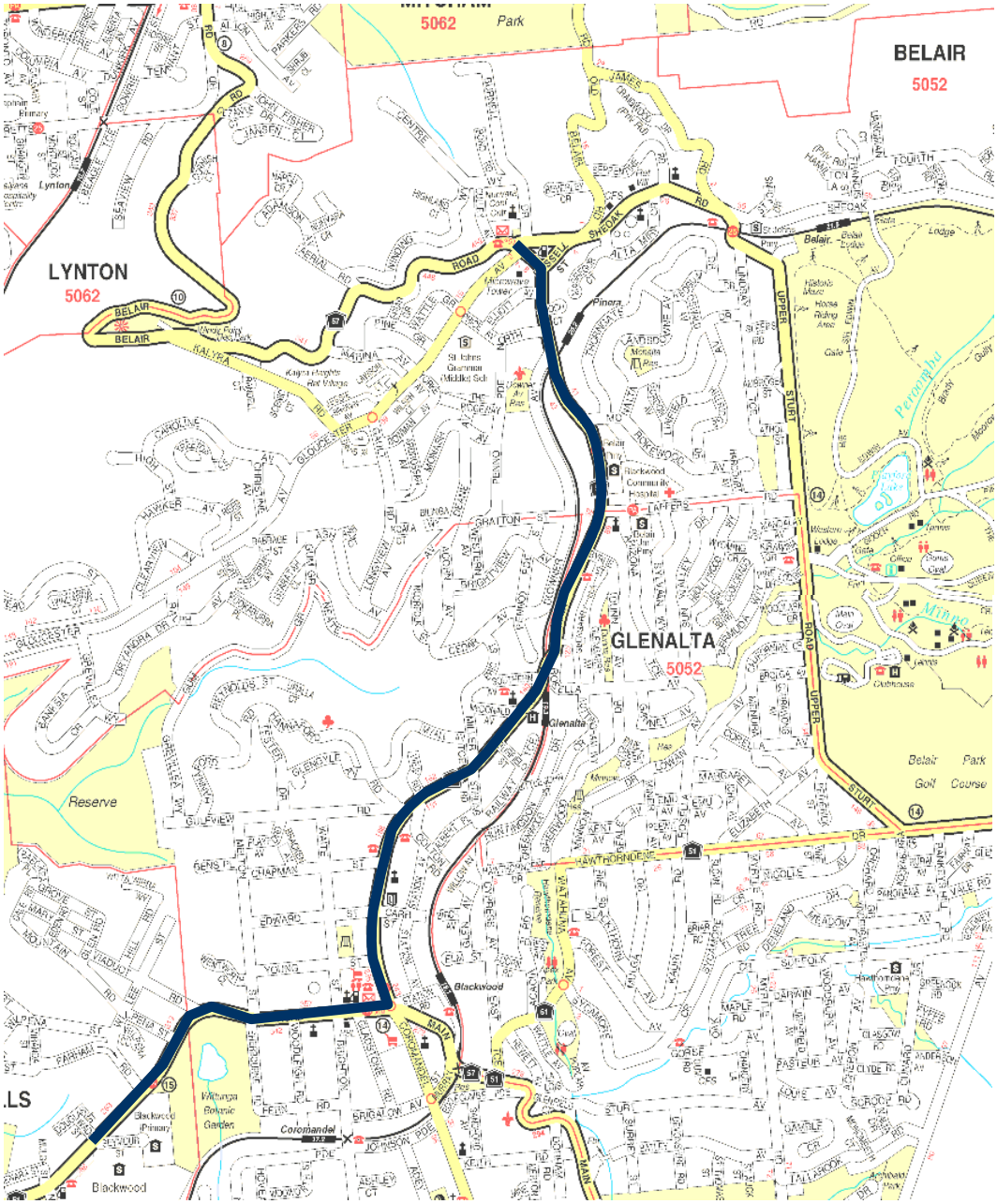
ROAD MANAGEMENT PLAN

RN6452 - Main Road (Belair – Blackwood)
RN6467 - Shepherds Hill Road (Blackwood - Seymour St)

Government of South Australia
Department for Transport, Energy and Infrastructure



Date	Revisions	Amended by
14-10-2005	Revisions table added.	C D'Agostini
14-10-2005	Section on "PUBLIC TRANSPORT" added.	C D'Agostini
14-10-2005	Bus route map added. Bus movements at Blackwood roundabout relocated.	C D'Agostini
14-10-2005	Council request for consideration to upgrade advance direction signs at Blackwood roundabout added.	C D'Agostini
14-10-2005	Parking bans at Blackwood roundabout included: - - On Shepherds Hill Road in front of post office - On Main Road adjacent to the church	C D'Agostini
09-11-2005	Section 2.2 Traffic volumes information updated	R. Blight
09-11-2005	Traffic flows at the Blackwood roundabout updated for 2005.	R. Blight
03-10-2006	Section 8.1.1: Main Road – Sheoak Road to Russell Street – investigation into safer pedestrian crossing facilities in this section upgraded to "high" priority	R. Blight
03-10-2006	Section 8.1.1: Main Road – Southern Avenue to Chapman Street – install painted median to improve traffic flow and safety upgraded to "high" priority	R. Blight
03-10-2006	Section 8.1.1: Main Road – Chapman Street to Shepherds Hill Road – reduce the speed limit to 50km/h upgraded to "high" priority. Furthermore, the reduced speed limit should be implemented between Stirling Road/Miller Terrace to the Blackwood roundabout (Shepherds Hill Road)	R. Blight
03-10-2006	Section 8.1.2: Shepherds Hill Road – Main Road to Melton Street – reduce the speed limit to 50km/h upgraded to "high" priority. Furthermore, the reduced speed limit should be implemented between the Blackwood roundabout (Main Road) to Woodleigh Road	R. Blight
03-10-2006	Section 7.1.13 & 8.2.1: Blackwood Roundabout – the proposed improvements upgraded to "high" priority. The proposed improvements include: removal of parking outside the Post Office, removal of parking outside the Uniting Church and the widening of the median for improved pedestrian safety, upgrading of the directional signs, increasing the diameter of the roundabout, and the closure of exiting movements from Station Parade. Furthermore, reducing the speed limit to 50km/h on Main Road (south-east) from the roundabout to a location approx. 150m east.	R. Blight

1 OVERVIEW

This Road Management Plan (RMP) provides an overall view of the operational and safety issues, including recommendations of traffic management improvements, on the following sections of road: -

1. Main Road, between Belair and Blackwood
2. Shepherds Hill Road, between Blackwood and Seymour Street

Although the plan is primarily the RMP for Main Road, the short section of Shepherds Hill Road has been included to address important traffic management issues raised by the community. It also plays an important role, together with Main Road, in providing access to the busy commercial precinct in the northwest quadrant of these two roads.

The objective of this Road Management Plan (RMP) is to identify operational and traffic management issues along the length of road and to propose traffic management improvements to address identified deficiencies. However, it should be noted that the RMP recommends low cost solutions to the existing road only and do not consider the broader transport issues in and surrounding Blackwood.

The process used to identify traffic management issues included: -

- Research of historical records
- Site auditing and site observations
- Analysis of recorded crash and traffic flow statistics
- Preliminary consultation with Council officers and through information gained from the local community

By looking at a road on a route basis, traffic management improvements can be developed to 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.

It is envisaged that this RMP will form the basis for discussion with Council and the community with a view to further development prior to implementation of the plan. Please note that whilst the RMP proposes a number of recommended treatments, the proposals are not presently funded. Funding for any improvements will need to be considered against other statewide priorities in future financial years.

Main Road has been divided into 4 sections, between Belair and Blackwood. Shepherds Hill Road has been designated as section 5 (see figure 1 below).

- Section 1 Main Rd, between Sheoak Rd and Russell St
  RRD 0.00 – RRD 0.10
- Section 2 Main Rd, between Russell St and Glenalta Level Crossing
  RRD 0.10 – RRD 1.52
- Section 3 Main Rd, between Glenalta Level Crossing and Chapman St
  RRD 1.52 – RRD 2.50
- Section 4 Main Rd, between Chapman St and Shepherds Hill Rd
  RRD 2.50 – RRD 2.98
- Section 5 Shepherds Hill Road, between Seymour St and Blackwood roundabout
  RRD 3.90 –RRD 5.16

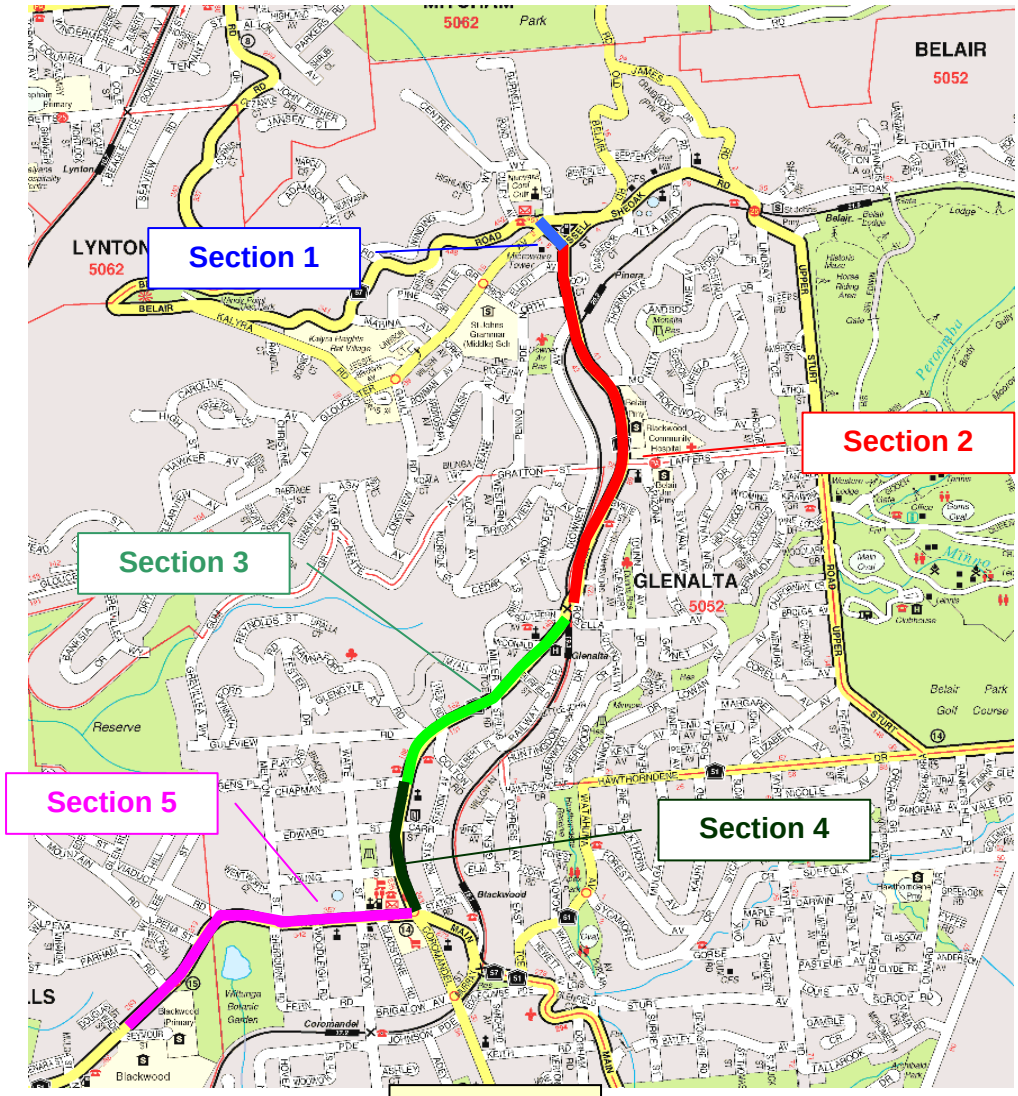


FIGURE 1

2 EXISTING

2.1 ROAD CROSS SECTION

2.1.1 Main Road – Sections 1 to 4

The section of Main Road referred to in this report is located within the City of Mitcham and extends from Sheoak Road to Shepherds Hill Road. The road cross section varies from a single travelling lane in each direction to an informal two lanes in each direction (marked as wide single travelling lanes) to a divided road on the approach to the Blackwood roundabout. The total length of the road (sections 1 to 4) is 2.98km.

The road crosses the railway line at two locations – one is grade separated in the vicinity of the Pinera station, and the other at the Glenalta level crossing.

Existing Lane and median widths of sections 1 to 4:

Start RRD	End RRD	Left Shoulder (m)	Left lane 2 (m)	Left lane 1 (m)	Median (m)	Right lane 1 (m)	Right lane 2 (m)	Right Shoulder (m)	CWY (m)
0	0.08			7.3		7.3			14.6
0.08	0.4			4.6		4.6			9.2
0.4	0.48			3.5		3.5			7
0.48	0.68			3.7		3.7			7.4
0.68	1.52	1		3.7		3.7			7.4
1.52	1.61			4.1		4.1			8.2
1.61	2.5			6.5		6.5			13
2.5	2.64				2	3.2	3.2	2.3	8.7
2.5	2.98	2	3.2	3.2					9.6
2.64	2.81				4	3.4	3.4		6.8
2.81	2.98				2	3	3	2.3	8.3

Note: -
Left side is eastern carriageway

2.1.2 Shepherds Hill Road – Section 5

The section of Shepherds Hill Road referred to in this report is located within the City of Mitcham and extends from the Blackwood roundabout to Seymour Street.

As stated earlier, this RMP deals primarily with Main Road and therefore no specific recommendations for general road appearance or cross section design is included in this report.

2.1.3 Metropolitan Road Widening Plan (MARWP)

There are no requirements for road widening within the MARWP for Main Road.

2.2 TRAFFIC VOLUMES

Figure 2 shows the Annual Average Daily Traffic (AADT) volumes, one-way peak hour traffic flows, and the commercial percentage of traffic for Main Road, sections 1 to 4.

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

- 2000: Main Road / Belair Road / Sheoak Road / Gloucester Avenue
- 2003: Main Road / Russell Street
- 2004: Main Road / Rosella Avenue
- 2005: Main Road / Laffers Road
  Main Road / Shepherds Hill Road / Coromandel Parade

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

- Main Road / Downer Avenue
- Main Road / Edward Street / Carr Street
- Shepherds Hill Road / Brighton Parade / Waite Street
- Shepherds Hill Road / Seymour Street / Wade Street

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

Section 2 of Main Road currently has a narrow road pavement width and therefore the lowest capacity. Road widening to provide additional road width for turning traffic and stopping buses in this section is therefore desirable.

All of the other sections of Main Road have sufficient road width to cater for the existing traffic flows and are able to cater for some anticipated short-term future traffic growth.

