Urban floodway | 202.63ha |
| Total developed and Undevelopable land | 306.87ha |
| Total Developable Area | 181.43ha |

The developable area will comprise as follows:

| | |
|---|-------------------------|
| Gross developable area | 181.43ha |
| Conventional residential development (average lot size of 800m ²) | 133.60ha (1256 lots) |
| Low density residential development (minimum lot size of 2,000m ²) | 41.50ha (156 lots) |
| Open space area | 6.33ha |

NB: The number of lots should be used as a guide only as they have been based on the minimum subdivision size for each area.

*Conventional residential development based on 9.4 lots/ha
Low density 2000m² based on 3.8 lots/ha
Low density 4000m² based on 1.9 lots/ha*

The fully developed capacity of the southern corridor ODP area is expected to provide for a resident population of 3,671 based on a total lot yield of approximately 1,412 (at 2.6 persons per household).

7.2 Subdivision design and layout features

The designs for the ODPs are based on a modified grid layout that allows for permeability through the corridors for both vehicles and pedestrians while responding to the natural characteristics of the site such as the significant vegetation, waterways and cultural features. The principal features of the subdivision design and layout are:

- Development on only one side of the road where land abuts land within the urban floodway and forming part of a river or watercourse alignment or adjacent to areas of public open space. The riparian environs of Seven Creeks form a significant component of the character of the southern growth corridor, and this design feature responds positively to this attribute. It provides a sense of identity and character, as residential dwellings will front onto the creek environs, thereby integrating with the residential setting. Development on only one side of the road also enhances the safety and security of residents and users of public open spaces. Dwelling and lots oriented to front public areas allow surveillance of streets and open spaces.
- A mix of lot sizes with opportunities for medium density development at appropriate locations such as adjacent to open space areas, public transport and local convenience centres.
- A limited length for the modules of 200 - 250 metres where practicable to maximise the permeability and effectively break up the continuous length of house frontage along the street.
- A street network based on a traditional grid pattern with distinct east-west and north-south links to adjoining existing and proposed development areas.
- Recognition and protection of local characteristics and features such as the creek/river corridors, irrigation channels, and vegetation in the subdivision layout.
- Provision for larger lots, setbacks, landscaped buffers and/or roads in locations where amenity could be affected by adjacent or nearby land uses such as industry or arterial roads.
- The orientation of lots to maximise views over open space areas and environmental features.
- The alignment of lots along existing title boundaries to allow staged development to effectively occur.
- The orientation of lots to front the Goulburn Valley Highway to improve the entrances to Shepparton. The development of land within 100 metres of the Goulburn Valley Highway is to have reference to and comply with Local Policy 22.04 of the Planning Scheme.
- A layout that recognises existing subdivisions and accommodates proposals submitted to Council at the time of the preparation of the ODPs.

7.2.1 Subdivision Design and Layout for the Northern Corridor

The subdivision layout for the north corridor comprises:

- A conventional residential development area north of Ford Road to the transmission easement.
- A conventional residential development area north of the transmission easement to the GMW Channel No. 12.
- An area of lower density residential development (minimum lot size of 2,000m²) north of the GMW Channel No. 14 and west of the existing Low Density Residential Zone (minimum lot size of 4,000m²).
- Various areas of open space
- The transmission easement and sub station, GMW infrastructure easements and the existing subdivision in the north east of the corridor.

Where possible residential lots should have views over existing irrigation channels and proposed open space areas.

For proposed residential areas in the north west of the corridor affected by the Shepparton Wastewater Treatment Complex Environmental Significance Area, subdivision plans will need to include building envelopes to exclude buildings from these areas.

7.2.2 Subdivision Design and Layout for the Southern Corridor

The subdivision layout for the south corridor comprises:

- A conventional residential development area north of Riverview Drive.
- A conventional residential development area south of Riverview Drive to Emerald Bank Heritage Farm and Paradise Motel.
- An area of lower density residential development south of River Road West to the intersection of the Goulburn Valley Highway and Seven Creeks.
- Highway business and commercial areas along the Goulburn Valley Highway.
- Various areas of open space.
- Flood prone land along Seven Creeks.
- The Emerald Bank Heritage Farm and Paradise Motel.
- Existing conventional residential developments.

