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# TABLE OF CONTENTS

1. **Introduction + Background** 5
   1.1 Introduction to this Report 5
   1.2 What is the purpose of the Naracoorte and Lucindale Structure Plan? 5
   1.3 What are the requirements of the Naracoorte and Lucindale Structure Plan? 5
   1.4 Background Policies and Plans that Informs this Report 6

2. **Population, Settlements and Future Growth** 7
   2.1 Current Population Numbers 7
   2.2 Future Residential Growth 7
   2.3 Consider a range of population scenarios 7
   2.4 Housing Diversity 8
   2.5 Housing close to services and infrastructure 8
   2.6 Housing that does not result in urban sprawl 8
   2.7 Return on housing investment 8
   2.8 Affordable housing, housing for older people, and housing on smaller allotments or at a greater density 9
   2.9 Housing for new international arrivals 9
   2.10 Availability of land for residential growth 9
   2.11 Availability of land for rural living housing 14
   2.12 Lucindale, Frances, Hynam and Kybybolite 19

3. **Environment and Culture** 20
   3.1 Biodiversity 20
   3.2 Natural + Cultural Assets 20
   3.3 Hazards 21

4. **Economic Development** 22
   4.1 SA Strategic Plan 22
   4.2 Naracoorte Lucindale Council Economic Development Plan 22
   4.3 Employment 22
   4.4 General Industry 22
   4.5 Commercial and Light Industry 23
   4.6 Primary Production 24
   4.7 Forestry 24
   4.8 Tourism 25

5. **Physical Infrastructure + Service Provision** 26
   5.1 Wastewater and Potable Water 26
   5.2 Stormwater 26
   5.3 Energy and Renewable Energy 26
   5.4 Airports 27
6. **Social Infrastructure + Service Provision**  
   6.1 Council’s Building Network  
   6.2 Facilities and services required in the future  
   6.3 Community satisfaction with Council services and facilities  
   6.4 Education  
   6.5 Health  
   6.6 Open Space + Recreation  

7. **Transport + Movement**  
   7.1 Walking and Cycling  
   7.2 Local Township Traffic Conditions  
   7.3 Regional Traffic Conditions  
   7.4 Heavy Vehicle Bypass Conditions  
   7.5 Tourism Routes  
   7.6 Assessing Capacity to Accommodate Traffic Growth  
   7.7 Way-finding – finding your way around Naracoorte Township  
   7.8 Parking Provision  

**Appendices**  
Appendix 1 – Residential Infill Assessments  
Appendix 2 – Traffic Assessment for Residential Growth (Supporting Figures)  
Appendix 4 – Further Support Information for Bypass Options
1. Introduction + Background

1.1 Introduction to this Report

This report is the background summary and investigations that inform the Naracoorte and Lucindale Structure Plan. It:

- Describes the **key land use and transport issues** that have been raised in all the relevant background information, site visits, and discussions with council staff.
- Highlights land use and transport **strategic directions** contained within a variety of other relevant reports.
- Provided **background information** about key issues for Council to consider and give early direction on prior to developing the Structure Plan.
- Can also inform future Development Plan Amendments and Section 30 Reviews undertaken into the future by Naracoorte and Lucindale District Council.

1.2 What is the purpose of the Naracoorte and Lucindale Structure Plan?

Naracoorte and Lucindale District Council commissioned Jensen Planning + Design (planning and design), in association with Mott Macdonald (transport) to undertake a Structure Plan for the Council area.

The plan looks forward to the next 21 years and provides Council with direction about future growth, character and transport issues in the region.

Importantly, the Structure Plan will inform future Development Plan Amendments to amend Development Plan zoning for the region. It will also inform Council’s future resource allocation and prioritisation of projects.

1.3 What are the requirements of the Naracoorte and Lucindale Structure Plan?

The future Naracoorte and Lucindale Structure Plan is required to:

- Provide increased certainty for its stakeholders about future land uses and development.
- Recognise the unique characteristics of the Naracoorte Lucindale district and its communities (Naracoorte, Lucindale, Frances, Kybybolite and Hynam).
- Recognise the existing urban fabric of Naracoorte and ensure successful integration with the Town Centre.
- Cater for a diverse range of industries.
- Plan for future residential growth (including expanded rural living).
- Protect and retain valuable primary production land.
- Support the health and wellbeing, safety and equitable access to services by the community.
- Support a transport network that brings together all modes of transport and is cognisant of the future industrial, rural living and residential areas.
- Improve traffic flow and seek to resolve conflicts between different transport modes.
- Strive to involve all stakeholders and to reach agreement regarding the prioritisation, scope and staging of future development.
- Influence the detailed development of precinct plans and future Development Plan policy.
1.4 Background Policies and Plans that Informs this Report

**State Government Documents**
- SA Strategic Plan
- SA Integrated Transport and Land Use Plan
- Limestone Coast Region Plan – A volume of the South Australian Planning Strategy
- Age-Friendly South Australia Guidelines for State Government
- Age-Friendly Neighbourhoods Guidelines and Toolkit for Local Government
- Age-Friendly Living Guidelines for Residential Development

**Other Documents**
- RDA Regional Roadmap 2010-2015
- Retail Study of Naracoorte 2008
- Butler Terrace Concept Plans
- Robertson Street Concept Plans
- Community Feedback on Strategic Planning
- MetroCount Traffic Counts

**Council Documents**
- Naracoorte Lucindale Council Strategic Plan 2013-2023
- Naracoorte Lucindale Council Open Space Strategy
- Council Policy: Asset Management
- Buildings – Infrastructure and Asset Management Plan
- Community Wastewater Management System – Infrastructure and Asset Management Plan
- Recreation – Infrastructure and Asset Management Plan
- Stormwater – Infrastructure and Asset Management Plan
- Transport – Infrastructure and Asset Management Plan
- Naracoorte Township Bike Walking Path Master Plan
- Naracoorte Lucindale Council Development Plan (29th November 2012)
- Open Space Hierarchy and Service Levels
- Road Hierarchy and Service Levels
- Naracoorte Lucindale Council General and Rural Living PAR (draft – 2008)
- Naracoorte Lucindale Council Economic Development Plan (Draft)
2. Population, Settlements and Future Growth

2.1 Current Population Numbers

In 2012, the Australian Bureau of Statistics (ABS) estimated the Council supported a population of 8,3331. According to the 2011 Census data, 51.3% of the population was male and 48.7% female.

The 2011 census populations for the three main townships (including their wider region) of Naracoorte, Lucindale and Frances are identified in the table below:

<table>
<thead>
<tr>
<th>Township + Region</th>
<th>Population</th>
<th>Private Dwellings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naracoorte</td>
<td>5,691</td>
<td>2,580</td>
</tr>
<tr>
<td>Lucindale</td>
<td>979</td>
<td>506</td>
</tr>
<tr>
<td>Frances (including Kybybolite)</td>
<td>533</td>
<td>267</td>
</tr>
<tr>
<td>Hynam and Joanna region</td>
<td>655</td>
<td>313</td>
</tr>
</tbody>
</table>

2.2 Future Residential Growth

It is difficult to determine future residential growth, and there are a range of projections. We have considered a couple of scenarios (Section 2.3).

Past Population Growth Rates in the Limestone Coast

The Limestone Coast Region experienced a 0.35% average annual growth rate between 1996 and 2008. In 2008, the region had a total population of 65,402, with a targeted population of 87,152 by 2036 (a total increase of 21,750, or 806 persons per year).

State Government Projections for the Council Area

According to the State Government population projections, the population of the Council area is expected to reach approximately **9,540 by the year 2026**, which represents a growth rate of approximately 1.5% per annum.

Is this population projection consistent with past trends?

If the average past growth rate of the Limestone Coast Region is applied (i.e. at a 0.35% growth rate) the 2011 population of the Council area will only grow to **approximately 8,599 by 2026** (nearly 1000 people less than the government’s projection).

2.3 Consider a range of population scenarios

The variation between projected growth (i.e. based on state government projections or on current trends) and aspiration growth (based on population objectives or desired futures) highlights the importance of scenario testing and planning for reasonable projections based on established and emerging trends.

The table below details a number of different scenarios for growth in the township of Naracoorte to highlight this consideration (projecting 21 years to 2035 and assuming 2.3 people per dwelling):

<table>
<thead>
<tr>
<th>Population (2011)</th>
<th>Growth Rate</th>
<th>Expected Population to 2034</th>
<th>Resultant Increase</th>
<th>Dwellings Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,691</td>
<td>0.35%</td>
<td>6,189</td>
<td>498</td>
<td>216</td>
</tr>
<tr>
<td>5,691</td>
<td>1.00%</td>
<td>7,226</td>
<td>1,535</td>
<td>667</td>
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<tr>
<td>5,691</td>
<td>1.50%</td>
<td>8,135</td>
<td>2,444</td>
<td>1,063</td>
</tr>
<tr>
<td>5,691</td>
<td>2.00%</td>
<td>9,154</td>
<td>3,463</td>
<td>1,505</td>
</tr>
</tbody>
</table>

For the purpose of the future Structure Plan, an agreed growth estimate or target is vital for its

---

1 Estimated Resident Population (ERP) 2012—1D Community Profile for Naracoorte Lucindale Council
direction. As highlighted in the table above which shows relatively low levels of growth, within the township of Naracoorte there may not need to be any further land set aside for residential purposes to cater for a modest (albeit, steady) growth rate.

But if more substantive levels are experienced (or expected), then planning for increased housing demand will be extremely important.

For the purpose of developing the Structure Plan, a growth rate of between 1% and 1.5% has been agreed to by Council, which suggests that we should plan for a population in Naracoorte Township of approximately 8,000 people (or an additional 750 houses) by 2035.

2.4 Housing Diversity

Notwithstanding the relatively small population projections, it is important to ensure that Naracoorte has a range of housing types to suit a variety of residential needs. For example older people, new migrants, young families buying their first home, and farmers looking to retire from the land and move to the town.

Whilst not all housing in Naracoorte, particularly those on large allotments, needs to be within close distance to the Town Centre, it is vitally important to provide some housing options that are close to key services and facilities – including shops, health services, chemists, schools, and parks. This will mean providing options to single storey detached housing on large allotments such as group housing, townhouses, cottage style housing, row housing, housing in community stratas and so on.

2.5 Housing close to services and infrastructure

The question for Naracoorte is whether the town currently provides enough options for housing development over the short, medium and long term on land close to the Town Centre. Some people live in other towns such as Lucindale, and commute to Naracoorte.

Land identified for future residential growth should ideally be located close to pedestrian and cycling links (so it provides easy access to services and facilities), employment, attractive open space and recreational facilities, schools, and other essential services.

Having destinations such as schools, shops, parks, libraries and social networks that are located within walking or cycling distance from our homes is also an important factor in encouraging people to be physically and mentally active and healthy. With current projections that within 20 years, every 1 in 4 children will be obese, and with heart disease and diabetes increasing (Healthy Spaces and Places, PIA, 2011) ensuring our towns are laid out in a way that supports every day activity like walking is extremely important.

2.6 Housing that does not result in urban sprawl

Where possible, there should be opportunities within townships to provide for residential growth rather than allowing townships to sprawl or expand out into their surrounding rural landscapes.

The expansion of the urban area (whether in a city or country centres), often requires more infrastructure investment by Council, which is often more expensive and less efficient to provide than if it is contained. Sustainable growth is just as important for regional centres like Naracoorte as it is for cities.

Urban sprawl also permanently removes land for rural and productive purposes.

2.7 Return on housing investment

Another consideration is that the parcels of land that are developed must be large enough to provide an investor with the opportunity to
develop a reasonable sized development that provides a range of housing types, and can also provide the necessary services, infrastructure and pleasant living environments within economies of scale.

It is difficult for a commercial developer to provide housing choice and housing affordability by developing single or double allotments because there are comparable overheads but not the same returns.

Additionally, the cost of building in Naracoorte, given transport expenses, also challenges housing affordability.

2.8 Affordable housing, housing for older people, and housing on smaller allotments or at a greater density

‘Ageing in Place’ is the nationally recognised approach to providing for an ageing population. This means supporting people to stay in their home for as long as possible, and also providing the full suite of services and facilities within a local area that might be required by an older person.

The Council area has a higher percentage of population aged between 50 to 59 years than the South Australian average (being 14.3% compared with 13.4%).

Many older people still prefer to live in their own homes, as consistent with the Ageing in Place objectives. This may mean living in houses on smaller allotments or at higher densities – a different kind of housing to what many in the region are used to.

The State Regional Strategy identifies the opportunity to provide for higher density housing near the centre of Naracoorte, and a supply of affordable and adaptable housing in Naracoorte (refer p. 53 and p. 58 of the Region Plan).

