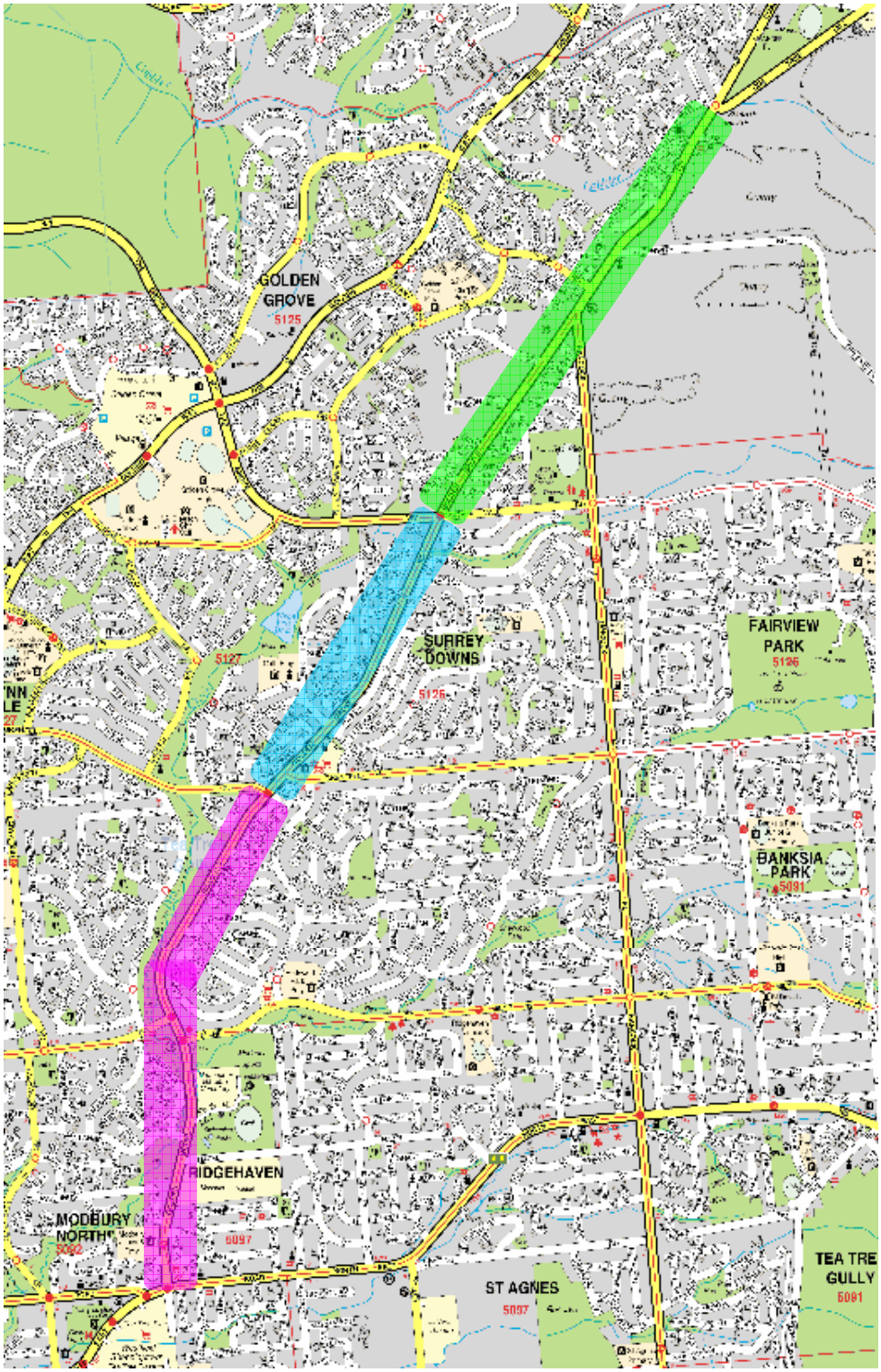
Government of South Australia
Department for Transport, Energy and Infrastructure

ROAD MANAGEMENT PLAN

RN05200 – Golden Grove Road



Date	Revisions	Amended by
3-11-2005	Revisions table added.	C D'Agostini
3-11-2005	Bus map updated	C D'Agostini
4-11-2005	Concerns raised re trucks turning from Greenwith Road included.	C D'Agostini

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1 OVERVIEW

The objective of this Road Management Plan (RMP) is to identify the operational and traffic management issues along the length of road and then to develop potential traffic management solutions on a broader network basis. By undertaking this RMP, it is intended that any upgrading that is undertaken along the road will be consistent with this plan, and it will overcome the tendency to undertake improvements in an isolated fashion that may result in possible inconsistent treatments or overlooking similar issues at other locations along the road.

The process that Transport SA has undertaken to identify traffic management issues involves:

- Research of historical records
- Site auditing and site observations
- Analysis of recorded crash and traffic flow statistics
- Consultation with Council and the local community

By looking at a road on a route basis, traffic management solutions to address the identified issues can be developed that take into account a range of factors including:

- Broader transport objectives
- Role and function of the road
- Needs of all modes of transport including, freight, buses, bicycles and pedestrians
- Future development and traffic growth
- Community needs and expectations
- Ensuring that any treatments are consistent with longer term plans for the road or area
- Appropriate standards and guidelines to ensure consistency and effectiveness of any proposed treatments

This RMP will form the basis for discussion and consultation with Council and the community with a view to further development and eventual implementation of the plan.

The RMP provides an overall view of the operational and safety issues on Golden Grove Road between One Tree Hill Road and North East Road, and includes traffic management recommendations and improvements required to improve safety and operational efficiency for this road.

For the purpose of this document, Golden Grove Road has been divided into 3 sections (refer Figure 1):

- Section 1: Between One Tree Hill Road and Yatala Vale Road
- Section 2: Between Yatala Vale Road and Grenfell Road (west)
- Section 3: Between Grenfell Road (west) and North East Road

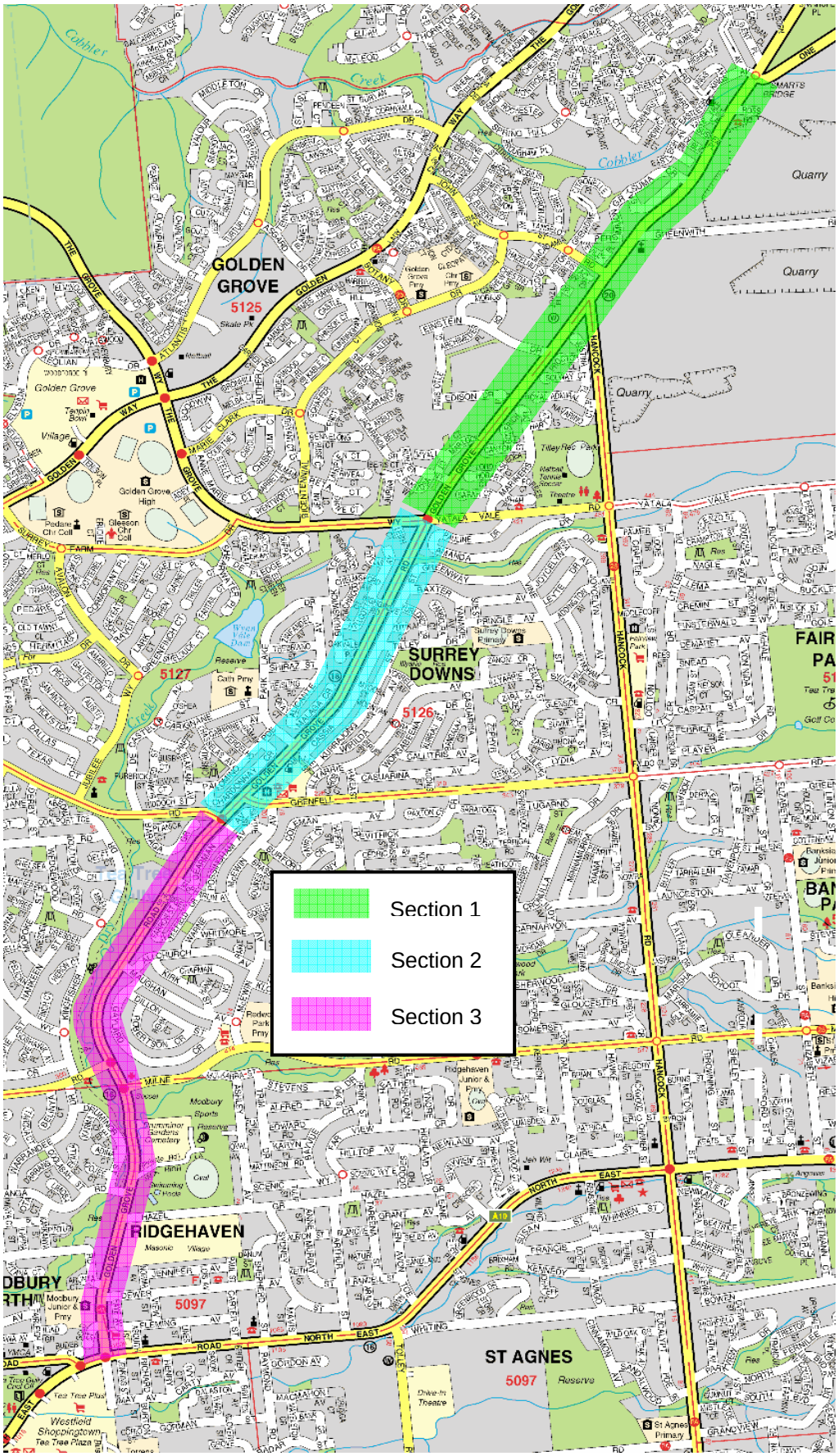

Figure 1: Golden Grove Road

2 EXISTING

2.1 GENERAL DESCRIPTION

Golden Grove Road is located within the City of Tea Tree Gully. Transport SA assumes the care, control and management of the road between One Tree Hill Road and North East Road, a total length of 6.43 km.

2.2 ROAD CROSS SECTION

The existing general cross section of Golden Grove Road is:

Start RRD	End RRD
3.2	7.0
7.0	9.6

Left Shoulder (m)	Bike Lane	Left Lane 2 (m)	Left Lane 1 (m)	Median	Right Lane 1 (m)	Right Lane 2 (m)	Bike Lane	Right Shoulder (m)
			3.1		3.1			
	1.2	3.1	3.1	4.0	3.1	3.1	1.2	

Note:-

1. RRD 3.2 is One Tree Hill Road and RRD 7.0 is Grenfell Road (east), with the Left side being the eastern carriageway
2. RRD 7.0 is Grenfell Road (east) and RRD 9.6 is North East Road, with the Left side being the eastern carriageway

2.2.1 Golden Grove Road – Sections 1 and 2

Sections 1 and 2 extend from One Tree Hill Road to Grenfell Road (east), covering a distance of 3.8 km. The sealed pavement width of the road and the roads cross-section varies over the length, but is typically 6.2m consisting of an undivided carriageway with 1 lane in each direction (refer Figure 1).

2.2.2 Golden Grove Road – Section 3

Section 3 extends from Grenfell Road (east) to North East Road and covers a distance of 2.6 km. The road cross-section is 18.8m wide, which involves a divided section with two lanes in each direction (refer Figure 1), with the road crossing the Dry Creek and Cobbler Creek watercourse.