Where possible lots should be oriented to provide views of the Seven Creeks and Broken River environs and the proposed open space areas.

Development set backs from the Seven Creeks corridor are to be in accordance with distances required by the Department of Natural Resources and Environment.

7.3 Traffic and transport

The transport network and traffic management structure of the ODPs is important in maintaining and contributing to the

amenity and liveability of the area. The transport and traffic planning for the corridors seeks to:

- Provide interconnectivity for all forms of transport so that car dependency can be reduced
- Utilise the existing arterial road network as the main traffic routes
- Provide options for maximising the potential for alternative transport provisions
- Integrate road areas with living spaces
- Ensure that development of roads takes into account the features of the corridors.
- Provide pavement widths and on-street parking to meet the appropriate level of activity along the road.

The features of the road network and layout for the ODPs are as follows:

- A grid based internal road pattern, which links to the adjoining arterial and secondary arterial roads. The primary arterial road for both corridors is the Goulburn Valley Highway and connections to this road must be minimised to maintain the efficient function of this arterial road.
- The provision of a traditional road hierarchy that provides for a safe layout and design by having road widths appropriate to the function of the road and road reserves sufficiently wide to allow for future road widening and the future placement of utility services.
- A general alignment of roads in a north/south or east/west direction to:
 - provide good internal connectivity;
 - facilitate the optimum solar orientation of lots;
 - provide drainage courses for overland flows;
 - maintain pleasant views from the roadway and lots to surrounding features.
- A layout that has good internal accessibility by limiting the provision of dead end streets to locations where roads terminate at open space.
- Pavement widths and on street parking to be provided in accordance with the appropriate Australian Standards.
- The distribution of collector roads at approximately 800 metres centres to allow for the provision of and easy access to bus routes.
- The provision of traffic calming treatments, such as roundabouts, at appropriate locations.

The road hierarchy and functions applicable throughout the corridors are described below.

Arterial roads (Primary and Secondary):

- The primary function of the arterial road network is to form the main traffic routes, and it is required to be continuous and facilitate the movement of high numbers of vehicles as

efficiently as possible. These roads also for the basis of inter-regional bus services.

- The Goulburn Valley Highway will perform a primary arterial function.
- Riverview Drive (in the southern growth corridor) and Ford and Verney Roads (in the northern growth corridor) will perform a secondary arterial road function.
- The upgrading and widening of Ford Road to reflect its purpose as a major east west link between industrial areas and the Shepparton by-pass will occur in the future as demand requires. Preliminary advice from VicRoads suggests that traffic signals are likely to be required at the intersection of Ford Road and the Goulburn Valley Highway. The pavement width and alignment of Ford Road east of Verney Road is also subject to review.
- Service roads will be provided along the primary arterial roads. This will improve the amenity of the abutting lots, ensure that vehicle movements along the roads are not compromised and will retain the visual aspect of the roads by having front fences rather than rear fences facing the roads.

Collector roads:

- The primary function of the collector roads is to provide a finer grain of traffic routes throughout the residential area and collect traffic from the local roads. Collector roads have a reasonable level of residential amenity by restricting traffic volumes and speeds. These roads will be the basis for the local bus services.
- The collector roads generally comprise a 20 metre wide reservation which provides for a 2 lane undivided two way carriageway with full access and indented parking for the abutting properties. Each side of the road will have a footpath. A typical cross section for these roads is shown in Figure 4.
- The proposed collector road in the southern growth corridor located between Taig Avenue and Raftery Road will have a split pavement with central median. The additional purpose of this road is to provide a drainage passage for overland flows.
- Four way intersections between collector roads will be controlled by roundabouts or other suitable traffic control devices. The ultimate traffic volumes on the collector roads will be adequately catered for in the proposed road sections.
- Collector road intersections with the arterial roads will require the provision of turning lanes at a minimum. Service roads and local street intersections should form uncontrolled T-intersections with the arterial roads.