The Age-Friendly Living Guidelines for Residential Development seek to ‘ensure our communities and environments remain accessible for people at every stage of their lives’ (p. 2). As outlined on page 13, the Guidelines seek to ensure:

- Affordable housing is provided in excess of legislative requirements
- Affordable housing is located in close proximity to public transport, open space, shops and community services
- Affordable housing in large developments is not concentrated in a single location

2.9 Housing for new international arrivals

As outlined in the Council’s Strategic Plan, since 2006 Naracoorte has experienced an increase in migrant population, reflected by the decrease in Australian born residents from 88% to 85%, and the current 16% of the population from non-English speaking backgrounds.

The popularity of the region is partly influenced by the visa conditions, with a number of migrants moving to Naracoorte region and working in local industries (including Teys Abattoir).

2.10 Availability of land for residential growth

The project has broadly identified land that is currently available and zoned for residential growth – often vacant or underutilised. This is part of the overall consideration of where future residential growth (albeit likely to be at a low level) is best located.

It is important to consider these existing residentially zoned areas as they may offer opportunities to build new houses within Naracoorte in the future. It makes sense to make the most of existing opportunities (where appropriate) within town in the first instance, rather than expanding outwards and having to build new services and infrastructure.
Whilst this study does not examine every individual parcel of land, it is recognised that not all existing land parcels are suitable for future residential use – there are a range of constraints such as flooding, size of allotments, bushfire risks, native vegetation and ownership patterns. These areas are broadly categorised in the form of:

- Existing individual or small groups of vacant allotments

  There are areas within Naracoorte that currently have low value and poor housing stock or are already zoned by residential use but remain vacant.

- Larger parcels of land

  Similarly, there are a number of large parcels of land such as that opposite the hospital understood to be public housing land and earmarked for future residential development. This site and other similar provide opportunities to develop housing that might be on smaller allotments and will provide some housing choice for people wanting to live close to the town and in particular close to the hospital (well suited to the older demographic).

A further potential is the land that is currently planted to pines surrounding the golf course. Given its existing zoning, it is already expected by the community as having potential to accommodate future township growth. This area is within close proximity of the centre of the Naracoorte township and could be well served by pedestrian linkages through attractive recreational areas.

In addition to the areas identified (see Map B1 overleaf which details the areas investigated to inform the Structure Plan), it is recognised that there may be other possible areas also.
2.10.1 Analysis of housing infill opportunities

This analysis of housing opportunities on land within the township that is currently undeveloped (as shown in map B1) highlights the existing capacity within the township of Naracoorte to support future housing growth.

It is important to note that this analysis is a guide only. Many assumptions like the size of housing, and the ability of land to be developed upon have had to take place. Whilst we have considered constraints to development such as flooding or existing vegetation, this analysis is only intended to give an overall picture of existing capacity for more housing.

This housing infill analysis has not formed the basis of any housing proposals or rezoning opportunities on the nominated parcels of land.

Extent of Analysis

The analysis considers areas / sites within the township currently sited within the Residential Zone.

At the time of writing this report, there were 53 parcels of land for sale in Naracoorte. These parcels and other vacant parcels scattered over the township have not been counted in the analysis – other than when within an infill site as defined in this report.

This analysis only assesses the capacity of land within the township already zoned for residential purposes and notes areas assigned as Deferred Urban or areas of Rural Living and Primary Production that may provide opportunities for increased dwelling yield. Housing Typologies

When assessing the yield scenarios for the township of Naracoorte, it has been necessary to consider the types of housing required to cater for demand and trends. This is because different housing types require different size land allotments. The size of allotment influences how much land is required into the future.

The following broad categories of housing choice are considered relevant to the township:

- Convenient / Low Maintenance
  
  Site areas at an average of 450 m², which is currently allowed within the zoning, however a review of the recent growth suggests this could be as low as 200 m² in practice

- Standard
  
  Site areas at an average of 600 m² to 800 m² (zone requires minimum of 600 m² but often lots extend to 800/900 m²)

The housing lot size used to calculate yield is provided in each individual assessment and chosen based on the proximity to the township and likely demand.

Details for each infill area analysis are provided in Appendix 1.

Outcomes – Approximate Housing Infill Capacity

The areas identified and assessed provide a theoretical dwelling yield in accordance with the following:

<table>
<thead>
<tr>
<th>Infill Area</th>
<th>Yield</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>2</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>4</td>
<td>60</td>
</tr>
<tr>
<td>5</td>
<td>43</td>
</tr>
<tr>
<td>6</td>
<td>62</td>
</tr>
<tr>
<td>7</td>
<td>45</td>
</tr>
<tr>
<td>8</td>
<td>60</td>
</tr>
<tr>
<td>9</td>
<td>124</td>
</tr>
<tr>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>11</td>
<td>38</td>
</tr>
</tbody>
</table>

**Total Yield = 777 dwellings**

Based on the analysis conducted, the township of Naracoorte has the theoretical capacity to provide housing to cater for population growth
over the period from now until 2035 utilising existing zoned land.

**IMPLICATIONS OF THIS HOUSING INFILL ANALYSIS**

If a slow growth rate of 0.35% is maintained, there will continue to be established capacity at the end of this period.

If growth increases to a rate of around 1.5%, then there may be insufficient land to support the housing required to cater for the growth.

However, while there is theoretical capacity as established by this analysis, state policy such as articulated in the Planning Strategy and Housing and Employment Land Supply Program recommends a program of rezoning that ensures land is available well in advance of need. This is to assist in relieving pressure on housing (thereby minimising price inflation) and to account for unknowns such as land owners choosing not to develop, and development that may occur at lower than expected densities.

2.10.2 *Deferred Urban Analysis (Golf Course)*

There are two areas currently zoned ‘Deferred Urban’ and are situated adjacent to Riddoch Highway on either end of Naracoorte Township. The northern area comprising the golf course is considered to provide a promising opportunity for residential growth due to its accessibility, amenity and separation from non-residential land uses.

Based on the existing Development Plan Concept Plan NaLu/3, and assuming a conservative net efficiency rate of 65% (i.e. amount of land remaining for housing once land for roads and other infrastructure are removed), the land identified for development surrounding the golf course has the capacity to deliver in the order of **600 allotments** at an average size of 700m². The Structure Plan recommends the western portion of this land only, due to the amount of available land and the availability of services.
2.11 Availability of land for rural living housing

2.11.1 Existing Zoning

The Rural Living Zone within the Council Area is divided between three separate precincts. Each of the precincts has a different minimum allotment size prescribed by the Development Plan. The following minimum allotment sizes apply to the respective precincts (found in Council’s Development Plan):

- Precinct 1 – 5000 square metres
- Precinct 2 – 1 hectare
- Precinct 3 – No additional allotments should be created wholly or partly within this precinct (due to the topographical features of the land)

The Development Plan also prescribes a number of requirements that govern the minimum widths and depth of new allotments and the placement of new dwellings. This may mean that, for example, a number of areas that currently contain rural living allotments which are technically large enough for subdivision are precluded from future development due to the constrained configuration requirements.

2.11.2 General and Rural Living PAR (2008)

A draft PAR (‘Plan Amendment Report’ – now known as a Development Plan Amendment of DPA’) was prepared for the Naracoorte Lucindale Council in 2008. The PAR includes investigations relating to rural living and adoption of modules, structure and format for the Development Plan to the Better Development Plan (BDP) standard.

The BDP investigations informed the most recent DPA, which resulted in the conversion of the Development Plan to the BDP format. The rural living investigations were not pursued and the PAR has remained in draft form since 2008.

The PAR provides an overview of the existing Rural Living and Country Living Zones relevant to the Township of Naracoorte. As discussed, the Rural Living Zone comprises three policy areas that detail appropriate allotment sizes ranging from 5000m² to 1 hectare (Policy Area 1 and 2 respectively) and no further division (Policy Area 3). These precincts form six Rural Living areas around the township. It also provided an analysis of the existing capacity within the zoned land and areas for possible Rural Living expansion.

2.11.3 Analysis of Rural Living Opportunities

The PAR concluded that approximately 73% of existing Rural Living allotments within the Naracoorte Township are already occupied by residential land uses. Of the remaining 86 vacant allotments, 34 form part of the recent “Hollywood Springs” development south of Naracoorte, east of Riddoch Highway (a recent development of the time, now at least 75% occupied).

The investigations conclude that, while there is some opportunities for subdivision within the existing zoned areas, that there is limited capacity within the established Rural Living Zone.

The investigations continued by assessing five additional areas for rezoning to Rural Living (refer Map B2 overleaf) concluding that four areas should be rezoned through the PAR.

While the investigations do not provide an analysis of the likely demand for Rural Living land or the yield capabilities of the areas recommended for rezoning, they do provide an assessment of the suitability of these areas for growth, based on assessment of suitability for agriculture (including both operational requirements and land suitability), proximity to the township, orderly expansion principles, etc.

These areas (including the rezoning of the southern deferred urban area) have the potential to provide for approximately 190 additional rural living allotments.
Rural Living Investigations

Legend

- Non-Residential Land Uses (2012)
- Rural Living
- Residential
- Deferred Urban

AREA 1 YIELD = 45 lots @ 2 - 5 hectares

AREA 2 YIELD = 62 lots @ 1 hectare [+ 27 approved]

AREA 4 YIELD = 55 lots @ 1 hectare

AREA 5 YIELD = 28 lots @ 1 hectare

AREA 1: 185 ha
AREA 2: 144 ha
AREA 4: 67 ha
AREA 5: 33 ha

Rural Living Expansion Recommended (2008)
Rural Living Expansion Investigated (Not Recommended) (2008)
Native Vegetation
2.11.4 The Pros and Cons of Rural Living

Collectively, there are a number of opportunities for people to buy rural living properties around Naracoorte and surrounding townships. It is understood that some farmers in the region who retire, want to retire onto smaller, more manageable allotments close to the town but not necessarily within an urban environment in the Town Centre. For some of these farmers a rural living allotment is ideal.

Rural living allotments are also in demand for families wanting to be able to ‘spread out’, have a few animals and space for their children but still be within close distance to the town and its services and facilities.

Rural living has been identified by the State Government and by many other planning authorities, as often difficult to manage. Often sub-division of farming land to smaller rural living allotments can result in small allotments that are not well managed, have an infestation of pests and weeds, with fencing and vegetation not well cared for.

It is also often seen as a deferred urban area, that is, over time (because the land has already been subdivided) it is a “fait accompli” that the area is used for housing development on the outskirts of the town.

Another issue is that Councils will usually experience demands from households living in rural living areas for improved services, postal delivery, sometimes paving, sometimes lighting, and sometimes transport requirements. This puts additional burden on Councils to provide services and infrastructure for only a few people.

It is important that the beautiful character of Naracoorte, which is surrounded by gently tree-studded farm land and highly productive landscapes, is protected as this is part of what makes the town and the region attractive.

2.11.5 Options for Additional Capacity

Notwithstanding the issues with rural living as discussed, there are three options to provide the township with additional rural living opportunities as it grows into the future:

- **Expand Zoning** as per the investigations of the PAR (refer Section 2.6.2)
- **Modify Requirements** of the existing zoning to facilitate densification of the rural living areas, such as through the reduction of allotment sizes or allotment attributes
- **Satellite Rural Living** opportunities exist in the surrounding settlements (such as in Lucindale)

**Expansion**

The assessment summarised from the 2008 draft PAR highlights opportunities for the expansion of rural living into land that displays limited agricultural significance, is often fragmented and adjoins the established township and peripheral rural living areas. Thus, ongoing agricultural pursuits on this land may not represent the highest and best use. Accordingly, should these areas become rural living the result on employment opportunities and economic prosperity of the Council Area is unlikely to be negatively affected.

**Modified Regulation**

Modifying existing zoning policy to facilitate smaller rural living allotments within established rural living areas offers the advantage of maximising existing infrastructure such as roads, school bus routes, sewer (where provided), electricity, etc. From the perspective of service provision and support, this is a logical way to provide increased housing yields. It also limits change to the natural landscape as it keeps dwellings and ancillary structures within more concentrated areas. Conversely, the risk is that by allowing further subdivision that the character of these areas will change and the natural, spacious
and rural characteristics that are sought after in these locations will be diminished or lost. This is not an option that has been considered viable for the future of the township or reflected in the Structure Plan.

**Satellite Rural Living**

There are substantial opportunities available within the nearby settlements to provide increased opportunities for rural living. The land is often cheap and there are established infrastructures (such as community waste infrastructure) that could be utilised in these locations. Facilitating / encouraging residential growth within these townships may provide additional support for economic activity (within Lucindale) and relieve the strain on residential expansion within Naracoorte.

The distance between Naracoorte and the settlements is conducive to “commuting” for work but presents an inconvenience for daily shopping needs and other social services. The challenge that this option presents for Council is that it will require its services to be “spread thinly” across the Council Area. But conversely, these settlements already support a small population. Providing opportunities to increase the population base in these areas may make the provision of some services more efficient.

Land within the established Lucindale settlement (on its eastern edge) is a possible candidate for such an approach. Within the area as defined in the following figures, there are approximately 130 allotments, ranging in size (but all under 5 hectares) equating to a total area of approximately 477 hectares. The area is gently undulating and densely vegetated in parts. Approximately half of the existing allotments are already being utilised for rural residential purposes.