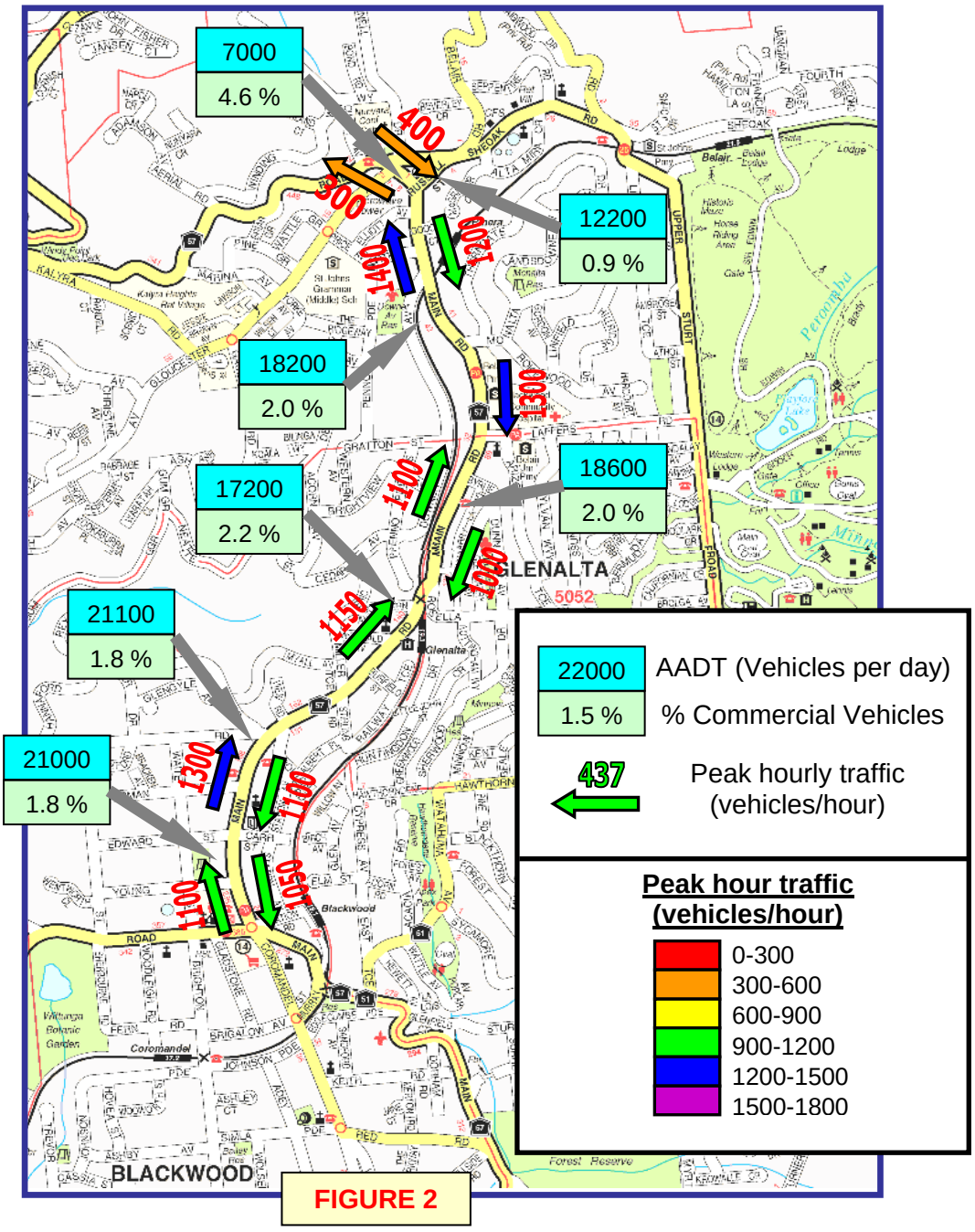

7000
4.6 %
400
300
140
120
12200
0.9 %
18200
2.0 %
300
17200
2.2 %
110
100
18600
2.0 %
GLENALTA
5052
115
21100
1.8 %
21000
1.8 %
130
110
105
110
BLACKWOOD
22000
1.5 %
AADT (Vehicles per day)
% Commercial Vehicles
437
Peak hourly traffic (vehicles/hour)
Peak hour traffic (vehicles/hour)
0-300
300-600
600-900
900-1200
1200-1500
1500-1800

FIGURE 2

3 ROAD ROLE AND FUNCTION

3.1 MAIN ROAD

Main Road is a major arterial route through the residential and commercial areas of Belair and Blackwood, and as such serves a number of key roles. The road also forms an important arterial link for commuter traffic between the Mitcham Hills and the Adelaide Plains, including the Adelaide CBD.

The role and function assigned to Main Road within the Transport Planning Agency is set out below:

- Strategic Route
  Provide an important link between key regional centres and areas of high activity
- Public Transport Routes
  Provide express bus routes to and from the city and other regional centres
- Cycle Route
  Provide reasonably long, inter-suburban continuous connections and access to key cycle trip generators (eg strip and local shopping, educational institutions and places of cultural and social activity)
- Commuter Route
  Provide for longer distance trips during the peak periods
  Cater for higher traffic volumes
  Minimise delays for long distance movements, especially during commuter peaks
- Pedestrian Precinct (applies to section 4)
  Ensure safe and accessible pedestrian movements by providing a pedestrian friendly road environment. It includes areas of high pedestrian activity associated with schools, shopping strips, shopping centres, businesses, entertainment and rest homes along the arterial road network.

3.2 SHEPHERDS HILL ROAD

Shepherds Hill Road is a major route, which forms an important arterial link for commuter traffic between the Mitcham Hills, the western suburbs and Adelaide Plains, including the Adelaide CBD.

The role and function assigned to Shepherds Hill Road within the Transport Planning Agency is set out below:

- Strategic Route
  Provide an important link between key regional centres and areas of high activity
- Cycle Route
  Provide reasonably long, inter-suburban continuous connections and access to key cycle trip generators (eg strip and local shopping, educational institutions and places of cultural and social activity)
- Commuter Route
  Provide for longer distance trips during the peak periods
  Cater for large traffic volumes
  Minimise delays for long distance movements, especially during commuter peaks.

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

4.1 MAIN ROAD

System management components	Functional outcomes	Target design / operational requirements
CAPACITY	- One clear operating lane will cater for traffic flows up to 1400 vph	Main Rd has traffic flows well under 1400 vph in each direction in sections 1,2,3. • **One uninterrupted operating lane in each direction to cater for existing and expected traffic volumes in sections 1,2,3** • **Section 4 has two lanes to cater for higher traffic flows.**
LANES	- Provide uninterrupted lanes of high standard - Wider kerb lanes (or indented bus bays) at bus stops to allow cars to pass stopped buses - Wider travelling lanes required on bus routes - Kerb lane to include cycle lane on cycle routes	• **Provide cycle lane, or wider kerb lane to accommodate bicycles** • **Wide uninterrupted traffic lane in sections 1,2,3** • **Indent all bus stops, particularly in the single lane sections**
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. This is particularly important on two lane roads.	Refer “MEDIANS” below
MEDIANS	- Solid median preferred on strategic routes - Provide medians to store right turn vehicles - Solid medians in busy pedestrian precincts and at	• **Raised medians where road widths permit or where significant numbers of pedestrians cross the road** • **Flush median where constraints such as limited road reserve width and the**

System management components	Functional outcomes	Target design / operational requirements
	busier pedestrian crossing sites	**need to retain as much as possible the adjacent landscaping make a raised median impractical**
TRAFFIC SIGNALS	- Rationalise traffic signal frequency	• **Avoid installation of signals**
SPEED LIMITS	- Encourage use of arterial road network (rather than local road network) through appropriate speed limits.	• **Maintain 60kph speed limit where appropriate.** • **Consider 50kph limit in busier commercial / pedestrian precinct (sections 4,5)**
ACCESS - MIDBLOCK	- Minimise direct property access - Consider protected turn lanes where warranted	Given the limited road width it will be difficult to limit direct access to midblock properties. • **Restrict midblock access to properties where necessary to ensure safe operation**
TRAFFIC MANAGEMENT AT INTERSECTIONS	- Major intersections and junctions should have active control - Minimise conflict points - Avoid uncontrolled right turns onto strategic routes	• **Reduce conflict points at uncontrolled intersections to improve safety (eg ban right turn movements), while maintaining reasonable access to adjacent areas** • **Provide active control (eg traffic signals, roundabouts) at major intersections where rationalisation of access / movements is not possible**
LANDSCAPING AND ROADSIDE FURNITURE	- Eliminate roadside hazards - Eliminate overhanging vegetation - Ensure adequate sight distance, particularly at designated pedestrian crossing points	• **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**
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 3.5m wide lane for buses** • **Indent all bus bays in two lane section of road (see also "CAPACITY", "LANES", "MEDIANS")**

4.2 SHEPHERDS HILL ROAD

As stated earlier, Shepherds Hill Road has only been included in this report for addressing specific traffic management issues. Analysis of the functional outcomes for the development of cross section requirements is therefore not included in this report.

5 LONG TERM VISION

A vision of how Main Road should look and operate has been developed based on the above "functional outcomes analysis". Constraints such as the need to retain as much of the existing landscaping, limitations in available road reserve and the need to maintain a reasonable level of access to adjacent property may require some compromises from the vision ideals. However, the traffic management recommendations in this report aim at realising as much as possible this vision while targeting the higher priority safety and operational requirements.

5.1 MAIN ROAD

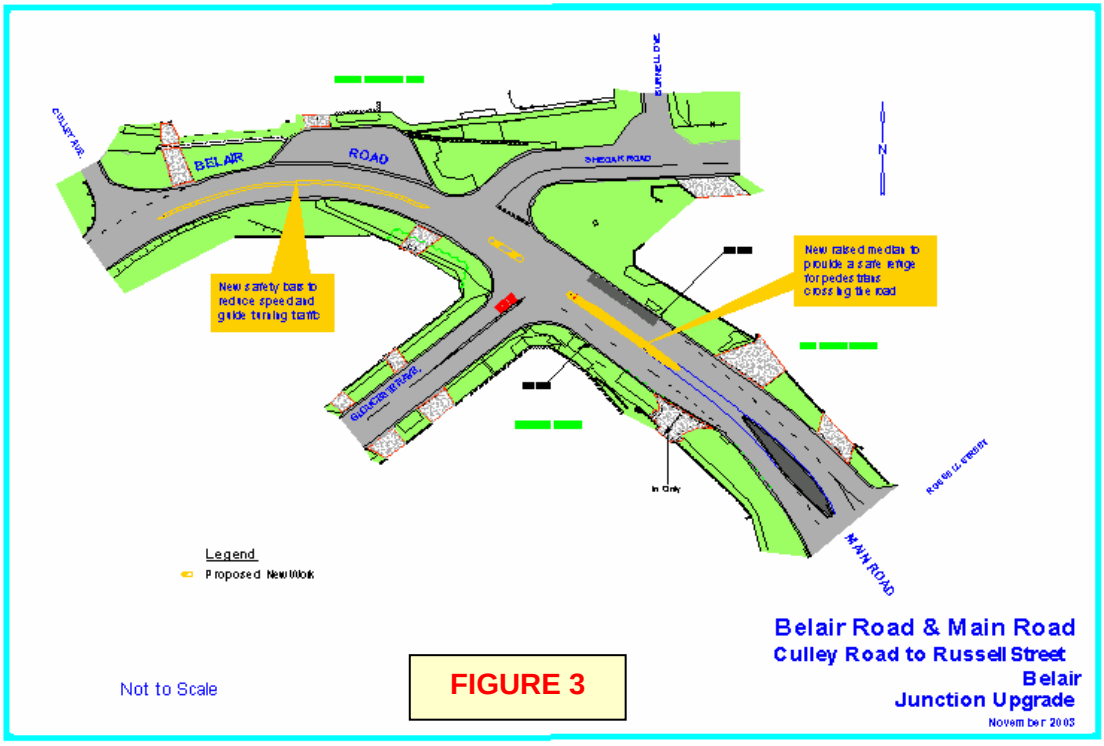
5.1.1 Sheoak Road to Russell Street

This section of Main Road was upgraded in 2004, (refer to figure 3 below).

The improvements that were undertaken included: -

- Safety bars and a raised median to delineate and calm traffic travelling through this area
- A raised median to provide refuge for pedestrians (including school children) crossing the road
- Upgrade of road lighting

Due to these works having recently been undertaken, there are no further traffic management improvements proposed to this section of Main Road.



5.1.2 Russell St to Gooch Crescent

This section of Main Road currently has two-lane operation, which has the capacity to cater for the existing traffic flow (1200 vehicles per hour per lane.)

The road is kerbed on both sides and has a wide raised median.

The existing road cross section is considered adequate for existing traffic conditions and no changes to the cross section are proposed. Any traffic management or road safety issues identified as part of this RMP are therefore treated in isolation.

5.1.3 Gooch Crescent to Southern Ave

The cross section shown in Figure 4 below represents the preferred cross section for this section of Main Road. It incorporates design and operational features that target key functional outcomes and maximises safety.

The existing narrow pavement widths, roadside drop offs, service locations and landscaping will make achieving this design for the entire length of this section of road difficult. However, the design of any isolated traffic management improvements recommended within this report aim at consistency with the preferred cross section.

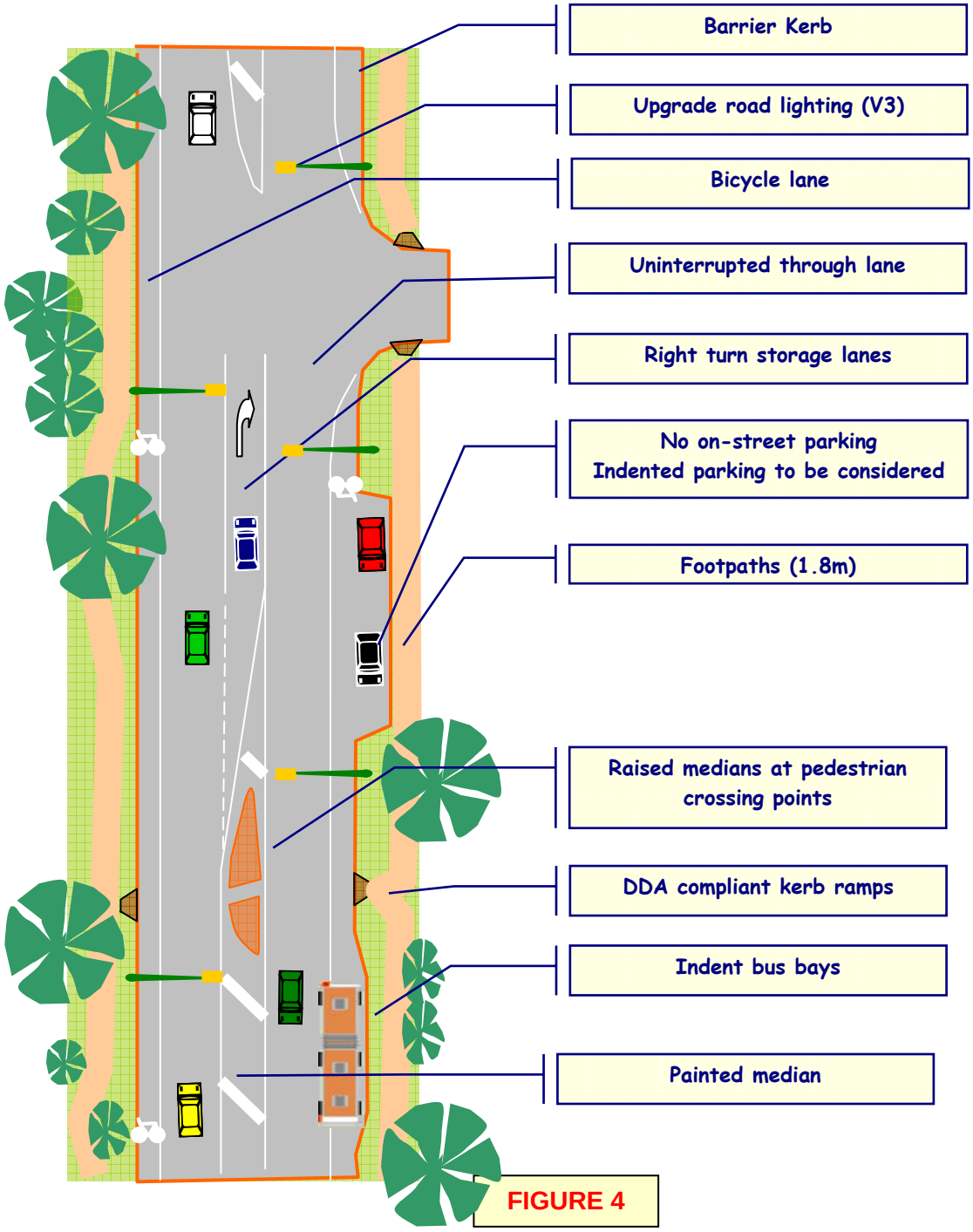


FIGURE 4

5.1.4 Southern Avenue to Chapman Street

This section of road is currently 13.0 metres wide (between kerbs) and it operates essentially as a two-lane road (one wide lane in each direction). Two-lane operation has adequate capacity for the existing traffic volumes (1200 vehicles per hour per lane).

The existing pavement width will allow for the implementation of the preferred cross section shown in Figure 4, formalising the existing two-lane operation and significantly improving the amenity and safety of the road in the immediate area for vehicular, cycle and pedestrian traffic.

5.1.5 Chapman Street to Shepherds Hill Road

This section of road currently has four traffic lanes and a raised median. It is therefore not proposed to alter the general road cross section of the road.

The high-density commercial and pedestrian activity on both sides of the road creates unique traffic management requirements.

Traffic management on this section will therefore focus on: -
- Pedestrian safety and DDA compliance of facilities
- Rationalisation of access at property accesses and intersections to improve safety
- Study / review of parking (on street and off street)
- Consideration of lower speed limits.