Local streets and access places:

- A 5.5 metre pavement width provides for parking on one side of the carriageway only while allowing the passing of a lane of traffic. These roads will generally cater for traffic volumes of up to 1,000 vehicles per day. A footpath will be provided on both sides of the road. A typical cross section of the local roads is shown in Figure 4.
- The width of these roads will be developed in negotiation with Council. The local roads should be designed to ensure that safety is not compromised. The location of traffic control facilities will be considered at the development approvals stage of development.

Service roads:

- Service roads will be located along the Goulburn Valley Highway. These roads would provide safer pedestrian environs, and would provide for developments to front main roads to improve the appearance of the highway. A typical cross section for these roads is shown in Figure 4. The provision of a service road responds positively to the location of the adjacent Goulburn Valley Highway.

7.4 Pedestrian Network

One of the primary aspects of new residential areas is the provision of aesthetic, accessible and numerous linear recreational parks for cyclists and pedestrians. The ODPs contain a network of paths, which link with the City of Greater Shepparton's broader shared pathway and pedestrian network. As there are two types of cyclists; the commuter and the recreational cyclist, the ODPs provide a variety of pathways to satisfy their varying needs. The features of the pedestrian network for the ODPs are:

- A hierarchy of paths to provide linkages to features and facilities throughout the corridors.
- Shared pathways for recreation cyclists and pedestrians are to be provided along the natural and man-made features of the corridor including the power easement, Seven Creeks and all roads.
- Pedestrian footpaths in all residential road reserves.

7.5 Streetscape

High quality and consistent landscaping treatment of private land and road reserves have a significance effect on the appearance and visual amenity of an area. The features of the ODPs that will contribute to improving streetscapes are the:

- Use of indigenous, exotic and low maintenance plant species to integrate with Council's adopted urban design themes including the City of Greater Shepparton's Streetscape Planting Strategy. In areas not covered by the Strategy, Council is to advise of the appropriate planting themes.
- Introduction of thematic planting along all roads and in local open space areas.

- Subdivision layouts to retain existing vegetation on lots where practicably possible particularly existing mature trees.
- Use of screen planting to provide buffers and to off-set the visual impacts of adjacent commercial and industrial areas, including the transmission easement and sub-station.
- Providing generous road reservations to create buffers between the traffic flows and properties. The buffer enables the retention and provision of significant vegetation and cultural features.
- The development of design concepts and treatments that seek to improve the appearance of the Goulburn Valley Highway and entrances to Shepparton.

7.6 Open space

The ODPs for both corridors provide a variety of open space areas, which take advantage of the existing and proposed natural and man made features. The resulting open space network provides a range of passive and active recreational opportunities, while creating a specific character and image for each of the corridors.

The open space network has been designed as an integral part of the development and will provide the framework for pedestrian walkways and cycle paths throughout the corridors, as well as linkage beyond the corridors.

The Greater Shepparton City Council is currently preparing a model for the location and distribution of public open space within the municipality. Development proposals within the corridors must give consideration to this model (when completed).

The incorporation of environmentally sustainable development principles is reflected in the design and location of the open space network. A number of open space areas will feature wetlands that will provide for both a visual function and provide for water retention and treatment within the overall water sensitive design concept.

The open space network comprises the following:

- An area of approximately 14 hectares in both corridors (7.8 ha in the northern corridor and 6.3 ha in the southern corridor) of unencumbered open space is provided in addition to the existing 14.7 hectares (Kialla Park) of unencumbered open space. This represents a total of approximately 30 hectares of unencumbered public open space.
- Although encumbered, the areas within both the urban floodway and the transmission easement are considered to be valuable as significant components in the overall linear park and open space network, and contribute 210 hectares.
- Open space areas will protect existing natural features such as trees, creeks and archaeological sites where practical.