The policy to facilitate dwellings could take the form of a Policy Area within the Primary Production Zone that provides an exemption for “dwellings” within the non-complying list of the Zone and they provide assessment criteria within the text of the Policy Area. Criteria should include attributes such as:

- Allotment width and depth (to provide adequate curtilage)
- Access to sewer or adequate spacing for septic
- Maximising areas of land available for primary production
- Minimising removal of native vegetation

Alternatively, the area could be made part of the Rural Living, Precinct 3 Zone that already specifies such requirements and does not facilitate further land division.

In summary, it is important to consider additional demand for rural living in the context of the ability of council to service these areas—provide appropriate levels of roads and other infrastructure.

**New rural living land should not “leap frog” existing urban areas** — it should be developed contiguously to adjacent housing so that existing services and infrastructure can be more efficiently provided.

Lastly, new rural living land should not remove productive rural land that is still, or is capable of being viable farmed, from rural production.

Other constraints to achieving new rural living land include flooding, existing vegetation, and conservation and bushfire risk.
An aerial photograph detailing the area to the east-south-east of Lucindale Settlement that already is largely used as rural living (as further emphasised by land use plan M14 in the Structure Plan)
2.12 Lucindale, Frances, Hynam and Kybybolite

2.12.1 Challenges and Considerations

The challenges and considerations for the Council relevant to its settlements differ significantly from those within the Naracoorte Township.

Rather than planning for ongoing growth and supporting current and future industry, Council must consider how it is to support the residents within these small settlements into the future, including considering:

- How will services be maintained?
- In light of declining population growth in settlements, how can sustainable growth (or at the very least, a stable population)?
- Should the areas that are currently functioning as rural living be recognised in the Development Plan?

The last point has been investigated with the enabling of formalised rural living within Lucindale.

Other settlements such as Frances, Hynam and Kybybolite do not display the same settlement pattern or have established allotments of a size that can easily be facilitated through policy for conversion to rural living.

Furthermore, there is still capacity within these small settlements for residential growth (refer Land Use Plans M13 to M17 in the Structure Plan).

The Structure Plan can only go a small way to addressing issues of decline within the settlements such as supporting industry, affordable housing and tourism. Other options for Council support are canvassed in the Structure Plan.
3. Environment and Culture

3.1 Biodiversity

The Limestone Coast Region Plan identifies the environmental and cultural assets of the Council area and the wider Limestone Coast region. These assets are identified and discussed in the Structure Plan, and include the RAMSAR wetland area, water eco-systems and resources, protected areas, and native vegetation.

The Region Plan proposes a policy to ‘introduce a clear hierarchy of environmental areas to be protected to improve development certainty and transparency, and incorporate the protection of these areas into Development Plans’. The three levels include:

- Areas of high environmental significance
- Areas of environmental significance
- Areas designated for human use

The Plan also highlights that long-term changes in water management are required to cope with increasing pressures on the region’s natural resources (including water). Growing numbers of development in the industry, residential and tourism industries need to be supported by Development Plans which are consistent with natural resources management plans and state policy frameworks (under the Natural Resources Management Act 2004).

3.2 Natural + Cultural Assets

The Limestone Coast Region Plan seeks to ensure that scenic landscapes are protected. The South East Natural Resource Management Region has many unique landforms and distinctive natural characteristics that have originated from a long, complex geological history. Development in these areas that might adversely affect views should be avoided. The importance of these landscapes includes:

- Ecological services
- Tourism infrastructure that supports the economic viability of the tourism industry
- Strong cultural ties to the land
- Attractiveness that helps to draw new residents to the region
- Health that is supported through recreation opportunities

3.2.1 Biodiversity

The combined region of the South East of South Australia and South West Victoria is considered a “biodiversity hotspot” by the Commonwealth Government. The South East contains such rich biodiversity because it is a transition zone, grading from a temperate climate to a more arid landscape. Prior to European settlement, the region supported a rich biodiversity categorised by a “rich tapestry” of woodlands and forests, heathlands and grasslands interspersed between vast areas of seasonal and permanent wetlands.

Past actions have greatly modified the extent of biodiversity in the region, such as the clearance of native vegetation, drainage of wetlands and the establishment of introduced plant and animal species. Nonetheless, the Naracoorte Lucindale District continues to support key biodiversity areas such as the Bool and Hack Lagoons (as discussed, which are categorised as biodiversity “remnant areas”) as well as key biodiversity (with threatened species) in the Hynam – Kybybolite Districts.

The South East Natural Resource Management Plan and work undertaken by the Department of Environment, Water and Natural Resources, have informed the development of the Limestone Coast Region Plan, and will inform the Structure Plan.

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2 Abstracted from the SE NRM Plan – Regional Description (2010)
3.3 Hazards

The majority of the Naracoorte Lucindale Council area is classified as having a ‘general bushfire risk’. However, significant areas north and south of Naracoorte, and in the northern and southern portions of the Council area, have high or medium bushfire risk.

Controls in regards to land division, building siting, and emergency vehicle access apply to areas of general, medium and high bushfire risk. Bushfire risk is an important consideration in regards to land use and future development.

Another control or safeguard is the Council’s involvement in emergency management through its role on the South East’s Zone Emergency Management Committee (ZEMC). The committee was established in fulfilment of the Emergency Management Act (2004) and its role is to plan for the proper management of emergencies, through the development of a plan that balances risk, community needs, and government and non-government responsibilities.

It is understood that the committee is in the process of identifying hazards but that a draft management plan is yet to be released. Hazards identified through this work to date include earthquakes, extreme weather events, flooding and fire.
4. Economic Development

4.1 SA Strategic Plan

The South Australian Strategic Plan identifies ‘economic growth’ as one of its targets. In particular, the Plan seeks to ‘exceed the national economic growth rate over the period to 2020’ (2011, p. 39). Other targets relating to economic development which are of relevance to this study include:

- **Target 37: Total exports** increase the value of South Australia’s export income to $25 billion by 2020 (p. 39)

4.2 Naracoorte Lucindale Council Economic Development Plan

Council is currently preparing its Economic Development Plan. The plan outlines that growth and prosperity in the district will come from a combination of economic drivers:

- Expansion of the local economy to meet growing needs, economic diversification
- Agriculture
- Tourism
- Manufacturing and industry expansion

4.3 Employment

As outlined in the table below, the major employment industry within the region is ‘sheep, beef cattle, and grain farming’. This industry employs approximately 17% of the Council area’s employed population (aged 15+ years).

The second major industry of employment is the ‘meat and meat product manufacturing’ sector, employing 5.8% of the population. This is followed by ‘school education’, ‘fruit and tree nut growing’, and ‘beverage manufacturing’.

### Industry of Employment

<table>
<thead>
<tr>
<th>Industry</th>
<th>Naracoorte Lucindale Council (%)</th>
<th>South Australia (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheep, Beef Cattle and Grain Farming</td>
<td>17.3</td>
<td>1.9</td>
</tr>
<tr>
<td>Meat and Meat Product Manufacturing</td>
<td>5.8</td>
<td>0.6</td>
</tr>
<tr>
<td>School Education</td>
<td>3.9</td>
<td>4.6</td>
</tr>
<tr>
<td>Fruit and Tree Nut Growing</td>
<td>3.1</td>
<td>0.6</td>
</tr>
<tr>
<td>Beverage Manufacturing</td>
<td>2.9</td>
<td>0.9</td>
</tr>
</tbody>
</table>

*Source: ABS Census Data 2011*

4.4 General Industry

Naracoorte is identified as an industrial hub and as a major commercial/regional service centre. The Region Plan recognises the need to reinforce the major commercial and services role of Naracoorte as ‘the focus of secondary retail, commercial, administrative, education, health and recreational developments in the region’ (p. 45 Region Plan).

In addition to industry clusters around strategic transport hubs, Naracoorte is identified as a major hub for primary production processing activities (p. 38 Region Plan).

New horticulture and viticulture development potential is identified in locations between Bordertown and Naracoorte. The Strategic Plan identifies additional land for industrial areas in Naracoorte (p. 36), as well as strengthening the role of Naracoorte as a major regional centre (p. 16).

The two main industrial areas are located either side of the Naracoorte township – out past the showgrounds to the east, and out to the west. This has meant that significant freight movements need to go through town to service both of these areas.

The Council’s sale yards (located east of the Naracoorte township) have received significant recent investment from Council, with a significant focus on reuse of water, meeting
animal safety and comfort standards, and providing state of the art operations. The facility is well on its way to becoming one of the industry’s preeminent sale yard operations, and is seen as a major component of the region’s economic development strategy.

This facility is closely linked to the Teyes Abattoir, as well as through to the surrounding region. Therefore, careful consideration is required to ensure future freight routes for transporting stock to the sale yards and abattoirs remains efficient and safe, while also not unreasonably impacting on the amenity of the nearby township.

The industrial area to the west comprises predominantly storage and shedding, as well as the Viterra grain storage silos, paving centre, and farm equipment suppliers. Both are capable of being serviced with necessary infrastructure.

An analysis of the areas zoned for industry concludes that there is significant capacity within these areas – particularly west of the township centre (see table below).

<table>
<thead>
<tr>
<th>Industrial Precinct (ha)</th>
<th>Existing zoned land (ha)</th>
<th>Estimated proportion of undeveloped land (%)</th>
<th>Estimated area of undeveloped land (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>135</td>
<td>70%</td>
<td>94.5</td>
</tr>
<tr>
<td>Eastern</td>
<td>80</td>
<td>5%</td>
<td>4</td>
</tr>
<tr>
<td>Teyes</td>
<td>100</td>
<td>60%</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>315</td>
<td>50%</td>
<td>158.5</td>
</tr>
</tbody>
</table>

Furthermore, through consultation with Council there are no known constraints to the servicing of these areas and adequate capacity on the road network to accommodate freight movement growth (discussed later in this report).

4.5 Commercial and Light Industry

Naracoorte is identified as the major hub for commercial development and services within the Council area as identified within the Limestone Coast Region Plan.

The centre has experienced low vacancies rates in commercial buildings, suggesting that the centre operates at equilibrium and economically sufficient within the existing supply of commercially zoned land. It is understood that while the town experiences low vacancies, that there is a high turnover of businesses, highlighting the tough economic conditions within a rural township.

In September 2008, a retail study was commissioned to consider the effect of increased retail floor space within the township. It concluded that there was some capacity to allow additional growth (by way of the rezoned railyards). This informed the DPA that expanded the retail capacity within the township.

This rezoned railway yard surplus land is currently for sale and the slow uptake suggests a weakening of commercial activity within the township. It also suggests that there is adequate supply of land for commercial development over the life of the Structure Plan.

Land in Question, Former Railway Yards, Naracoorte
4.6 Primary Production

4.6.1 Existing Requirements

The Development Plan currently limits the minimum allotment size for land division within the Primary Production Zone for various land uses. The following table provides an outline of the minimum allotment sizes:

<table>
<thead>
<tr>
<th>Form of Development</th>
<th>Minimum Allotment Size (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farming</td>
<td>40</td>
</tr>
<tr>
<td>Commercial forestry</td>
<td></td>
</tr>
<tr>
<td>Intensive animal keeping irrigated pasture</td>
<td>20</td>
</tr>
<tr>
<td>Land aquaculture</td>
<td></td>
</tr>
<tr>
<td>Horticulture</td>
<td>10</td>
</tr>
<tr>
<td>Market garden</td>
<td></td>
</tr>
<tr>
<td>Community title land division</td>
<td>1</td>
</tr>
<tr>
<td>Land division to accommodate 1 or 2 dwellings that existed or were under construction before 1 December 1972</td>
<td>1</td>
</tr>
</tbody>
</table>

Conversely, the question remains whether small allotments are financially viable and ever likely to be returned to productive uses despite their primary production zoning. One opportunity is for horticulture development as a more intensive farming technique, with the main inhibitor being water supply.

The analysis of capacity within the township of Naracoorte and supporting settlements is that there are substantive existing opportunities for housing, whether traditional or rural living. Furthermore, proposed expansion of opportunities within Naracoorte and Lucindale (as outlined in the Structure Plan) provide further capacity. Thus, the further loss of productive land to rural living is not further investigated by this project due to its complexity, risks and as there is insufficient demand for housing.

4.6.2 Issues and Constraints

The issue for some Naracoorte farmers is that they own allotments that are already smaller than 40ha are not viable as farm units (for example, allotments close to Cedar Avenue and Riddoch Highway). As their land is already fragmented, and allotments close to town attract higher land values, it is unlikely that they will be amalgamated into bigger farming units.

The issue of suitable farming land size is an issue not confined to Naracoorte Lucindale. Removing any allotment from a primary production zone will seal the land’s fate and near guarantee that the allotment will never be returned to a productive use. Many would argue that this is detrimental to future economic returns to the agricultural industry.

4.7 Forestry

A portion of the Naracoorte Lucindale Council sits within the ‘Green Triangle’. Within the Green Triangle, forestry contributes approximately 30% of annual regional GDP and is a major employment sector.