5.2 SHEPHERDS HILL ROAD

5.2.1 Main Road to Melton Street

There is no proposal to alter the road cross section on this section of road. This section is within a major commercial and pedestrian precinct and has traffic management requirements similar to those on Main Road between Chapman Street and Shepherds Hill Road (refer above).

Traffic management on this section will therefore focus on: -
- Pedestrian safety and DDA compliance of facilities
- Rationalisation of access at property accesses and intersections to improve safety
- Study / review of parking (on street and off street)
- Consideration of lower speed limits.

5.2.2 Melton Street to Seymour Street

There is no proposal to alter the road cross section on this section of road.

6 ROAD SAFETY

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

- Reducing the number of crashes / 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 road network.

Recommendations in this report therefore target road safety focussing on the key safety issues that have been identified.

6.1 MIDBLOCK CRASH DATA

Midblock crashes for the period from 1999 to 2004 (inclusive) are tabled for all road sections.

Road sections where crash numbers for this period exceed 6 (more than 1 crash per annum) have been identified as traffic management issues for further investigation within this report.

6.1.1 Main Road; Gloucester Avenue to Russell Street

This section has recently been upgraded to include a raised median and general traffic calming devices.
The recorded crash numbers are low indicating that the existing traffic controls are working reasonably well. Although no safety issues are identified for further investigation, other specific issues raised by the community are dealt with later in this report.

ROAD SECTION	MAIN RD MIDBLOCK SECTION	Crash data 1999 - 2004
1	Gloucester - Russell	

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

6.1.2 Main Road; Russell Street to Chapman Street

Crash rates for this section of road are relatively low (≤ 6 during the 6 year period).

Crash types comprise mainly of rear end, sideswipe or hit fixed object collisions. Traffic management recommendations in this report target these types of crashes and include: -

- Painted median allowing right turning traffic to store out of the travelling through lane
- Wider lanes (including bicycle lanes) to improve amenity and manoeuvring space.
- Indented bus bays

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<table>
<tr><th>ROAD SECTION</th><th>MAIN RD MIDBLOCK SECTION</th><th>Crash data 1999 - 2004</th></tr>
<tr><td>2</td><td>Russell - Elliott</td><td></td></tr>
<tr><td>2</td><td>Elliott - Gooch</td><td></td></tr>
<tr><td>2</td><td>Gooch – Penno Pde North</td><td></td></tr>
<tr><td>2</td><td>Penno Pde North - Downer Ave</td><td></td></tr>
<tr><td>2</td><td>Downer Ave - Monalta Dve</td><td>
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<tr><td>Rear End</td><td>2</td><td></td><td>2</td></tr>
<tr><td>Hit Fixed Object</td><td>2</td><td></td><td>2</td></tr>
<tr><td>Hit Parked Vehicle</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>Total</td><td>2</td><td></td><td>6</td></tr>
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<tr><td>2</td><td>Monalta Dve – Laffers Rd</td><td>
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<tr><td>Rear End</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Hit Fixed Object</td><td></td><td>1</td><td>1</td></tr>
<tr><td>Head On</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Total</td><td>3</td><td>2</td><td>5</td></tr>
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<tr><td>2</td><td>Laffers Rd – Byrne St</td><td>
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<tr><td>Side Swipe</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>2</td><td>Byrne St – Rosella Ave</td><td></td></tr>
<tr><td>2</td><td>Rosella Ave – Level crossing</td><td></td></tr>
<tr><td>3</td><td>Level crossing – Southern Ave</td><td>
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<tr><td>Rear End</td><td>4</td><td></td><td>4</td></tr>
<tr><td>Total</td><td>4</td><td></td><td>4</td></tr>
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<tr><td>3</td><td>Southern Ave to McDonald Ave</td><td>
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<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Rear End</td><td>1</td><td>1</td><td>2</td></tr>
<tr><td>Right Angle</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Side Swipe</td><td></td><td>1</td><td>1</td></tr>
<tr><td>Total</td><td>2</td><td>2</td><td>4</td></tr>
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ROAD SECTION	MAIN RD MIDBLOCK SECTION	Crash data 1999 - 2004
3	**McDonald – Burfield Ave**	**Crash Type** / PDO / **Casualty** / **Total** Hit Fixed Object / / 2 / 2 Rear End / / 1 / 1 **Total** / / 1 / **3**
3	**Burfield Ave – Stirling Rd**	**Crash Type** / PDO / **Casualty** / **Total** Rear End / 1 / / 1 **Total** / 1 / / 1
3	**Stirling Rd – Colton Rd**	**Crash Type** / PDO / **Casualty** / **Total** Hit Fixed Object / 1 / / 1 **Total** / **1** / / **1**
3	**Colton Rd – Gulfview Rd**	**Crash Type** / PDO / **Casualty** / **Total** Rear End / 1 / / 1 Side Swipe / 1 / / 1 Right Angle / 1 / / 1 Hit Parked / 1 / / 1 **Total** / **4** / / **4**
3	**Gulfview Rd – Chapman St**	**Crash Type** / PDO / **Casualty** / **Total** Right Angle / 4 / 2 / 6 Rear End / / 3 / 3 Hit Parked / 2 / / 2 **Total** / **6** / **5** / **11**

Sections requiring further investigation

1. **Main Road**
   Gulfview Rd – Chapman St

6.1.3 Main Road; Chapman Street to Shepherds Hill Road

Crash rates are generally higher on this section of road due to the higher traffic flows and the increase in commercial and pedestrian activity, in particular approaching the Blackwood roundabout.

SECTION	MAIN RD MIDBLOCK SECTION	Crash data 1999 - 2004

4	**Chapman St – Edward St**	**Crash Type**	**PDO**	**Casualty**	**Total**
		Side Swipe	3	1	4
		Right Angle		1	1
		Total	**3**	**2**	**5**
4	**Edward St – Young St**	**Crash Type**	**PDO**	**Casualty**	**Total**
		Other	1		1
		Hit Pedestrian		1	1
		Hit Fixed Object		1	1
		Hit Parked Vehicle	1		1
		Side Swipe	1		1
		Right Angle		1	1
		Total	**3**	**3**	**6**
4	**Young St – Blackwood Roundabout**	**Crash Type**	**PDO**	**Casualty**	**Total**
		Right Angle	12	1	13
		Rear End	8	4	12
		Hit Parked Vehicle	2		2
		Side Swipe	1	1	2
		Hit Pedestrian		1	1
		Total	**23**	**7**	**30**

Sections requiring further investigation

1. **Main Road**
   Young St – Blackwood Roundabout

6.1.4 Shepherds Hill Road; Main Road to Seymour Street- Section 5

Crash numbers are relatively low (≤ 4 during the 6 year period) for most sections of road.

Crash rates are generally higher on the section of Shepherds Hill Road between Main Road and Gladstone Avenue due to the higher traffic flows and the increase in commercial and pedestrian activity, in particular approaching the Blackwood roundabout.

<table>
<tr><th>ROAD SECTION</th><th>SHEPHERDS HILL RD MIDBLOCK SECTION</th><th>Crash data 1999 - 2004</th></tr>
<tr><td>5</td><td>Main Rd – Gladstone 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>8</td><td></td><td>8</td></tr>
<tr><td>Right Angle</td><td>3</td><td></td><td>3</td></tr>
<tr><td>Hit Pedestrian</td><td></td><td>2</td><td>2</td></tr>
<tr><td>Other</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Hit Parked Vehicle</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Hit Fixed Object</td><td></td><td>1</td><td>1</td></tr>
<tr><td>Total</td><td>13</td><td>3</td><td>16</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Gladstone Rd - Brighton</td><td></td></tr>
<tr><td>5</td><td>Brighton Rd – Woodleigh Rd</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Side Swipe</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Total</td><td>1</td><td></td><td>1</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Woodleigh Rd – Sherbourne 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>1</td><td></td><td>1</td></tr>
<tr><td>Side Swipe</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Total</td><td>2</td><td></td><td>2</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Sherbourne Rd – Viaduct 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>2</td><td></td><td>2</td></tr>
<tr><td>Hit Fixed Object</td><td></td><td>1</td><td>1</td></tr>
<tr><td>Side Swipe</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Total</td><td>3</td><td>1</td><td>4</td></tr>
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</td></tr>
<tr><td>5</td><td>Viaduct Rd – Wilpena St</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Head On</td><td></td><td>1</td><td>1</td></tr>
<tr><td>Total</td><td></td><td>1</td><td>1</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>ROAD SECTION</th><th>SHEPHERDS HILL RD MIDBLOCK SECTION</th><th>Crash data 1999 - 2004</th></tr>
<tr><td>5</td><td>Wilpena St – Parham 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>1</td><td></td><td>1</td></tr>
<tr><td>Side Swipe</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Total</td><td>2</td><td></td><td>2</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Parham Rd – Seymour St</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Hit Parked Vehicle</td><td>3</td><td></td><td>3</td></tr>
<tr><td>Right Angle</td><td></td><td>1</td><td>1</td></tr>
<tr><td>Total</td><td>3</td><td>1</td><td>4</td></tr>
</table>
</td></tr>
</table>

<u>Sections requiring further investigation</u>

1. **Shepherds Hill Road**
   Blackwood Roundabout to Gladstone Ave

6.2 INTERSECTION CRASH DATA

6.2.1 Main Rd - Sections 1 to 4

The crash data for all of the intersections is summarised below.

Sites with crash numbers exceeding 6 in the period 1999 to 2004 have been identified as requiring further investigation.

<table>
<tr><th>ROAD SECTION</th><th>MAIN ROAD INTER SECTION</th><th>Crash data 1999 - 2004</th></tr>
<tr><td>1</td><td>Main Road - Sheoak Rd</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Right Angle</td><td>2</td><td></td><td>2</td></tr>
<tr><td>Rear End</td><td>2</td><td></td><td>2</td></tr>
<tr><td>Right Turn</td><td>2</td><td></td><td>2</td></tr>
<tr><td>Total</td><td>6</td><td></td><td>6</td></tr>
</table>
</td></tr>
<tr><td>1</td><td>Main Rd - Gloucester Ave</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Right Angle</td><td>3</td><td></td><td>3</td></tr>
<tr><td>Total</td><td>3</td><td></td><td>3</td></tr>
</table>
</td></tr>
<tr><td>1</td><td>Main Road - Russell St</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Right Turn</td><td>6</td><td>3</td><td>9</td></tr>
<tr><td>Rear End</td><td>7</td><td>1</td><td>8</td></tr>
<tr><td>Right Angle</td><td>4</td><td>2</td><td>6</td></tr>
<tr><td>Total</td><td>17</td><td>6</td><td>23</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Main Road - Elliott Ave</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Rear End</td><td></td><td>1</td><td>1</td></tr>
<tr><td>Total</td><td></td><td>1</td><td>1</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Main Road - Gooch Crt</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Hit Pedestrian</td><td></td><td>1</td><td>1</td></tr>
<tr><td>Other</td><td></td><td>1</td><td>1</td></tr>
<tr><td>Total</td><td></td><td>2</td><td>2</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Main Road - Penno Pde North</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Head On</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Hit Pedestrian</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>
</table>

<table>
<tr><th>ROAD SECTION</th><th>MAIN ROAD INTER SECTION</th><th>Crash data 1999 - 2004</th></tr>
<tr><td>2</td><td>Main Road - Downer Ave</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Rear End</td><td>5</td><td>2</td><td>7</td></tr>
<tr><td>Right Angle</td><td>4</td><td>1</td><td>5</td></tr>
<tr><td>Hit Fixed Object</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Total</td><td>10</td><td>3</td><td>13</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Main Road - Monalta Dve</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></td><td>4</td></tr>
<tr><td>Head On</td><td>-</td><td>1</td><td>1</td></tr>
<tr><td>Other</td><td>-</td><td>1</td><td>1</td></tr>
<tr><td>Right Angle</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Total</td><td>5</td><td>2</td><td>7</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Main Road - Laffers Rd</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Right Angle</td><td>13</td><td>1</td><td>14</td></tr>
<tr><td>Rear End</td><td>8</td><td></td><td>8</td></tr>
<tr><td>Right Turn</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Total</td><td>22</td><td>1</td><td>23</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Main Road - Byrne St</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Rear End</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Hit Fixed Object</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>2</td><td>Main Road - Byrne Lane</td><td></td></tr>
<tr><td>2</td><td>Main Road - Rosella Ave</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Right Angle</td><td>2</td><td>1</td><td>3</td></tr>
<tr><td>Head On</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Rear End</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Hit Fixed Object</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>Total</td><td>6</td><td>1</td><td>7</td></tr>
</table>
</td></tr>
</table>

ROAD SECTION	MAIN ROAD INTER SECTION	Crash data 1999 - 2004
3	Glenalta Level Crossing	
	Main Road - Southern Ave	Crash Type: Rear End, PDO 2, Casualty , Total 2 Right Angle, 2, , 2 Hit Fixed Object, 1, , 1 **Total, 5, , 5**
3	Main Road - McDonald Ave	Crash Type: Rear End, PDO 2, Casualty , Total 2 **Total, 2, , 2**
3	Main Road - Burfield Ave	Crash Type: Hit Fixed Object, PDO 1, Casualty , Total 1 **Total, 1, , 1**
3	Main Road - Stirling Rd / Miller Tce	Crash Type: Right Angle, PDO 3, Casualty 2, Total 5 Rear End, 1, 1, 2 Right Turn, 1, , 1 **Total, 5, 3, 8**
3	Main Road - Colton Rd / View Rd	Crash Type: Right Angle, PDO 1, Casualty , Total 1 Rear End, 1, , 1 Right Turn, 1, , 1 **Total, 3, , 3**
3	Main Road - Gulfview Rd	Crash Type: Rear End, PDO 2, Casualty 1, Total 3 Right Turn, 1, 1, 2 Right Angle, 1, 1, 2 **Total, 4, 3, 7**

ROAD SECTION	MAIN ROAD INTER SECTION	Crash data 1999 - 2004
3	Main Road - Chapman St	

Crash Type	PDO	Casualty	Total
Rear End	1	1	2
Right Angle	1	1	2
Side Swipe	1		1
Total	**3**	**2**	**5**

ROAD SECTION	MAIN ROAD INTER SECTION	Crash data 1999 - 2004
4	Main Road - Edward St	

Crash Type	PDO	Casualty	Total
Rear End	4	1	5
Hit Fixed Object	1	1	2
Right Angle	2		2
Right Turn	1		1
Total	**8**	**2**	**10**

ROAD SECTION	MAIN ROAD INTER SECTION	Crash data 1999 - 2004
4	Main Road - Young St	

Crash Type	PDO	Casualty	Total
Rear End	6	2	8
Side Swipe	1		1
Total	**7**	**2**	**9**

ROAD SECTION	MAIN ROAD INTER SECTION	Crash data 1999 - 2004
4	Blackwood Roundabout	

Crash Type	PDO	Casualty	Total
Right Angle	47	7	54
Side Swipe	31	2	33
Rear End	24	3	27
Hit Pedestrian		1	1
Right Turn	1		1
Hit Fixed Object		1	1
Other		1	1
Total	**103**	**15**	**118**

Sites requiring further investigation

1. **Main Road – Russell Street**
2. **Main Road – Downer Ave**
3. **Main Road – Monalta Dve**
4. **Main Road – Laffers Road**
5. **Main Road – Rosella Ave**
6. **Main Road – Stirling Road – Miller Tce**
7. **Main Road Gulfview Road**
8. **Main Road – Edward Street – Carr Street**
9. **Main Road – Young Street**
10. **Blackwood Roundabout**

6.2.2 Shepherds Hill Road – Section 5

Crash data for all of the intersections is summarised below.