- The provision of local neighbourhood open space generally within 300 metres walking distance to all households. Local park areas will approximately 0.5 – 1 hectare in size, and have been located within the corridors to provide immediate access and to improve views for vehicles and pedestrians. The size and location of these parks is to be determined in negotiation with Council at the development approval stage.
- Provision of active frontages to open space areas will be promoted to increase natural surveillance of parks and to capitalise on 'green' views.
- Provision of open space along linear elements such as creeks and easements to provide the opportunity for linkages to future developments and facilities.
- Provision of a variety of streetscape and road treatments along open space areas in order to reinforce the hierarchy of parks and to manage traffic and vehicle speeds to increase safety.

7.6.1 Open Space in the Southern Corridor

- In the southern corridor extensive areas are designated urban floodway. The future ownership and management of these areas is further discussed in Section 8.1 of this Report.

7.7 Environment

The Greater Shepparton Municipal Strategic Statement (MSS) identifies the need to protect the municipality's environmental assets, particularly as the natural environment has been fundamentally altered by past human activities to the extent that there are few natural environmental areas in the municipality. The features of the ODPs that address these issues are as follows:

Catchment and waterway management:

- Water sensitive urban design approaches to be used to manage the environmental impacts of urban stormwater.
- Provision of appropriate water quality treatment measures to ensure development does not disrupt the integrity of the existing irrigation, water supply or catchment systems. The approaches include the provision of reticulated sewerage to residential (including lower density) development; the minimisation of impervious surface areas; attenuation or "dampening" of stormwater flows; removal of pollutants; the retention and creation of habitat areas; and water conservation.
- Drainage systems including retention basins to be designed to attenuate stormwater flows at strategic locations to optimise the interception, retention and removal of pollutants. Stormwater drainage to be designed in accordance with the Urban Stormwater – Best Practice Environmental Management Guidelines (CSIRO 1999)
- Subdivision layout and design to meet Goulburn Valley Water, Goulburn Murray Water and the Goulburn Broken Catchment Management Authority's particular requirements including the

relevant recommendations arising from the Shepparton – Mooroopna Floodplain Management Plan 2002.

- Written documentation and plans submitted with a planning permit application are to include local drainage strategies to identify the works that are required for the drainage of proposed subdivisions. Developers are required to carry out work to implement the proposed drainage schemes.
- Construction works are required to adopt measures that minimise the movement of sediments into the natural drainage systems in accordance with best practice guidelines (Construction Techniques for Sediment Pollution Control, EPA 1991).
- A strategy for the future ownership and management of land within the Seven Creek environs that is subject to flooding and therefore constrained for development is currently being prepared. Section 10.1 of this Report provides further details in regard to this issue.

Flora and Fauna:

- Preservation of remnant vegetation and habitat areas is to occur where practicably possible as a theme for the corridors. Where practicable, vegetation is to be incorporated into the open space areas and road reserves.
- Planning permit applications for subdivision are to be supported by a detailed flora and fauna study. In the event of the identification of significant sites, a report must be prepared from a suitably qualified botanist or zoologist to demonstrate the impacts of the development proposal on the existing vegetation and fauna species.
- Weed control and revegetation works to be encouraged to increase the ecological values of the corridors.
- Preservation and provision of native vegetation is encouraged within site development.

Aboriginal & Cultural:

- Subdivision proposals are to include archaeological surveys and reports to identify whether a site contains any artefacts. In situations where artefacts are found, the proponent is required to undertake careful site works to ensure that the proper identification and recording of potential aboriginal artefacts is not compromised.

Contaminated Land:

- Subdivision proposals to provide supporting evidence that the requirements of Ministerial Direction No. 1 relating to contaminated land have been met.

Erosion and sediment control:

- During construction, developers are to carry out ‘best practice’ site management practices to reduce sediment export from the site. Examples include silt fences, ponds, socks, hay bales and similar techniques to minimise the transport of sediments to the drainage lines. Development plans are to include a management plan in accordance with the EPA Guidelines.

