

No significant improvements to bus services are expected within Gawler. The Passenger Transport Division has indicated that there may be only a minor expansion of existing services to cater for expected demands.

### 3.4 Gawler Transport Study

DTEI in conjunction with the Town of Gawler and The Barossa Council and the District Council of Light, has recently developed the Gawler Transport Plan to direct future infrastructure provision within the Gawler region. The study has taken into consideration future residential development at Gawler East and Evanston Gardens as well the proposed developments at Concordia (within and outside of the UGB). The proposed Urban Pacific Concordia development is located primarily outside the current Urban Growth Boundary and would require a separate study to identify traffic impacts.

DTEI, as part of Gawler Transport Plan, has undertaken detailed traffic / transport modelling to identify future traffic volume projections (for 2021 and 2031) on the major road network within the Gawler region. The traffic modelling was undertaken for eight scenarios associated with the upgrading of existing and / or provision of new major road links as indicated below:

- Option 1 - A new / upgraded road link between Gawler East and Adelaide Road Potts Road;
- Option 2 - A new / upgraded road link between Gawler East and Main North Road via Bentley Road and Tiver Road;
- Option 3 - A new north eastern connection for the extension of the Urban Growth Boundary, between Barossa Valley Way and Sturt Highway;
- Option 4 - A combination of Options 1 and 3;
- Option 5 - A combination of options 2 and 3;
- Option 6 - A new north eastern connector for the Urban Pacific Concordia development
- Option 7 - A combination of Options 1 and 6; and
- Option 8 - A combination of Options 2 and 6.

The key outcome of the study to date is that the provision of the new road links between Gawler East and Adelaide Road/Main North Road and from Barossa Valley Way to Sturt Highway are considered to be local roads and not arterial. However it should be noted that a north eastern connection would also facilitate diversion of heavy vehicle traffic from the Gawler Town Centre area.

A review of the model indicates there is a significant reduction in traffic on some sections of Adelaide Road and Murray Street with the provision of both the north east and south east connections. It is expected that the redirection of traffic with these connections would result in significant improvements in amenity and traffic flow in the Gawler Town Centre.

The traffic modelling undertaken for the Gawler Transport Study has been used in this assessment to verify assumptions made regarding traffic generation and distribution.

## 4 Proposed Development

The proposed re-zoning is expected to provide for a residential development with a potential total of 3,900 dwellings and provision for a Neighbourhood Centre, local centre and a number of schools.

The proposed development area comprises two main phases as indicated in Figure 1. Both Phases are totally within the current Urban Growth Boundary.

Phase 1 is located to the south of Calton Road and north of South Para River and includes 2,700 residential dwellings, schools and a neighbourhood and local centre. Road access will be made to Calton Road and Balmoral Road to the north and east, and ultimately Gawler to Kersbrook Road to the west. It is proposed the development would be staged over a 10 year period starting in 2009. An indicative layout of Phase 1 is contained in Appendix A.

Phase 2 is primarily located to the southwest of the South Para River and includes 1,200 residential dwellings. Road access will be made to Potts Road, and One Tree Hill Road (Gawler to Kersbrook Road). Subject to market conditions Phase of the development could be expected to come on stream in 2011/12 and would be staged over a 15 year period.

A link road will be provided (by Delfin) that connects the two Phases from Sunnydale Avenue in the north to Potts Road at the southern end.

Access roads to the development are provided at two points along Calton Road, one along Balmoral Road and at the connection to the Gawler to Kersbrook Road. The form of the access roads and traffic control devices are the subject of this report.

It is proposed to stage construction of the development with the initial stage being at the far eastern part of the site and then progressively developing to the west in areas adjacent to Calton Road. The total development is expected to be completed over a 10 to 15 year time frame.

## 5 Traffic / Transport Assessment

The proposed re-zoning and future development will generate a significant amount of traffic which will be distributed onto the abutting local road network. The assessment of the traffic impacts includes a discussion on traffic generation and distribution, ultimate volumes, staging and impacts on existing infrastructure.