Sites with crash numbers exceeding 6 in the period 1999 to 2004 have been identified as requiring further investigation

<table>
<tr><th>ROAD SECTION</th><th>SHEPHERDS HILL ROAD INTERSECTIONS</th><th>Crash data 1999 - 2004</th></tr>
<tr><td>5</td><td>Gladstone Rd</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Right Angle</td><td>3</td><td>1</td><td>4</td></tr>
<tr><td>Right Turn</td><td>2</td><td></td><td>2</td></tr>
<tr><td>Rear End</td><td>2</td><td></td><td>2</td></tr>
<tr><td>Total</td><td>7</td><td>1</td><td>8</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Brighton / Waite</td><td>
<table>
<tr><th>Crash Type</th><th>PDO</th><th>Casualty</th><th>Total</th></tr>
<tr><td>Right Angle</td><td>20</td><td>6</td><td>26</td></tr>
<tr><td>Rear End</td><td>6</td><td></td><td>6</td></tr>
<tr><td>Right Turn</td><td>4</td><td>1</td><td>5</td></tr>
<tr><td>Hit Fixed Object</td><td>3</td><td></td><td>3</td></tr>
<tr><td>Side Swipe</td><td>3</td><td></td><td>3</td></tr>
<tr><td>Hit Pedestrian</td><td></td><td>1</td><td>1</td></tr>
<tr><td>Head On</td><td>1</td><td></td><td>1</td></tr>
<tr><td>Total</td><td>37</td><td>8</td><td>45</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Woodleigh 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>3</td><td></td><td>3</td></tr>
<tr><td>Hit Fixed Object</td><td></td><td>1</td><td>1</td></tr>
<tr><td>Total</td><td>3</td><td>1</td><td>4</td></tr>
</table>
</td></tr>
</table>

ROAD SECTION	SHEPHERDS HILL ROAD INTERSECTIONS	Crash data 1999 - 2004

5 — **Sherbourne Rd / Melton Street**

Crash Type	PDO	Casualty	Total
Rear End	11	2	13
Right Angle	8	2	10
Head On	1		1
Roll Over		1	1
Hit Fixed Object	1		1
Total	**21**	**5**	**26**

5 — **Viaduct Rd**

Crash Type	PDO	Casualty	Total
Hit Fixed Object	1		1
Total	**1**		**1**

5 — **Wilpena St**

Crash Type	PDO	Casualty	Total
Hit Fixed Object	3	1	4
Rear End	1	2	3
Right Turn	1		1
Total	**5**	**3**	**8**

5 — **Parham Rd**

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

5 — **Seymour St**

Crash Type	PDO	Casualty	Total
Right Angle	1	1	2
Right Turn	1	1	2
Side Swipe	1		1
Hit Parked Vehicle	1		1
Head On	1		1
Rear End	1		1
Total	**6**	**2**	**8**

Sites requiring further investigation

1. **Shepherds Hill Road – Gladstone Road**
2. **Shepherds Hill Road – Waite Road – Brighton Pde**
3. **Shepherds Hill Road – Sherbourne Rd - Melton Street**
4. **Shepherds Hill Road – Wilpena Street**
5. **Shepherds Hill Road – Seymour Street**

6.3 SPEED ENVIRONMENT

The existing speed limit along Main Road is 60km/h. On a number of occasions the community have indicated a wish to reduce this speed limit to 50km/h.

Main Road is a major arterial road and the 60kph limit is generally consistent with the road category and environment.

However, sections of Main Road and Shepherds Hill Road in the busier commercial / pedestrian precincts have increased through traffic movement, together with significant pedestrian and slower moving traffic associated with parking and access to shopping centres. Crash records indicate a higher number of crashes occur in these areas.

It is therefore recommended that the speed limits in these areas be reduced to 50kph.

6.4 ROADSIDE HAZARDS

At present, there are potentially dangerous roadside hazards located along Main Road, in particular throughout the narrower sections of Main 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. Other hazards include roadside obstacles (stobie poles, drainage structures etc) and unprotected roadside drop offs.

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

6.5 PEDESTRIANS

The provision of properly designed, safe, and DDA compliant walking facilities along Main Road is primarily the responsibility of Mitcham Council. Existing shared paths along Main Road are of substandard design and discontinuous along the road. Council have indicated that they intend to abandon the existing shared paths given their poor condition and width limitations imposed by the surrounding landscape. Council should therefore consider the provision of properly designed pedestrian footpaths on both sides of Main Road to improve amenity and safety for pedestrians.

The footpath design and function should target: -

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

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

- Existing pedestrian actuated crossings on Main Road and Shepherds Hill Road already cater for pedestrians crossing in the busier pedestrian precinct.
- The installation of a painted median and removal of on-street parking will make the general road cross-section much more pedestrian friendly.
- Installation of a raised median with walk throughs on Main Road between Downer Avenue and Penno Parade (N) will improve safety for pedestrians, including school children crossing from the Pinera railway station to the western side bus stops or going to St John's Grammar School

- Upgrading of pedestrian refuge areas on Main Road at Gulfview Road
- The installation of a new pedestrian refuge and walkthrough between Southern Avenue and Mc Donald Avenue (adjacent the Belair Hotel).
- Upgrading of road lighting.

6.6 CYCLISTS

Both the "Bike Direct" network and Mitcham Council's "Local Area Bicycle Plan" identify Main Road and Shepherd's Hill Road as strategically important for inter and intra-regional bicycle travel.

Shepherd's Hill Road has reasonable kerb lane widths and marked bicycle lanes in various parts. Main Road however, has no formalised bicycle facilities (on road or off road) and narrow pavement widths, creating a significant hazard for cyclists.

The widening of the narrow cross sections incorporating marked bicycle lanes have therefore been recommended in this report (Refer 4).

6.7 PUBLIC TRANSPORT

A number of bus routes currently use Main Road and Shepherds Hill Road. To provide uninterrupted traffic flows, bus stops should be indented on sections of road with only two lanes.

The figures below show bus movements at the Blackwood Roundabout and the routes along Main Road and Shepherds Hill Road.

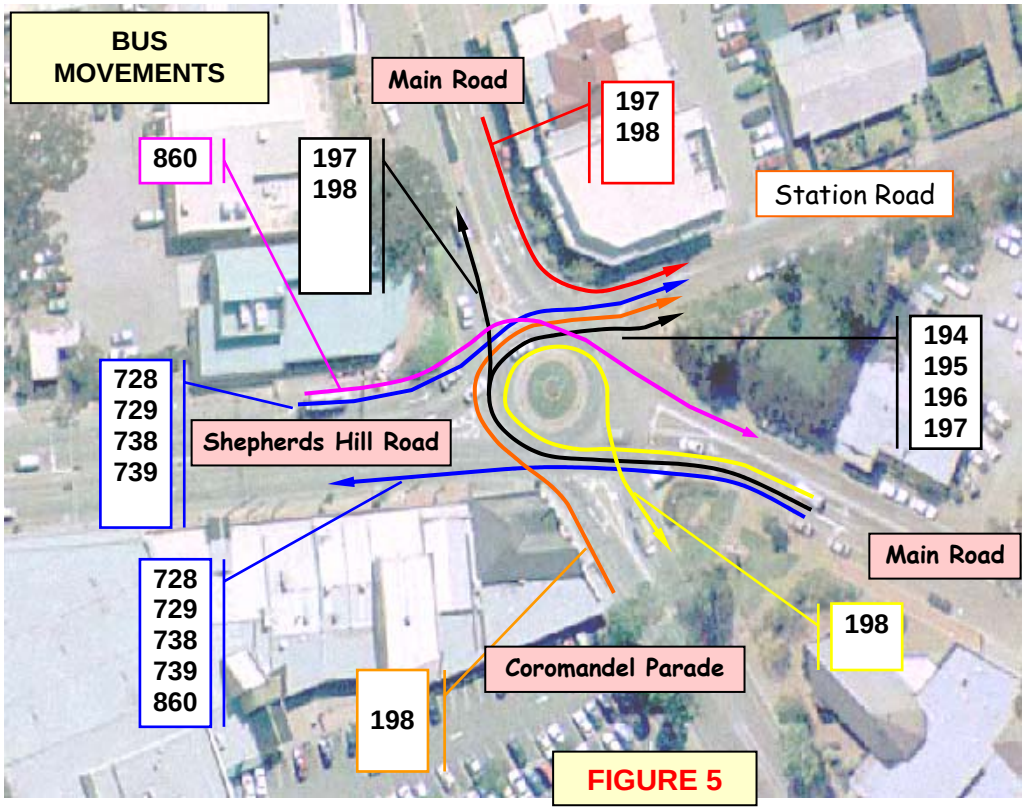
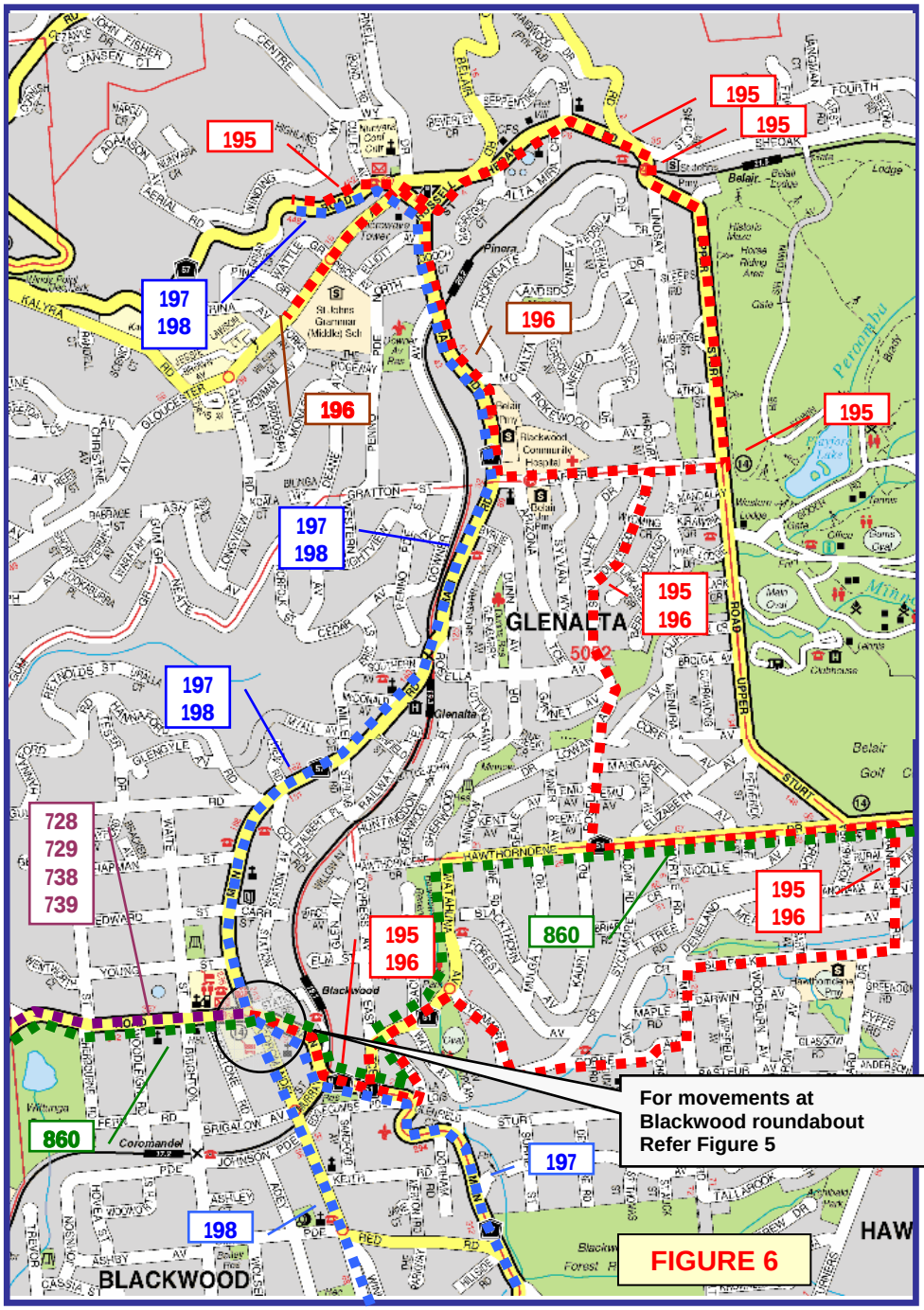


FIGURE 5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GLENALTA
5062
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728
729
738
739
195
196
860
195
196
860
197
198
BLACKWOOD
For movements at
Blackwood roundabout
Refer Figure 5

FIGURE 6

7 TRAFFIC ISSUES AND RECOMMENDATIONS

7.1 ISSUES ARISING FROM CRASH DATA ANALYSIS

7.1.1 Main Road - Gulfview Road to Chapman Road

From the crash data analysis, this section of road was identified as requiring further investigation.

The factors contributing to crash risk are: -
- Higher level of adjacent commercial activity
- Wide cross section with lanes poorly delineated

Recommendation: -
- Install painted median in accordance with preferred scheme - Refer Figure 4

7.1.2 Main Road - Young Street to Blackwood Roundabout

This section of road is in the busier part of the commercial precinct resulting in a higher number of crashes (30 crashes in the period 1999-2004). From the analysis it was found that the crash types are mainly rear end and right angle crashes.

Right angle crashes involve traffic turning right from adjacent businesses, in particular the Foodland Shopping Centre car park.

Rear end crashes are associated mainly with queuing from the roundabout or vehicles stopping at the pedestrian actuated traffic signals.

Factors contributing to crash risk at this site include: -
- Increased pedestrian activity, parking vehicles, turning traffic etc.
- Poor design standard of car park access roads.
- Mix of slow shopping / turning traffic and high volume through commuter traffic.
- Complexity / confusion resulting from traffic entering and exiting several access points on both sides of the Main Road between Young Street and the pedestrian actuated crossing.

Recommendations: -
- Rationalise access points where possible.
- Improve design of accesses (width, delineation, and sight distances).
- Consider restricting turning movements to left in / left out by installing a raised median from the pedestrian crossing to Young Street.

7.1.3 Shepherds Hill Road – Main Road to Gladstone Road

This section of road has been identified as requiring further investigation due to the number of recorded crashes (16 crashes in the period 1999-2004).

Crash types are predominantly right angle and rear end.

Factors contributing to crash risk on this section of road include: -
- Increased pedestrian activity, parking vehicles, turning traffic etc.
- Access points located immediately opposite Gladstone Road.

Recommendations: -
- Rationalise access points where possible.
- Improve design of accesses (width, delineation, sight distances).

7.1.4 Main Road – Russell Street

This section of road has been identified as requiring further investigation due to the number of recorded crashes (23 crashes in the period 1999-2004).

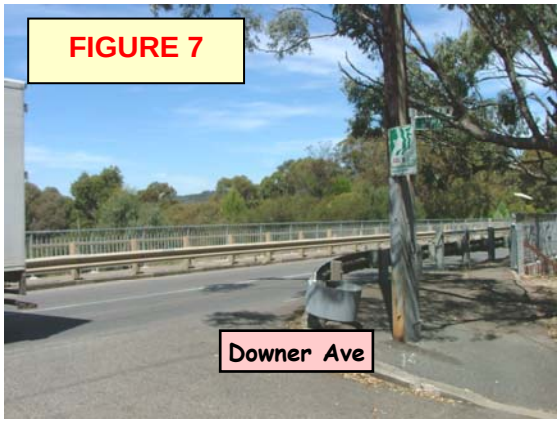
A significant number of theses crashes involve right turning traffic from Main Road into Russell Street

Options for consideration include: -

- Alter junction to make Main Road / Russell Street the priority movement.
- Ban the right turn movement (either full-time or during the peak hours) from Russell Street to Main Road
- Install a roundabout
- Install traffic signals

7.1.5 Main Road - Downer Avenue

A moderate number of right angle and rear end crashes have occurred at this junction.