Highway Noise:

- Residential properties along the Goulburn Valley Highway are to be sited, designed and constructed so they meet the standards set out in AS 367/-1989 Acoustic and Road Traffic Noise Intrusion – Building Siting and Construction.

7.7.1 Environment in the Southern Corridor

- Approximately 202.63 hectares of land is potentially affected by floodway as identified by the Shepparton Mooroopna Floodplain Management Study along the alignment for the Seven Creeks. The ownership and management of these areas is further discussed in Section 8.1 of this Report.
- Where land is affected by the ‘Land Subject to Inundation Overlay’, the development plans must meet the Goulburn Broken Catchment Management Authority’s requirements in particular the requirement that floor levels of houses be set at 0.3 metres above the 100 year flood level.
- Design of stormwater facilities and retarding basins to be in accordance with the State Environment Protection Policy “Best Practice Environmental Guidelines” and to include gross pollutant/litter traps, filter strips and vegetated swales, sedimentation ponds and wetlands (dry and wet).
- The alignment of roadways and reserves to accommodate the natural direction of overland (north-west) flow in order to minimise obstruction of major flows where possible.
- Retardation and wetland systems to discharge to Seven Creeks based on the 20 year ARI event. All retarding basins are to incorporate water quality treatment measures to meet the SEPP water quality objectives.
- Development plans are to include detailed investigations and site responsive designs to address flooding impacts.
- Pump/penstock arrangements should be in place for all outfalls receiving water to allow discharge of stormwater during periods of high flow in the Seven Creeks and the Broken River.
- The provision of underground drainage systems for all residential development. The system is to be constructed to the 1 in 5 year average recurrence interval (ARI).

7.8 Convenience Shopping

One of the objectives of the Greater Shepparton Planning Scheme is to provide local, small scale convenience shopping facilities for new residential areas. The ODPs for the northern and southern growth corridors recognise the need for such facilities in newly established communities, and have flexibility in design for such convenience centres to be located in appropriately determined sites.

7.9 Utilities

With respect to the provision of utilities the features of the ODPs are:

- Wide nature strips to allow for the common trenching of facilities.
- The provision of electricity, sewer, water gas and telecommunications in most locations. However additional infrastructure is required in some areas to ensure capacity addresses future demand. These requirements are detailed in Sections 7.9.1 and 7.9.2 below.
- The provision of pump stations to assist drainage.
- The undergrounding of powerlines within the corridor.

7.9.1 Utilities for the Northern Corridor

In addition to the matters specified in above, servicing of the north corridor requires the following:

- The installation of new powerlines to service development north of the transmission line by the developer and SPI PowerNet. New infrastructure or works on or within 60 metres of the transmission line easement or adjacent to the Terminal Station shall be referred to SPI PowerNet for comment.
- The Shepparton Terminal Station situated in Verney Road is the hub that feeds the electrical distribution network in the Goulburn Valley area. The forecast load growth for the next 20 years will be met by a number of 66kV power lines originating from this terminal station and connecting to zone substations at regional towns in the area. This will result in a greater concentration of this type of infrastructure in this area than would normally be expected. Planning and design of residential areas in general and arterial road corridors in particular should be made in consideration of this infrastructure requirement. Early consultation with the electrical distribution utility service provider is advised to assist in delivering the most effective long term outcome in this regard. Easements may be included within road reservations.
- The extension of the existing gas supply north of Ford Road by Origin energy.
- Specific initiatives arising from Goulburn Valley Water's Sewer and Water Strategies.
- The extension of the 300mm water main, north along Verney Road, which is to be funded by a combination of direct

developer contributions and Goulburn Valley Water via water supply headworks charges.