2.2.3 Metropolitan Road Widening Plan (MARWP)

The Metropolitan Adelaide Road Widening Plan Act was developed in 1972 as a means to control building works so that land would be available for the widening of existing and construction of future arterial roads with minimum disruption to abutting property, should this need arise in the future. As outlined in the MARWP, locations of Golden Grove Road, which may be affected, include:

- between Greenwith Road and Hancock Road, where an extra 15m may in future be added to the roads width on the south-eastern side of Golden Grove Road (refer Figure 2)
- between Hancock Road and The Grove Way/Yatala Vale Roads, where an extra 15m may in future be added to the roads width on the north-western side of Golden Grove Road (refer Figure 3)

- at the intersection of Golden Grove Road and The Grove Way, where an extra 15m may in future be added to the roads width on the South-eastern side of the intersection (refer Figure 4)
- south of the intersection with The Grove Way, where an extra 21m may in future be added to the roads width on the North-Western side of Golden Grove Road (refer Figure 4)

It should be noted however, that there are no plans in the foreseeable future for works to be undertaken which are outside of the existing road reserve width.

Figure 2: Possible future road widening between Greenwith Road and Hancock Road

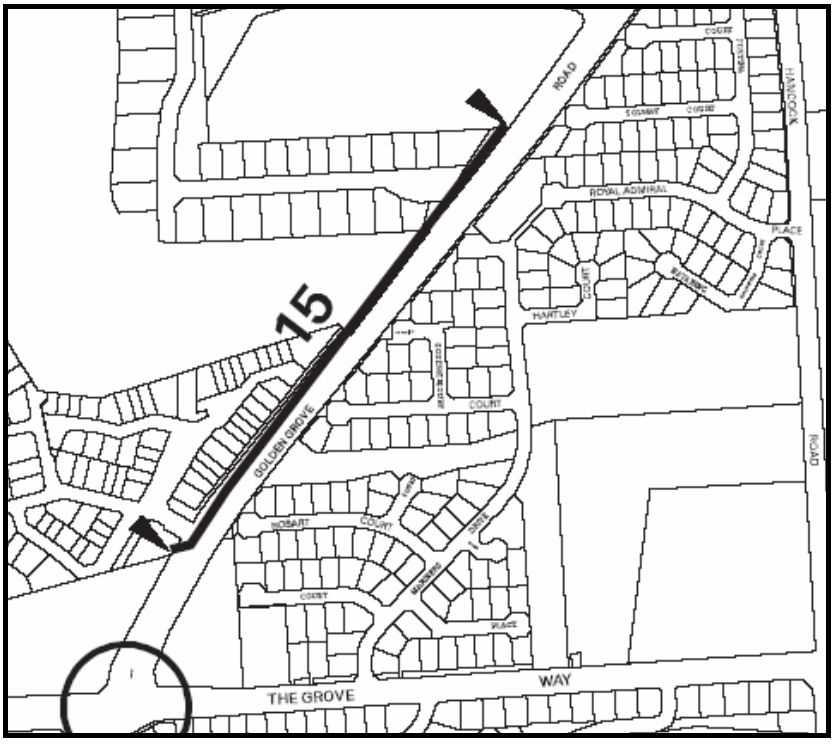

Figure 3: Possible future road widening between Hancock Road and The Grove Way

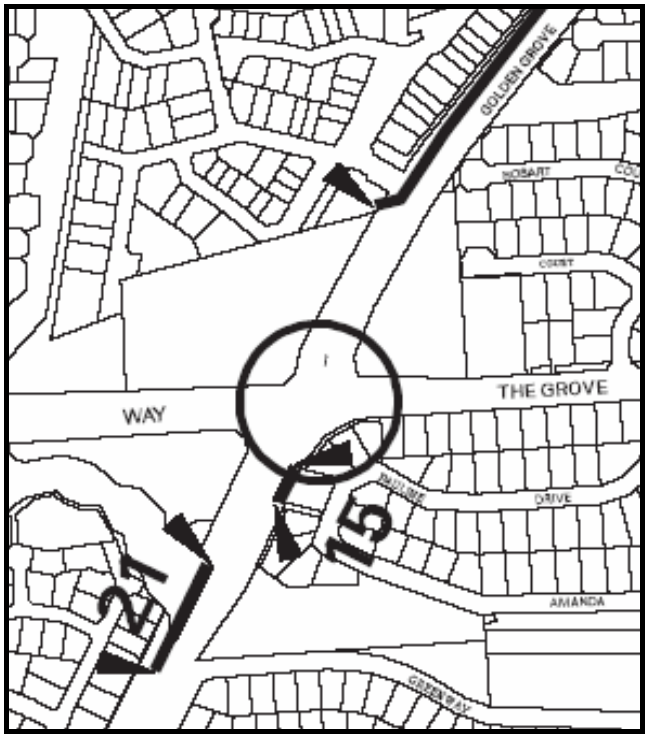

Figure 4: Possible future road widening at the intersection of Golden Grove Road and The Grove Way, and on Golden Grove Road south of this intersection

2.3 TRAFFIC VOLUMES AND COMMERCIAL QUANTITY

Figure 5 shows the Annual Average Daily Traffic (AADT) volumes, one-way peak hour traffic flows, and the commercial percentage of traffic for Golden Grove Road between One Tree Hill Road and North East Road.

This information has been sourced from traffic turning counts undertaken at the following intersections:

- 2003: Golden Grove Road / Hancock Road
- 2004: Golden Grove Road / One Tree Hill Road / Kings Avenue
  Golden Grove Road / Grenfell Road
- 2005: Golden Grove Road / The Grove Way / Yatala Vale Road
  Golden Grove Road / Milne Road
  Golden Grove Road / North East Road

Additional traffic turning counts have been undertaken at the following locations during 2005:

- John Road
- McPharlin Avenue
- Maughan Avenue

It should be noted that a single clear lane of traffic (unimpeded by turning vehicles, stopping busses etc) has the capacity to cater for up to 1400 vehicles per hour.

Section 1 and 2 of Golden Grove Road has a narrow pavement width and therefore the lowest capacity. Road widening to provide additional road width for turning traffic and stopping busses in these sections are therefore highly desirable.

Section 3 has sufficient road width to cater for the existing traffic flows and is able to cater for the anticipated future traffic growth.

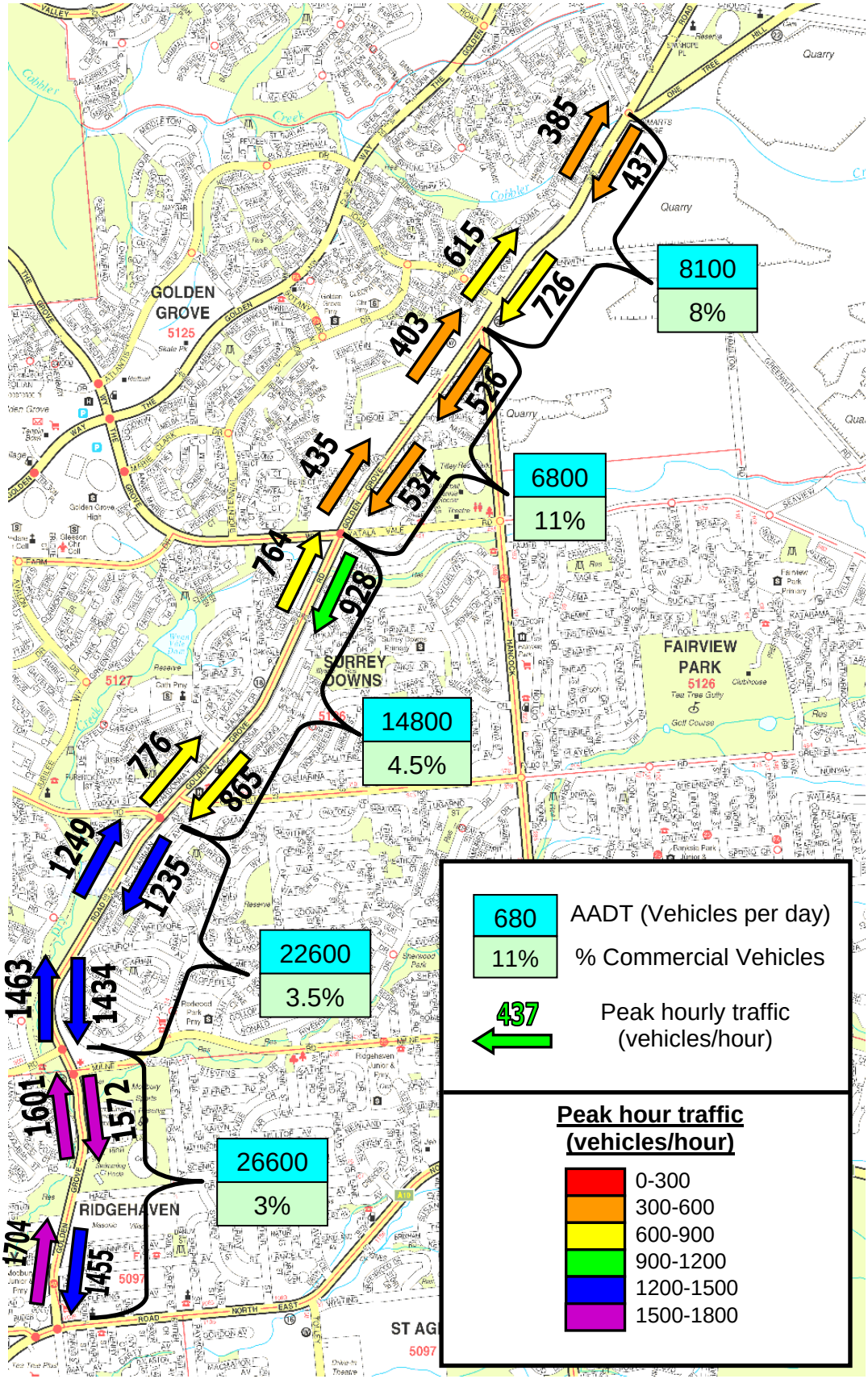

Figure 5: Annual Average Daily Traffic (AADT) volumes and one-way peak hour traffic flows for Golden Grove Road.

3 ROAD ROLE AND FUNCTION

Golden Grove Road is a major arterial road through the residential and commercial areas of Modbury and Golden Grove, and as such serves a number of key roles.

The role and function assigned to Golden Grove Road is as set out below:

Freight Route
Required to cater for significant freight movements generated by industrial and commercial areas, including Austral and PGH bricks, Garden Grove garden and landscaping suppliers, and the sand quarries.

Public Transport Route
Services a number of bus routes including a transit link bus route connecting the north-eastern suburbs to and from the Adelaide CBD via the O-Bahn

Cycle Route
Provides for reasonably long, inter-suburban continuous connections and access to key cycle trip generators such as strip and local shopping, educational institutions and places of cultural and social activity (eg Tea Tree Plaza)

Commuter Route
Provides an arterial link serving commuter traffic between the north-eastern suburbs (and beyond) to the Adelaide CBD. It also provides connectivity to residential, commercial and industrial areas to the north and west of Adelaide via strategic routes such as The Grove Way, McIntire Rd, Kings Rd and Montague Rd

4 FUNCTIONAL OUTCOMES

Functional outcomes are specific performance objectives to assist in the selection of system management components such as traffic signals, lanes, access control, roadside environment and pedestrian facilities. These outcomes provide guidance for the selection of road management techniques to achieve the broader network objectives, consistent with roads specified role and function.