Forestry is growing rapidly within the broader Limestone Coast but is primarily located outside of the Naracoorte Lucindale Council area.

One issue is the best use of land following the harvesting of blue gum forestry plantations located in primary production zones. Harvesting is currently underway and will continue into the future. The land ownership in many instances has changed to accommodate blue gum operations.
4.8 Tourism

The SA Strategic Plan sets a target to ‘increase visitor expenditure in South Australia’s total tourism industry to $8 billion … by 2020’ (p. 27).

In order to promote tourism and expenditure within the region, Naracoorte should be promoted as the primary visitor service centre for the central Limestone Coast, and widely recognised as the home of the World Heritage-listed Naracoorte Caves (p. 42 Region Plan).

The Tourism Research National Visitor Survey and International Visitor Survey conducted in 2005 estimated 591,000 overnight visitors to the Limestone Coast region in the one year period, equating to more than any other region in South Australia with the exception of Adelaide. Reasons for domestic visitors to the region were described by visitors as:

- To escape and unwind 42%
- Nature-based experience 12%
- Tour around and explore 28%
- For adventure 13%

The Naracoorte Cave area attracts many tourists – but how many of them stop and stay in the region and economically contribute to the township? What does the township have to offer tourists so that they are enticed to stay longer?

4.8.1 Tourism Opportunities

The Naracoorte Caves area has been identified as having potential for other “value adding” land uses. These uses could consist of accommodation, retail sales, café, boutique industry that harnesses local art, woodworking and other talents.

Currently, the caves and land surrounding it is located within the Primary Production Zone. This presents an opportunity to further support the tourist value of the site and facilitate “value adding” activities through the further investigation of an additional policy area within the zone that can recognise and support tourist activities (whilst protecting the natural setting).
5. Physical Infrastructure + Service Provision

5.1 Wastewater and Potable Water

Increased recycling of wastewater is included as a target within the State Government’s Strategic Plan, with the desire to ‘recycle up to 50GL of wastewater per annum by 2025’.

The Naracoorte Lucindale Council supplies a Community Wastewater Management System (CWMS) network within Lucindale, providing Lucindale residents with safe disposal of excess water from septic systems. The CWMS consists of 2 aerobic ponds, 5 effluent pump stations, 5 pump sheds and pipes. There is a plan to supply this recycled water back into the township for irrigation purposes and non-drinking demands. Currently some of this water is carted into the township for use.

At the time of publication of the CWMS plan (2008), 185 properties were connected to Council’s CWMS. It is predicted that there will be some growth in the number of properties connected to the system, with 200 properties connected by 2028 (CWMS Infrastructure and Asset Management Plan 2008, p. 10). Industrial growth, including a significant wind farm development planned for the area and growth around Kingston Avenue is not likely to impact on water supply.

Demand for new services will be met through managing existing assets, upgrading existing assets or providing new assets to meet demand. SA Water is constructing test bores at Bool Lagoon as a potential source to further secure drinking water supplies to Naracoorte.

5.2 Stormwater

The SA Strategic Plan seeks to increase the amount of recycled stormwater. In partnership with the South East Drainage Board and Department of Water, Land and Biodiversity Conservation, the Naracoorte Lucindale Council provides a stormwater network. Developers are also involved through the building of new infrastructure, which is then handed over to Council to take ownership and maintain the infrastructure to enable the provision of a clean and safe delivery of Stormwater across the Council area (Stormwater Infrastructure and Asset Management Plan 2008, p. 1).

It is important to consider opportunities for stormwater capture and reuse wherever possible.

5.3 Energy and Renewable Energy

The SEAGas pipeline supplies natural gas to some industries within the Council area. The pipeline runs within 8 kilometres of Naracoorte. Gas spur lines from the pipeline extend to the Teys abattoir, providing a supply of natural gas to the industry.

Renewable energy production and development is highlighted in the SA Strategic Plan. Target 64 seeks to ‘support the development of renewable energy so that it comprises 33% of the state’s electricity production by 2020 (p. 47).
5.4 Airports

There are two airfields within the Council area, namely the Naracoorte Aerodrome and Lucindale Airstrip.

The Region Plan seeks to ‘Reinforce the role of the region’s airport, aerodromes and airstrips to support economic and social development and to provide emergency access for the Royal Flying Doctor Service’.

There has been a suggestion to strengthen or expand the airport to facilitate further visitation. The Hudson Howell Report (Naracoorte Aerodrome Strategic Management Plan 2013-2023) does not recommend any further expansion of the airport, and therefore is not considered further in this report.

Notwithstanding, both the Naracoorte Aerodrome and Lucindale Airstrip are reflected in the Structure Plan to emphasise their value to the region and their retention (in accordance with the Region Plan).
6. Social Infrastructure + Service Provision

6.1 Council’s Building Network

Council’s Building Infrastructure and Asset Management Plan identifies the Council owned building assets within the area. Council’s Building network enables Council to operate and lease its buildings effectively and for use by community based organisations.

The building asset categories include:

- Community halls
- Sporting facilities
- Office accommodations for Council and other agencies under lease arrangements
- Council Depot facilities
- Public toilet facilities

6.2 Facilities and services required in the future

Table 1 (overleaf) provides a guide to what sorts of facilities are required to meet the needs of a range for particular population numbers.

It should be noted that these are guides only – and the table shows how different areas view what triggers an additional service or community infrastructure. There are many other factors that should be considered as part of a more detailed review of community services and infrastructure.

Typically, such a review might also consider:

- How well the current facilities/services are being run?
- What is the future demand for the service or facility (looking forward say 10 – 20 years)?
- What are the trends for that service or facility (for example what is happening around Australia in terms of bowls, hockey, netball, playgrounds etc, and are there new sporting or recreational trends)?

Council’s Building Asset Management Plan also recognises that various factors will impact upon the demand for Council buildings, including population and demographic changes, seasonal factors, vehicle ownership levels, consumer preferences and expectations, economic factors, agricultural practices, and environmental awareness.

6.3 Community satisfaction with Council services and facilities

A recent Customer Satisfaction survey based on a sample of residents within the Council area highlighted that the community are generally satisfied with Council’s services and facilities.

Accordingly, a change to the provision or type of service facility Council makes will need to be considered against current community expectations (which may differ from benchmarking as shown in Table 1).
### Table 1 Comparison of Response to Planning for Social Needs

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Care Centre</td>
<td>1:500 – 700 children (0-4 years) or 1:9,500</td>
<td>1:4,000 – 8,000</td>
<td>1:9,000</td>
<td>1 place : 5 children 0-4 years</td>
<td>1:4,000</td>
</tr>
<tr>
<td>Community Health Centre</td>
<td>1:20,000 – 30,000</td>
<td>1:20,000 – 30,000</td>
<td>1:30,000</td>
<td>1:20,000</td>
<td>1:10,000 – 12,000</td>
</tr>
<tr>
<td>Local Community Centre</td>
<td>1:6,000 – 10,000</td>
<td>1:6,000 – 10,000</td>
<td>1:8,000</td>
<td>1:6,000</td>
<td>1:10,000 – 15,000</td>
</tr>
<tr>
<td>Youth Centre</td>
<td>1:20,000 – 50,000</td>
<td>1:10,000 – 20,000</td>
<td>1:8,000 (youth space)</td>
<td>1:20,000</td>
<td>1:10,000 – 15,000</td>
</tr>
<tr>
<td>Seniors Centre</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>1:10,000 – 15,000</td>
</tr>
<tr>
<td>Library</td>
<td>1:15,000 – 30,000</td>
<td>1:15,000 – 30,000</td>
<td>1:60,000</td>
<td>1:33,000</td>
<td>n/a</td>
</tr>
<tr>
<td>Indoor Recreation Centre</td>
<td>n/a</td>
<td>n/a</td>
<td>1:20,000</td>
<td>n/a</td>
<td>1:30,000 – 60,000</td>
</tr>
<tr>
<td>Aged Care Nursing Home</td>
<td>1:20,000 – 100,000</td>
<td>n/a</td>
<td>1:30,000</td>
<td>40 beds : 1,000 people 70+ years</td>
<td>n/a</td>
</tr>
<tr>
<td>Public Primary School</td>
<td>1:7,500</td>
<td>1:6,000 – 6,500 (school aged children 12-14% of population)</td>
<td>1:9,000</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Public High School</td>
<td>1:20,000</td>
<td>1:15,000 – 25,000</td>
<td>1:30,000</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Arts/Cultural/ Performing Arts Centre</td>
<td>1:30,000 – 50,000</td>
<td>1:30,000 – 50,000</td>
<td>1:30,000</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

\(^3\) Compiled by Jensen Planning + Design (2013)
6.4 Education

Within the Naracoorte Lucindale Council area there are currently five primary schools and two high schools. "School education" represented the third highest response from participants of the 2011 Australian Census regarding field of employment (at 3.9% of employed people of 15 years of age). TAFE SA has a campus in Naracoorte. A TAFE learning centre is also located at Lucindale (Region Plan p. 71).

An increase in tertiary education participation is one of the targets outlined in the SA Strategic Plan. In particular, the target is to ‘increase the proportion of South Australians aged 15-64 participating in tertiary education and training to 17% by 2016’ (p. 61).

Recent trends within the education sector may put pressure on the rationalisation of sites, which can create access inequalities within the district. Conversely, other trends noted such as the shared use of facilities (i.e. sporting facilities and theatres) presents opportunities for Council and the community to broaden access to facilities more efficiently.

6.5 Health

A public hospital is situated at Naracoorte and health services are located at Lucindale (Region Plan p. 71). Similar to education, health services are under pressure to rationalise and amalgamate in the interest of efficiency and improved service levels, but at the risk of access inequalities. With the aging demographic profile of the district, access to health services is vital to the ongoing wellbeing of the community – particularly within the smaller settlements.

In accordance with the Age-Friendly South Australia Guidelines for State Government, health and community support services should ensure:

- ‘A range of community support and health services is offered for promoting, maintaining and restoring health and wellbeing
- Older people are able to remain in their homes because they can easily access appropriate home care services
- Staff providing support and services are respectful, helpful and trained to serve older people
- Older people are able to choose from a range of burial or cremation options
- Emergency planning and response situations take into account the vulnerabilities and capacities of older people’
6.6 Open Space + Recreation

Healthy communities are a major focus of the State’s Strategic Plan. The importance of recreation and sport participation is highlighted by Target 83 of the Plan, which seeks to ‘increase the proportion of South Australians participating in sport or physical recreation at least once per week to 50% by 2020 (p. 55).

The Naracoorte Lucindale Council supplies a network of recreation areas and parks, including some in association with sporting clubs and groups. The long term plan for the recreation assets within the Council area, as set out in the Recreation Infrastructure and Asset Management Plan (2008, p. 1), include the need to:

- Ensure the Parks & Recreational facilities are maintained at a safe and functional standard
- Upgrade playground equipment in accordance with current standards, to meet community needs, and to provide a safe environment for all age groups
- Use water sensitive techniques to provide well maintained playing fields

In 2008, 68% of the Naracoorte Lucindale population was under the age of 45, and 33% under the age of 25. The future demand assessments of the Recreation Infrastructure and Asset Management Plan identifies that demand on outdoor activities will increase. Despite this, the current network of recreational facilities is considered to be adequate to meet the demand generated by population growth to 2028 (Recreation Infrastructure Asset Management Plan 2008, p. 12).

The Open Space Hierarchy and Service Levels document provides definitions for the classification of various open spaces, according to their function and the catchment area they serve. These include:

- **Regional open space** – areas servicing a wide catchment (with people likely to drive longer distances to access them). These include arenas and venues and areas of cultural and environmental significance.
- **District open space** – areas where the wider community choose to visit for a specific activity. These include sports fields, youth parks and dog parks.
- **Neighbourhood open space** – areas within 1 kilometre of every household providing opportunity for informal play and sport, and social activities.
- **Local open space** – areas catering for households within a 500 metre radius, providing opportunity for small scale activities and relaxation.

Recent surveys confirm that the community are generally satisfied with the recreational facilities within the Council area (Recreation Infrastructure and Asset Management Plan 2008, p.7).

The Council has an extensive number of Council assets and a variety of users. Consideration should be given to achieving efficiencies in the building stock and use. This should also include a review of accessibility as per Age-Friendly South Australia Guidelines for State Government, and open spaces should be ‘designed to be accessible and provide the facilities needed by older people.’

This will require a more detailed consideration of the nature of users and audit of assets, and is outside the scope of this plan.

Open Spaces and Social Infrastructure provided in Naracoorte is mapped in the Structure Plan (refer Map M8).
7. Transport + Movement

7.1 Walking and Cycling

A Bike / Walking Path Master Plan was developed for the town of Naracoorte in 2007. The Master Plan provides for a network of recreational, commuting and training routes.

It is identified in the Master Plan that the major generators of cycling and pedestrian trips are schools (including Naracoorte High School, Naracoorte Primary School, Naracoorte South Primary School, and Naracoorte Christian School), the key retail/commercial precinct of Naracoorte and North Parklands recreational trail (Naracoorte Township Bike Walking Path Master Plan 2007, p. 2).