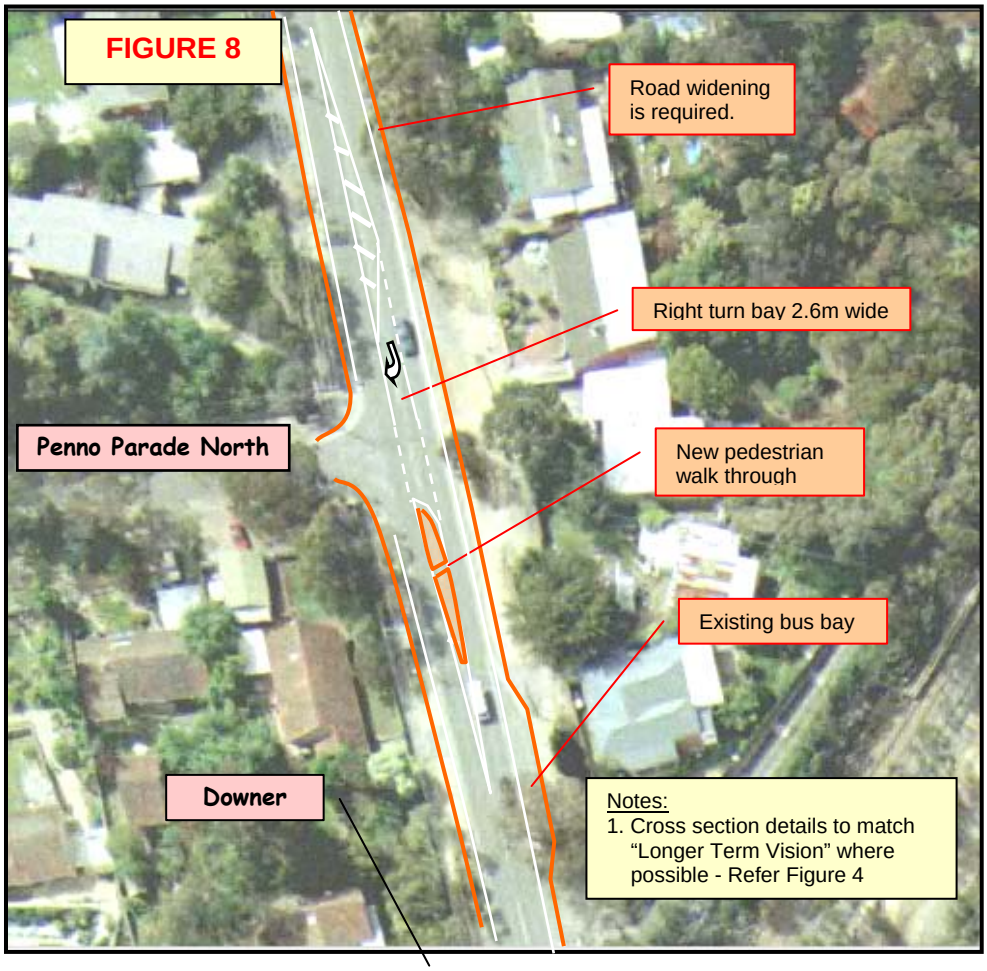


The junction is located immediately north of the Pinera Street railway bridge. On-site observations indicate that the tree, w-beam guardrail and bridge rail fencing restricts sight distance for traffic entering Main Road from Downer Avenue (refer photo), contributing to the right angle crashes.

Almost all rear end crashes occur as a result of traffic stopping to turn right into Downer Avenue. However, a right turn storage lane to allow turning traffic to store without obstructing through traffic cannot be provided due to the narrow roadway over the railway bridge.

Recommendations: -

- Ban all right turn movement into and out of Downer Avenue. Recommend Downer Avenue is restricted to left turn in only.
- Install a right turn storage lane at Main Road and Penno Parade North junction to provide a safe alternative to turning right at Downer Avenue. Note that road widening in the vicinity of Penno Parade North is also required for the installation of a raised pedestrian walk through (Refer "Other Traffic management Issues / Community Concerns – Penno Pde to Downer Ave").



7.1.6 Main Road – Monalta Dve

A moderate number of crashes have occurred at this site (7 crashes in the period 1999-2004). Three of the rear end crashes involve northbound traffic and vehicles turning right into Monalta Dve.

Factors contributing to crash risk at this site include: -
- Right turning traffic obstructing through traffic movements

Recommendations: -
- Consider road widening to provide right turn storage lane as per preferred cross section recommended for this section of road - refer Figure 4.

7.1.7 Main Road - Laffers Road

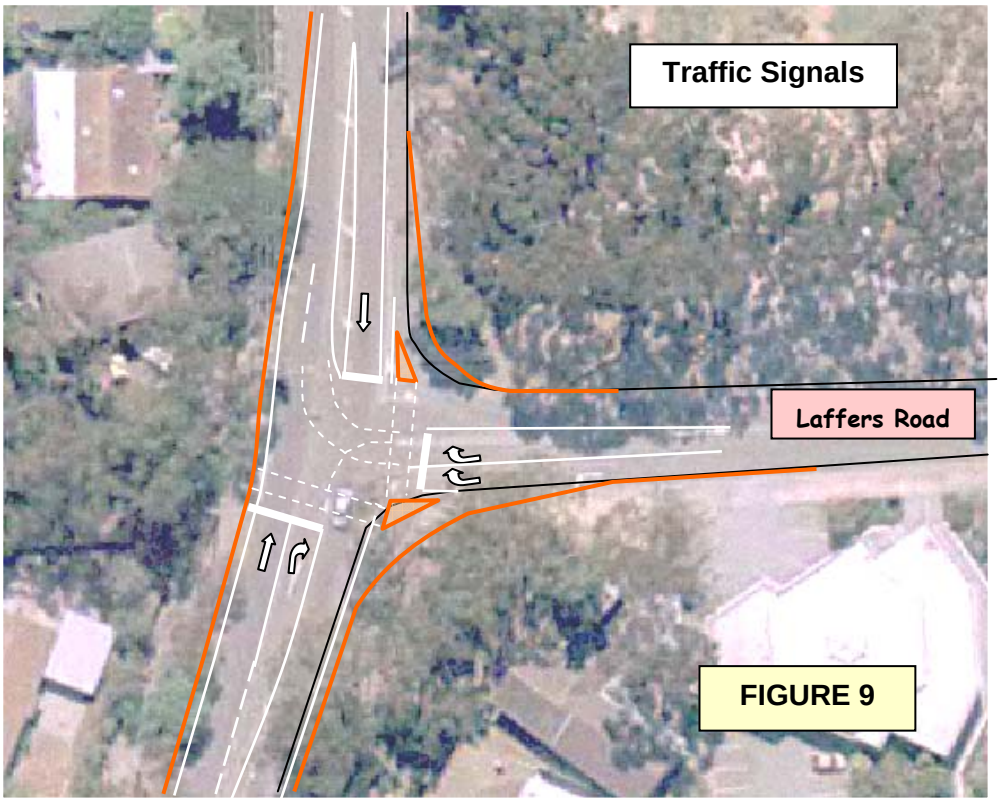
A high number of crashes have occurred at this site (23 crashes in the period 1999-2004).

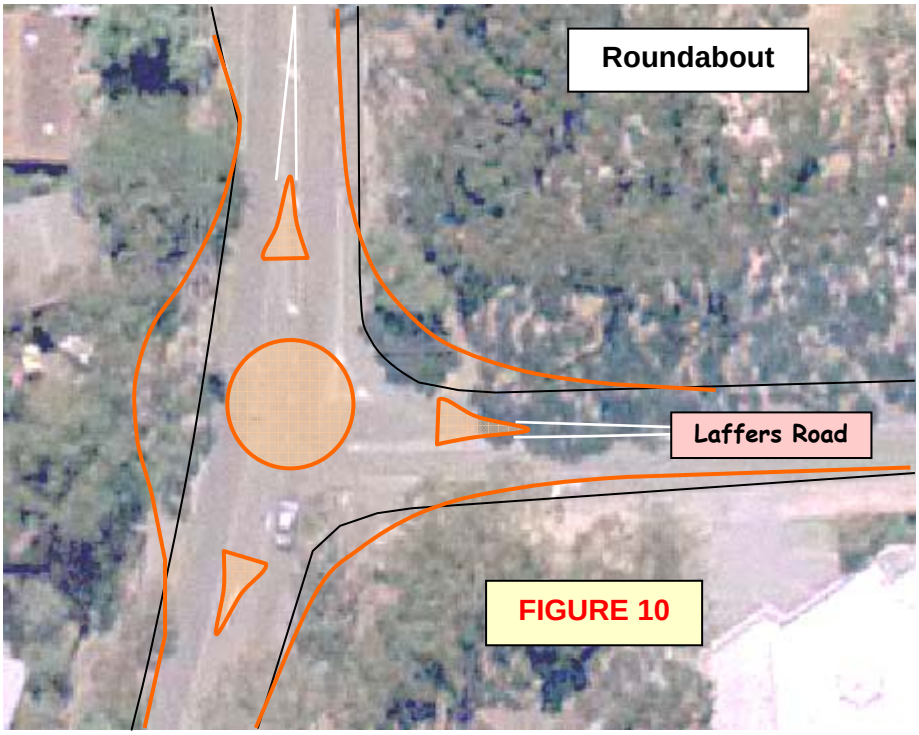
The number of right angle crashes is particularly high due to difficulties experienced by traffic turning right out of Laffers Road. The site has been the topic of previous complaints about the delay and safety experienced by traffic turning right from Laffers Road and requests for the installation of traffic signals have been received from Council and the community for a number of years.

The installation of traffic signals has the potential to address specific operational issues at the junction, including making access from Laffers Road safer and easier, reducing crashes and providing active pedestrian control. It would also platoon traffic providing gaps in the traffic flow creating more opportunity for traffic entering Main Road from uncontrolled side streets, which will be effective for a considerable distance either side of the signals.

However, it should be noted that operationally the installation of a roundabout at this junction would provide additional benefits when compared to traffic signals. Therefore, Transport SA will further investigate the installation of traffic signals or a roundabout to address both operational and safety issues at the junction, and will liaise with Mitcham Council to determine the most appropriate treatment.

Potential schemes are shown in the figures below.


Traffic Signals
Laffers Road
FIGURE 9


Roundabout
Laffers Road
FIGURE 10

7.1.8 Main Road - Rosella Avenue

A moderate number of crashes have occurred at this site (7 crashes in the period 1999-2004).

The junction is located immediately north of the Glenalta level crossing and vehicles turning right into Rosella Avenue block the through traffic travelling along Main Road, thereby causing queues to extend over the level crossing.

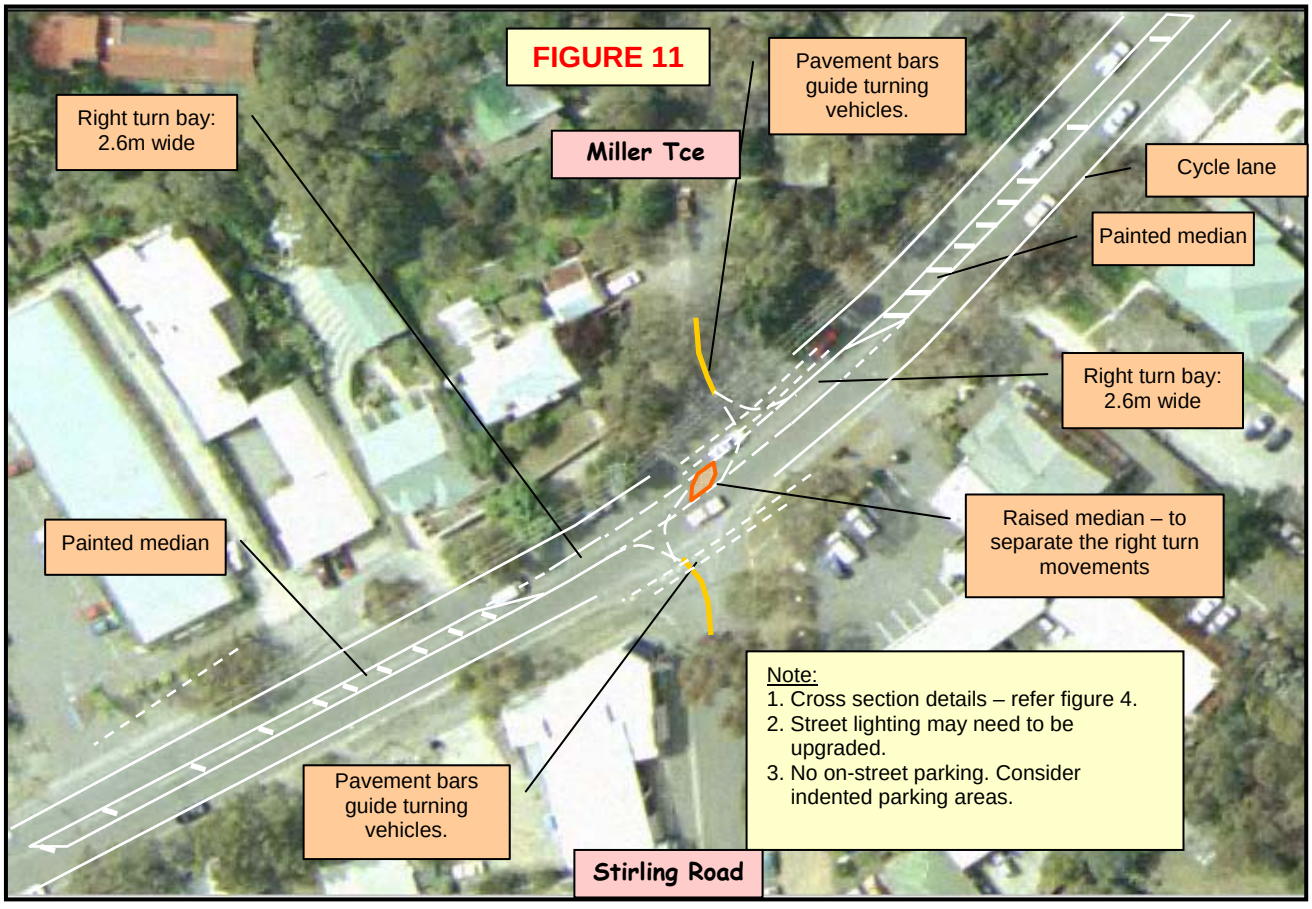
Transport SA is currently discussing traffic management options to improve safety at the junction and eliminate queuing over the level crossing with Mitcham Council.

7.1.9 Main Road - Stirling Road - Miller Terrace

A moderate number of crashes have occurred at this site (8 crashes in the period 1999-2004).

Factors contributing to crash risk at this site include: -
- Stobies and trees restrict sight distance from the side roads.
- Close proximity of opposing side roads (Miller Terrace and Stirling Road)
- Poor channelisation and lane delineation on approaches
- Right turning traffic obstructing through traffic movements

Recommendations: -
- Install painted median in accordance with longer-term vision - refer Figure 4.
- Trim / remove trees to improve sight distances
- Refer concept sketch below.



7.1.10 Main Road - Gulfview Road

A moderate number of crashes have occurred at this site (7 crashes in the period 1999-2004).

Crash types are random with no predominant crash pattern.

However, a need for improved facilities to assist pedestrians crossing at this site has been identified.

Recommendations: -
- Painted median in accordance with longer-term vision - refer Figure 4.
- Upgrade existing raised pedestrian refuge areas.
- Refer concept sketch below.

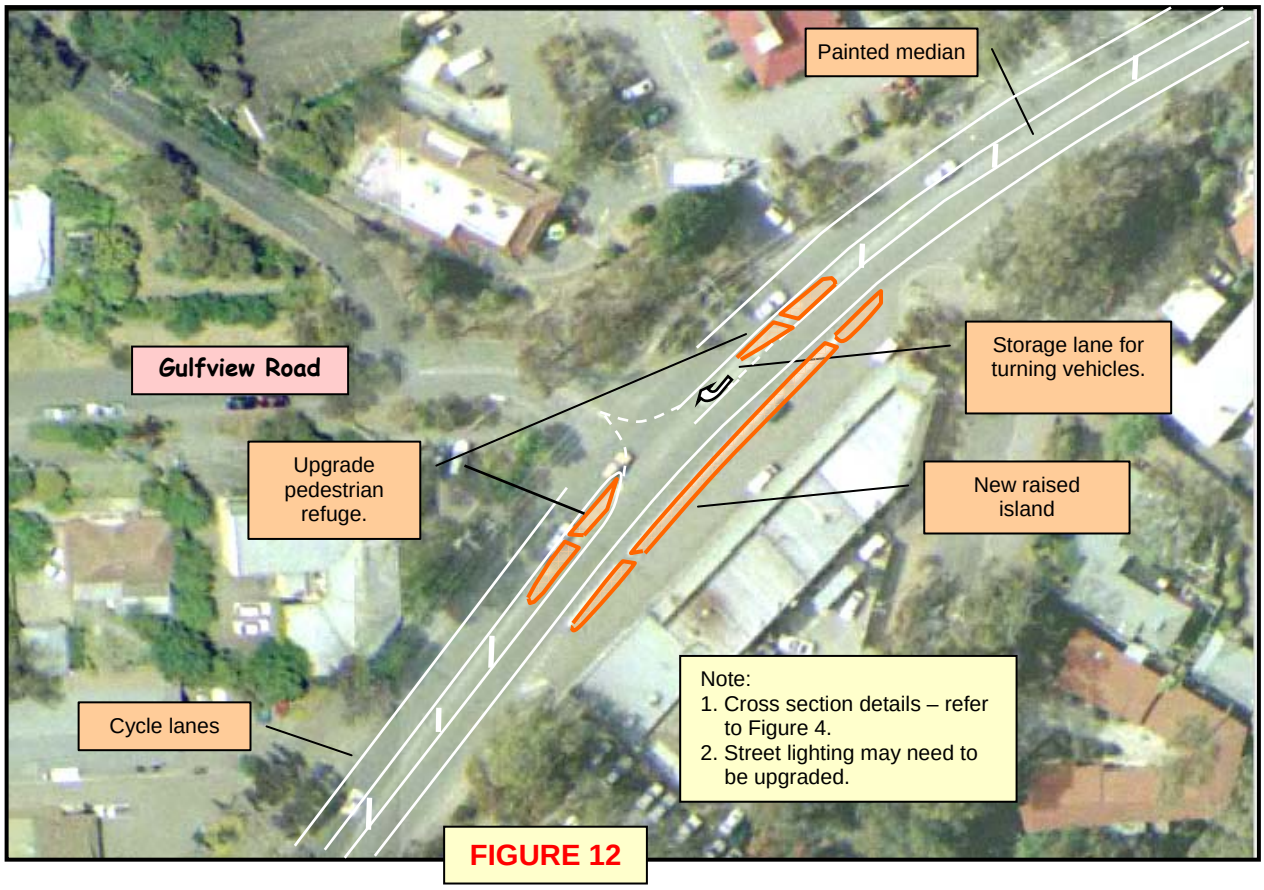


FIGURE 12

7.1.11 Main Road - Edward Street - Carr Street

This site is in the busier part of the commercial precinct resulting in a higher number of crashes (10 crashes in the period 1999-2004).