Routes will however, need to be assessed based on the opportunities and constraints of the area and some trade offs may be required, particularly where the road serves a number of roles.

Functional outcomes have been used to develop an overall plan or vision of how the road should look and operate.

It should however be noted, that road safety is a key outcome in the selection of any road management techniques within this document.

The relevant target design/operational requirements are shown in Table 1.

Relevant Requirements for Golden Grove Road

Table 1: Functional Outcomes and Target design/optional requirements for Golden Grove Road

System management components	Functional outcomes	Target design / operational requirements
CAPACITY	• One clear operating lane will cater for traffic flows up to 1400 vph	As shown in Figure 5, the only section of Golden Grove Road which experiences traffic flows greater than 1400 vph is south of Grenfell Road (west), which currently has dual lanes in each direction. The remaining length has traffic flows well under 1400 vph in each direction. • **One uninterrupted operating lane in each direction to cater for existing and expected traffic volumes in sections 1 and 2** • **Section 3 currently has two lanes to cater for higher traffic flows.**

LANES	• Provide at least one clear lane at all times • Provide lane widths to accommodate heavy vehicles and busses • Provide adequate kerb lane widths for freight vehicles or busses to pass a stationary bus at bus stops and parked cars in one lane roads • Provide adequate lane width where cyclists and traffic share the kerb lane or provide exclusive bicycle lanes	• **At least one wide uninterrupted traffic lane.** • **To ensure traffic flow is uninterrupted in sections 1 and 2** – **Indent Bus Stops** – **Provide right turn storage lanes where traffic turns right at intersections or to gain access to adjacent properties** • **Indent all bus stops, particularly in the single lane sections** • **Provide cycle lanes, or where this is not possible or practical, wider kerb lanes to accommodate bicycles**
TURNING TRAFFIC	• Where traffic turns right or U turns, separate turn lanes with appropriate deceleration tapers and storage lengths should be provided so that turning vehicles do not interfere with the smooth flow of traffic.	• **All U Turns manoeuvres should be banned at median openings except at locations where protected right turn lanes are provided as in Section 3.** • **See also "MEDIANS"**
MEDIANS	• Provide medians to store right turn vehicles including cyclists	• **Raised or flush median to provide storage lane for right turning vehicles where required**
TRAFFIC SIGNALS	• Coordinate during the peak to minimise stops and delays to buses, and commuters • Consider bus priority measures at key delay locations • Provide high level of right turn facilities for bus movements • Provide storage areas, and adequate detection and green time for cyclists at signalised intersections • Provide storage area for cyclists turning right • Favour major commuter peak flow • Cater for right turn demand into Golden Grove Road during peak times	• **Avoid the installation of additional traffic signals**

SPEED LIMITS	• Maintain speed limit at or above 60km/hr	• **Existing speed limits are appropriate for the existing level of adjacent development and design standards, therefore no changes are proposed.**
ACCESS - MIDBLOCK	• Provide reasonable spacing between driveways to enable bus stops to be installed • Minimise access points to reduce conflict points (Minimise direct property access) • Consider protected turn lanes where warranted	Given the limited road width it will be difficult to limit direct access to mid-block properties. • **Restrict midblock access to properties where necessary to ensure safe operation**
TRAFFIC MANAGEMENT AT INTERSECTIONS	• Provide adequate bus turning circles into side roads • Major intersections and junctions should have active control • Minimise conflict points	• **Provide active control (eg traffic signals, roundabouts) at major intersections where rationalisation of access / movements is not possible** • **Investigate various sites for active control**
LANDSCAPING AND ROADSIDE FURNITURE	• Eliminate roadside hazards • Eliminate overhanging vegetation • Provide bus shelters, seating and timetables at all bus stops • Eliminate roadside furniture, except bus shelters, within 8m of approach to bus pole • Ensure adequate sight distance between exiting traffic and cyclists	• **Trim vegetation and remove trees where necessary for road safety**
PEDESTRIANS	• Minimise crossing distances • All facilities to be DDA compliant • Raised medians at crossing points • Reduce traffic speeds if possible • Ensure visibility at crossing points • Provide appropriate clear width and heights on walkways and footpaths • Good road lighting	• **Provide raised medians / kerb protuberances / walk throughs at busy pedestrian crossing points** • **Upgrade road lighting in busy pedestrian locations** • **Provide appropriately designed footpaths** • **All pedestrian footpaths, ramps, cut outs etc. to be DDA compliant**

BUSES	• Ensure suitable width travelling lane • Co-locate bus stops and pedestrian crossing facilities • Bus stops on exit side of traffic signals • Indent bus bays where buses interfere with flow of following buses	• **Provide appropriate width travelling lanes for buses** • **Indent all bus bays in sections 1 and 2 (see also "CAPACITY", "LANES", "MEDIANS")**

5 LONG TERM VISION

5.1 *SECTIONS 1 AND 2*

A vision of how Golden Grove Road should look and operate has been developed based on the above "functional outcomes analysis". The traffic management recommendations in this report aim at realising as much as possible this vision and they therefore target the higher safety and operational requirements.

However there may be constraints requiring some compromises from the vision ideals, such as the need to retain as much of the existing landscaping and roadside vegetation, limitations in available road reserve and the need to maintain a reasonable level of access to adjacent property.

The preferred general cross section for sections 1 and 2 of Golden Grove Road, to meet "target design and operational requirements" listed in table 1 above is shown below.

Figure 6 shows the preferred traffic management at junctions; while Figure 7 shows the preferred general mid-block cross section (where limited direct access to adjacent properties exists).

Both cross sections include indented bus bays, separate bicycle lanes or lane widths appropriate for bicycle use, and un-interrupted through travelling lanes.