7.9.2 Utilities for the Southern Corridor

In addition to the matters specified in above, servicing of the north corridor requires the following:

- The installation and upgrade of the following powerlines and tie lines by the developer and GPU Powernet.
 - the existing 22kv urban supply along the Goulburn Valley Highway to the Caravan Park and along Riverview Drive (the Kialla/Mooroopna Tie 2739)
 - the STN 002 22 KV urban supply along Raftery Road to Raftery Road Bridge
 - the Shepparton South 3279/3 line.
 - STN 002 rural supply from Raftery Road Bridge to Arcadia Downs Estate.
 - STN003 22kV which runs along Raftery Road, south of River Road west to Doyles Lane South.
- The provision of mounted sub-stations in areas subject to inundation.
- The upgrade of the existing 50mm gas supply main along Raftery Road to Arcadia Downs and the provision of a new gas line along River Road West by Origin Energy.
- Specific initiatives arising from Goulburn Valley Water's Sewer Strategy when completed.

8.0 Implementation and Staging

8.1 Management of flood prone land

As stated in Section 3.3, the outcomes of the Shepparton Mooroopna Floodplain Management Study were released in October 2002. In applying the information from this study to the southern growth corridor, it was identified that larger areas of privately owned land than previously the case are now subject to flooding and therefore constrained for residential development.

The Greater Shepparton City Council is currently developing a strategy for the future ownership and management of the areas to be included within the Urban Floodway Zone. A series of workshops have been held with the various authorities that are likely to have a role on the future of the subject lands.

The objectives identified for the future use and management of the land include:

- Protection of the flood and drainage ways
- Enhancement of water quality of Seven Creeks
- Enhancement of biodiversity of the creek environs
- Providing connectivity and linkages throughout and beyond the growth corridor (cycling and walking)
- Community health, education and recreation
- Provision of open space areas with different experiences
- Maintenance and enhancement of a nature reserve

Whilst there is still work to be undertaken on developing the strategy for the future ownership and management of these areas, an interim position has been adopted by the Council regarding this matter. In the interim, it is suggested that as properties are subdivided and developed, the areas within the Urban Floodway Zone (which cannot be developed for residential purposes) be transferred to Council as a public open space contribution in return for the remaining portion of the land being zoned for residential development. It is the long-term intention that these areas eventually be surrendered to the Crown. Following an environmental and cultural assessment of the area an appropriate land manager(s) will be determined.

It is intended that the subject lands be managed in agreement by various public authorities. The authorities with responsibility for the on-going management of the flood prone areas include the Goulburn Broken Catchment Management Authority (GBCMA), the Department of Natural Resources and Environment (DNRE), Land Victoria, Parks Victoria, Goulburn Murray Water (GMW) and the Greater Shepparton City Council.

Once finalised, the strategy for the future management and ownership of the flood prone land should be referred to and

implemented as properties within the southern growth corridor are subdivided and developed.

For reasons stated in Section 7.2 of this Report, it is proposed that development occur on only one side of the road located alongside the urban floodway area of the Seven Creeks. By providing a clear distinction between the public and private realm and addressing dwellings to front the public open space, passive surveillance over the Seven Creeks environs is increased and a consistent interface between residential development and the open space is provided.

To protect the Seven Creek environs from vehicular traffic while still maintaining permeability and access for pedestrians and cyclists, a low transparent fence with openings is proposed between the open space and the roads. Typical fencing may include timber post and wire/rail/chain or similar and bollard treatment. Detailed design of the fencing shall be determined in consultation with the Council at the development approval stage.

It is expected that the construction of these roads will be fully funded by the developer as a significant design outcome and net community benefit will be gained through the implementation of this urban design treatment.

8.2 Environs of the Shepparton Airport

The Shepparton Airport is located on the east side of the Goulburn Valley Highway, opposite the southern growth corridor and 5 kilometres from the Shepparton CBD.

The *Future Needs and Planning Issues for the Aerodrome to the year 2050* (January 2002) looks at the future use of the airport for two periods, being now to 2020 and from 2020 to 2050.