Crash types are mainly rear end and a number involving right turning and through traffic from the side roads. Right turn and cross movements from side roads at uncontrolled intersections are often the cause of more serious crashes.

Factors contributing to crash risk at this site include: -
- Increase complexity and conflict points at the intersection
- Increased pedestrian activity, parking vehicles, turning traffic etc.
- Minimal traffic control for an intersection in a busy commercial precinct.

- U-turners from Main Road (northern approach) have difficulty completing turn and conflict with traffic in Carr Street

The installation of active traffic control such as traffic signals or a roundabout is not considered appropriate at this location for the reasons set out below.

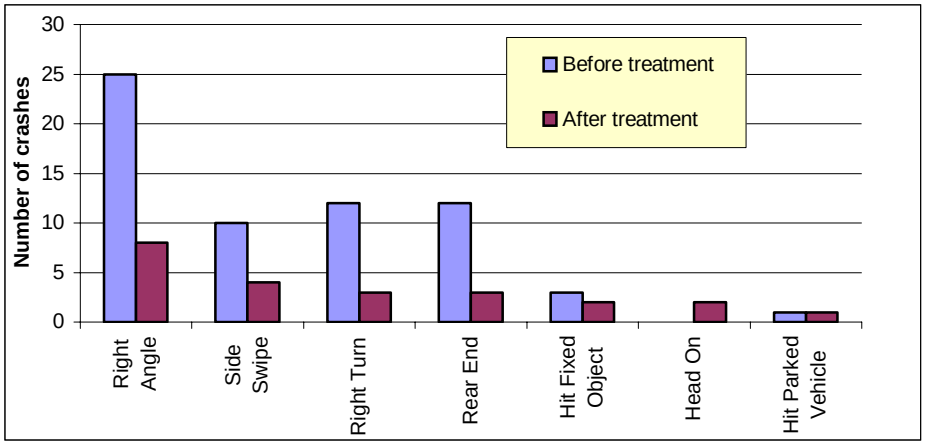
Traffic signals
- High installation costs
- Rear end and right turn crashes (from Main Road) are likely to increase
- Reduced level of service for Main Road traffic
- Proximity of existing signals at the pedestrian actuated crossing
- Proximity to the Blackwood Roundabout

Roundabout
- High installation costs
- Increase safety risk for pedestrians and cyclists
- Assigns priority to side road traffic over traffic on Main Road, increasing delays on the arterial road
- Priority afforded the side road traffic would result in traffic using the commercial / shopping precinct to bypass the Blackwood roundabout (eg via Edward St – Brighton Pde)
- Requires significant property acquisition

Crash potential is high at uncontrolled intersections on major strategic routes and treatments that focus on restricting movements to reduce conflict points and simplify the driving task are the most cost effective way of improving safety.

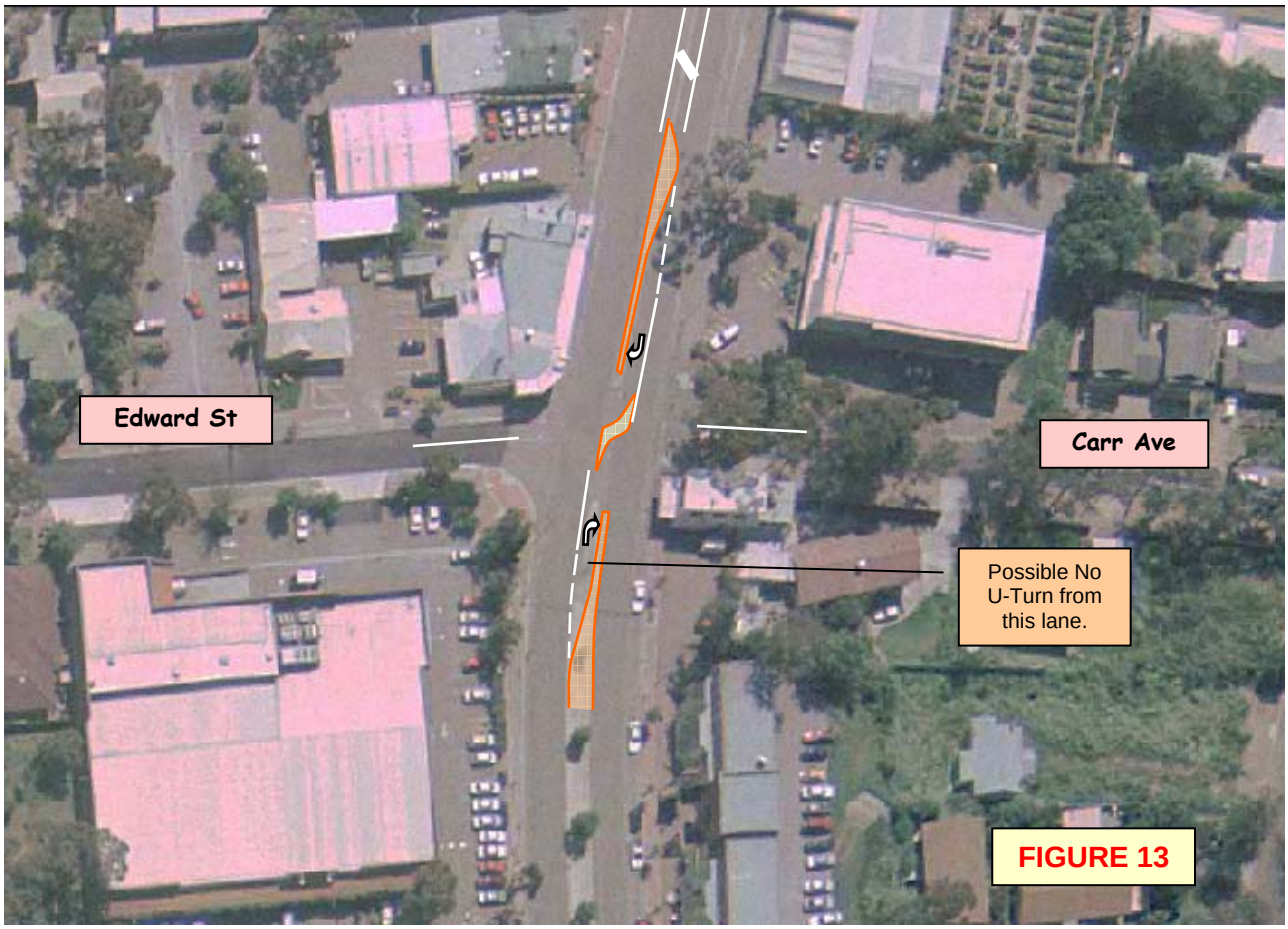
The proposed scheme shown in the concept sketch below will significantly improve safety without the need for more intrusive and less cost effective traffic control measures. Through and right turn movements from the side roads will be prohibited, however access to and from the adjacent commercial / business precincts will not be adversely affected as there are reasonable alternatives via adjacent streets (eg Station Ave, Waite St, Young St etc).

It should be noted that a similar scheme was installed at the intersection of The Parade and Sydenham Road at Norwood in February 1999. Crash statistics for the four-year periods before and after implementation of the scheme show a significant reduction in both the number and severity of crashes – refer the chart below.



Recommendations: -

- Reduce conflict points at the intersections by banning some movements to simplify the driving task and improve safety.
- Consider banning U-turn movements from Main Road (southern approach)
- Refer concept sketch below.



7.1.12 Main Road - Young Street

A moderate number of crashes have occurred at this junction (9 crashes in the period 1999-2004).

Nearly all crashes are the rear end type, six (6) of which involved northbound motorists U-turning at the Young Street median opening.

Recommendation: -
- Ban the U-turn movement. Vehicles that currently U-turn will have reasonable alternatives via the adjacent road network.

7.1.13 Blackwood Roundabout

This site has a relatively high number of crashes (118 crashes in the period 1999-2004).

Contributing factors include:
- Relatively high volumes of traffic on most approaches to the roundabout
- Increased pedestrian activity, parking vehicles, turning traffic etc.
- Substandard design of the roundabout (diameter, lane widths, splitter islands, deflection paths etc)

Operation of the roundabout has been the subject of complaints from Mitcham Council and the community for a number of years, with repeated requests for the installation of traffic signals. Preliminary investigations have been carried out to determine the suitability of shorter-term traffic management improvements including signalising approaches of the existing roundabout (similar to the Blythewood roundabout) and replacement of the roundabout with traffic signals.

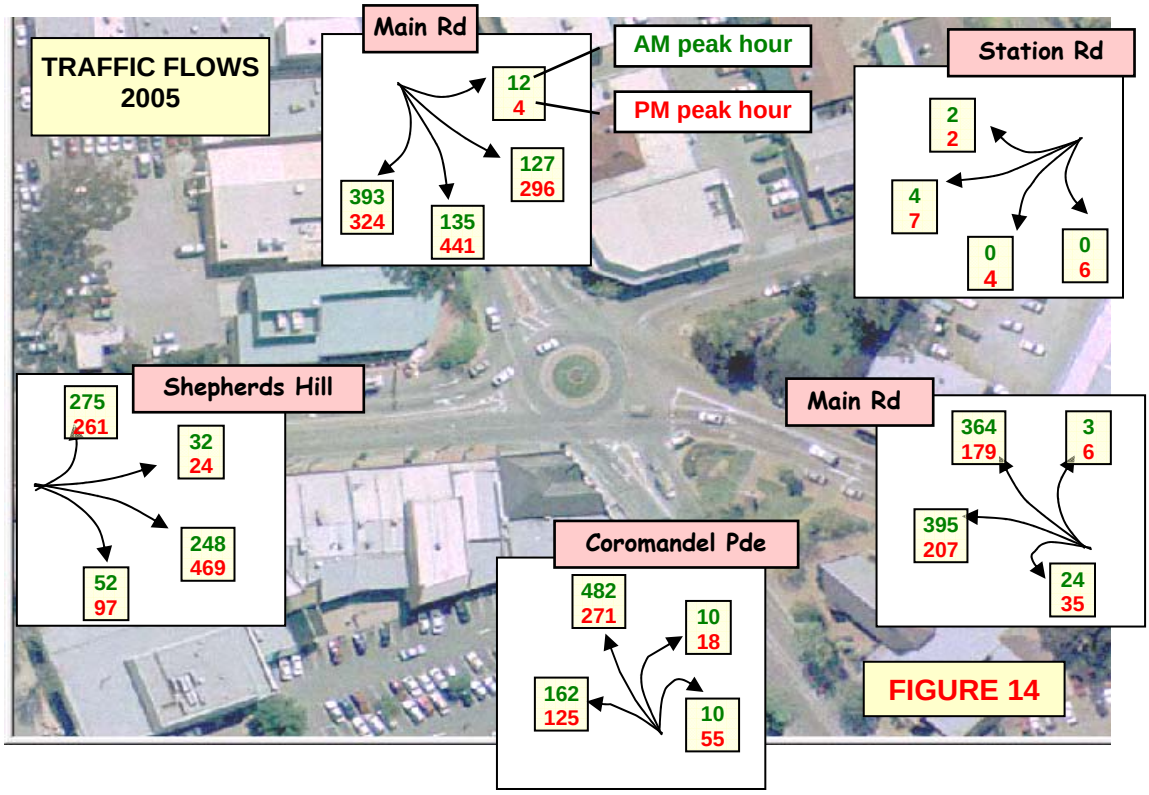
Signalise approaches of the existing roundabout (similar to the Blythewood roundabout)
Traffic flows are relatively evenly balanced on the busier approaches to the roundabout and the installation of part time traffic signals to alter traffic priorities would not have any significant overall operational or safety benefit (Figure 14 shows peak hour turning flows). For example, to give priority to Main Road east (786 vehicles) and Coromandel Parade (664 vehicles) in the morning peak period would require stopping Main Road north traffic (667 vehicles). Furthermore, to give priority to Coromandel parade traffic in the morning peak would require stopping Main Road east traffic (as well as Main Road north), which at present is the major traffic flow, and hence would result in increased delay for these motorists.

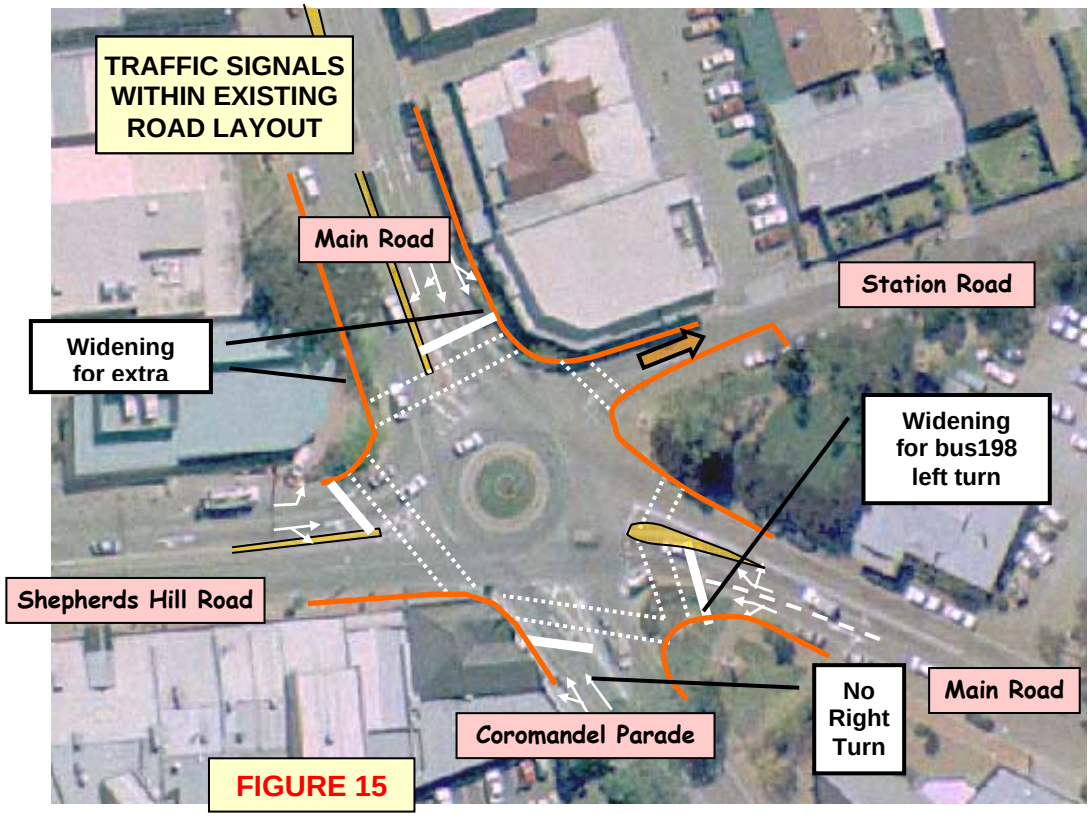
Replace the roundabout with traffic signals
To replace the roundabout with traffic signals within the existing road reserve (example as depicted in Figure15) would require the banning of on street parking between the roundabout and the pedestrian actuated crossing, together with other access restrictions to achieve acceptable levels of service. Access restrictions would include the banning of the westbound movement out of Station Road and also the banning of right turn movements from Coromandel Parade into both Main Road (south) and Station Road. Note that the installation of traffic signals will affect access for buses to and from the Blackwood railway station (current bus movements are shown in Figure 5). Even with these access restrictions in place, modelling has indicated that delays at the traffic signals would still be significantly greater than occur at the existing roundabout (traffic queues up to 3 times longer).