### 5.1 Traffic Generation

The Gawler Development Plan recommends a rate of 10 trips per day per dwelling for traffic assessment of residential developments. This rate is considered high for metropolitan areas and large townships. However, Phase 1 of the proposed development does contain a neighbourhood centre and primary schools. On this basis, it is assumed the external trip generation is 8 trips per day per dwelling.

The modelling for the Gawler Transport Plan (using MASTEM) has indicated a daily traffic generation rate of just over 8 trips per dwelling for external trips (trips made outside of a particular zone) for each of the zones that comprise the two Phases of the project.

On this basis, using the assumed rate of 8 trips per dwelling, it is estimated that 21,600 trips per day would be generated by Phase 1 and 9,600 trips per day by Phase 2 once both phases are fully developed.

It is understood that Phase 1 would be constructed over a 10 year time frame with beginning in 2009. Initial stages would be centred on the areas fronting Calton Road. Phase 2 of the development is expected to begin in 2011/12 and be concentrated in the area adjacent Potts Road. It is anticipated that full development of Phase 2 would be completed by 2025.

It is noted that the development of the Concordia land (within the UGB) is not expected to occur prior to 2021. As a result, no consideration has been given to traffic generated from Concordia as part of this assessment. This traffic assessment has been undertaken assuming that the Link Road will end at Potts Road. No consideration has been given to redirecting the Link Road onto Bentley Road and then Tiver Road.

The above assumes no significant increase in public transport services to the Gawler East area. It is expected that services and demand could increase particularly with the electrification of the rail line and the possible Concordia land (within and outside the UGB) development to the north of the Barossa Valley Way. However, the Concordia proposal is likely to result in the rail line being extended to the east with possibly one or two rail stations. The predicted traffic distribution takes this into consideration by redirecting traffic from the Town Centre to the new stations.

It is important to note that if regular / frequent bus services were provided to the Town Centre then a reduction in the number of trips per dwelling could be considered. The proposed development allows for bus services in its conceptual design.

## 5.2 Traffic Distribution

The traffic distribution for the proposed development is based on knowledge of the area, location of services (schools, shopping etc) and the 2006 ABS Census Journey to Work Data. For this assessment, the following distribution has been assumed:

### To The East (15%)

#### Destination

- Barossa Valley – Angaston, Lyndoch, Tanunda and Williamstown

#### Routes

- via Barossa Valley Way from both Cheek Avenue and Sunnydale Avenue
- Balmoral Road also caters for some of the eastbound traffic

### Gawler (30%)

#### Destination

- including Town Centre, schools (Trinity College etc), shopping, employment etc

#### Routes

- Barossa Valley Way from both Cheek Avenue and Sunnydale Avenue, Calton Road
- Adelaide Road and the Link Road to Adelaide Road using First Street, Second Street, Hill Street or Fifth Street

### Salisbury / Playford (23%)

#### Destination

- Salisbury, Elizabeth and Munno Para District Centres and Edinburgh

#### Routes

- essentially two routes using Main North Road (majority) and the Northern Expressway
- For traffic using Main North Road, the Link Road and Calton Road are the primary routes. However there is some usage expected for longer distance traffic using the Northern Expressway which would use Barossa Valley Way to Redbanks Road

### Metropolitan Adelaide (27%)

#### Destination

- south of Salisbury

#### Routes

- essentially two routes using the Northern Expressway (majority) and Main North Road
- For traffic using Northern Expressway it is assumed that traffic would use both the Redbanks Road (via Barossa Valley Way) and Ryde Street (via the Link Road)

routes. For Main North Road, the Link Road and Calton Road are the primary routes.

### **New Train Station (5%)**

- essentially to the Barossa Valley Way from both Cheek and Sunnydale Avenues
- For Phase 2 it is assumed that traffic will not use the rail station and this traffic redistributed to Salisbury / Munno Para and Metropolitan Adelaide.

For traffic using the Barossa Valley Way, it is assumed that traffic with destinations to the west (Town Centre and the Expressway) the majority of would use Cheek Avenue with traffic to the east primarily using Sunnydale Avenue.