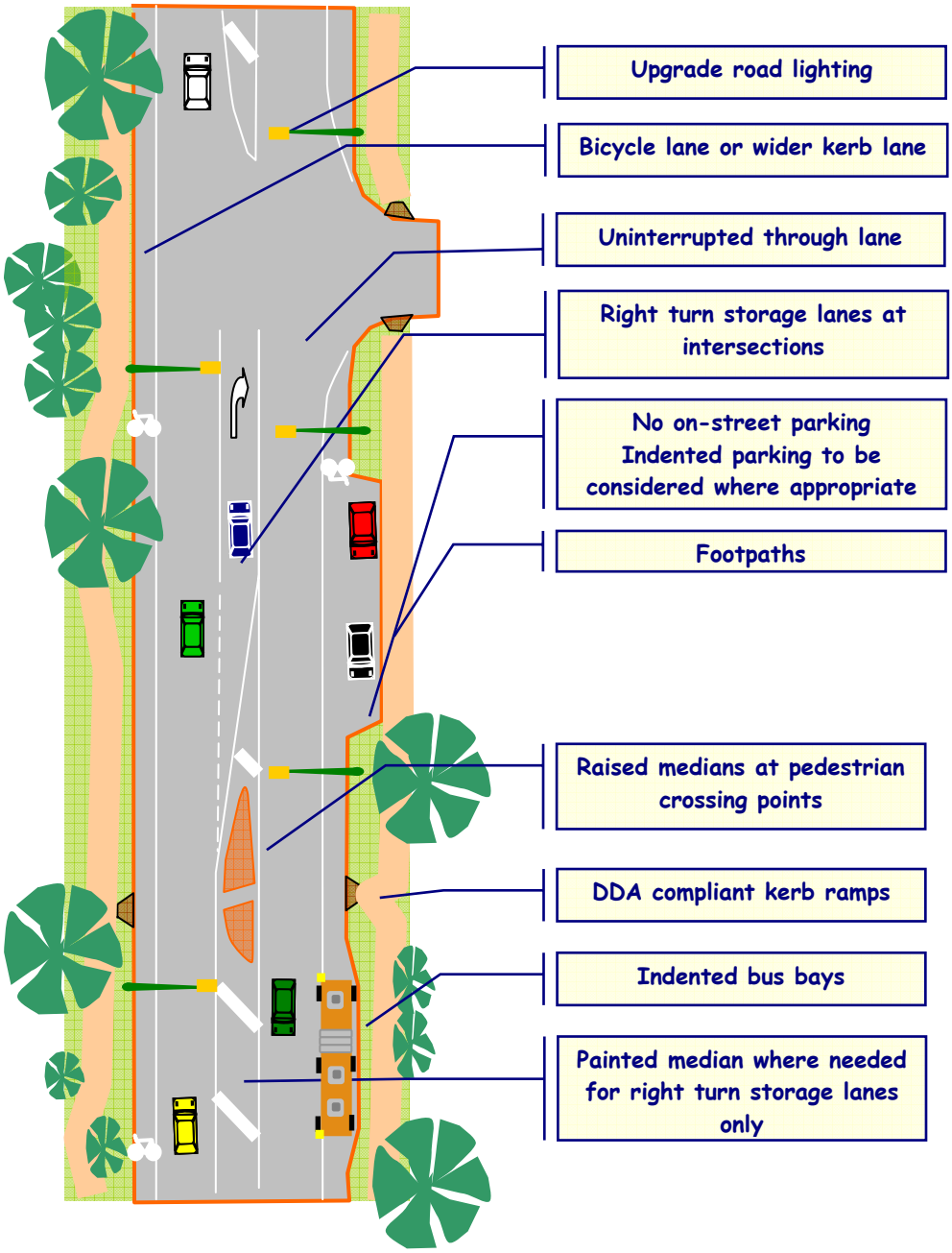

Figure 6: Typical Cross section of Golden Grove Road at side road junctions

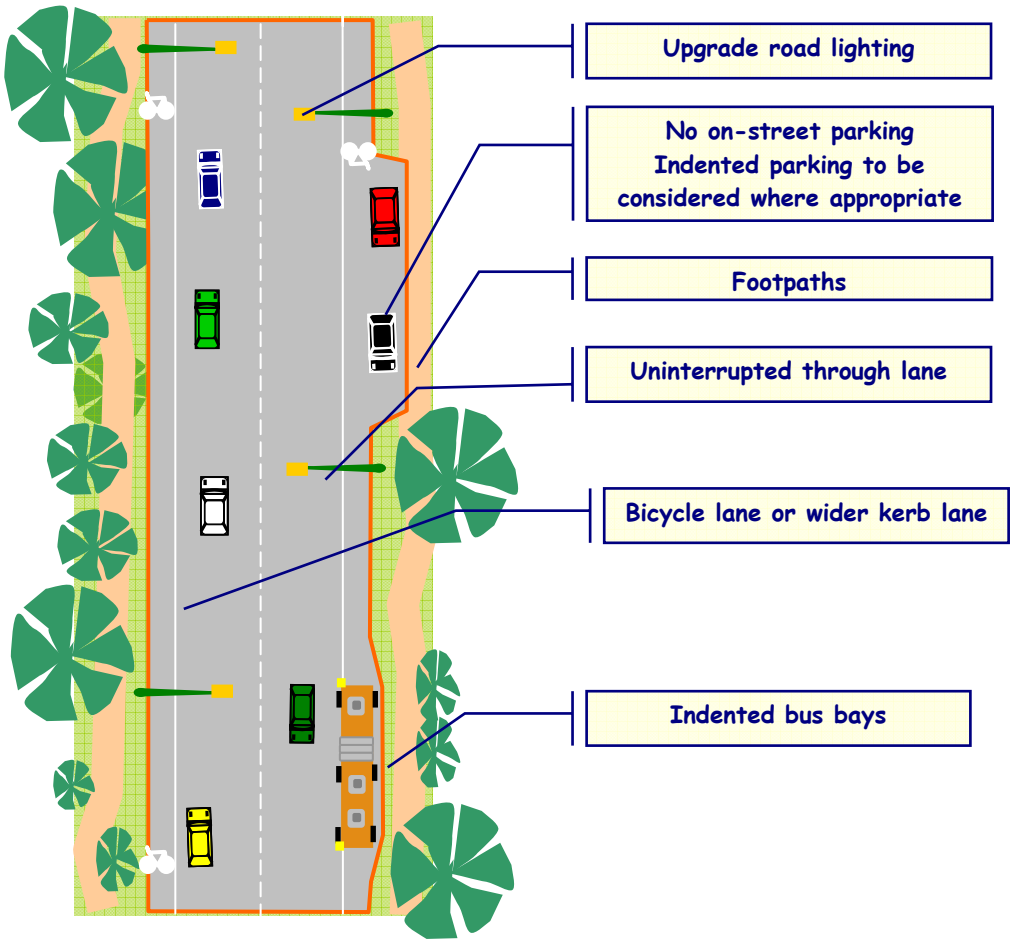

Figure 7: Typical Mid-block Cross-section for Sections 1 and 2

5.2 SECTION 3

As Section 3 currently has two travelling lanes in each direction, on-road bicycle lanes, and a raised median with turning facilities and adequate lighting there are no changes proposed for this section of road.

6 ROAD SAFETY

The community expects a safe and secure transport system. The South Australian Government has set out clear directions for Transport Safety including: -

- Reducing the number of crashes and/or incidents and their human impact
- Providing the community with a safer and more secure transport system
- Having specific regard for the safety and security of vulnerable road users

Road safety works, targeting high priority "Black Spots" and other safety improvements are recognised as having significant potential in reducing the number and severity of crashes on the key safety issues that have been identified.

Crash data has been studied for the five-year period of 2000 to 2004 inclusive. Sites with total accident numbers exceeding 5 (more than 1 crash per year) have been identified as traffic management issues for further investigation within this report.

6.1 INTERSECTION CRASH DATA

<table>
<tr><th>ROAD SECTION</th><th>GOLDEN GROVE ROAD INTER SECTION</th><th>Crash data 2000 - 2000</th></tr>
<tr><td>1</td><td>One Tree Hill Rd/ Kings Av</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Hit Fixed Object</td><td>-</td><td>1</td><td>1</td></tr>
<tr><td>Total</td><td>-</td><td>1</td><td>1</td></tr>
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</td></tr>
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<tr><td>Hit Fixed Object</td><td>1</td><td>-</td><td>1</td></tr>
<tr><td>Total</td><td>1</td><td>-</td><td>1</td></tr>
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<tr><td>1</td><td>Satsuma Cr</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Right Angle</td><td>1</td><td>-</td><td>1</td></tr>
<tr><td>Total</td><td>1</td><td>-</td><td>1</td></tr>
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</td></tr>
<tr><td>1</td><td>Greenwith Rd</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Rear End</td><td>4</td><td>2</td><td>6</td></tr>
<tr><td>Right Turn</td><td>1</td><td>-</td><td>1</td></tr>
<tr><td>Side Swipe</td><td>1</td><td>-</td><td>1</td></tr>
<tr><td>Right Angle</td><td>1</td><td>-</td><td>1</td></tr>
<tr><td>Other</td><td>-</td><td>1</td><td>1</td></tr>
<tr><td>Total</td><td>7</td><td>3</td><td>10</td></tr>
</table>
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</table>

ROAD SECTION	GOLDEN GROVE ROAD INTER SECTION	Crash data 2000 - 2004
1	John Rd	Crash Type / PDO / Casualty / Total Right Angle 3 1 4 Rear End 1 - 1 **Total 4 1 5**
1	Hancock Rd	Crash Type / PDO / Casualty / Total Right Angle 3 2 5 Rear End 1 1 2 Hit Fixed Object 1 - 1 Other - 1 1 **Total 5 4 9**
1	Einstein Dr	Crash Type / PDO / Casualty / Total Rear End 1 1 2 Right Angle 1 1 2 Hit Animal 1 - 1 **Total 3 2 5**
1	Kunzea Wy	
1	The Grove Way / Yatala Vale Rd	Crash Type / PDO / Casualty / Total Rear End 12 3 15 Right Turn 7 6 13 Right Angle 2 2 4 Side Swipe 3 - 3 Hit Fixed Object 2 - 2 Hit Pedestrian 1 - 1 **Total 27 11 38**

ROAD SECTION	GOLDEN GROVE ROAD INTER SECTION	Crash data 2000 - 2004
2	Highgrove Rd	
2	Park Lake Dr	
2	Grenfell Rd (east)	
3	Grenfell Rd (west)	

Crash Type	PDO	Casualty	Total
Rear End	3	-	3
Total	**3**	**-**	**3**

Crash Type	PDO	Casualty	Total
Right Angle	2	1	3
Total	**2**	**1**	**3**

Crash Type	PDO	Casualty	Total
Right Angle	10	7	17
Rear End	9	4	13
Right Turn	3	1	4
Side Swipe	3	-	3
Hit Fixed Object	1	-	1
Head On	1	-	1
Total	**27**	**12**	**39**

Crash Type	PDO	Casualty	Total
Rear End	53	13	66
Right Turn	22	19	41
Right Angle	1	3	4
Hit Fixed Object	3	-	3
Side Swipe	1	-	1
Total	**80**	**35**	**115**

ROAD SECTION	GOLDEN GROVE ROAD INTER SECTION	Crash data 2000 - 2004

ROAD SECTION	GOLDEN GROVE ROAD INTER SECTION	Crash data 2000 - 2004
3	McPharlin Av	

Crash Type	PDO	Casualty	Total
Right Angle	3	4	7
Hit Fixed Object	2	-	2
Hit Parked Vehicle	1	-	1
Right Turn	1	-	1
Rear End	1	-	1
Total	**8**	**4**	**12**

ROAD SECTION	GOLDEN GROVE ROAD INTER SECTION	Crash data 2000 - 2004
3	Maughan Av	

Crash Type	PDO	Casualty	Total
Rear End	3	-	3
Right Angle	1	2	3
Hit Fixed Object	1	-	1
Total	**5**	**2**	**7**

ROAD SECTION	GOLDEN GROVE ROAD INTER SECTION	Crash data 2000 - 2004
3	Milne Rd (west)	

Crash Type	PDO	Casualty	Total
Right Turn	11	4	15
Rear End	12	3	15
Right Angle	7	1	8
Hit Fixed Object	3	-	3
Other	-	1	1
Roll Over	-	1	1
Side Swipe	1	-	1
Total	**34**	**10**	**44**

ROAD SECTION	GOLDEN GROVE ROAD INTER SECTION	Crash data 2000 - 2004
3	Milne Rd (east)	

Crash Type	PDO	Casualty	Total
Rear End	5	3	8
Right Turn	3	5	8
Hit Fixed Object	2	1	3
Right Angle	1	-	1
Total	**11**	**9**	**20**

ROAD SECTION	GOLDEN GROVE ROAD INTER SECTION	Crash data 2000 - 2004
3	Jack High La	Crash Type: Right Angle PDO 2 Casualty - Total 2; Other - 1 1; **Total 2 1 3**
3	Oratanga Rd	Crash Type: Right Angle PDO 2 Casualty 1 Total 3; Rear End 1 1 2; **Total 3 2 5**
3	Hazel Gr	Crash Type: Rear End PDO 6 Casualty 1 Total 7; Right Angle 4 - 4; Hit Fixed Object 1 - 1; **Total 11 1 12**
3	Rawlings Rd	Crash Type: Right Angle PDO 3 Casualty 1 Total 4; Rear End - 1 1; **Total 3 2 5**
3	Dewer Av	Crash Type: Right Angle PDO 3 Casualty 1 Total 4; Rear End 3 - 3; Side Swipe 2 - 2; Head On - 1 1; **Total 8 2 10**

ROAD SECTION	GOLDEN GROVE ROAD INTER SECTION	Crash data 2000 - 2004

3	Gold Crt	

Crash Type	PDO	Casualty	Total
Right Angle	1	-	1
Total	**1**	**-**	**1**

3	North East Rd	

Crash Type	PDO	Casualty	Total
Rear End	53	14	67
Right Angle	12	3	15
Side Swipe	13	1	14
Hit Fixed Object	1	1	2
Roll Over	-	1	1
Head On	1	-	1
Other	1	-	1
Hit Pedestrian	-	1	1
Total	**81**	**21**	**102**

Intersections requiring further investigation

1. **Golden Grove Road – Greenwith Road**
2. **Golden Grove Road – Hancock Road**
3. **Golden Grove Road – The Grove Way/Yatala Vale Road**
4. **Golden Grove Road – Grenfell Road (east)**
5. **Golden Grove Road – Grenfell Road (west)**
6. **Golden Grove Road – McPharlin Avenue**
7. **Golden Grove Road – Maughan Avenue**
8. **Golden Grove Road – Milne Road (west)**
9. **Golden Grove Road – Milne Road (east)**
10. **Golden Grove Road – Hazel Grove**
11. **Golden Grove Road – Dewer Avenue**
12. **Golden Grove Road – North East Road**

Figure 8 shows the intersections that exceed the limit of 5 crashes as detailed above. It can be seen that intersections that are currently controlled by traffic signals are those with the higher number of crashes.

From Figure 8 it can also be seen the majority of these accidents are Right Angle and Rear End type accidents (with the distribution of each of these shown in Figure 9).

