ALICE SPRINGS
CENTRAL BUSINESS DISTRICT

TRAFFIC MANAGEMENT STUDY

March 2013
12-0238
## DOCUMENT ISSUE

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1.0 INTRODUCTION

Alice Springs Town Council commissioned Murray F. Young and Associates (MFY) Pty Ltd to undertake a review of traffic conditions within the Town’s Central Business District (CBD). The area encompassed by this study is bounded by Stott Terrace to the south, Leichhardt Terrace to the east, Wills Terrace to the north and the Stuart Highway to the west.

The primary scope of this report is to provide an update of traffic issues identified in the previous CBD study undertaken by Cardno Willing in 2004. A review has therefore been undertaken of the issues and associated recommendations identified in the Cardno Willing report.

Discussions were held with a representative of Council’s Technical Services to ensure additional issues experienced since the preparation of the 2004 study have been considered in this review.

Detailed site inspections of the CBD road network have been undertaken to review previously reported issues as well as identify any additional traffic related issues. A review of crash statistics and other available traffic data has also been undertaken.
2.0 BACKGROUND

The subject study area comprises the Alice Springs CBD as illustrated in Figure 1. The CBD covers approximately 50 hectares and has generally been developed for commercial land uses (retail, office, accommodation, etc.) and community uses (schools, reserves, etc.).

![Figure 1 - CBD study area (depicted by dashed line)](image)

The CBD road network is characterised by a traditional grid layout with a number of four-way intersections. The majority of the four-way intersections are controlled by either traffic signals or roundabouts, with the exception of the intersection of Parsons Street and Railway Terrace (which is priority controlled). Most of the CBD roads...
comprise a single traffic lane in each direction, with parking typically accommodated on both sides of the streets. The majority of roads within the study area are under the care and control of Alice Springs Town Council, with the exception of Stott Terrace, which is cared for and controlled by the NT Government’s Department of Transport.

A number of key traffic control treatments have been installed throughout the CBD network and are illustrated on Figure 2 below.

![Figure 2 – Key traffic control devices within the Alice Springs CBD](image)

The section of Todd Street between Parsons Street and the cul de sac south of Wills Terrace is a ‘pedestrian mall’. General vehicle access is prohibited within the Mall, with the exception of those being operated under the required permit (i.e. Council vehicles). The Mall continues along Todd Street to the south of the project area (until its termination at Gregory Terrace) and also extends 20 to 35 metres into either side of Parsons Street. Vehicular access (for permitted vehicles) is accommodated via crossovers at the Todd Street / Gregory Terrace intersection and the Todd Street cul de sac (south of Wills Terrace). At the time of writing, the northern section of the Todd Street Mall was undergoing construction works to reopen to vehicular traffic (allowing movements between Wills Terrace and Leichhardt Terrace via the eastern section of Parsons Street).

To the immediate west of the study area is the Stuart Highway (a national highway) which forms the majority of the north-south vehicle route between Adelaide and
Darwin. The remaining roads which ‘feed’ into the CBD provide access to and from the surrounding residential and commercial/industrial areas of Alice Springs as well as the wider rural region.

2.1 BUS AND LARGE COMMERCIAL VEHICLE ACCESS

Five public bus services operate between the Alice Springs CBD and surrounding suburbs. The bus routes utilise four stops within the CBD, namely the Railway Terrace interchange, a stop on Hartley Street (between Gregory Tce and Parsons Street), a stop on Wills Terrace (between Bath Street and Hartley Street) and a stop on Bath Street (between Gregory Terrace and Stott Street). The five routes and the associated number of services are as follows:

- Route 100/101 (Braitling and Ciccone) – 9 weekday and 4 Saturday services;
- Route 200/201 (East Side and Sadadeen) – 9 weekday and 4 Saturday services;
- Route 300/301 (Ross and The Gap) – 10 weekday and 4 Saturday services;
- Route 400/401 (Gillen, Araluen and Larapinta) – 9 weekday and 4 Saturday services;
- Route 500 (The Gap and Gillen) – 6 weekday and 4 Saturday services.

There are no bus services on Sundays, public holidays, Christmas Day or Good Friday.