The areas affected by the flight paths from both the north-south and east-west runways are currently subject to the provisions of the Airport Environs Overlay (AEO). The objectives of this overlay aim to identify areas of land that will be subject to aircraft noise, and to assist in shielding people from the impact of aircraft noise. Under the provisions of the Greater Shepparton Planning Scheme, the schedule to this overlay requires that permit applications for sensitive uses of land (as listed in the schedule) be referred to the airport owner. A planning permit is also required to subdivide land.

Advice from the Department of Infrastructure suggests that a proposal to rezone land located within the 25 Australian Noise Exposure Forecast (ANEF) of an airport would not be supported by the Department. The Greater Shepparton City Council has mapped the 25 ANEF line for the north-south runway and it falls just outside the boundaries of the southern growth corridor.

The ANEF lines have not been mapped for the east-west runway, however this runway receives minimal use and it is not anticipated that this will increase significantly whilst the airport is in its current location.

In assessing applications for subdivision of land opposite the airport, the responsible authority should consider the present and future operations of the airport and the views of the airport owner(s).

For use and/or development applications on land located within the 20 ANEF and within the transition slopes for both runways, it is also recommended that under the provisions of the Planning and Environment Act 1987, a Section 173 Agreement be entered into with landowners so as to acknowledge the presence and the potential impact of the airport. The Section 173 Agreement should be used to:

- Specify that new buildings must be constructed so as to comply with any noise attenuation measures required by the applicable Australian Standard.
- Upper levels and roofs of buildings must be constructed with non-reflective materials.
- Equipment that may cause interference with radio communications pertinent to the operations of the airport must not be installed without further approval.
- Inform property owners that there may be restrictions on building heights and vegetation within the transition slopes of the runways.

8.3 Urban Interfaces with Intensive Agriculture

There are existing rural uses within (and adjacent to) the corridors that should be encouraged to continue in the interim, particularly in the northern growth corridor where irrigation infrastructure bisects the land. It is therefore necessary for the ODP to manage the interface and off-site impacts of rural and urban uses in an appropriate manner.

The main conflicts that can occur between the residential uses and primary production include:

- Spray drift from chemicals used in primary production
- Noise from machinery and farm operations
- Dust from farm operations
- Odours from farm waste and so on.

There are a number of management techniques that the Council could adopt in regard to the urban/rural interface. A recent approach implemented by the Greater Shepparton City Council was to use an agreement under Section 173 of the Planning and Environment Act 1987 to ensure that as residential development occurred a minimum 50 metre buffer distance to orchard trees on the same property or adjoining properties. It is suggested that this approach be adopted

where conflict may arise in the north and south growth corridors.

This buffer distance may be varied depending on the environmental and topographic features of land separating the dwelling from the agricultural land use. Appropriate tree planting in the buffer should also be encouraged. Such a buffer should comprise various species with a variety of leaf shapes and heights, and located in a manner that provides for airflow through the buffer, but limits the drift of sprays.

In assessing permit applications for use and/or development that may cause or be affected by spray drift, it is recommended that the responsible authority take into consideration the following:

- the potential for off target movement of agricultural chemicals and its potential effect on sensitive uses including residences
- the location of the use and development in relation to the release point of the spray
- the topography of the land
- the micro-climatic conditions of the area, and
- the method of application, frequency of application and target structure.

Where appropriate, the proposed staging of subdivision should reflect adjoining intensive agricultural uses and the need to maintain the buffer for as long as the adjoining intensive agricultural use is operational.

8.4 Development Approval Process

The ODPs for the northern and southern growth corridors are to be used as a guide for future development. Proposed developments within these areas must be generally consistent with the overall principles and layout of the ODPs in terms of open space allocation; road reserves, hierarchy and network; buffer zones; pedestrian/cycle movements; retarding basins; connections and densities. Each development application will be assessed on its merits and its general consistency with the ODP. The approved ODPs are flexible to respond to site opportunities and constraints.