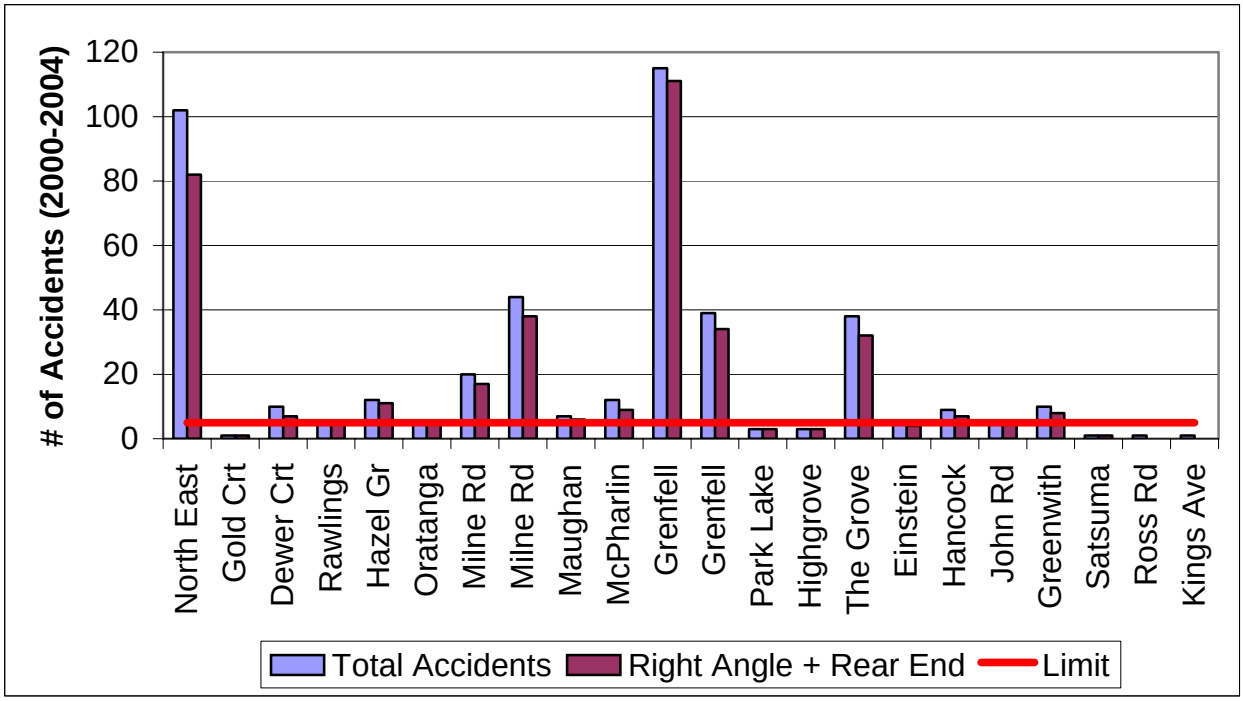


Figure 8: Crash Data; 2000-2004, Golden Grove Road Intersections

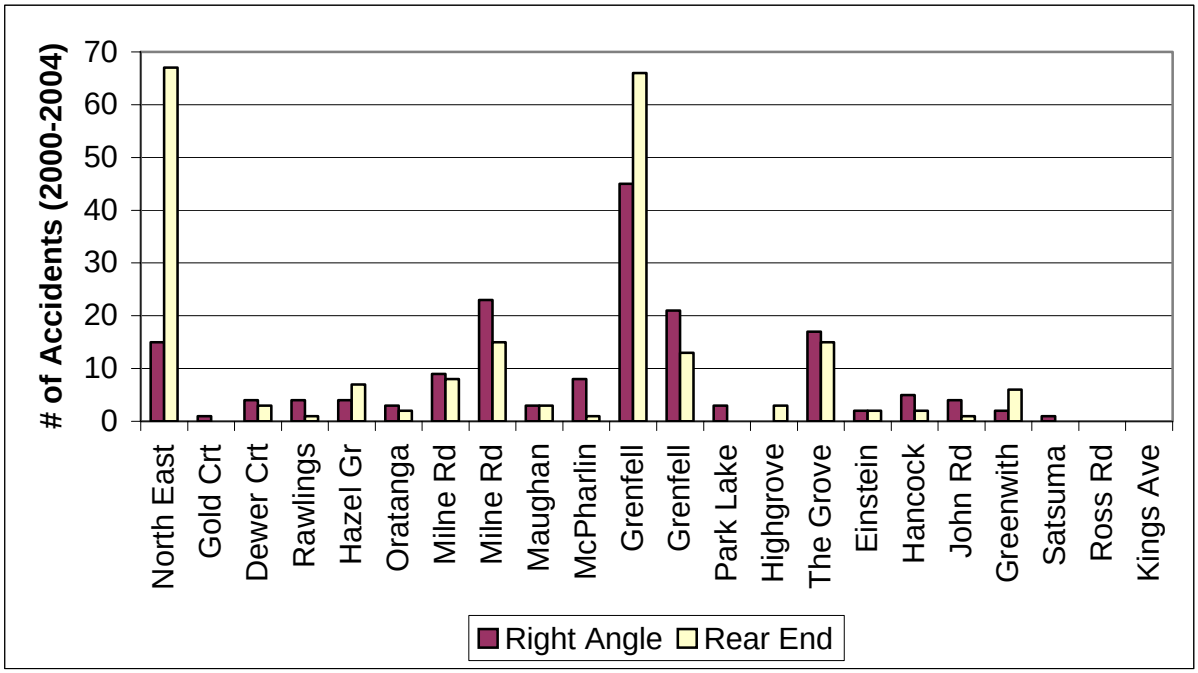


Figure 9: Crash Data; 2000-2004, Right Angle and Rear End accidents at Golden Grove Road Intersections

6.2 MID-BLOCK CRASH DATA

Investigations of the crash statistics for the mid-block sections show that whilst the crash numbers are significantly lower than those for the intersection locations, those that are comparatively high (3 sites ranging from 5 to 12 accidents in the five years), are located in the near vicinity of the shopping precincts. It would appear that these accidents are associated with the turning manoeuvres of motorists into and out of the shopping areas. These collisions could be alleviated with the inclusion of right turn storage lanes and left turn deceleration lanes into the shopping precincts, where the entrances to these sites are minimised (hence reducing confusion with respect to where vehicles may be turning) and having these entrances as far away as practically possible from intersections.

<table>
<tr><th>ROAD SECTION</th><th>GOLDEN GROVE ROAD MIDBLOCK SECTION</th><th>Crash data 2000 - 2004</th></tr>
<tr><td>1</td><td>Kings Av/One Tree Hill Rd – Ross Rd</td><td></td></tr>
<tr><td>1</td><td>Ross Rd – Satsuma Cr</td><td><table><tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr><tr><td>Hit Fixed Object</td><td>-</td><td>1</td><td>1</td></tr><tr><td>Rear End</td><td>1</td><td>-</td><td>1</td></tr><tr><td>Total</td><td>1</td><td>1</td><td>2</td></tr></table></td></tr>
<tr><td>1</td><td>Satsuma Cr – Greenwith Rd</td><td></td></tr>
<tr><td>1</td><td>Greenwith Rd – John Rd</td><td><table><tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr><tr><td>Hit Fixed Object</td><td>1</td><td>-</td><td>1</td></tr><tr><td>Head On</td><td>-</td><td>1</td><td>1</td></tr><tr><td>Total</td><td>1</td><td>1</td><td>2</td></tr></table></td></tr>
<tr><td>1</td><td>John Rd – Hancock Rd</td><td></td></tr>
<tr><td>1</td><td>Hancock Rd – Einstein Dr</td><td><table><tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr><tr><td>Right Angle</td><td>-</td><td>1</td><td>1</td></tr><tr><td>Hit Fixed Object</td><td>1</td><td>-</td><td>1</td></tr><tr><td>Total</td><td>1</td><td>1</td><td>2</td></tr></table></td></tr>
<tr><td>1</td><td>Einstein Dr – Kunzea Wy</td><td></td></tr>
<tr><td>1</td><td>Kunzea Wy – The Grove Wy/Yatala Vale Rd</td><td></td></tr>
</table>

ROAD SECTION	GOLDEN GROVE ROAD MIDBLOCK SECTION	Crash data 2000 - 2004
2	The Grove Wy/Yatala Vale Rd – Highgrove Rd	
2	Highgrove Rd – Park Lake Dr	
2	Park Lake Dr – Grenfell Rd (east)	
2	Grenfell Rd (east) – Grenfell Rd (west)	
3	Grenfell Rd (west) – McPharlin Av	
3	McPharlin Av – Maughan Av	

Crash Type	PDO	Casualty	Total
Rear End	1	-	1
Side Swipe	1	-	1
Total	**2**	**-**	**2**

Crash Type	PDO	Casualty	Total
Rear End	5	-	5
Right Angle	3	1	4
Side Swipe	1	-	1
Hit Pedestrian	-	1	1
Total	**9**	**2**	**11**

Crash Type	PDO	Casualty	Total
Rear End	1	-	1
Right Angle	-	1	1
Total	**1**	**1**	**2**

Crash Type	PDO	Casualty	Total
Hit Fixed Object	2	1	3
Rear End	-	1	1
Head On	-	1	1
Total	**2**	**3**	**5**

Crash Type	PDO	Casualty	Total
Hit Fixed Object	1	-	1
Rear End	1	-	1
Total	**2**	**-**	**2**

ROAD SECTION	GOLDEN GROVE ROAD MIDBLOCK SECTION	Crash data 2000 - 2004
3	Maughan Av – Milne Rd (west)	Crash Type / PDO / Casualty / Total Hit Fixed Object / 1 / - / 1 Rear End / 1 / - / 1 **Total / 2 / - / 2**
3	Milne Rd (west) – Milne Rd (east)	Crash Type / PDO / Casualty / Total Hit Fixed Object / 1 / - / 1 Rear End / - / 1 / 1 **Total / 1 / 1 / 2**
3	Milne Rd (east) – Jack High La	Crash Type / PDO / Casualty / Total Rear End / 2 / - / 2 **Total / 2 / - / 2**
3	Jack High La – Oratanga Rd	Crash Type / PDO / Casualty / Total Side Swipe / 1 / - / 1 **Total / 1 / - / 1**
3	Oratanga Rd – Hazel Gr	Crash Type / PDO / Casualty / Total Rear End / 1 / - / 1 **Total / 1 / - / 1**
3	Hazel Gr – Rawlings Rd	Crash Type / PDO / Casualty / Total Rear End / 2 / 2 / 4 **Total / 2 / 2 / 4**
3	Rawlings Rd – Dewer Av	

ROAD SECTION	GOLDEN GROVE ROAD MIDBLOCK SECTION	Crash data 2000 - 2004
3	Dewer Av – Gold Ct	

Crash Type	PDO	Casualty	Total
Rear End	2	1	3
Side Swipe	2	-	2
Hit Fixed Object	1	-	1
Hit Pedestrian	-	1	1
Total	**5**	**2**	**7**

3	Gold Ct – North East Rd	

Crash Type	PDO	Casualty	Total
Rear End	5	1	6
Right Angle	6	-	6
Total	**11**	**1**	**12**

Sites requiring further investigation

1. **Golden Grove Road: Park Lake Drive – Grenfell Road (east)**
2. **Golden Grove Road: Dewer Avenue – Gold Court**
3. **Golden Grove Road: Gold Court – North East Road**

6.3 SPEED ENVIRONMENT

The speed limit along Section 1 of Golden Grove Road was reduced from an 80km/hr zone to a 60km/hr zone in late 2000. The change of speed limit was deemed necessary to maintain consistency with the other sections of Golden Grove Road.

The current speed limits along Golden Grove Road are shown in Figure 10.

There are no current plans to change the current speed zones along Golden Grove Road.