In addition to public transport buses, coaches and mini-buses are also utilised within the CBD road network to service tourists. Larger buses are generally encouraged to utilise the ‘outer’ roads of the CBD area, with designated coach/bus parking zones provided on Leichhardt Terrace (both on-street and off-street) and Railway Terrace (on-street). MFY has also liaised with the operators of the public transport bus services and were advised that while future extensions to bus services/routes may be considered, there were no short term proposals currently under consideration.

Large commercial vehicles (Semi-Trailers and Heavy Rigid Trucks) are utilised to service the main shopping centres within the CBD. It is understood that these vehicles enter the CBD via Wills Terrace (from the Stuart Highway), turn right into either Railway Terrace, Bath Street or Hartley Street, access their respective loading bays and then exit back to the Stuart Highway via a right turn on to Stott Terrace.

2.2 PARKING

The CBD road network accommodates a relatively high number of on-street parking spaces. The majority of on-street spaces within the CBD are time restricted (typically 3 hours or less). Additional public parking is provided in off-street areas such as the car parks adjacent Leichhardt Terrace and Wills Terrace (both of which accommodate longer term parking than most of the on-street parking areas). A number of private
2.3 WALKING AND CYCLING

Footpaths are provided on both sides of all roads within the study area, with the exception of Leichhardt Terrace (which is serviced by a parallel shared path adjacent the Todd River to the east). The footpath network accommodates both pedestrians and cyclists (cyclists are permitted to ride on the footpath in the Northern Territory). In addition to the shared path adjacent the Todd River, the CBD is also serviced by shared paths running parallel to Telegraph Terrace/Stuart Highway and at the rear of Anzac Hill. Footpath connections to/from the broader area are also provided along Stott Terrace, Undoolya Road, Larapinta Drive and Whittaker Street.

2.4 PREVIOUS TRAFFIC STUDY

A traffic and parking study for the CBD was prepared in 2004 by Cardno Willing. The 2004 report provided a number of recommendations in relation to traffic conditions within the CBD. The following table provides a summary of the traffic related recommendations made in the previous study and associated commentary on the current status of the recommendations made.

Table 1 - Recommendations from the 2004 Traffic Study and current status

<table>
<thead>
<tr>
<th>Location</th>
<th>Treatment recommended</th>
<th>Implemented by Council?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wills Tce / Hartley St intersection</td>
<td>Install traffic signals</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Wills Tce / Leichhardt Tce / Undoolya Rd signalised intersection</td>
<td>Investigate the installation of a right turn arrow for right turning vehicles on Wills Tce</td>
<td>Yes</td>
</tr>
<tr>
<td>Stott Tce / Bath St signalised intersection</td>
<td>Investigate the provision of right turn arrows</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Stott Tce / Hartley St signalised intersection</td>
<td>Investigate the provision of right turn arrows</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Stott Tce / Todd St signalised intersection</td>
<td>Investigate the provision of right turn arrows</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Gregory Tce / Todd St intersection</td>
<td>Install kerbside landscape plots to channel pedestrian movements</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Parsons St / Railway Tce intersection</td>
<td>Ban right turn for southbound traffic on Railway Tce</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Parsons St / Railway Tce intersection</td>
<td>Install ‘Do Not Queue Across Intersection’ linemarking on Parsons St</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Parsons St / Hartley St roundabout</td>
<td>Install large ‘No Through Road’ signs</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Location</td>
<td>Action</td>
<td>Status</td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Hartley St midblock between Gregory Tce and Parsons St</td>
<td>Close the exit only egress from Hartley St carpark</td>
<td>Yes</td>
</tr>
<tr>
<td>Hartley St midblock between Gregory Tce and Parsons St</td>
<td>Widen kerb return on the entry to the Yepereny Shopping Centre car park to improve access</td>
<td>Access points removed</td>
</tr>
<tr>
<td>Hartley St midblock between Gregory Tce and Parsons St</td>
<td>Relocate kerb ramp 3m north &amp; install planter box on footpath</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Hartley St midblock between Gregory Tce and Parsons St</td>
<td>Widen pedestrian refuge island &amp; install planter boxes</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Bath St midblock between Gregory Tce &amp; Parsons St</td>
<td>Replace planting in pedestrian refuge with low level planting</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Bath St midblock between Gregory Tce &amp; Parsons St</td>
<td>Install planter box on pedestrian refuge to channel pedestrian movements</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Bath St midblock between Gregory Tce &amp; Parsons St</td>
<td>Widen pedestrian refuge island &amp; kerb ramps</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>Wills Tce midblock between Hartley St and Bath St</td>
<td>Remove children’s crossing and pedestrian refuge if signals are installed at the Wills Tce / Hartley St intersection</td>
<td>Not undertaken</td>
</tr>
<tr>
<td>CBD</td>
<td>Introduce 50 km/h speed limit</td>
<td>Speed limit changed to 40 km/h</td>
</tr>
<tr>
<td>Hartley St between Gregory Tce and Parsons St</td>
<td>Reduce speed limit to 40 km/h outside shopping centre</td>
<td>Yes</td>
</tr>
<tr>
<td>Bath St between Gregory Tce and Parsons St</td>
<td>Reduce speed limit to 40 km/h outside shopping centre</td>
<td>Yes</td>
</tr>
<tr>
<td>Gregory Tce</td>
<td>Reduce speed limit to 40 km/h for full length</td>
<td>Yes, but 30 km/h speed limit around Todd St intersection</td>
</tr>
<tr>
<td>Around Our Lady of the Sacred Heart College</td>
<td>Install ‘School Zone 40 km/h 8.00am – 9.30am, 2.30pm – 4.00pm School Days’ signage</td>
<td>Not undertaken</td>
</tr>
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</table>
3.0 TRAFFIC DATA