The following issues relating to walking and cycling were identified by the community (as set out on page 5 of the Master Plan):

- Issues with cyclists and pedestrians on the same path
- Bike/walking tracks would encourage people to exercise
- Pram access and access for elderly generally poor
- Need tracks to the caves
- Utilise old rail corridor as tracks
- MacDonnell Street railway bridge crossing safety concern
- No footpaths for children to and from schools
- Pedestrian crossing needed in Park Terrace
- No bike racks in town
- No separate footpath on Park Terrace to the school
- Extend the bicycle tracks to the outer areas for children to/from schools
- Danger concern around the Naracoorte Primary School
- A safe bike track linking schools and sporting facilities would be advantageous
- Need for a multi-purpose and continuous facility for walkers and cyclists
- Examples of many streets were given here there is a lack of footpath provision

- CBD bypass for cyclists in a north-south and east-west direction

The Master Plan identifies three potential options for meeting the needs of cyclists within the area (to be considered by Council). These include:

- Sharing the carriageway with other traffic and widening of the road to allow for safer sharing of the carriageway.
- Widening the carriageway to include sealed shoulders. Design standards recommend a width of 2.0m for cyclists to use for roads with a speed limit of 80kph. The cost of such a widening may be excessive.
- Provide a shared use path on the western verge. A 2.5m shared use path from the township to the National Park for pedestrians, cyclists and other users.

Addressing the shortfalls in the cycling network would help to achieve the SA Strategic Plan’s target to ‘double the number of people cycling in South Australia by 2020’.

The Naracoorte Township Bike Walking Path Master Plan also identifies a lack of pedestrian footpaths in the Naracoorte Township, as well as a lack of bicycle parking.

State Age-Friendly Living Guidelines for Residential Development seek to:

- Ensure that footpaths are well maintained and free of obstructions,
- Pedestrian crossings are provided (and are safe for use by people with various disabilities),
- Cycle paths are separated from pedestrian walkways, and
- Pavements are non-slip and sufficient in width for wheelchairs.

Additionally, ‘regional and metropolitan scale trails networks, such as shared-use linear parks, should be designed to be safe and accessible for older people.’
Challenges and Opportunities

Challenges

- Limited implementation of the Naracoorte Township Bike / Walking Path Master Plan recommendations
- Some footpath infrastructure non-compliant with the Disability Discrimination Act (DDA)
- An ageing population with decreased mobility, but in some areas Connectivity limited in some areas throughout the township for pedestrians and cyclists
- Limited provision of pedestrian / cyclist – crossing points, refuges, and ramps in certain locations
- No provision of bicycle parking facilities (aside from schools)
- Bicycle/ traffic conflicts
- Signage/ line-marking / way-finding poor for existing off-road pedestrian / bicycle routes
- Safety concerns on regional roads for cyclists
- Determination of priority for available funding
- Willingness for residents to support transport planning focused on a hierarchy of transport (e.g. walking → cycling → public transport → private transport)

Opportunities

- Develop and promote Naracoorte as a walking and cycling friendly and dominant Town and strengthen options for cycling to tourist attractions
- Every local (non-arterial) street should have a safe bicycle environment
- Appropriate bicycle parking facilities should be provided at all activity centres, shopping centres, community facilities and recreational facilities / open space (with suitable “end of trip” facilities at other key locations)
- DDA compliancy is important in areas that are, or will be, heavily used by pedestrians and provide linkages between land uses
- Footpaths should be provided based on pedestrian desire lines
- Develop or enhance regional bikeway connections
- Improve the ‘Creek Walk’ shared path (currently 5-6km long) for recreational cyclists and pedestrians (currently unsealed which is the preference of the community)
- Improve way finding signage
- Continue to strengthen awareness programs for school children and off-road path connections (“way2go” DPTI program)
- Pedestrian / cyclist integration with potential development on Robertson Street (as a 3rd Main Street)
- East / west rail line is closed, however, provides an ideal linear track for walking and cycling (particularly as a regional connector to communities and / or a tourist route)
- Additional off road cycling facilities into Town Centre (connection to existing facilities adjacent sports precinct)
- An update to the existing walking and cycling plan is required
- Improve quality and amenity of pedestrian desire lines around shops within the Town Centre (e.g. existing laneways)

Walking and Cycling - Structure Plan Response

The Structure Plan for Naracoorte seeks to identify and support the development of pedestrian and cycle paths between areas of important community use such as schools, reserves and community facilities. These paths are also reflected in Council’s Bike Walking Path Master Plan.
7.2 Local Township Traffic Conditions

Analysis

The traffic conditions affecting Naracoorte were reviewed at a high-level and informed by traffic data, crash data and the following key documents:

- Transport Infrastructure and Asset Management Plan, 2008
- Butler Street Concepts
- Town Centre bypass as shown on Naracoorte Lucindale Development Plan, Road Hierarchy and Service Levels (consolidated 29 November 2012).

7.2.1 Existing Traffic Data

Traffic data from 2003 and 2004 informed the analysis of existing traffic conditions – specifically of Smith Street, which is currently the Naracoorte ‘Main Street’ and is vested under the care and control of the Department of Planning Transport and Infrastructure (DPTI).

A more recent traffic count was undertaken by the department and the results released in January 2014. These revised statistics have been considered but the numbers have not been changed in the report due to the timing of the revised data.

The 2003 and 2004 traffic data obtained from DPTI indicates the maximum Average Annual Daily Traffic (AADT) recorded on Smith Street (west of Jones Street) was 7,400, with a heavy vehicle volume of 4.4%. Of this 114 vehicles were articulated vehicles and 7 were B-Doubles.

It is noted that heavy vehicle movements have increased since this count to approximately 55-60 B-Double movements per day (or at an average of one per 10-12 minutes).

The increase to B-Double movement has been captured during revised traffic counts undertaken by Council (in conjunction with DPTI), with recent 7 day traffic and speed counts at the following locations:

- Smith Street, between MacDonnell Street and Bank Place
- Wimmera Highway, 120m east of Jenkins Terrace
- Wimmera Highway, 160m west of Carters Road
- Wimmera Highway, east of Carters Road (3km east of Jenkins Terrace)

The implications of the increase to movements are felt by residents and regular users of Smith Street through the impact of noise and vibration of the trucks. Whilst this issue has an effect on the township, the levels of movements experienced are not creating safety concerns (see crash data discussion to follow) and are not considered to be beyond the operational capacity of the road (Smith Street). More discussion regarding a bypass is provided in Section 7.4.

A detailed traffic volume summary (2003-2004) is provided as an appendix to this report.

7.2.2 Crash Data

Crash data has been obtained from DPTI for the five year period between 2008 and 2013. Analysis indicates that no severe accidents have occurred on Smith Street in the last five years, other than ‘minor property damage only’ incidents. The crash data analysis also indicates that there is no evidence of accidents involving B-Doubles. Refer to the attached table for a detailed summary of crash data.

Challenges and Opportunities

Challenges

The major issue is east / west movement of heavy vehicles in the Town Centre B-Double movements are associated with transport / industrial terminals, the stockyards or the
transportation of grain. Issues within the Town Centre include:

- Safety of pedestrians and cyclists
- Odour (and animal waste)
- Noise / pollution
- Accidents (trucks hitting awnings)
- Impacts on an ageing population
- Township identity and amenity (e.g. impact to the Town Centre as a recreation (green) destination)
- Preservation of the ‘look and feel’ of Naracoorte
- B-double movements associated with the Stockyards can be up to 80-100 per day for large sales or 30-40 for sales of approximately 1800 head of stock

Heavy vehicles accessing the stockyards travel from all over the country, which is a challenge in defining B-Double routes. There are no ring routes for heavy vehicles, with the original bypass planned for Riddoch Highway / Deviation Road, which is now a developed area. Retail / residential development at the old township railway station may also increase traffic within the Town Centre (dependant on yields).

Opportunities

- Establish community bus if there is suitable demand
- Lower speed limit in Town Centre if excessive speeding is an issue
- Develop a Local Area Traffic Management (LATM) prioritisation process
- Align further transport recommendations to existing Transport Improvement Plan (refer Transport Infrastructure and Asset Management Plan)
- Council’s transport vision of the area (an active and healthy community which promote social inclusion and connects all modes of transit)
- Install or replace kerb in identified local streets to avoid water ponding
- Council have expressed potential support for improving traffic flow in the Naracoorte and preliminary options have been investigated, as follows:

**One-Way Loop for Southern Access into the Naracoorte Township**

A potential one-way loop for vehicles using McRae Street and Gordon Street (‘big and little
cutting”) has been identified by Council to improve pedestrian and cyclist safety on the key access roads into the Naracoorte Township.

Given the existing site constraints of these roads (narrow cross sections – McRae Street approximately 8.5m (including footpath width) and Gordon Street (north of Loveday Street) approximately 9.0m (including both the sealed and unsealed footpath)), a potential 5m one-way lane with a 3m shared use path (and buffer) could be implemented on both roads while retaining existing access to the Woolworths shopping centre.

This would result in McRae Street being one-way into the township while Gordon Street would be one-way out of the township. These works are considered to improve connectivity to the Town Centre for pedestrians and cyclists, while also make these connections safer.

To implement will only require line-marking, signage, pavement and kerb modifications, while providing opportunities for entry statements into the Naracoorte Township.

**Local Township Traffic – Structure Plan Response**

- One-way section for traffic at the ‘small’ cutting (out) and the ‘big’ cutting (in) to improve pedestrian and cyclist connectivity

- Support the development of a Local Area Traffic Management (LATM) prioritisation process

- Review opportunities for township caravan parking
7.3 Regional Traffic Conditions

Challenges and Opportunities

Challenges

- Safety associated with an increase in heavy vehicles surrounding the township
- Interfaces between state and local roads
- Likely future demand due to the potential for industry / agricultural growth
- Non-compliant roads / intersections which currently cater for heavy vehicle movements (e.g. sight distance, erosion on unsealed roads and road width)
- Local roads carry heavy vehicle traffic from plantations
- Intersection at the Teys Abattoir is a concern and requires a road safety audit given the large amount of B-Double movements
- Increase in Council asset provision and maintenance
- DPTI can’t keep up with maintenance of state roads and the regional road network is not attracting DPTI funding
- Appropriate road impact assessment for new development (e.g. impact to existing assets and regional road network intersections)
- Maintain amenity of key routes into the township, particularly those used for tourism purposes
- Upgrade road / intersections to meet future demand
- Definition of local road hierarchy based on future land use and function which informs future upgrades

Opportunities

- Implement strategies to improve safety and define heavy vehicle routes
- Develop strategies to cater for industrial and agricultural expansion
- Develop strategies to strengthen the function of tourism and the wine industry routes

7.3.1 Settlements (Lucindale / Frances)

It has been identified by Council that Lucindale and Frances do not have any significant transport issues due to their small population. However, given Frances is a key area associated with the storage and transport of grain (particularly in the summer), some definition of heavy vehicle movement within the township is required. Temporary traffic management is required for Lucindale when ‘Field Days’ run, although this is anticipated by the community and is not considered to cause a significant issue.

Regional Traffic Conditions – Structure Plan Response

- Support the enhancement of tourist routes for cyclists (such as Old Caves Road)
- Support the development of a regional bike network (as recommended by the Limestone Coast Region Plan)
7.4 Heavy Vehicle Bypass Conditions

This background review of transport issues relating to the Structure Plan has considered:

- The need for a new Naracoorte bypass
- The pros and cons and a high level review of various bypass options that can inform future, more detailed investigations.

Challenges and Opportunities

Challenges

Heavy vehicle movement on Smith Street (B-Doubles) within the Naracoorte Town Centre has been identified as a key transport issue. Issues relate to:

- Safety of pedestrians and cyclists
- Noise, odour / animal waste
- Previous accidents (trucks hitting awnings), impacts to the ageing population (accessibility) and
- Township identity (amenity and impact to a ‘green’ destination).

Smith Street is defined as commodity route for B-Doubles (approved general freight, 25m B-Double route by DPTI).

The Smith Street routes are approved under ‘notice of approval and exemption – operation of B-Doubles up to 25m in length’ pursuant to Sections 161A and 163AA of the Road Traffic Act 1961.

The primary trip generators of B-Double movement are the stockyards (accessed from Carters Road) and Teys abattoir (accessed from Wimmera Highway) both located east of the Town Centre, and the Industrial Zone west of the Town Centre (accessed from the Riddoch Highway). It is noted that there is potential for the stockyards and the industrial zone to provide for increased industrial land uses, leading to increased B-Double movement.

These land uses have resulted in east / west B-Double movement through the Naracoorte Town Centre on Smith Street.

Council has identified that up to 100 B-Double movements per day are associated with a ‘big’ sale at the stockyards, while approximately 40 B-Doubles are associated with a typical sale (approximately 1800 head of stock).