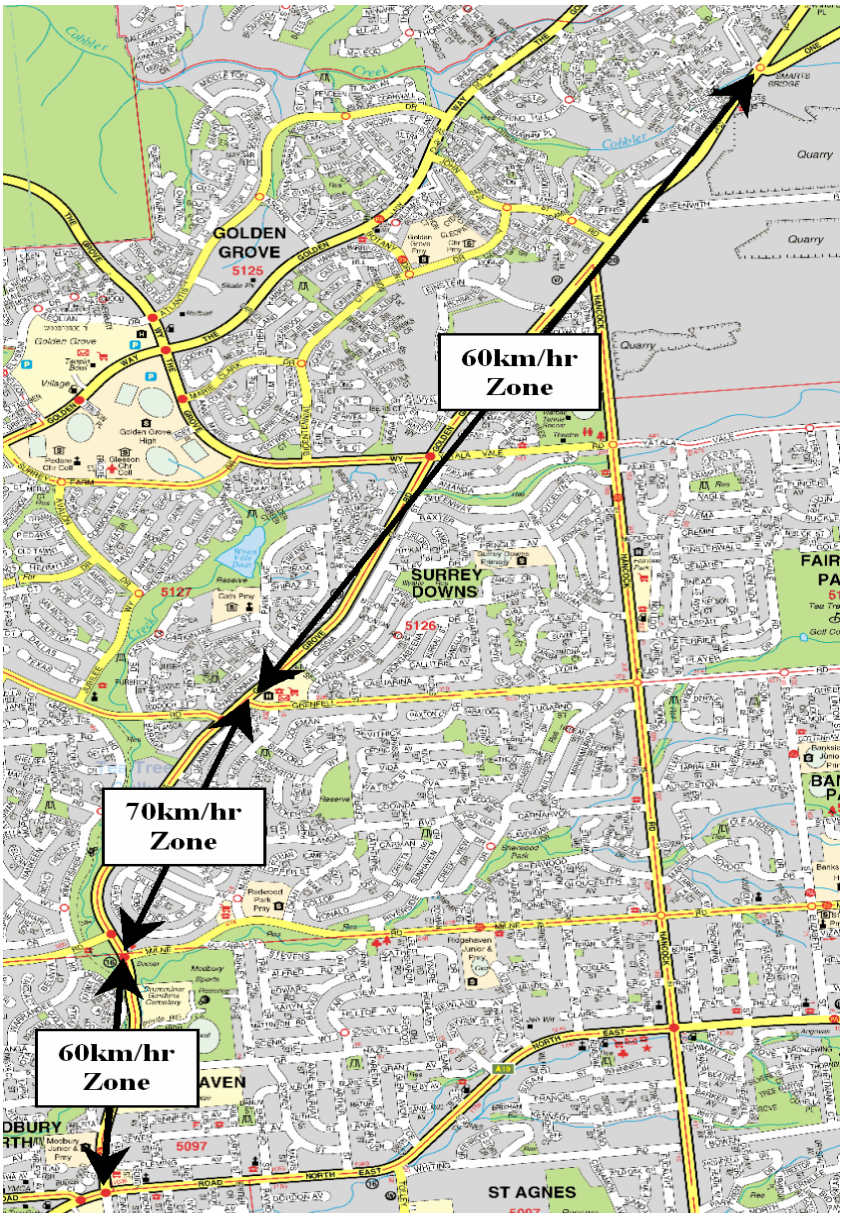


Figure 10: Current Speed Zones

6.4 ROADSIDE HAZARDS

At present, there are potentially dangerous roadside hazards located along Golden Grove Road. A number of these are in the form of natural hazards and include substantial sized trees within the shoulder area of the road and associated overhanging low branches. Hazards include roadside obstacles (trees, stobie poles, drainage structures etc) and unprotected roadside drop offs.

Whilst no specific recommendations are made for this RMP regarding roadside hazards, Transport SA will carry out an audit and assessment of risk associated with these hazards and recommend treatments where applicable.

6.5 PEDESTRIANS

The provision of properly designed, safe, and DDA compliant walking facilities along Golden Grove Road is primarily the responsibility of Tea Tree Gully Council.

The footpath design and function should target: -

- Clear width and height requirements
- DDA compliant gradients and crossfall
- DDA compliant kerb ramps and tactile indicators
- Access to public transport

Transport SA is primarily responsible for providing safe pedestrian facilities across the arterial roads (eg pedestrian actuated crossings and median walk throughs). Several treatments to improve safety for pedestrians have been recommended in this report, including:

- The installation of a raised pedestrian refuge on Golden Grove Road just south of the junction of Park Lake Drive
- The installation of a pedestrian median walkthrough in the raised median on Golden Grove Road immediately north of Grenfell Road (east)
- Upgrading of existing median walkthroughs in the raised median within Section 3 of Golden Grove Road.

6.6 CYCLISTS

Both the "Bike*direct*" network and the City of Tea Tree Gully's "Local Area Bike Plan" have identified Golden Grove Road as strategically important in the bicycle network, providing for inter- and intra-regional bicycle travel, whilst also connecting recreational features and points of interest.

Whilst Section 3 of Golden Grove Road has marked bicycle lanes, there are no formalised bicycle facilities in sections 1 and 2 (either on road or off road), and narrow pavement widths in sections, creating significant hazards for cyclists.

The widening of the narrow cross section of Sections 1 and 2 of Golden Grove Road incorporating marked bicycle lanes has therefore been recommended in this report.

6.7 PUBLIC TRANSPORT

A number of bus routes use Golden Grove Road. In order to provide an uninterrupted traffic lane, bus stops should be indented.

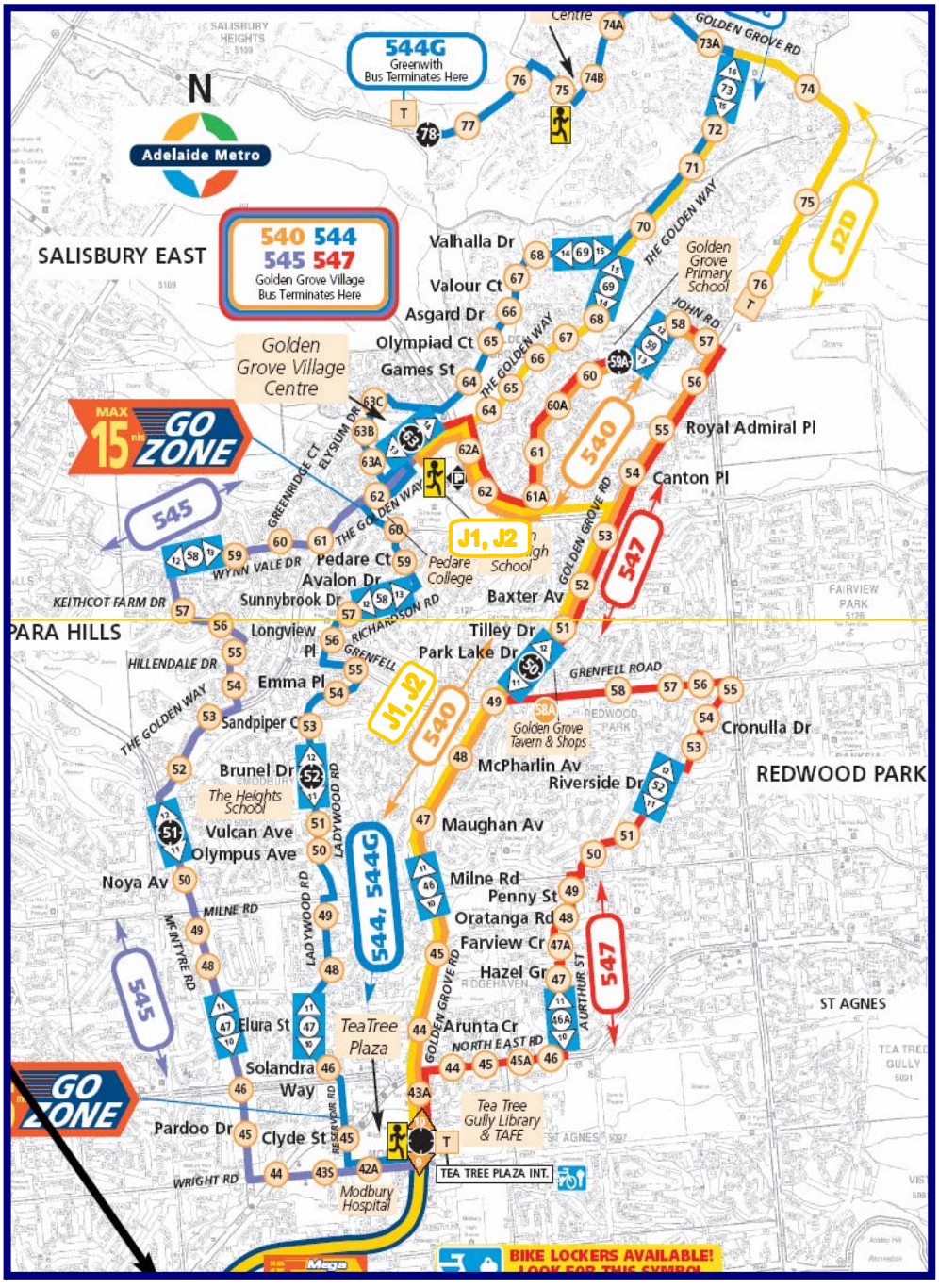


Figure 11: Bus routes present on Golden Grove Road

6.8 STRUCTURES (BRIDGES AND CULVERTS)

A number of structures currently exist along Golden Grove Road including:

Smarts Bridge (PN 0026) – 40m southeast of One Tree Hill Road.
The culvert was designed in 1914. The last routine inspection showed the structure has an overall rating of fair condition. The structure is due for reinspection in September 2007, and reconstruction assessment in 2015.

Minor Watercourse Crossing (PN 0741) – 10m northeast of Hancock Road.
The culvert was designed in 1937. The last routine inspection showed the structure has an overall rating of fair condition. The structure is due for reinspection in January 2006, and reconstruction assessment in 2009.

Watercourse Crossing (PN 1569) – 160m southwest of Yatala Vale Road
The culvert was designed in 1949. The last routine inspection showed the structure has an overall rating of good condition. The structure is due for reinspection in January 2006, and reconstruction assessment in 2015.

Northern Bridge over Dry Creek (PN 5381) – 110m south of Milne Road
The bridge was designed in 1984. The last routine inspection showed the structure has an overall rating of very good condition. The structure is due for reinspection in January 2006, and reconstruction assessment in 2064.

Southern Bridge over Dry Creek (PN 5382) – 250m north of Hazel Grove
The bridge was designed in 1984. The last routine inspection showed the structure has an overall rating of very good condition. The structure is due for reinspection in January 2006, and reconstruction assessment in 2064.