The rationalisation of traffic movements and restriction of parking on approaches to the roundabout to simplify the operation and improve safety at the roundabout are therefore the only low cost improvements possible at this stage.

Recommendations: -

- Consider rationalisation of movements to simplify operation of the roundabout (Eg ban entry to roundabout from Station Road, ban certain right turn movements).
- Extend parking bans on approaches to free up operation and improve safety at the roundabout, including: -
  - Ban parking in front of the Post Office on Shepherd's Hill Road.
  - Ban parking on Main Road adjacent to the Uniting Church to improve approach alignment at the roundabout and also provide a wider median to improve pedestrian safety.
- Consider upgrading advance direction signing to better indicate turning movements through the roundabout.
- Consider increasing the diameter of the roundabout.
- Reduce the speed limit to 50 km/h on Main Road (south east) from the roundabout to a location approximately 150m east.




TRAFFIC SIGNALS WITHIN EXISTING ROAD LAYOUT
Main Road
Station Road
Widening for extra
Widening for bus198 left turn
Shepherds Hill Road
No Right Turn
Main Road
Coromandel Parade
FIGURE 15

7.1.14 Shepherds Hill Road - Gladstone Road

A moderate number of crashes have occurred at this site (8 crashes in the period 1999-2004).

Four (4) of these involve right turn vehicles from or into Gladstone Road. This is a relatively low number of crashes given the level of activity on this section of road.

Recommendations: -
- Improve existing delineation
- Consider rationalisation of movements (eg left-in / left-out from Gladstone Road)

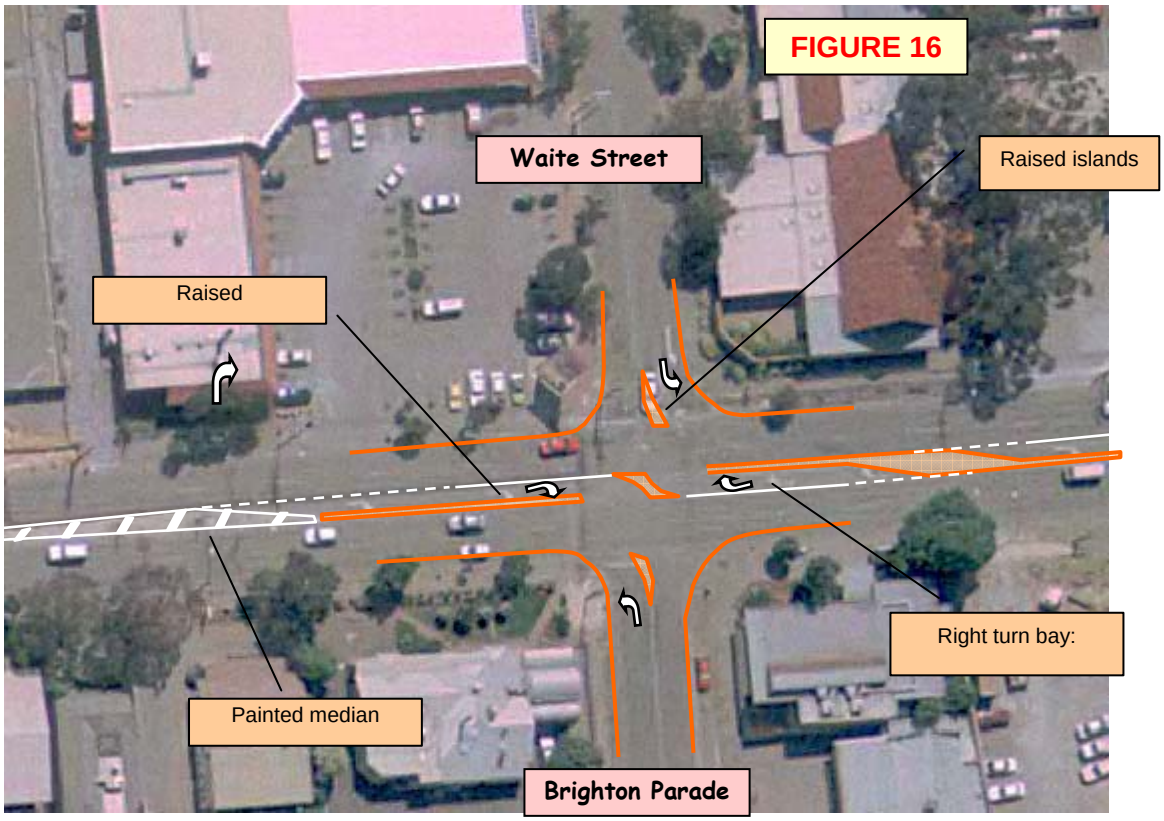
7.1.15 Shepherds Hill Road - Waite Street - Brighton Parade

This site has a high number of crashes (45 crashes in the period 1999-2004).

A significant number of these are right angle crashes (25) involving vehicles crossing Shepherds Hill Road. This site has similar traffic management problems to the intersection of Main Road - Edward Street - Carr Street.

Contributing factors include:
- Increase complexity and conflict points at the intersection
- Increased pedestrian activity, parking vehicles, turning traffic etc.
- Minimal traffic control for an intersection in a busy commercial precinct.
- Vehicles are having difficulty finding suitable gaps to cross Shepherds Hill Road.

Recommendations: -
- Reduce conflict points at the intersections by banning through and right turn movements from Brighton Avenue and Waite Street, similar to recommendation for Main Road – Edward Street – Carr Street.
- Refer concept sketch below.



7.1.16 Shepherds Hill Road - Sherbourne Road – Melton Street

A higher than average number of crashes has occurred at this intersection (26 crashes in the period 1999-2004).

Crashes are primarily the rear end type (11) and right angle type (7) and are mostly associated with traffic turning right into or out of Melton Street.

Contributing factors include:

- Poor sight distance for traffic on Melton Street
- Traffic turning from median lanes on Shepherds Hill Road impeding through traffic.

Recommendations: -

- Install painted median to reduce rear ends and right angle crashes
- Investigate clearing of vegetation to improve sight distance for traffic in Melton Street.
- Refer concept sketch below.

FIGURE 17

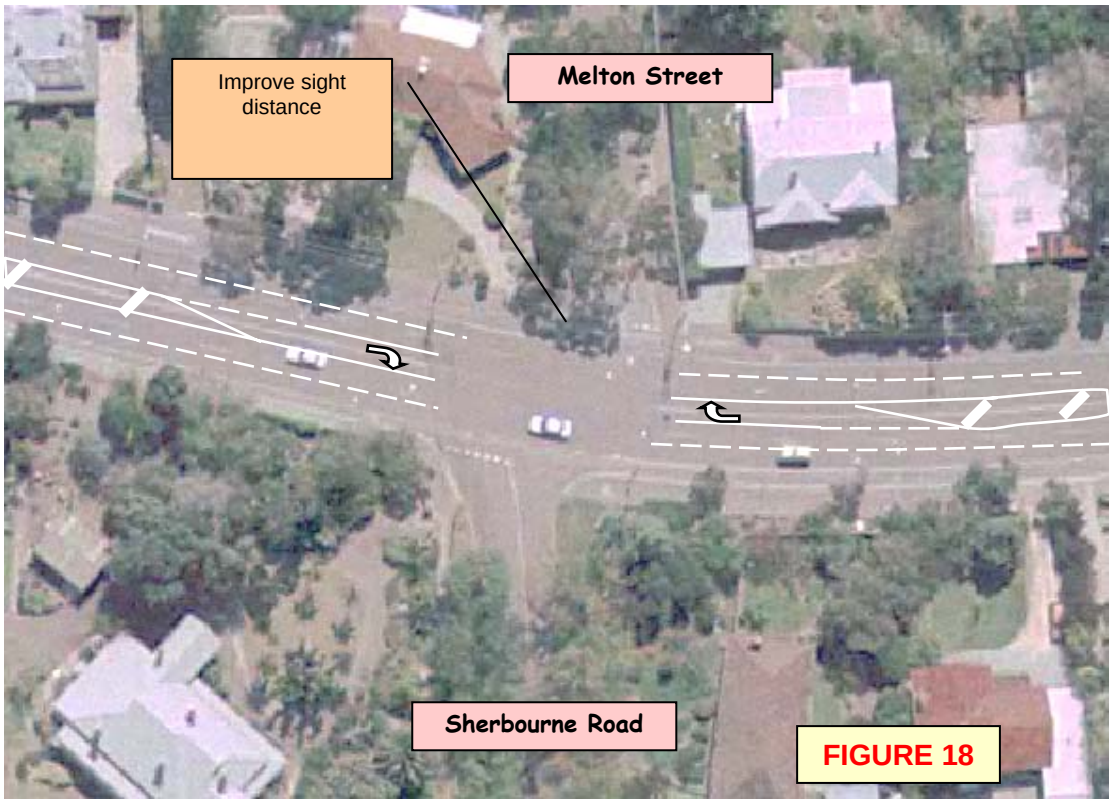


FIGURE 18

7.1.17 Shepherds Hill Road - Wilpena Street

A moderate number of crashes have occurred at this junction (8 crashes in the period 1999-2004).

Specific crash patterns are evident. Four (4) crashes involve westbound vehicles losing control on the bend on Shepherds Hill Road immediately east of Wilpena Street and hitting fixed objects. Three (3) rear end crashes involve traffic turning right into the Wittunga Park access opposite Wilpena Street.

Recommendation: -

- Improve delineation of curve on Shepherds Hill Road east of Wilpena Street (Raised pavement markers, sighter posts etc)
- Consider installation of painted median with storage lane for vehicles turning right into Wittunga Park.
- Refer concept sketch below

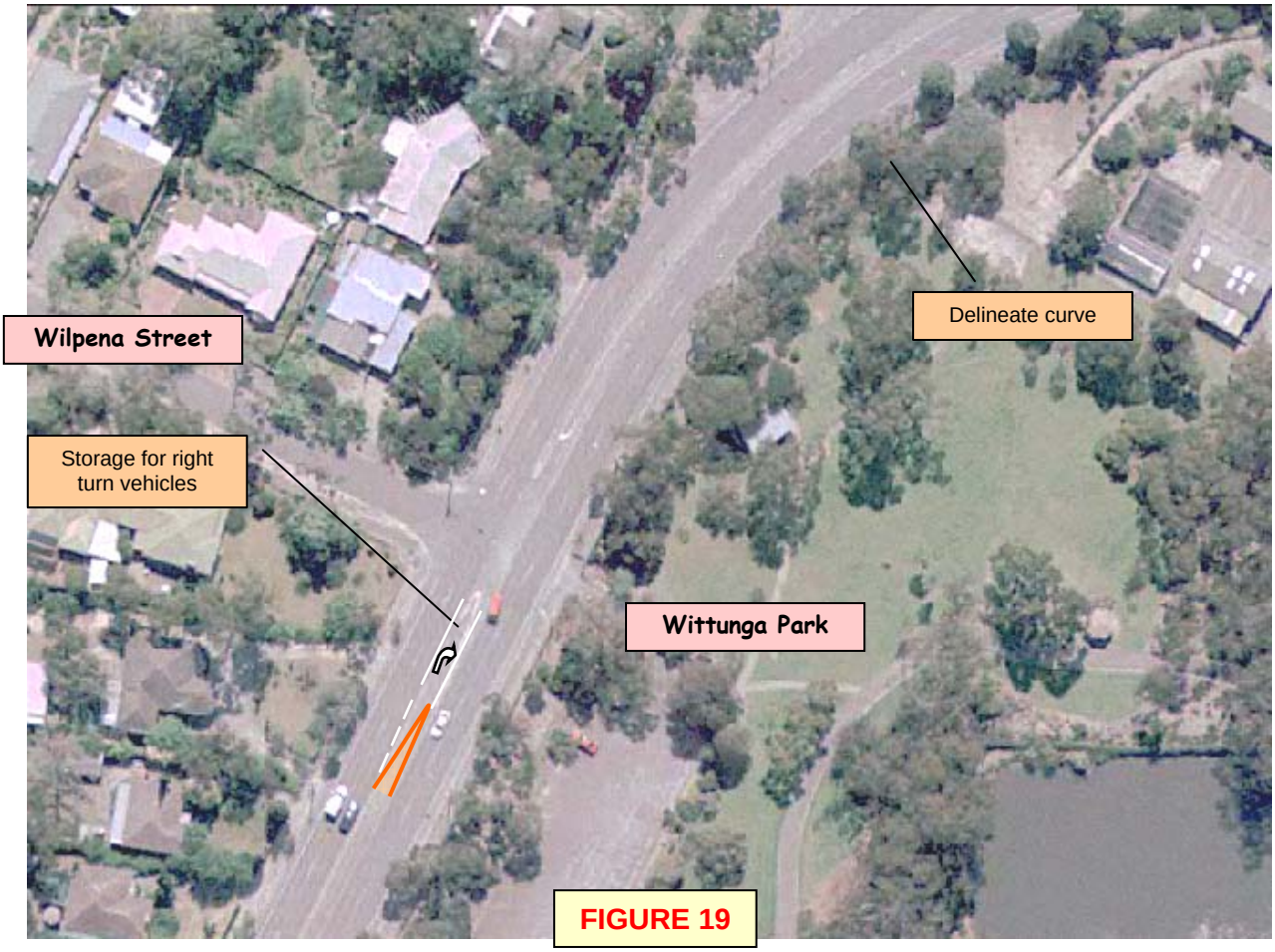


FIGURE 19

7.1.18 Shepherds Hill Road – Seymour Street

A relatively low number of crashes have occurred at this junction (7 crashes in the period 1999-2004).

Crash patterns are random with no predominant crash type or time of day pattern.

Priority for any traffic management treatment is relatively low at this site.

The installation of a painted median would improve operation and safety at the site but requires road widening and tree removal, the cost of which would be difficult to justify at present.

The local community has raised concerns of long delays for traffic in Seymour Street during the afternoon school peak times. Vehicles waiting to turn right from Seymour Street block the road for left turn movements out of Seymour Street causing queuing of traffic, sometimes for the entire length of Seymour Street.

Recommendation: -
- Possible longer-term installation of painted median
- In conjunction with Mitcham Council, consider widening Seymour Street to provide two dedicated lanes exiting Seymour Street
- Refer concept sketch below.