3.1 MODAL SPLIT

‘Journey to work’ data available from the Australian Bureau of Statistics’ 2011 Census as summarised in the NT Department for Transports ‘2011 Census – Journey to Work Summary for Darwin and the Northern Territory’ indicates that:

- the level of private motor vehicle use (82.6%) for ‘journey to work’ trips is relatively low compared to other regions;
- the level of public transport use (4.5%) is higher than average when compared to regional towns/cities of similar size; and
- Alice Springs has very high levels of bicycle use (5.4%) and walking (7.5%) for ‘journey to work’ trips compared to other regions in Australia.

While the above data only relates to one trip purpose (i.e. doesn’t identify mode of transport for shopping, educational, recreational trips, etc.), the statistics indicate that non-motorised transport use is relatively high in Alice Springs.

3.2 CRASH STATISTICS

During the five year period between 2008 and 2012, there were a total of 386 crashes in the area under investigation. This comprised 262 crashes at intersections and 124 midblock crashes. This is a decrease of 31% from 563 crashes in 1999-2003. Of the 386 crashes, there was only one fatality. In January 2008 a pedestrian was fatally hit on the Stuart Highway, 50m north of the Stuart Highway / Larapinta Drive / Stott Terrace / Telegraph Terrace intersection. In total, there have been 35 crashes involving pedestrians (9.1% of total crashes) which is a decrease of 35% from 54 in 1999-2003. Appendix A shows the total and pedestrian crashes at intersections and mid-block.

Crashes tend to occur more often at those intersections with traffic signals installed than those with roundabouts. Midblock statistics show that where continuous medians are provided, mid-block crash statistics are also generally lower. For example, on Gregory Terrace between Todd Street and Leichhardt Terrace one crash has occurred, compared with 10 on Todd Street between Gregory Terrace and Stott Terrace.

The four intersections with the most crashes were all on Stott Terrace, and all at signals. Thirty-one occurred at the intersection with Bath Street, 22 at the intersection with Hartley Street and 28 at the intersection with Todd Street. A similar issue was identified by the previous study with total crashes of 40 at Bath Street, 32 at Hartley Street and 42 at Todd Street.
The predominant crash types over the study period were rear end accidents (94), vehicle collisions when crossing traffic (61), right turning traffic colliding with through moving traffic (24) and incidents with parked cars (23).

### 3.3 TRAFFIC VOLUMES

The Department of Lands and Planning (DLP) “Annual Traffic Report 2011” provides annual average daily traffic (AADT) volumes for a number of sites in Alice Springs over a 10-year period. Of specific relevance to this study, data from the following count sites is available in the DLP report:

- Stuart Highway (south of Skinner Street);
- Stuart Highway (south of Woods Street);
- Stuart Highway (north of Schwartz Crescent);
- Stott Terrace (between Bath Street and Hartley Street);
- Stott Terrace (west of Sadadeen Road);
- Larapinta Drive (west of George Crescent); and
- Undoolya Road (west of Sturt Terrace).

Figure 3 illustrates the average daily traffic volumes recorded by DLP at the count stations between 2002 and 2011.