7 TRAFFIC ISSUES AND RECOMMENDATIONS

7.1 ISSUES ARISING FROM CRASH DATA ANALYSIS

7.1.1 Golden Grove Road – Greenwith Road

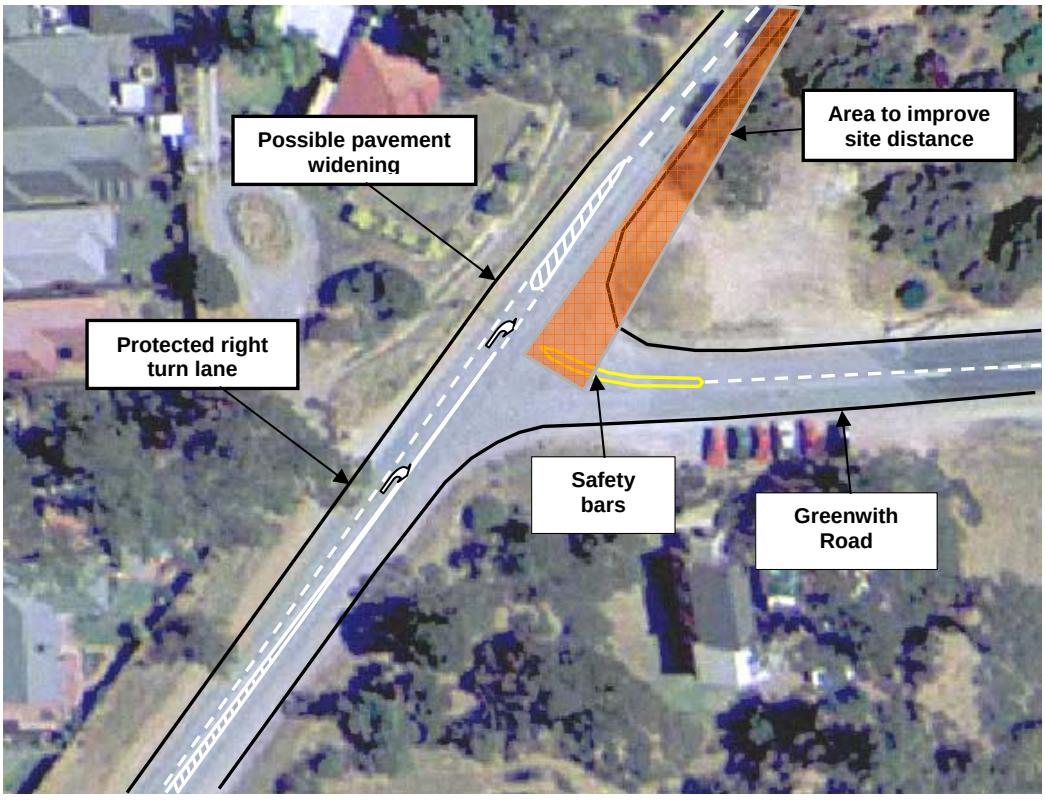
A moderate number of collisions have occurred at this junction (10 recorded crashes in the period 2000 – 2004). The crashes are primarily the rear end type (6) involving traffic on Golden Grove Road.

Contributing factors include: -

- Lack of pavement width on Golden Grove Road for through traffic to safely pass vehicles waiting to turn right.
- Poor sight distance to the north of the junction of Greenwith Road
- Poor junction delineation

Recommendations:

- Install a protected right turning lane along Golden Grove Road to reduce the rear end and right angle crashes
- Investigate clearing of vegetation and the removal of the embankment to improve sight distances at the junction
- Install safety bars and upgrade delineation on the Greenwith Road approach to the junction.



7.1.2 Golden Grove Road – Hancock Road

A moderate number of collisions have occurred at this junction (9 recorded crashes in the period 2000 – 2004).

The crashes are primarily the right angle type (5).

Due to concerns with safety at this junction and vehicle speeds entering Hancock Road, Transport SA undertook modifications to this junction in March 2001.

Recommendations:

- Install a protected right turning lane along Golden Grove Road to reduce the rear end and right angle crashes
- Investigate the longer-term traffic management options, including the realignment of the junction or the provision of a roundabout.

7.1.3 Golden Grove Road – The Grove Way/Yatala Vale Road Intersection

A higher number of crashes have occurred at this signalised junction (38 crashes in the period 2000-2004).

The recorded crashes are primarily the rear end (15) and right turn (13) type. More detailed analysis of the collision diagrams is required to determine the most suitable treatment at this site to reduce the number of these types of accidents.

Treatments to be considered will most likely involve the provision of mast arms or additional signal poles to improve the conspicuity of the traffic lanterns, and alterations to the radii of the left turning lanes to improve the view of oncoming vehicles.

7.1.4 Golden Grove Road – Grenfell Road (east) Intersection

A high number of crashes have occurred at this junction (39 crashes in the period 2000-2004).

The recorded crashes are primarily the rear end (13) and right angle (17) type.

Transport SA will undertake another traffic turning count and more detailed analysis of the collision diagrams to determine a suitable treatment(s) at this site to reduce the number of crashes occurring.

Traffic management options being considered, include: -

- Alteration to left turning radii (eg 70 degree left turn on Grenfell Road).
- Other traffic management / delineation improvements.

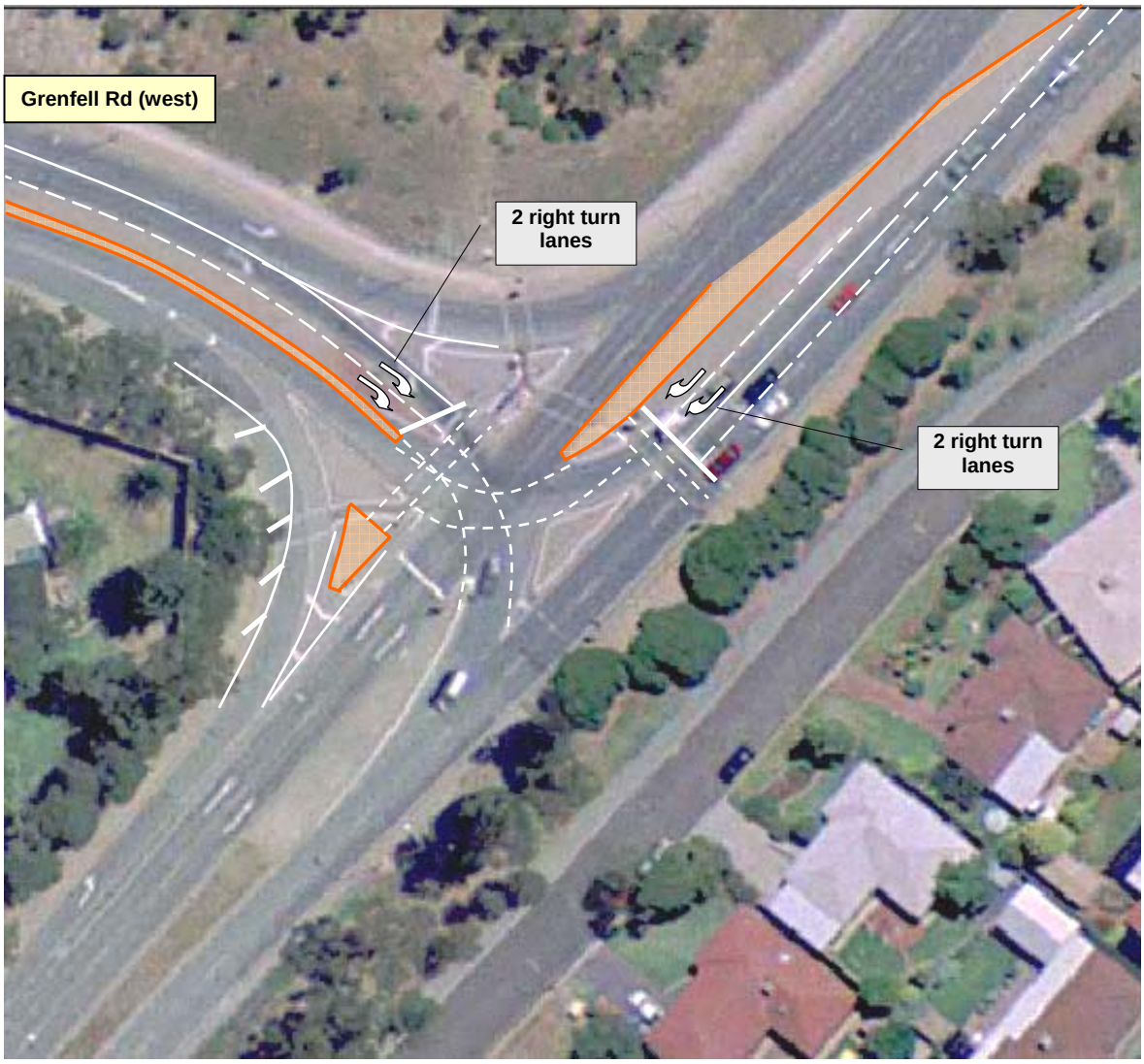
7.1.5 Golden Grove Road – Grenfell Road (west) Intersection

A high number of crashes have occurred at this signalised junction (115 crashes in the period 2000-2004).

The recorded crashes are primarily the rear end (66) and right turn (41) type.

This junction has been investigated to improve its safety record and has subsequently been submitted for Black Spot funding for improvements in the 2005/06 financial year. Analysis of the recorded collision data indicates that the addition of a second right turn lane on Golden Grove Road and the controlling of this right turn movement will reduce the number of collisions occurring at this site. In addition, a second right turn lane on Grenfell Road (west) should also be installed to reduce the traffic delays at the junction.

Refer concept sketch below.



7.1.6 Golden Grove Road – McPharlin Avenue

A moderate number of collisions have occurred at this junction (12 recorded crashes in the period 2000 – 2004).

The crashes are primarily the right angle type (7), which can be attributed to motorists undertaking the right turn movements with unsuitable gaps in the traffic flow.

Recommendations:

- Consider the permanent banning of right turns out of McPharlin Avenue onto Golden Grove Road
- Consider the extension of the dedicated right turning lane within the median on Golden Grove Road to the current standard requirements

7.1.7 Golden Grove Road – Maughan Avenue

A moderate number of collisions have occurred at this junction (7) recorded crashes in the period 2000 – 2004).

The crashes are primarily the right angle (3) and rear end (3) type.

Contributing factors include:

- Poor sight distance for motorists exiting Maughan Avenue
- Short right turn lane on Golden Grove Road within the median and lack of sight distance to this facility

Recommendations:

- Consider the permanent banning of right turns out of Maughan Avenue onto Golden Grove Road
- Consider the extension of the dedicated right turning lane within the median on Golden Grove Road to the current standard requirements
- Consider improving sight distances to the junction

7.1.8 Golden Grove Road – Milne Road (west) Intersection

A higher number of crashes have occurred at this junction (44 crashes in the period 2000-2004).

The recorded crashes are primarily the rear end (15), right turn (15) and right angle (8) type. More detailed analysis of the collision diagrams is required to determine the most suitable treatment at this site to reduce the number of these types of accidents.

7.1.9 Golden Grove Road – Milne Road (east) Intersection

A moderate number of crashes have occurred at this junction (20 crashes in the period 2000-2004).

The recorded crashes are primarily the rear end (8) and right turn (8) type. More detailed analysis of the collision diagrams is required to determine the most suitable treatment at this site to reduce the number of these types of accidents.

7.1.10 Golden Grove Road – Hazel Grove Intersection

A moderate number of crashes have occurred at this junction (12 crashes in the period 2000-2004).

The recorded crashes are primarily the rear end (7) and right angle (4) type. More detailed analysis of the collision diagrams is required to determine the most suitable treatment at this site to reduce the number of these types of accidents.

7.1.11 Golden Grove Road – Dewer Avenue Intersection

A moderate number of crashes have occurred at this junction (10 crashes in the period 2000-2004).

The recorded crashes are primarily the rear end (3) and right angle (4) type. More detailed analysis of the collision diagrams is required to determine the most suitable treatment at this site to reduce the number of these types of accidents.

7.1.12 Golden Grove Road – North East Road Intersection

A high number of crashes have occurred at this junction (102 crashes in the period 2000-2004).

The recorded crashes are primarily the rear end (67), side swipe (14) and right angle (15) type. More detailed analysis of the collision diagrams is required to determine the most suitable treatment at this site to reduce the number of these types of accidents.