An alternative has been considered that is expected to reduce traffic impacts on Sunnydale Avenue. This alternative would involve directing the Link Road to Balmoral Road and Kalbeeba Road to distribute eastbound traffic to the Barossa Valley Way as indicated in Figure 7. It is expected that this would not change the overall demand for eastbound traffic but provide an alternative to Sunnydale Avenue for connections to the arterial road network. Depending on connections within Phase 1 of the development, the use of Balmoral Road could reduce traffic on Sunnydale Avenue by 2,500 to 3,500 vpd. However it is expected to increase traffic on Balmoral and Kalbeeba Roads by a similar amount.

Comparison of the above assumptions with the traffic model for the Gawler Transport Plan indicates there are large differences in traffic distribution. In particular, the model indicates that approximately 50% of traffic generated by the development has a destination within the Town of Gawler (outside of the Town Centre) compared to the 30% assumed. DTEI's MASTEM model also indicates that there are fewer trips with destinations in Playford (12%) and destinations south (10%). The 50% figure does not appear to be reasonable as the majority of employment within Gawler is located in the Town Centre area.

The effect of this change in destination is that there is expected to be higher traffic volumes on Calton Road, Barossa Valley Way and Adelaide Road (north of Potts Road). However it is also expected there would be a reduction in traffic on the Link Road and on Adelaide Road south of Potts Road. Based on a 40% distribution within Gawler the increase in traffic on Calton Road and Adelaide Road Road (north of Potts Road) is expected to be in the order of 2,000 vpd each. The daily traffic reductions expected on the Link Road would be in the order of 1,500 vpd and Adelaide Road north of Potts Road 3,500 vpd.

## **5.3 Traffic Operation**

### **5.3.1 Traffic Volumes**

Figures 3, 4 and 5 indicate the daily traffic volumes on the road network within the proposed site and on the adjacent road network at 50% development and full development (in 2025) respectively.

Two alternatives have been considered at 50% development; they are with and without the Link Road to the Gawler to One Tree Hill Road. The aim of this assessment is to

gain an indication of the need and timing of the Link Road. Once Phase 2 of the proposed development is substantially complete, the Link Road would then be extended to Potts Road.

The volumes shown on the figures include the traffic generated by the development and an increase in existing volumes based on a nominal growth rate of one percent per annum. This growth rate is considered appropriate for the local road network as there is expected to be minimal development within the immediate vicinity of the proposed site.

Figures 3 and 4 show that without the Link Road, traffic volumes in 2014 on Calton Road just east of Cheek Avenue would vary between 14,100 to 15,800 vpd in 2014. Provision of the Link Road is expected to reduce the traffic volumes on this section of Calton Road to between 9,500 and 11,400 vpd.

At full development in 2025 daily traffic volumes on Calton Road without the Link Road could be in the order of 26,000 to 28,000 vpd. If the road link is not provided then there is expected to be significant increases in traffic on Barossa Valley Way, Murray Street and Adelaide Road north of Potts Road. The provision of the Link Road is expected to reduce the daily traffic volume on Calton Road to between 12,900 and 15,600 vpd.

The traffic volumes shown in the figures and indicated below include the impacts associated with the Northern Expressway. This assessment has assumed that approximately 5,000 vpd would be diverted from Adelaide Road due to the new road.

On the remaining major roads the following increases in traffic and total volumes (shown in brackets) are expected at full development in 2025 (Refer Figure 5).