Council has indicated that B-Double movement to / from the stockyards is from ‘all directions’ and at all times. The stockyards are an important economic asset for Council and encouraging and facilitating its use is a key consideration.

Recent traffic data compiled by DPTI suggests that B-Double movements constitute approximately 55-60 per day at an average of one movement per 10-12 minutes.

Opportunities

Following a site visit and discussion with Council, the following issues have influenced the scope of some of the bypass opportunities that have been explored as part of this Structure Plan:

- Council’s objective is not to remove general traffic from accessing Smith Street where local business, services and tourist information is located. Crash data should continue to be monitored to ensure that Smith Street continues to perform safely as movements increase with town development
- Consider options for removing B-Double movements travelling east-west
- DPTI has developed a South East / Limestone Coast Region Freight Transport Plan. Of relevance to the plan the Planning Division of DPTI has advised the following pertaining to a potential bypass route: ‘Bypasses were proposed for Penola, Mount Gambier and Millicent whilst no interventions were identified for Naracoorte. Some very preliminary work has also been undertaken on a statewide basis to assess locations where possible town bypasses could be worthwhile and this work did not identify an east-west bypass of Naracoorte.”
Therefore, it doesn’t appear to be a project which has been on the radar of the strategic planning area of DPTI.

- Somewhat conversely, the State Integrated Traffic and Land Use Plan, identifies “work with local councils to complete local transport strategies to complement land use directions of local development plans, with a focus on freight movements and accessible townships: options for heavy vehicle bypass of affected towns, including Naracoorte”.

Investigations have been carried out based on recent traffic volume and crash data, coupled with residential and industrial growth projections.

Based on a comparison of historic traffic data and 2013 traffic data, the growth rate of heavy vehicles (particularly B-Doubles) has been high over the past 10 years.

While existing general and heavy vehicle traffic can be accommodated within the capacity of the existing road network, it is acknowledged that the current numbers of heavy vehicles are perceived as negative within the Naracoorte Township due to previously mentioned issues associated with amenity.

To date, Council has identified a potential bypass route for B-Doubles at a high level only (refer to the Naracoorte Lucindale Council Development Plan (consolidated 12 November 2012) Concept Plan Map NaLu/2 Naracoorte Bypass Route). Challenges

**Heavy Vehicle Bypass – Structure Plan Response (Map M11 and M11A)**

- The high cost of a regional bypass when compared against the benefits for the Naracoorte Township suggests that it is not something that should be further progressed in the short term.

- However, investigations about the need for, and opportunity for, a bypass should continue into the future.

- Discussions with DPTI should continue to canvass these options

- Analysis of the pros and cons of a range of bypass options to inform these ongoing discussions.

- An option to bypass to the west and south of Naracoorte is included. This picks up east west movements and proposes a north south route.

- Council has reconstructed a section of Boddingtons Road to Cadgee Road north of Naracoorte. Cadgee Road runs south to Carters Road, accessing the Naracoorte Regional Livestock Exchange and the Wimmera Highway. This is identified as a possible heavy vehicle bypass option should the demand arise.

- A potential bypass route is identified in the Naracoorte Lucindale Development Plan (Map NaLu2).

- Additionally, Council should support the development of a regional bike network (as recommended by the Limestone Coast Region Plan).

- East / west heavy vehicle numbers should be closely monitored. If heavy vehicle growth continues at its current rate it is likely an east / west bypass may be required (subject to future distributional traffic demands which given the potential location of new / expanded industry (east or west) would likely remain similar).
Intersection Upgrade Required

Bypass Options

Approved General Freight 25m B-Double Route

General Mass Restricted

Bypass Option 2

Bypass Option 3

Bypass Option 4

Intersection Upgrade Required

Note: Dashed lines indicate existing unsealed roads, with thick dash lines indicating a new road link is required

Refinement of Bypass Concept shown in Naracoorte Lucindale Council Development Plan (Consolidated 29 November 2012) - refer to M11A for extent

* Note Bypass Option 1 is the 'do nothing' option as described in Section 7.4.1 in the Background Report
Legend

- - - - Refinement of Bypass Concept shown in Naracoorte Lucindale Council Development Plan (Consolidated 29 November 2012)
7.4.1 By Pass Options

Option 1 – Do Nothing

No bypass route would be defined under this option, however, strategies which may improve the management of heavy vehicles include:

- Additional signage (e.g. avoid using noisy exhaust brakes in urban areas)
- B-Double speed management on Smith Street. (e.g. 40km/h zone on Smith Street-Town Centre)
- Further definition of north / south pedestrian desire lines to improve safety
- Driver awareness programs
- Provide designated parking area for heavy vehicles

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low cost; no risk of other (light) vehicles bypassing the Town Centre</td>
<td>Doesn’t solve existing issues associated with amenity, noise and odour; B-Double traffic may continue to increase on Smith Street if further industrial land use is developed and sales associated with stockyards are increased</td>
</tr>
</tbody>
</table>

Option 2 – Jenkins Terrace

Jenkins Terrace is an existing road which provides access to residential areas, health services and schools and connects to both the Riddoch Highway and the Wimmera Highway.

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Established road corridor; wide cross section; wide intersection with Wimmera Highway</td>
<td>Transfers the existing issues such as noise and pollution from the commercial precinct to an existing road with residential, health and education land use; intersects with Arthur Street which would require upgrading; the Riddoch Highway / Jenkins Terrace intersection would require upgrading; significant environmental impacts in a residential area; may upset affected residents</td>
</tr>
</tbody>
</table>

This option is not considered feasible given the high negative impacts to sensitive land uses along Jenkins Terrace.
Option 3 – Regional Bypass Route

North of the Town Centre (route options):

- Repeater Station Road – Unsealed
- Carters Road – Sealed
- Cadgee Road - Sealed
- Carthy Road – Unsealed
- Wild Dog Valley Road – Sealed

South of the Town Centre (route options):

- Clarksons Road – Unsealed
- Pistol Club Road - Unsealed
- Caves Road – Sealed (intersection with Clarksons Road and Pistol Club Road)
- Casterton-Naracoorte Road – Sealed
- Haynes Edwards Road
- Carters Road – Sealed

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removes B-Doubles from the Naracoorte Town Centre improves amenity</td>
<td>Potential high cost of intersection modification to cater for B-Double traffic. Modification cost is potentially high due to the existing nature of some intersections, existing connections to unsealed roads and sight distance; time (if DPTI funding is required) – while it is possible to source DPTI funding (e.g. through the Black Spot or Roads to Recovery programs), there is no guarantee funds can be sourced consistent with Councils timeframes for establishing a bypass, due to DPTI funding priorities; may upset affected residents; likely to require sealing and pavement rehabilitation works; provides a potential Naracoorte bypass route for general traffic which may affect local businesses; increases travel time as vehicles will be required to travel longer distances; a connection between Carthy Road and the Wimmera Highway would require a newroad connection (approximately 230m)</td>
</tr>
</tbody>
</table>

Further investigations into the merits of these options are required, subject to future traffic demand. However, it is recommended that Council retain road widths in these areas for potential future use.
Option 4 – Boddingtons Road / Cadgee Road Route (north of the Town Centre only)

Boddingtons Road connects the Riddoch Highway with Cadgee Road. Boddingtons Road has been sealed to cater for B-Double movement (aside from a small section immediately before the intersection with the Riddoch Highway which remains unsealed but with design underway for the intersection).

It is noted that during a site visit on 3 September 2013, an ‘oversized’ vehicle was observed using the unsealed section of Boddingtons Road which indicates heavy vehicles may be using the intersection with the Riddoch Highway to turn into Boddingtons Road. Further, various development proposals associated with the use of heavy vehicles have been lodged abutting Boddingtons Road.

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited works associated with road and intersection upgrades in comparison to Option 3.</td>
<td>Very high cost of intersection modification at the Riddoch Highway / Boddingtons Road intersection due to sight distance and topography (land acquisition possible); only provides a bypass for vehicles travelling to Naracoorte from the North and does not account for heavy vehicle traffic from the south.</td>
</tr>
</tbody>
</table>

Further investigation into the merits of this option is required, subject to future traffic demand. However, it is recommended that Council retain road widths in these areas for potential future use.

Note: Further detail information pertaining to the travel distances of each option and related road widths is provided in Appendix 3.

7.4.2 Implementation

If Council was to pursue a new freight route and restrict B-Double movements on Smith Street, the following process will need to be undertaken:

- Define Council’s preferred route and reserve a future corridor following detailed feasibility investigations.
- Liaise with DPTI pertaining to a change in commodity route definition. This is required to ensure all B-Double operators comply with the Higher Mass Limits Route Compliance Certificate, required for all operators who are required to nominate their route on South Australian Roads (determined from the attached map).
- Liaise with DPTI pertaining to ownership, maintenance and rehabilitation requirements.
- It is noted that a bypass route must comply with B-Double route design requirements stipulated by DPTI, with a minimum carriageway width of 12m (two-way).
7.5 Tourism Routes

Regional tourist routes are defined by DPTI in *A Functional Hierarchy for South Australia’s Land Transport Network*. The Riddoch Highway and the Wimmera Highway / Smith Street are defined as direct / scenic tourist routes. These are reflected in the Structure Plan with recommendations to enhance and support the function of these roads a primary tourist routes.

7.6 Assessing Capacity to Accommodate Traffic Growth

A capacity analysis has been undertaken to consider the potential future impacts on the existing road network as a result of growth as facilitated by the Structure Plan.

It considers the effects of uptake of the residential infill areas as identified, rural living growth and high levels of industrial growth (at the western end of Naracoorte Township).

7.6.1 Assumptions

Mott MacDonald undertook the high level capacity analysis based on the following parameters / assumptions:

- Assessment is for a peakhour operation only
- As per the Austroads’ Guide to Traffic Management – Part 3 Traffic Studies and Analysis
- Existing capacity on the Riddoch Highway is 900 vehicles per hour / per lane
- Existing capacity on other roads is 600 vehicles per hour / per lane (kerb lane with occasional parked vehicles)
- An annual growth rate of 0.35% has been applied to determine current traffic volumes (from 2003 / 2004 data)
- Existing peak hour mid-block traffic distribution (shown on the attached map) is estimated where data is not available
- Traffic generation has been based on dwelling yield capacities (refer Appendix 1)

- The peak hour vehicle trip generation rate of 0.85 per dwelling is based on the RTA Guide to Traffic Generating Developments
- The peak hour vehicle trip generation rate of 0.25 per 100m² gross floor area for traffic generation from industrial development as per recent warehouse, logistic, industrial trends (compared to 0.5 – 1 per 100 m² gross floor area as per the RTA Guidelines)
- Traffic distribution is based on a 50 / 50 directional split

7.6.2 Residential Growth

The following table details the estimated vehicle trips generated by theoretical residential development, correlating to the Infill Areas previously defined (but with slightly higher dwelling yields). Utilising higher than expected dwelling yields provides a “worst case” scenario for traffic generation and is therefore a more conservative assessment.

<table>
<thead>
<tr>
<th>Infill Area</th>
<th>Dwelling Yield</th>
<th>Estimated Peak Hour Vehicle Trips generated in 2035*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>203</td>
<td>173</td>
</tr>
<tr>
<td>2</td>
<td>28</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>95</td>
<td>81</td>
</tr>
<tr>
<td>4</td>
<td>90</td>
<td>77</td>
</tr>
<tr>
<td>5</td>
<td>45</td>
<td>38</td>
</tr>
<tr>
<td>6</td>
<td>64</td>
<td>54</td>
</tr>
<tr>
<td>7</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>8</td>
<td>71</td>
<td>60</td>
</tr>
<tr>
<td>9</td>
<td>141</td>
<td>120</td>
</tr>
<tr>
<td>10</td>
<td>75</td>
<td>64</td>
</tr>
<tr>
<td>11</td>
<td>30</td>
<td>26</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>912</strong></td>
<td><strong>775</strong></td>
</tr>
</tbody>
</table>

Note: *As per RTA Guide to Traffic Generating Developments*
7.6.3  Rural Living Growth

The following table shows the estimated vehicle trips generated by the potential rural living residential developments in 2035 (as per Structure Plan).

<table>
<thead>
<tr>
<th>Area</th>
<th>Dwelling Yield</th>
<th>Estimated Peak Hour Vehicle Trips generated in 2035*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45</td>
<td>38</td>
</tr>
<tr>
<td>2</td>
<td>62</td>
<td>53</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>55</td>
<td>47</td>
</tr>
<tr>
<td>5</td>
<td>28</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>190</td>
<td>162</td>
</tr>
</tbody>
</table>

Note: *As per RTA Guide to Traffic Generating Developments

7.6.4  Industrial Growth

The following table shows the estimated vehicle trips generated by the expected industrial developments in 2035 (as per Structure Plan / existing zoning).