7.1.13 Golden Grove Road: Park Lake Drive – Grenfell Road (east)

This section of Golden Grove Road has been discussed with the City of Tea Tree Gully for improvements to be undertaken to improve the amenity and safety for all road users.

The crash data analysis indicates that a number of rear end and right angle collisions have occurred along this section.

Recommendations:

- Provide protected turning lanes (painted median) in accordance with preferred scheme
- Install raised pedestrian refuge
- Refer concept sketch below.

7.1.14 Golden Grove Road: Dewer Avenue – Gold Court

A moderate number of crashes have occurred at this junction (7 crashes in the period 2000-2004).

The recorded crashes are random with no pattern being identified.

This section is in the busier commercial section of Golden Grove Road, which involves a signalised pedestrian crossing.

Analysis of collision diagrams has revealed no pattern to the type and location of collisions and as such no recommendations have been made for this site, however Transport SA will monitor this site in the future with the possibility of investigating the installation of mast arms at the signalised pedestrian crossing.

7.1.15 Golden Grove Road: Gold Court – North East Road

A moderate number of crashes have occurred at this junction (12 crashes in the period 2000-2004).

The recorded crashes are primarily the rear end (6) and the right angle (6) type.

This section is also in the busier commercial section of Golden Grove Road.

Analysis of the collision diagrams shows that rear end crashes are primarily associated with traffic lights located at the intersection of Golden Grove Road and North East Rd. No recommendations have been made for this site. However Transport SA will monitor this site in the future.

7.2 OTHER TRAFFIC MANAGEMENT ISSUES / COMMUNITY CONCERNS

7.2.1 Bus Stop 56

There have been concerns raised by a member of the public associated with the location of Bus Stop 56 on the northbound route. It was suggested that most bus passengers alighting from the bus walk in a southerly direction, and therefore it was considered that the bus stop should be relocated further south and closer to their destinations.

Transport SA will liaise with the Office of Public Transport to determine whether the bus stop should be relocated.

7.2.2 Bus Stop 53

There have been concerns raised by a member of the public associated with the condition of Bus Stop 53 which is located immediately north of The Grove Way intersection, and opposite the new MFS facilities). The concern was related to the lack of sealing of the bus stop and the lack of a suitable place to walk along the roadway.

As per Item 5 “long term vision” and figure 7, the recommended cross-section proposes indented sealed bus bays and footpaths should be provided along Golden Grove Road.

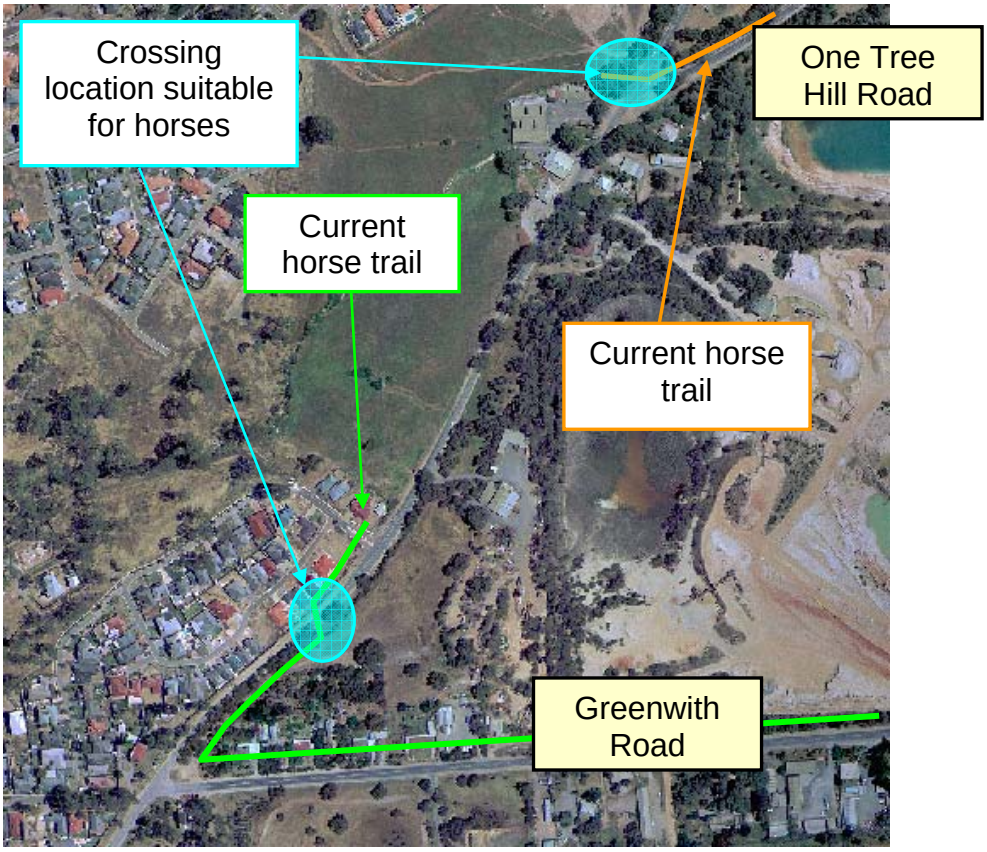
7.2.3 Horse SA

Horse SA (also Known as the Horse Federation of South Australia) is the umbrella organisation for the recreation and sporting horse community and industry and has raised concerns relating to the existing horse trails paths located along Golden Grove Road. The area of Golden Grove is home to a number of horse establishments and there are dedicated horse paths/routes through the areas of Golden Grove and Salisbury.

Concerns have been raised as to the ability for horses and riders to travel/ride safely from their establishments to these trails.

Refer to the concept sketch below that indicates the location of the horse trails.

Transport SA will investigate allowances for safe and appropriate roadside riding areas and the location for crossing Golden Grove Road



7.2.4 Golden Grove Road – Greenwith Road

Greenwith Road has a number of larger trucks accessing industrial areas along Greenwith Road, including PGH and Austral Bricks.

Trucks turn right into and left out of Greenwith Road. Concerns have been raised with regard to the poor condition of the pavement and the difficulties trucks have turning left from Greenwith Road.

This site has been identified as having a moderate number of crashes and treatments to address safety and operational concerns have been recommended in this report (refer to “Issues Arising From Crash Data Analysis”).

The treatments proposed also address the above concerns and include: -

- Provision of a protected right turn lane (for turning into Greenwith Road)
- Clearing vegetation and remove embankment to improve sight distance at the intersection. This will assist trucks turning from Greenwith Road.
- Improve delineation at the intersection.

7.2.5 Residential Development

Residential development is proposed north of One Tree Hill Road. It is anticipated that 400-500 additional residences will be built in the longer term. Recommended treatments in this report need to consider potential future traffic growth along golden Grove Road.

8 TREATMENT SUMMARY

A number of traffic management and road maintenance improvements have been recommended in this report. The recommendations are summarised in the following tables. Also included in the table is a priority rating for each of the recommendations.

Three levels of priority are indicated: high (red), medium (orange) and low (yellow).

The priority of treatments has been determined based on:

- Safety benefits, particularly those that improve safety for vulnerable road users (eg pedestrians and cyclists)
- Benefit / cost
- Operational benefits

8.1 MIDBLOCK TREATMENTS

ROAD SECTION	TREATMENT	PRIORITY
Golden Grove Road Park Lake Drive to Grenfell Road (east)	In conjunction with Council, install protected turning lanes, install pedestrian refuge, install pedestrian walkthrough, and indent bus bay. Refer Concept Sketch.	**High**
Golden Grove Road Dewer Avenue to Gold Court	Further detailed analysis of the collision information is required.	
Golden Grove Road Gold Court to North East Road	Further detailed analysis of the collision information is required.	
Golden Grove Road One Tree Hill Road to The Grove Way / Yatala Vale Road	Undertake pavement widening, install painted median where direct access to adjacent properties is required, indent and seal bus bays and install on-road bicycle lanes. Refer Figure 6 and 7.	**Medium**
Golden Grove Road The Grove Way / Yatala Vale Road to Park Lake Drive	Undertake pavement widening, indent and seal bus bays, and install on-road bicycle lanes. Refer Figure 7.	**High**
Golden Grove Road Grenfell Road (west) to North East Road	Upgrade existing median walkthroughs and pedestrian facilities at the traffic signals for compliance with DDA requirements.	**High**
Golden Grove Road Grenfell Road (west) to North East Road	Install “no u-turn” signs at all median openings without sheltered turning lanes, to improve safety and traffic flow.	**High**
Golden Grove Road One Tree Hill Road to Greenwith Road	Investigate options and provide suitable facilities for the safe crossing of Golden Grove Road for horses.	**Medium**

8.2 INTERSECTIONS / JUNCTIONS

INTERSECTION / JUNCTION	TREATMENT	PRIORITY
Golden Grove Road – Greenwith Road	Install a protected right turning lane along Golden Grove Road, investigate improvements to sight distances, and improve the delineation of the approaches to the junction. Refer Concept Sketch.	**Medium**
Golden Grove Road – Hancock Road	Install a protected right turning lane along Golden Grove Road. Investigate longer-term traffic management improvements such as realigning of the junction or the installation of a roundabout. Refer Concept Sketch.	**Low**
Golden Grove Road – The Grove Way / Yatala Vale Road	Further detailed analysis of the collision information is required.	
Golden Grove Road – Grenfell Road (east)	Further detailed analysis of the traffic turning counts and collision information is required to reduce the number of collisions in the interim. Investigate longer-term traffic management requirements.	**Medium**

Golden Grove Road – Grenfell Road (west)	Install additional right turn lanes on Golden Grove Road and Grenfell Road (west) and control these turns. Improve left turn lane angle from Golden Grove Road into Grenfell Road (west). Refer Concept Sketch.	**High**
Golden Grove Road – McPharlin Avenue	Consider the banning of right turns out of McPharlin Avenue, and consider extending the protected right turn lane along Golden Grove Road. Refer Concept Sketch.	**High**
Golden Grove Road – Maughan Avenue	Consider the banning of right turns out of Maughan Avenue, investigate improvements to sight distances, and consider extending the protected right turn lane along Golden Grove Road. Refer Concept Sketch.	**Low**
Golden Grove Road – Milne Road (west)	Further detailed analysis of the collision information is required.	
Golden Grove Road – Milne Road (east)	Further detailed analysis of the collision information is required.	
Golden Grove Road – Hazel Grove	Further detailed analysis of the collision information is required.	
Golden Grove Road – Dewer Avenue	Further detailed analysis of the collision information is required.	
Golden Grove Road – North East Road	Further detailed analysis of the collision information is required.	

9 CONCLUSIONS

This RMP has made a number of recommendations to address the operational and safety issues that have been identified along Golden Grove Road.

All of the proposed recommendations are conceptual only, and will therefore require further development and consultation with the City of Tea Tree Gully and the community prior to any proposed implementation.

Transport SA has arranged for the collection of up-to-date traffic volume and survey data to facilitate the further development of the recommended treatments.

Importantly, whilst this plan proposes longer-term intentions for traffic management along Golden Grove Road, funding commitments to the initiatives detailed in this plan are subject to normal budgetary processes and priorities.

Initially, implementation of the recommendations are likely to be limited to the higher priority more cost effective treatments that target specific sites with higher crash rates. The design of specific treatments will aim at consistency with and target the longer-term functional outcomes outlined in the RMP.