- 2,000 to 4,500 (6,300 to 17,000) vpd on Barossa Valley Way,
- 1,000 to 1,500 vpd (4,500) on Balmoral Road (note if the Balmoral/Kalbeeba Road link is provided then the increase would be in the order of 4,000 to 4,500 vpd)
- 5,900 (6,300) vpd on Sunnydale Avenue (note if the Balmoral/Kalbeeba Road link is provided then the increase would be in the order of 3,000 vpd),
- 4,200 (6,500) on Cheek Avenue,
- 1,500 to 4,500 (20,400 to 29,700) vpd on Murray Street
- 12,700 (31,100) vpd on Adelaide Road south of Potts Road
- 4,200 (5,700) vpd on Gawler to Kersbrook Road/Seventh Street
- 11,900 (14,300) vpd on Potts Road

If the Link Road is not extended to Potts Road (beyond 2014 / 2017) then there is expected to be traffic distributed from the Gawler to Kersbrook Road to Potts Road for long distance movements (outside of Gawler) and to a number of local streets that connect to Adelaide Road including First, Second, Fifth, and Hill Streets for short trips.

Traffic volumes at full development (2025) on the main roads within the proposed development are indicated below:

- 11,200 vpd on the Link Road north of Potts Road
- 17,300 vpd on the Link Road east of the Gawler to Kersbrook Road,
- 16,700 vpd on the section just west of the connection to Calton Road,
- 17,300 vpd adjacent to the neighbourhood centre,
- 12,300 vpd on the Link Road south of Calton Road,
- 10,300 vpd on the Connecting Road between the Link Road and Calton Road (note if the Balmoral/Kalbeeba Road link is provided then the traffic volume is expected to be in the order of 8,000 vpd),
- 3,000 vpd on the connection from the Link Road to Balmoral Road (note if the Balmoral/Kalbeeba Road link is provided then the traffic volume is expected to be in the order of 6,000 vpd).

Two-way peak volumes are typically 8% of the daily flows and assuming that 70% of traffic travels in the peak direction. Hence increases in one-way peak volumes are likely to range from 100 to 500 vehicles per hour.

It is expected that a north east connection of Gawler linking the Barossa Valley Way with the Sturt Highway would be provided with the Concordia development (within and/or outside the UGB). The main impacts of this connection would be to:

- Reduce the volume of through traffic using Calton Road, Barossa Valley Way and Murray Street for long distance travel. Based on the traffic distribution in the previous section the reduction in volumes would be a maximum of 2,000 vpd each on Calton Road and Barossa Valley Way west of Murray Street.
- Increase the volume of traffic on Barossa Valley Way (depending on the location of the connection) as well as Sunnysdale Avenue and the Link Road for traffic destined for Adelaide Road (ie Trinity College).

### 5.3.2 Traffic Summary

The increase in residential and other development is expected to have impacts on the road network within the vicinity of the proposed development. It is considered that the existing roads should generally be able to cater for the proposed volumes without significant disruption to road users.

For Phase 1, the main impact in terms of traffic operation is that access to side streets and abutting properties on various roads could be restricted, particularly on Calton Road, Cheek Avenue, Sunnysdale Avenue and Barossa Valley Way. These roads will require further investigations and agreement with DTEI and the Town of Gawler and District Council of Barossa. In addition, there may be a need to upgrade sections of road and individual intersections to cater for the expected traffic demands.

Traffic increases on Calton Road are significant in 2014 without the Link Road of almost 8,000 vpd. It is expected that Murray Street and Bridge Street would not be able to cater for this increase. The provision of the Link Road to initially the Gawler to Kersbrook Road (2014 to 2017 depending on rate of development) and ultimately to



Potts Road would ease congestion in this area and allow an alternative access into the proposed development. This would also provide appropriate linking of the two Phases of the development in terms of access to shopping and schools.

Phase 2 of the development is expected to increase traffic on various local roads but primarily Potts Road and the Gawler to Kersbrook Road initially. The modelling indicates that there could be increases in traffic of around 2,000 to 3,000 vpd prior to the Link Road being extended to the Gawler to Kersbrook Road. The provision of the Link Road is expected to increase traffic demands on Potts Road by a further 4,000 vpd when first provided between 2014 and 2017.

Redirecting the Link Road through to Balmoral Road / Kalbeeba Road could be used as an alternative to Sunnysdale Avenue for eastbound traffic as it better distributes traffic movements.

As this is a strategic assessment, no detailed SIDRA assessment of the peak flows have been undertaken to identify localised impacts. This will be undertaken as part of the development approval process once the land has been rezoned.