<table>
<thead>
<tr>
<th>PRECINCT</th>
<th>Year 2035 @ 50% developed</th>
<th>Net developed land in 2035 (site efficiency of 85%) (ha)</th>
<th>Gross Floor Area of developed land in 2035 (30%) (ha)</th>
<th>Peak hour vehicle trips in 2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>47</td>
<td>40</td>
<td>12</td>
<td>301</td>
</tr>
<tr>
<td>E</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>T</td>
<td>30</td>
<td>26</td>
<td>8</td>
<td>191</td>
</tr>
<tr>
<td></td>
<td><strong>79</strong></td>
<td><strong>67</strong></td>
<td><strong>20</strong></td>
<td><strong>505</strong></td>
</tr>
</tbody>
</table>

Note: *As per RTA Guide to Traffic Generating Developments

7.6.5  Deferred Urban Areas

The potential development of the deferred urban area north of the Naracoorte Town Centre (adjacent to the golf course) with approximately 600+ dwellings has been identified (post 2025) in the Structure Plan.

The surrounding road network has sufficient capacity to cater for the additional traffic generated by the potential development. However, a development in this area will have significant impacts at the access junction with the Riddoch Highway, given that demands for access to services will be located south, within the Town Centre.

Pedestrian and cyclist paths that directly link the deferred urban area with the Town Centre will also be particularly important.

Further analysis will be required if residential development proceeds in this area but for the purposes of the Structure Plan, this junction and the pedestrian and cycling connections are noted.

A summary of traffic generations and impact to key streets is provided overleaf.
### 7.6.6 Summary of Traffic Generation and Distribution

<table>
<thead>
<tr>
<th>Key roads</th>
<th>Est. Current Peak Hour Traffic Flow on Mid-block (veh/ hr/ ln)</th>
<th>Est. Additional Peak hour vehicle trips generated by Residential and Rural living on Mid-block in 2035 (veh/ hr/ ln)</th>
<th>Est. Additional Peak hour vehicle trips generated by Industrial developments on Mid-block in 2035 (veh/ hr/ ln)</th>
<th>Est. Peak Hour Traffic Flow on Mid-block in 2033 (veh/ hr/ ln)</th>
<th>Lane capacity on Mid-block (veh/hr/ln)*</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith St (Riddoch Hwy - Sandstone Ave)</td>
<td>340</td>
<td>100</td>
<td>70</td>
<td>510</td>
<td>600</td>
<td>Within capacity, but level of service reduced. Further analysis required</td>
</tr>
<tr>
<td>Smith St (east of Sandstone Ave)</td>
<td>225</td>
<td>90</td>
<td>90</td>
<td>405</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Riddoch Hwy (Smith St- Jenkins Tce)</td>
<td>115</td>
<td>90</td>
<td>50</td>
<td>255</td>
<td>900</td>
<td></td>
</tr>
<tr>
<td>Riddoch Hwy (South of Jenkins Tce)</td>
<td>210</td>
<td>95</td>
<td>60</td>
<td>365</td>
<td>900</td>
<td></td>
</tr>
<tr>
<td>Riddoch Hwy (North of Smith St)</td>
<td>215</td>
<td>110</td>
<td>50</td>
<td>375</td>
<td>900</td>
<td>Spare mid-block capacity available in 2035</td>
</tr>
<tr>
<td>Gordon St</td>
<td>150</td>
<td>20</td>
<td>10</td>
<td>180</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Jenkins Tce</td>
<td>110</td>
<td>80</td>
<td>10</td>
<td>200</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Arthur St</td>
<td>135</td>
<td>50</td>
<td>10</td>
<td>195</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Sandstone Ave</td>
<td>120</td>
<td>80</td>
<td>10</td>
<td>210</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>MacDonnell St</td>
<td>110</td>
<td>20</td>
<td>10</td>
<td>140</td>
<td>600</td>
<td></td>
</tr>
</tbody>
</table>

Note:* As per Austroads Guide to Traffic Management Part 3 - Traffic Studies and Analysis
7.6.7 Conclusions

The Structure Plan has been developed on the assumption of a more modest growth rate. However, a higher growth rate has been considered in terms of the implications of growth on traffic generation and the capacity of the existing road network. Doing so provides an assessment of the “worst case scenario” (with respect to traffic generation). We note that the actual impact of expected growth on the road network in likely to be far less severe than shown.

Potential residential, rural living and industrial development within infill areas will not adversely affect the capacity and operation of the existing Naracoorte transport network under a full development scenario.

However, Smith Street may near capacity by 2035 if high growth is achieved and full development scenarios are met, including the development of infill areas as indicated in Section 2.5. If this were to occur, important factors such as amenity and pedestrian connectivity along Smith Street would be impacted (particularly due to increased east/west heavy vehicle movements).

Capacity to Accommodate Future Traffic Growth – Structure Plan Response

- Given the uncertainty over potential industrial growth, it is recommended that future industrial/heavy vehicle growth is monitored closely by Council in conjunction with DPTI (including the detailed feasibility investigations of a future bypass).

- Council should also continue with existing transport asset maintenance and proceed with planned or potential transport and traffic projects (e.g. as per the opportunities identified within the Naracoorte Lucindale Structure Plan Background Information Document).

- The network is monitored as development continues and the Structure Plan revised if growth occurs at a more rapid than expected rate.

Of particular importance will be management of:
- Access layouts which would be determined by the scale and intensity of development,
- Connectivity for pedestrians and cyclists (and the consideration of the requirement for public transport),
- Car parking within the Town Centre. Demand would be expected to increase (due to increased demand for services from population growth) leading to potential requirements for additional spaces and/or changed car parking policies.
7.7 Way-finding – finding your way around Naracoorte Township

Challenges and Opportunities

Challenges

Currently, way-finding throughout Naracoorte township for people who do not know the town intimately is problematic and is subject to a number of relevant issues and consideration, including:

- Vandalism
- Sight distances
- Maintenance
- Lack of signage

Opportunities

There is potential to further explore innovate solutions for way-finding and signage such as:

- Through combining new way-finding with different coloured pavement and existing signage
- Integrating into streetscape improvements
- Improved visibility
- Align to Council’s hierarchy of open spaces
- Focus on pedestrian and cyclist connectivity to key locations
- Improve and encourage tourism

7.8 Parking Provision

Challenges and Opportunities

Challenges

- Perceived lack of car parking from Naracoorte residents
- Underutilisation of car parks along Riverside Avenue
- The provision of adequate car parking to service perceived community demand, while encouraging active transport

Opportunities

- Improve management of parking spaces to improve customer access and increase turnover
- Improved way-finding, particularly for visitors which may not be aware of car parking locations
Appendices
Appendix 1 – Residential Infill Assessments
INFILL AREA 1

1.6 Site Overview
- The site is north of the Town Centre, adjoining the golf course, deferred urban area and the Naracoorte Creek
- It sits within the Residential Zone
- A small portion of the site has already been developed for housing with an approved land division scheme
- There is approximately 25 hectares of underdeveloped land

1.7 Site Constraints
- Flooding of the Naracoorte Creek and the management of flood waters and stormwater will limit the yield possible
- A lower site efficiency ratio is applied to account for this constraint

1.8 Yield Analysis

<table>
<thead>
<tr>
<th>Site Efficiency</th>
<th>Site Area</th>
<th>Net Developable Area</th>
<th>Average Allotment Size</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>16.3 hectares</td>
<td>16.3 hectares</td>
<td>800m²</td>
<td>207</td>
</tr>
</tbody>
</table>
INFILL AREA 2

1.9 Site Overview

- The site is north of the Naracoorte Show Grounds, adjoining Sanderson Avenue to the east and edged by primary production land
- It sits within the Residential Zone and is occupied by residential housing
- The housing is characterised by timber construction with weatherboard cladding
- The site comprises approximately 12 hectares of developed land that is expected to be redeveloped over time, with a number of vacant allotments and large allotments that will facilitate a small amount of increased dwelling yield

1.10 Site Constraints

- Existing Development Plan policy will restrict the number of additional allotments

1.11 Yield Analysis

<table>
<thead>
<tr>
<th>Site Efficiency</th>
<th>Developable Area</th>
<th>Net Developable Area</th>
<th>Average Allotment Size</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>85%</td>
<td>≈2 hectares</td>
<td>≈1.7 hectares</td>
<td>600m²</td>
<td>28</td>
</tr>
</tbody>
</table>
INFILL AREA 3

1.12 Site Overview
- The site is located at the eastern end of the Naracoorte Town Centre, adjacent to and north of the railway line
- It sits within the Residential Zone and is occupied by residential housing
- Two large Council owned parks are sited centrally within the site and it is also bounded to the north by the Town’s primary sporting and recreation facilities
- The housing is characterised by timber construction with weatherboard cladding
- The site comprises approximately 28.2 hectares of developed land could be redeveloped over time, with a number large allotments that could facilitate increased dwelling yield in the form of Detached, Semi-detached and Group Dwellings
- Allotments range from 900m² to 1900m² and between 17 to 34 metres wide

1.13 Site Constraints
- It contains a Local Heritage Item
- Existing Development Plan policy will restrict the number of additional allotments
- Established allotment pattern
- Flooding of the Naracoorte Creek at the southern end of the infill site
1.14 Yield Analysis

<table>
<thead>
<tr>
<th>Site Efficiency</th>
<th>Developable Area</th>
<th>Net Developable Area</th>
<th>Average Allotment Size</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>450-600m²</td>
<td>60</td>
</tr>
</tbody>
</table>
INFILL AREA 4

1.15 Site Overview

- The site is located at the eastern end of the Naracoorte Town Centre, south of the railway line
- It sits within the Residential Zone and is occupied by residential housing
- The housing is characterised by timber construction with weatherboard cladding
- The site comprises approximately 13.9 hectares of developed land could be redeveloped over time, with a number large allotments that could facilitate increased dwelling yield in the form of Semi-detached and Group Dwellings
- Developable allotments range from 1000m² to 1400m² and generally are 20 metres wide

1.16 Site Constraints

- Existing Development Plan policy will restrict the number of additional allotments
- Established allotment pattern

1.17 Yield Analysis

<table>
<thead>
<tr>
<th>Site Efficiency</th>
<th>Developable Area</th>
<th>Net Developable Area</th>
<th>Average Allotment Size</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>450m²</td>
<td>60</td>
</tr>
</tbody>
</table>

*Note: Development of the adjacent TAFE Campus for residential uses could facilitate an additional 30 allotments*
INFILL AREA 5

1.18 Site Overview
- The site is located at the eastern end of the township, fronting a long stretch of Arthur Street
- It sits within the Residential Zone and currently used for general farming
- The site comprises approximately 4.2 hectares

1.19 Site Constraints
- Existing Development Plan policy will restrict the number of additional allotments
- Flooding and stormwater management in the local area

1.20 Yield Analysis

<table>
<thead>
<tr>
<th>Site Efficiency</th>
<th>Developable Area</th>
<th>Net Developable Area</th>
<th>Average Allotment Size</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>65%</td>
<td>4.2 hectares</td>
<td>2.7 hectares</td>
<td>600m²</td>
<td>43</td>
</tr>
</tbody>
</table>
INFILL AREA 6

1.21 Site Overview
- The site is located at the south-eastern end of the township, fronting Arthur Street
- It sits within the Residential Zone and is currently used for some low density housing and general farming
- The site comprises approximately 6.0 hectares

1.22 Site Constraints
- Existing Development Plan policy will restrict the number of additional allotments
- Flooding and stormwater management in the local area

1.23 Yield Analysis

<table>
<thead>
<tr>
<th>Site Efficiency</th>
<th>Developable Area</th>
<th>Net Developable Area</th>
<th>Average Allotment Size</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>65%</td>
<td>6.0 hectares</td>
<td>3.91 hectares</td>
<td>600m²</td>
<td>62</td>
</tr>
</tbody>
</table>

Produced Oct 2013
1.24 Site Overview
- The site is located at the southern end of the township, behind the Hospital and fronting encompassing land bounded by Aitchison Avenue, Cedar Avenue and Jenkins Terrace
- It sits within the Residential Zone and is currently used for low density housing
- The site also includes a Council owned 0.4 hectare vacant site
- The total area comprises approximately 10.0 hectares

1.25 Site Constraints
- Existing Development Plan policy will restrict the number of additional allotments

1.26 Yield Analysis

<table>
<thead>
<tr>
<th>Site Efficiency</th>
<th>Developable Area</th>
<th>Net Developable Area</th>
<th>Average Allotment Size</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>450m²</td>
<td>≈ 45</td>
</tr>
</tbody>
</table>
INFILL AREA 8

1.27 Site Overview
- The site is a Housing SA owned redevelopment site, located at the southern end of the township, behind the Hospital, fronting Aitchison Avenue and flanked by Cedar Avenue and Grieve Avenue
- It sits within the Residential Zone
- The total area comprises approximately 3.8 hectares

1.28 Site Constraints
- Existing Development Plan policy will restrict the number of additional allotments

1.29 Yield Analysis

<table>
<thead>
<tr>
<th>Site Efficiency</th>
<th>Developable Area</th>
<th>Net Developable Area</th>
<th>Average Allotment Size</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>65%</td>
<td>3.8 hectares</td>
<td>2.5 hectares</td>
<td>450m²</td>
<td>60</td>
</tr>
</tbody>
</table>
INFILL AREA 9