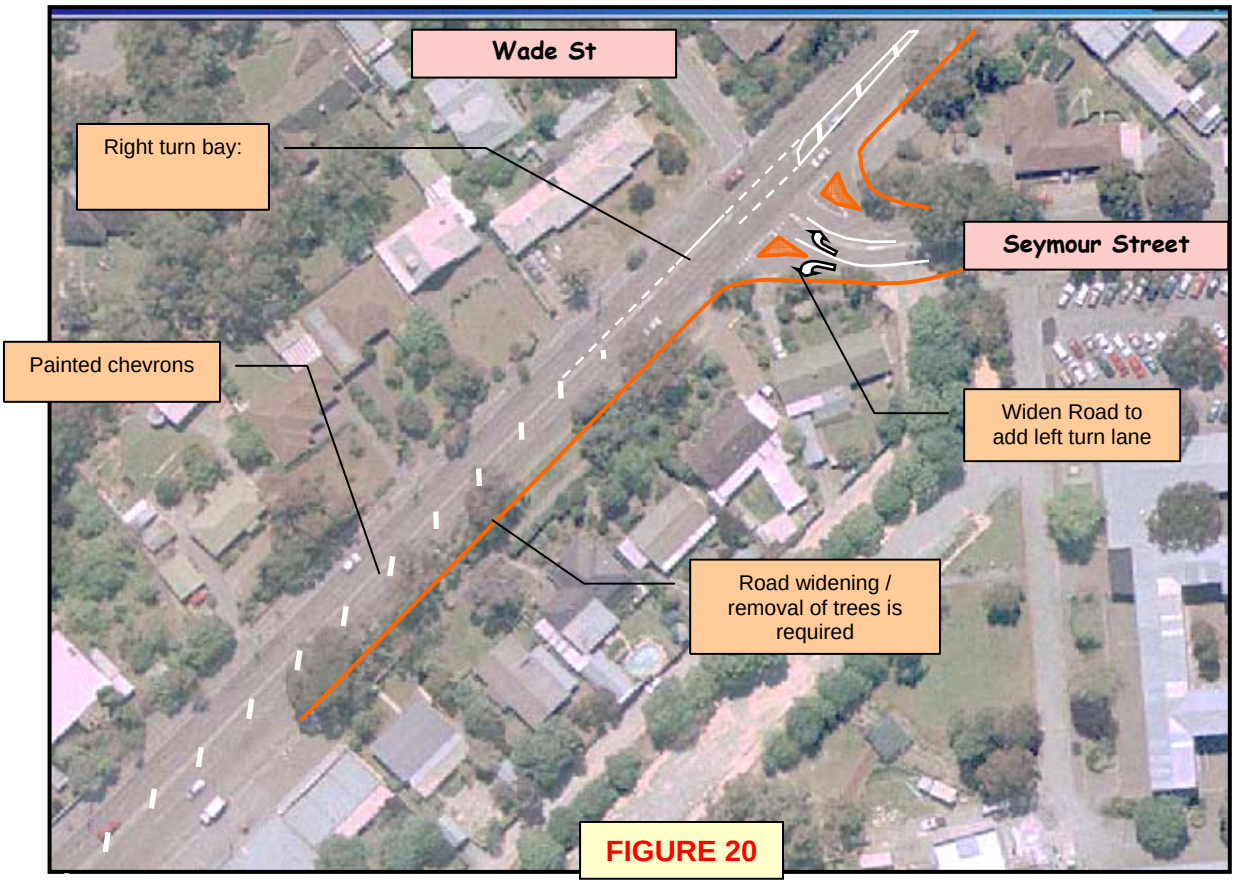


FIGURE 20

7.2 OTHER TRAFFIC MANAGEMENT / COMMUNITY CONCERNS

7.2.1 Main Road – Sheoak Road – Gloucester Avenue

The community has raised concerns at the limited sight distance for motorists existing from Gloucester Avenue onto Main Road, particularly to traffic approaching from the left on Belair Road. Turning from Gloucester Avenue onto Belair Road is made more difficult by the proximity of Sheoak Road opposite, resulting in an "S" movement of traffic between Sheoak Road and Gloucester Avenue. Motorists in Gloucester Avenue therefore have difficulty seeing traffic coming from the left and right along Belair Road, whilst also having to watch for traffic coming out of Sheoak Road.

Recent changes including the installation of a raised median, safety bars and upgraded road lighting has provided traffic calming and improved safety for vehicular and pedestrian traffic.

Recommendations:
- No further action recommended.

7.2.2 Main Road – Pedestrian crossing north of Russell Street

The community and St John's Grammar School have raised concerns at the lack of a formal pedestrian crossing facility on Main Road between Gloucester Avenue and Russell Street.

Recent traffic calming measures, including the installation of safety bars and a raised median has provided a much safer environment for pedestrians crossing at this location.
However, in view of concerns raised and the fact that school student numbers have increased in recent years, Transport SA will investigate the need for a higher order pedestrian facility, taking into account the warrant / priority for installation. Even if warranted, there would be difficulty in finding a suitable location (geometrically), given the position of accesses to the BP Service Station, The Vines Shopping Centre and also bus stops located on both sides of Main Road. Some restriction or rationalisation of driveway accesses may be required.

7.2.3 Penno Parade (N) to Downer Avenue

Requests have been received to install a raised median to assist pedestrians crossing in this area (from the Pinera Railway station to bus stops on Main Road or to the St Johns Grammar School).

Recommendations:
- Install raised median
- Refer Figure 8.

7.2.4 Railway Level Crossing at Glenalta

The level crossing has active control (flashing lights, bells and boom gates). The Transport SA Level Crossing Unit has identified queuing of city bound vehicles from the Rosella Avenue junction over the level crossing as a significant safety risk.

Treatments to eliminate safety risks are currently being discussed with Mitcham Council.

7.2.5 Main Road, Southern Avenue – McDonald Avenue

The need for a pedestrian refuge has been identified at this location.

A proposal to provide a painted median, incorporating a raised pedestrian refuge adjacent the Belair Hotel, between Southern Ave and McDonald Ave, has been developed. The proposed scheme also requires the relocation of the bus stop on the western side of Main Road in front of the Blackwood Curtains, Blinds and Furniture premises. Buses currently stop in the travelling lane as cars often park in the indented area at the bus stop.

Recommendations: -

- Install painted median and raised pedestrian walk through
- Relocated bus stop on western side in front of the Blackwood Curtains, Blinds and Furniture to south of McDonald Ave.

Refer concept sketch below

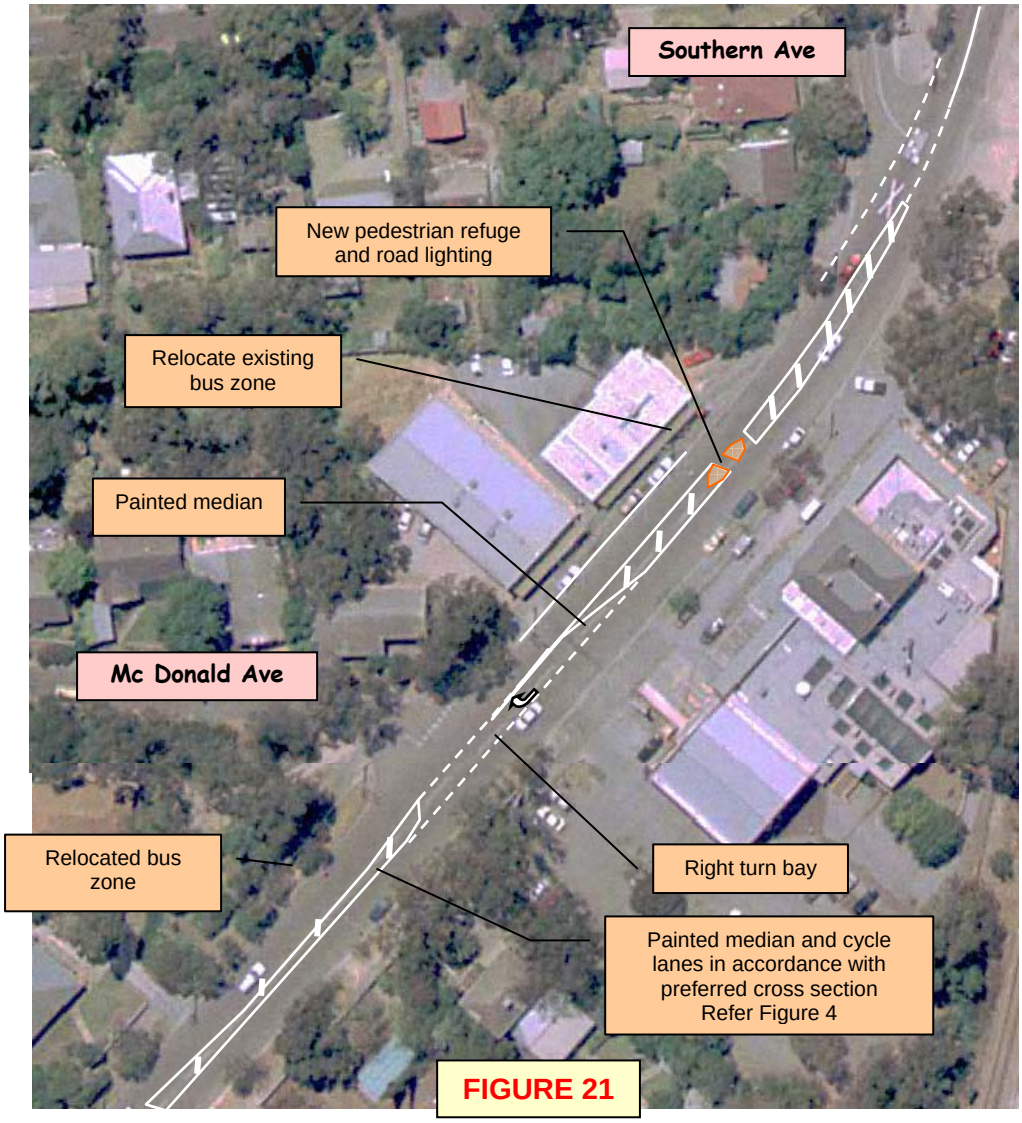


FIGURE 21

7.2.6 Main Road - Miller Terrace – Stirling Road

Requests have been received for traffic management improvements to increase road safety. Sight distance restrictions for traffic entering Main Road cited as contributing to safety risks.

Refer "Issues arising from crash data – Figure 11" for recommendations

7.2.7 Main Road - Gulfview Road

Need for upgrading of pedestrian refuge areas identified.

Sight distance restrictions for traffic entering Main Road cited as contributing to safety risks.

Refer "Issues arising from crash data – Figure 12" for recommendations.

7.2.8 Main Road – Chapman Street

Requests for pedestrian facilities in the vicinity of Chapman Street have been received.

Pedestrian numbers are not sufficient to warrant the installation of a pedestrian actuated crossing. Recommendations in this report therefore include a painted median with raised pedestrians refuges at locations where higher numbers of pedestrians cross - Refer "Long Term Vision – Southern Ave to Chapman Street"

7.2.9 Main Road – Edward Street – Carr Street

Requests have been received for improvement to traffic management at this location.

Traffic management suggestions include: -
- Installation of traffic signals or a roundabout.
- Ban U turn movements from Main Road (southern approach)
-

Crash analysis has identified this site a having a high crash rate.

Refer "Issues arising from crash data - Figure 13" for recommendations

7.2.10 Blackwood Roundabout

Requests have been received for improvement to traffic management at this location.
Traffic management suggestions include: -
- Installation of traffic signals or a roundabout.
- Upgrade advance warning signs to better indicate turning movements through the roundabout.

Crash analysis has identified this site as having a high crash rate.
Refer "Issues arising from crash data - Blackwood roundabout" for recommendations

7.2.11 Shepherds Hill Rd / Waite St / Brighton Pde

Requests have been received for improvement to traffic management at this location.

Traffic management suggestions include the installation of traffic signals or a roundabout.

Crash analysis has identified this site a having a high crash rate.

Refer "Issues arising from crash data – Figure 16" for recommendations

7.2.12 Shepherds Hill Rd / Seymour St / Wade St intersection

This site has been the subject of ongoing requests for the installation of signals or a roundabout to reduce delays to side road traffic and to provide active control for pedestrians crossing Shepherds Hill Road. Delays to Seymour Street traffic during the afternoon school peak have been raised as a concern.

Investigations by Transport SA determined that the installation of signals is not warranted based on either traffic demand or pedestrian crossing requirements, as the pedestrian numbers crossing in this area are very low. On-site observations indicate that the existing pedestrian crossing near Parham Road is well utilised.

Refer section "ISSUES ARISING FROM CRASH DATA ANALYSIS Figure 20" above for details.

However, it should be noted that the crash numbers at this site are relatively low, and therefore the priority for this treatment would be low in comparison to other recommendations in this report.

8 TREATMENT SUMMARY

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

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).
- Operational benefits

8.1 MIDBLOCK TREATMENTS

8.1.1 Main Road

ROAD SECTION	TREATMENT	PRIORITY
Main Road **Sheoak to Russell Street**	Recently installed median, safety bars, pedestrian walkthrough and road lighting upgrade. Investigate the installation of safer pedestrian crossing facilities in this section.	**High**
Main Road **Russell Street to Gooch Crescent**	This section is kerbed, has four lanes and a wide median. No changes recommended at this stage.	**N/A**
Main Road **Gooch Crescent to Southern Ave**	Pavement widening and painted median to improve traffic flow and safety for all transport modes. Refer Figure 4	**Low**
Main Road **Penno Pde (N) to Downer Ave**	Install a raised pedestrian walk through between Downer and Penno Pde (N). Refer Figure 8.	**High**
Main Road **Southern Ave to Chapman Street**	Install painted median to improve traffic flow and safety. Refer Figure 4	**High**
Main Road **Southern Ave to McDonald Ave**	Install painted median and raised pedestrian walk through Relocated bus stop on western side in front of the Blackwood Curtains, Blinds and Furniture to south of McDonald Ave. Refer Figure 21.	**Medium**
Main Road **Chapman to Shepherds Hill Road**	Reduce speed limit to 50kph and implement between Stirling Road / Miller Terrace and the Blackwood roundabout.	**High**

8.1.2 Shepherds Hill Road

ROAD SECTION	TREATMENT	PRIORITY
Main Road to Melton Street	Reduce speed limit to 50kph and implement between the Blackwood roundabout and Woodleigh Road.	**High**
Shepherds Hill Road **Melton Street to Seymour Street**	No proposal to alter the cross section.	**N/A**

8.2 INTERSECTIONS / JUNCTIONS

8.2.1 Main Road

INTERSECTION / JUNCTION	TREATMENT	PRIORITY
Main Road - Russell Street	Investigate traffic management options	**Medium**
Main Road – Penno Parade (N)	Install a right turn storage lane on Main Road to provide a safer alternative to turning right at Downer Ave. Install a raised pedestrian walk through between Downer and Penno Pde (N). Refer Figure 8.	**High**
Main Road - Downer Ave	Ban all movements from Downer Ave and the right turn from main road (i.e. allow left turn into Downer Ave only).	**Medium**
Main Road – Monalta Drive	Consider road widening to provide right turn storage lane. Refer also - "MIDBLOCK TREATMENTS – Gooch Crescent to Southern Ave" above.	**Low**
Main Road - Laffers Road	Investigate the possible installation of traffic signals or a roundabout in conjunction with Mitcham Council. Refer Figure 9. Refer Figure 10.	**Medium**
Main Road - Stirling Road – Miller Tce	Install raised island to separate right turn movements from Stirling Rd and Miller Tce. Trim / remove trees to improve sight distances Refer Figure 11.	**Low**
Main Road - Gulfview Road	Upgrade existing raised pedestrian refuge areas. Refer Figure 12.	**High**
Main Road - Edward St - Carr St	Reduce conflict points at the intersections by banning some movements to simplify the driving task and improve safety. Consider banning U-turn movements from Main Road (southern approach) Refer Figure 13.	**Medium**
Main Road - Young Street	Ban the U-turn movement from Main Road (south approach).	**Medium**
Blackwood Roundabout	Consider banning of some movements to simplify operation of the roundabout (eg ban entry to roundabout from Station Road, ban right turn movements from Main Road (southern approach). Remove parking outside the Post Office, remove parking outside the Uniting Church and widen the median for improved pedestrian safety, upgrade the directional signs, increase the diameter of the roundabout, reduce the speed limit to 50 kph on Main Road (south east) from the roundabout to approx. 130m south.	**High**

8.2.2 Shepherds Hill Road

INTERSECTION / JUNCTION	TREATMENT	PRIORITY
Shepherds Hill Rd - Gladstone Road	Improve existing delineation Consider rationalisation of movements (eg left-in / left-out from Gladstone Road)	**Low**
Shepherds Hill Rd - Waite Street	Reduce conflict points at the intersections by banning some movements to simplify the driving task and improve safety. Refer Figure 16.	**High**
Shepherds Hill Rd - Melton Street	Install painted median to reduce rear ends and right angle crashes Remove hedge and vegetation restricting sight distance for traffic in Melton street Refer Figure 18.	**High**
Shepherds Hill Rd - Wilpena Street	Improve delineation of curve on Shepherds Hill Road east of Wilpena Street (Raised pavement markers, sighter posts etc) Consider installation of painted median with storage lane for right turn vehicles on Shepherds Hill Road Refer Figure 19.	**Medium**
Shepherds Hill Rd – Seymour street	Install painted median. Widen Seymour street. Refer Figure 20.	**Low**

9 Conclusions

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

All of the proposed recommendations are conceptual only, and will therefore require further development and consultation with Mitcham Council 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 recommended treatments. It is anticipated that this information will be available during May 2005.

Importantly, funding commitments to the initiatives detailed in this plan are subject to normal budgetary processes and priorities.

Initially, implementation of recommendations is likely to be limited to the higher priority and 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 this Road Management Plan.