In order to implement and achieve the intended outcomes of the ODPs, it is proposed to introduce schedules to the Development Plan Overlay within the Greater Shepparton Planning Scheme. Under the provisions of this overlay, the approved Development Plans for the corridors are the *Shepparton North and South Growth Corridors Outline Development Plans*, November 2002 (both written report and plans). The schedules will specify the process to be followed and the material required to accompany a permit application for use and development. Generally the process will be as follows:

Use and developments proposals must be generally consistent with the approved Development Plan and material submitted with the application must show or include the following:

- Consistency with the approved Development Plan, both the written report and plans.
- The proposed subdivision of each part of the land.
- The relationship of the land to the adjoining land.
- The layout of the subdivision and development of the land including roads, lot boundaries and areas of public open space.
- The provision of a variety of lots sizes, incorporating energy efficiency elements.
- The provision of safe and efficient vehicle and pedestrian access to and from the land.
- How the proposed development addresses any flood impacts on the subject land.
- Infrastructure provision and connection including sewerage, water, drainage and other utility services.
- Open space facilities that provide safe and convenient areas to serve the recreational needs of future residents.
- Landscaping, retention of existing vegetation and streetscape treatment.
- Road network, hierarchy and cross sections
- The stages, if any, in which the land is to be subdivided and developed, and a timetable of any staged development of the land.

The written documentation and plans accompanying the permit application must take into account the following:

- The values and features of the site, as identified in the following:
 - An environmental assessment of the land,
 - An archaeological survey,
 - A stormwater management plan detailing how stormwater will be collected and treated within the development,
 - A preliminary soil assessment demonstrating the extent of any contaminated soils that may exist on the subject land, and if detected, a more detailed assessment outlining the location of the contaminated soil, the type of contaminants detected, and strategies required to be undertaken to de-contaminate the affected areas.
- Where appropriate:
 - The provision of buffers from land used for industrial, agricultural or commercial purposes.

- The recognition of the impact of aircraft noise and identification of appropriate land uses within the affected areas;
- The provision of infrastructure clearly demonstrating the ability to overcome any deficiency in water or sewerage supply;
- The need to provide for safe and efficient vehicle access and ensure that traffic generated by the proposed use and development does not have a detrimental impact on the amenity of surrounding properties or roads;
- The need for any agreement to be made pursuant to the provisions of Section 173 of the Planning and Environment Act 1987 with respect to matters arising from the proposed use and development;
- Whether the proposal meets a high standard of urban and landscape design.

If a proposed use and/or development is not consistent with the approved Development Plan, the written documentation and plans accompanying the permit application must demonstrate consistency with the objectives and intended outcomes of the approved Development Plan, and must be prepared in consultation with Council and the community in accordance with the following process:

- An initial “pre-plan” and issues development meeting with Council
- A consultation meeting to consider the proposal with residents and Council.
- Notification and advertising of the proposal in accordance with the requirements of the Planning and Environment Act 1987. Third party review rights to the Victorian Civil and Administrative Tribunal also apply to such proposals.

8.5 Development Contributions

A Development Contributions Plan has been prepared in accordance with the guidelines provided by the Department of Infrastructure. The collection of development contributions recognises the link between development and items needed to support a community as a direct result of a development. It recognises that the responsibility for infrastructure is shared between those developing the land and the Council. This contribution is additional to the infrastructure items provided in the course of developing new residential areas such as the internal road network, drainage and local open space.

8.6 Staging

The staging sequencing for the development and release of land within the growth corridors has been determined on the basis of:

- Supply and demand projections for residential land.
- The logical and cost effective extension of infrastructure.
- Existing and future land ownership considerations.
- Council policy to discourage out of sequence development.

The resultant staging plans are shown in Figures 5a and 5b. In determining the staging of the corridor, Council should give preference to locations that are outside the EPA buffer distance requirements and are not affected by spray drift on residential properties. A more precise appreciation of the timing and detail of this plan will evolve through the ongoing development of the area as dictated by market demand.