## 5.4 Cycling and Walking

The proposed master plan for the site will show connections to existing pedestrian and cycle paths, the importance of a link to South Para River has already been identified.

The Town of Gawler has undertaken a strategic review of the cycling and pedestrian facilities. It is proposed that during the development of the proposed site, cycle paths and pedestrian connections will be made to any links that are developed by the strategic review.

## 5.5 Public Transport

The provision of public transport is dependent on generated demand and location of services that need to be accessed by various users. There are a number of developments within the Gawler area (this site, Concordia and Evanston South) that would add significant demand to the system.

The electrification of the rail to Gawler is expected to increase passenger numbers as the service would have increased frequencies. DTEI has indicated that several studies are about to begin or are being planned to determine possible options for providing the infrastructure to support the electrification of the rail line. These studies will take into consideration the future developments in Gawler.

The Public Transport Division (PTD) has indicated that there could be an extension to the Gawler line further east to service both the Gawler East (Phase 1) and Concordia development. However, given the distance from the development there would need to be provision of feeder bus services and/or large park and ride facilities to make the stations viable.

The PTD has indicated that feeder services only to a rail station typically have lower patronage compared to a service that has other destinations such as shopping/retail locations. They have indicated that a feeder service could be provided to the various

developments in Gawler but must be connected to the major rail stations and shopping precinct in Murray Street. This would include any proposed rail stations that are extended to the east.

In allowing for future services, PTD has indicated that it is critical to ensure that the proposed development has a road system that is designed to cater for buses. The points to include in the design are:

- Ensure buses can undertake turns safely at all junctions,
- Bus stops are located to ensure good connectivity to surrounding areas,
- Sufficient room is provided in the road reserve for bus shelters, and
- The road is sufficient for other vehicles to pass a stopped bus (eg. indented bus bays).

It is understood that the development accommodates future bus services, in particular along the main collector road within proposed carriageways currently operating effectively at Mawson Lakes.

## 6 Infrastructure Requirements

The proposed re-zoning to provide for residential other development will have impacts on the road network and provision of road-based infrastructure in the area. This section details some of the requirements for road infrastructure based on current investigations. The proposed requirements are separated into internal and external areas and are indicated on Figure 6.

### 6.1 Internal Requirements (within the development)

The traffic assessment indicated that traffic volumes on the major roads within the development are expected to vary between 9,000 and 17,000 vpd in 2025. Typically a two lane cross section could cater for this volume of traffic. It is recommended that a median or pedestrian refuge be provided to allow for safe pedestrian movement across the roadway and at side road junctions, adjacent to the neighbourhood centre and school.

T-junctions with the main connecting roads are considered appropriate and should provide storage lanes for right turn movements. However, at either end of the neighbourhood centre roundabouts could be considered to reduce speed entering the area and to provide a visual cue that conditions in the area have changed. It is recommended that a roundabout be provided at the Link Road / Calton Road / Sunnysdale Avenue intersection. At this time, T-junctions are considered appropriate treatments for the other access road connections to the existing road network.

Cycling should be promoted within the development. Consequently the Link Road and all collector roads should provide for on-road cycling by either on road cycle lanes (1.2m wide minimum) or having a minimum road width of 4.5m. Shared paths (minimum of 2.5m wide) should also be provided along main corridors and through greenways (creek lines etc).

### 6.2 External Requirements

There is expected to be some improvement required on the road network within the vicinity of the proposed development to cater for the expected traffic demands.

#### **Calton Road (increase in traffic between 5,000 and 12,000vpd)**

- A painted median is recommended / proposed along the full length of Calton Road to Cheek Avenue to assist with access into properties and side roads.
- For the section between Cheek and Sunnysdale Avenues the treatment will be dependant on whether there is direct access to the road from abutting properties. If there is, then a painted median is preferred.
- As indicated above, a roundabout should be provided for the Calton Road / Sunnysdale Avenue intersection. A roundabout is also proposed for the Cheek Avenue intersection due to the number of turning movements.