1.30 Site Overview
- The site is located at the southern extremities of the township and incorporates land fronting both sides of Attiwill Street
- It sits within the Residential Zone and is currently vacant, with the exception of a handful of dwellings fronting Attiwill
- The site comprises approximately 15.1 hectares

1.31 Site Constraints
- Existing Development Plan policy will restrict the number of additional allotments
- Flooding and stormwater management in the local area (a lower site efficiency rate has been used in response)
- Proximity to former dump site (adjoining the southern side of the site)

1.32 Yield Analysis

<table>
<thead>
<tr>
<th>Site Efficiency</th>
<th>Developable Area</th>
<th>Net Developable Area</th>
<th>Average Allotment Size</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>65%</td>
<td>15.1 hectares</td>
<td>9.8 hectares</td>
<td>800 m²</td>
<td>124</td>
</tr>
</tbody>
</table>
INFILL AREA 10

1.33 Site Overview
- The site is located at the southern extremities of the township and bounded by Riddoch Highway, Schinckel Road, Grieve Avenue and Alexander Avenue
- It sits within the Residential Zone and occupied by a diverse number of dwellings on various allotment sizes
- The site comprises approximately 14.7 hectares

1.34 Site Constraints
- Existing Development Plan policy will restrict the number of additional allotments

1.35 Yield Analysis

<table>
<thead>
<tr>
<th>Site Efficiency</th>
<th>DevelopableArea</th>
<th>Net Developable Area</th>
<th>Average Allotment Size</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>450m²</td>
<td>≈ 50</td>
</tr>
</tbody>
</table>

Produced Oct 2013
INFILL AREA 11

1.36 **Site Overview**
- Vacant residential zoned land at the southern end of town
- 3.1 hectares

1.37 **Yield Analysis**

<table>
<thead>
<tr>
<th>Area</th>
<th>Site Efficiency</th>
<th>Developable Area</th>
<th>Net Developable Area</th>
<th>Average Allotment Size</th>
<th>Approximate Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>65%</td>
<td>3.1 hectares</td>
<td>2.0 hectares</td>
<td>800m²</td>
<td>25</td>
</tr>
<tr>
<td>B</td>
<td>100%</td>
<td>1.06 hectares</td>
<td>1.06 hectares</td>
<td>800m²</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>3.06 hectares</strong></td>
<td></td>
<td><strong>38</strong></td>
</tr>
</tbody>
</table>
Appendix 2 – Traffic Assessment for Residential Growth (Supporting Figures)
Residential Yield Analysis: Naracoorte Township

Please note that these figures are approximate only.

Legend:
- Primary Production
- Airfield / Infrastructure
- Rural Living
- Conservation
- Industry / Light Industry
- Residential
- Deferred Urban
- Commercial / Town Centre
- Caravan & Tourist Park
- Recreation
- Mixed Use
- Residential Infill Area
- Flow Direction

As per Austroads Guide to Traffic Management Part 3 Traffic Studies and Analysis:
- Capacity on the Riddoch Highway is 900 vehicles per hour / per lane
- Capacity on other roads is 600 vehicles per hour / per lane

*An annual growth rate of 0.35% has been applied to determine the current traffic volumes from 2003 / 2004 data.
Residential Yield Analysis: Naracoorte Township

Please note that these figures are approximate only

Legend
- Primary Production
- Airfield / Infrastructure
- Rural Living
- Conservation
- Industry / Light Industry
- Residential
- Deferred Urban
- Commercial / Town Centre
- Caravan & Tourist Park
- Recreation
- Mixed Use
- Residential Infill Area
- Flow Direction

As per Austroads Guide to Traffic Management Part 3 Traffic Studies and Analysis:
- Capacity on the Riddoch Highway is 900 vehicles per hour / per lane
- Capacity on other roads is 600 vehicles per hour / per lane
* Traffic distribution based on a 50:50 directional split

80 Additional Traffic Generated Residential
50 Additional Traffic Generated Rural Living
50 Additional Traffic Generated Industrial

Traffic Distribution Residential
Traffic Distribution Rural Living
Traffic Distribution Industrial
Please note that these figures are approximate only.

Legend
- Primary Production
- Airfield / Infrastructure
- Rural Living
- Conservation
- Industry / Light Industry
- Residential
- Deferred Urban
- Commercial / Town Centre
- Caravan & Tourist Park
- Recreation
- Mixed Use
- Residential Infill Area
- Flow Direction
- Estimated Mid - Block Traffic Flow Per Hour / Per Lane

As per Austroads Guide to Traffic Management Part 3 Traffic Studies and Analysis:
- Capacity on the Riddoch Highway is 900 vehicles per hour / per lane
- Capacity on other roads is 600 vehicles per hour / per lane
- Traffic distribution based on a 50:50 directional split
## Naracoorte - Traffic Volume Summary - 2008 to 2013

<table>
<thead>
<tr>
<th>Location</th>
<th>Survey Date</th>
<th>AADT</th>
<th>Heavy Vehicle</th>
<th>Articulated Vehicle (Semi)</th>
<th>B-Double</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith St, east of Riddoch Hwy</td>
<td>Wed, 09.06.2004</td>
<td>4500</td>
<td>310</td>
<td>6.9%</td>
<td>125</td>
<td>2.8% 28 0.6% Based on traffic survey at the roundabout of Riddoch Hwy/ Smith St</td>
</tr>
<tr>
<td>- Eastbound</td>
<td>2200</td>
<td>155</td>
<td>7.0%</td>
<td>60</td>
<td>2.7%</td>
<td>13 0.6%</td>
</tr>
<tr>
<td>- Westbound</td>
<td>2300</td>
<td>155</td>
<td>6.7%</td>
<td>65</td>
<td>2.8%</td>
<td>14 0.6%</td>
</tr>
<tr>
<td>Smith St, east of McRae St</td>
<td>Wed, 25.06.2003</td>
<td>6900</td>
<td>305</td>
<td>90</td>
<td>22</td>
<td>Based on the traffic survey at the intersection of Smith St/ McRae St</td>
</tr>
<tr>
<td>- Eastbound</td>
<td>2900</td>
<td>156</td>
<td>50</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Westbound</td>
<td>4000</td>
<td>149</td>
<td>41</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith St, west of McRae St</td>
<td></td>
<td>4600</td>
<td>271</td>
<td>79</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>- Eastbound</td>
<td>2300</td>
<td>143</td>
<td>43</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Westbound</td>
<td>2300</td>
<td>128</td>
<td>35</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith St, east of Jones St</td>
<td>Tue, 08.06.2004</td>
<td>6600</td>
<td>312</td>
<td>4.7%</td>
<td>109</td>
<td>1.7% 7 0.1% Based on the traffic survey at the intersection of Smith St/ Jones St</td>
</tr>
<tr>
<td>- Eastbound</td>
<td>2500</td>
<td>146</td>
<td>51</td>
<td>51</td>
<td>2.0%</td>
<td>4 0.2%</td>
</tr>
<tr>
<td>- Westbound</td>
<td>4100</td>
<td>166</td>
<td>58</td>
<td>14</td>
<td>1.4%</td>
<td>3 0.1%</td>
</tr>
<tr>
<td>Smith St, west of Jones St</td>
<td></td>
<td>7400</td>
<td>327</td>
<td>4.4%</td>
<td>114</td>
<td>1.5% 7 0.1%</td>
</tr>
<tr>
<td>- Eastbound</td>
<td>3200</td>
<td>153</td>
<td>52</td>
<td>1.6%</td>
<td>4</td>
<td>0.1%</td>
</tr>
<tr>
<td>- Westbound</td>
<td>4200</td>
<td>174</td>
<td>62</td>
<td>1.5%</td>
<td>3</td>
<td>0.1%</td>
</tr>
</tbody>
</table>
Naracoorte - Crash History Summary - 2008 to 2013

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Total Crashes</th>
<th>Type of vehicle involved</th>
<th>Severity</th>
<th>Crash Type</th>
<th>Most common Apparent Error</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Failure</td>
<td>Right Turn</td>
<td>Inattention</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PDO</td>
<td>Rear End</td>
<td>Fail to Give Way</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hit Fixed Object</td>
<td>Side Swipe</td>
<td>Hit Ped</td>
</tr>
<tr>
<td>Riddoch Hwy/ Macdonnell St</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Riddoch Hwy/ Gordon St</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Disobey Give Way</td>
</tr>
<tr>
<td>Riddoch Hwy/ Smith St</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Smith St/ McCoy St</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Inattention</td>
</tr>
<tr>
<td>Smith St/ Magarey Crescent</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>Fail to Give Way</td>
</tr>
<tr>
<td>Smith St/ McRae St</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>Fail to Give Way</td>
</tr>
<tr>
<td>Smith St/ Jones St</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Fail to Give Way</td>
</tr>
<tr>
<td>Smith St/ De Garis Place</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>Inattention</td>
</tr>
<tr>
<td>Smith St/ Rolland Street</td>
<td>6</td>
<td>6</td>
<td>1</td>
<td>5</td>
<td>Fail to Give Way, In attention</td>
</tr>
<tr>
<td>Smith St/Cadgee</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>Follow too closely, Overtake w/o care</td>
</tr>
<tr>
<td>Smith St/ Jenkins Terrace</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>Fail to Give Way, In attention</td>
</tr>
<tr>
<td>Wimmera Hwy/ Needwood Drive</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Fail to Give Way</td>
</tr>
<tr>
<td>Wimmera Hwy/ Nicholson Street</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Vehicle fault</td>
</tr>
<tr>
<td>Wimmera Hwy/ Carters Road</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>Follow too closely/ Disobey Give Way</td>
</tr>
</tbody>
</table>

TOTAL  33  27  2  3  0  5  28  1  4  5  9  1  13
Appendix 4 – Further Support Information for Bypass Options

Approximate Road Widths

This information is indicative only and has been obtained from the SA Government Property Location Browser online aerial photography. It is noted that the values presented in the table below have been measured at a specific location and actual width of the roads may vary from location to location. For as accurate as possible measurements the entire road reserve land parcel has been measured (e.g. includes footpaths and or vegetation at side of road).

<table>
<thead>
<tr>
<th>Road</th>
<th>Road Reserve Land Parcel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jenkins Terrace</td>
<td>20m (adjacent Rolland Street)</td>
</tr>
<tr>
<td>Repeater Station Road</td>
<td>17m (adjacent Banksia Lane)</td>
</tr>
<tr>
<td>Carters Road</td>
<td>24m (south of the Wimmera Highway)</td>
</tr>
<tr>
<td>Cadgee Road</td>
<td>19m (adjacent Playford Drive)</td>
</tr>
<tr>
<td>Cathy Road</td>
<td>19m (adjacent Cadgee Road)</td>
</tr>
<tr>
<td>Wild Dog Valley Road</td>
<td>27m (adjacent Cadgee Road)</td>
</tr>
<tr>
<td>Clarksos Road</td>
<td>15m (adjacent Cedar Avenue)</td>
</tr>
<tr>
<td>Pistol Club Road</td>
<td>14m (adjacent Old Caves Road)</td>
</tr>
<tr>
<td>Casterton-Naracoorte Road</td>
<td>20m (adjacent Pistol Club Road)</td>
</tr>
<tr>
<td>Haynes Edwards Road</td>
<td>17m (adjacent Pistol Club Road)</td>
</tr>
</tbody>
</table>

These measurements indicate that a road cross section of 12m can be accommodated within the existing road reserve land parcel owned by DPTI or Council without land acquisition. However, intersection upgrades and pavement works, e.g. shoulder widening will likely be required for a defined bypass route.

Additional Bypass Travel Distances

This information is indicative only and has been obtained from the SA Government Property Location Browser online aerial photography. It is noted that exact distances may vary slight from the values present in this table.

<table>
<thead>
<tr>
<th>Option</th>
<th>Existing Route Distance (Km)</th>
<th>Option Route Distance (Km)</th>
<th>Additional Distance (Km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 2</td>
<td>6km</td>
<td>4.6km</td>
<td>-1.4km</td>
</tr>
<tr>
<td>Option 3 (via Sandstone Avenue)</td>
<td>8.2km</td>
<td>8.8km</td>
<td>0.6km</td>
</tr>
<tr>
<td>Option 3a (via Carthys Road)</td>
<td>8.2km</td>
<td>7.6km</td>
<td>-0.8km</td>
</tr>
<tr>
<td>Option 3b (via Pistol Club Road and Casteron Naracoorte Road)</td>
<td>9km</td>
<td>9.3km</td>
<td>0.3km</td>
</tr>
<tr>
<td>Option 3c (via Haynes Edwards Road and Casteron Naracoorte Road)</td>
<td>9km</td>
<td>8.7km</td>
<td>-0.3km</td>
</tr>
<tr>
<td>Option 4</td>
<td>22km</td>
<td>26km</td>
<td>4km</td>
</tr>
</tbody>
</table>