![Traffic Volumes Chart](image)

**Figure 3 - Average daily traffic volumes over a 10 year-period**

The above chart illustrates that the traffic volumes at the count locations have generally increased over the past 10 years, with the exception of volumes on Undoolya
Road (which experiences fluctuations in the average traffic volume due to occasional flooding of the roadway). The other count stations have experienced growth in the order of 0.5% to 2.0% per annum over the 10 year period.

The DLP report also provides a monthly breakdown of average traffic volumes for the above count locations for 2011. The monthly breakdowns indicate that average daily volumes are relatively constant across the year with only slight reductions during the Christmas/New Year holiday period and slight increases during the peak tourist season (mid-year).

In addition to the above data, the 2004 traffic study identified peak hour turning counts at the following two intersections:

- Gregory Terrace/Todd Street; and
- Hartley Street/Wills Terrace.

Figures 4 and 5 summarise the am and pm peak hour movements (including those undertaken by pedestrians) at the two intersections.

![Diagram](image)

*Figure 4 – 2004 AM and (PM) peak hour vehicle and pedestrian counts at Todd Street/Gregory Terrace intersection (Source: Cardno Willing, 2004)*
Based on the DLP data, the worst case growth recorded at the Alice Springs count stations over the past 10 years was 2% per annum. Assuming similar growth has occurred at the above intersections, current peak hour volumes have been estimated. Figures 6 and 7 illustrate the extrapolated peak hour data for 2013 at the two intersections.
Figure 6 – Extrapolated 2013 AM and (PM) peak hour vehicle and pedestrian counts at Todd Street/Gregory Terrace intersection (Source: after Cardno Willing, 2004)

Figure 7 – Extrapolated 2013 AM and (PM) peak hour vehicle and pedestrian counts at Hartley Street/Wills Terrace intersection (Source: after Cardno Willing, 2004)

SCATS data has also been provided by the Department of Transport for the intersection of Stott Terrace and Todd Street. The data, however, cannot be directly converted to turning counts due to the shared lane arrangements.
(through+left/through+right) on each approach to the intersection, however Figure 8 illustrates the daily traffic volumes on each approach as identified by the SCATS data.

Figure 8 - Approximate daily traffic volumes (approaches only) at the intersection of Todd Street/Stott Terrace
4.0 SITE INVESTIGATIONS AND RECOMMENDATIONS

This section provides a summary of traffic issues identified during the site inspection. In addition, recommendations associated with the issues identified (based on-site observations, crash statistics and previously raised concerns) are provided. A summary of the recommendations is also provided in Appendix B as well as a map of the CBD identifying the main recommendations.

4.1 GENERAL COMMENTS

4.1.1 SPEED LIMITS

A speed limit of 40 km/h applies on all roads within the Alice Springs CBD (with the exception of the Gregory Terrace/Todd Street intersection, south of the project area, where a localised 30 km/h limit applies). The Stuart Highway and Stott Terrace (the two roads that bound the CBD to the west and south) both have a speed limit of 60 km/h. All vehicles entering the CBD are notified of the change in speed limit by 40 km/h signs as well as numerical “40” linemarkings on the carriageway. For drivers exiting the CBD, 60 km/h signage is displayed on the reverse side of these signposts. This creates potential for drivers to accelerate as they enter the effected intersections, which is undesirable (i.e. the 60 km/h signs should be located on the departure sides of the intersections, not the approaches).

*Recommendation 1: Relocate 60km/h signs for drivers exiting the CBD to the departure sides of relevant intersections.*

A School Zone applies on Wills Terrace from the service station between Bath Street and Railway Terrace to immediately west of Todd Street. The zone extends along Hartley Street for 25 m, and along Bath Street, finishing 25 m north of Parsons Street. The School Zone and consequent speed ‘restriction’ of 40 km/h applies from 7.00am to 5.00pm on school days (refer Figure 9). On Gap Road, for example, where the speed limit is 60 km/h, the same 40 km/h school zone is appropriate. However, the existing speed limit in the CBD is 40 km/h, and the signage may be confusing for some motorists (i.e. some may think a higher speed limit applies once they have passed the School Zone).
Recommendation 2: Review the appropriateness of the 40 km/h speed limit within the School Zone. Consideration could be given to a lower speed limit in within the School Zone (i.e. 25 km/h as applied in some other areas in Australia).

As shown in Figure 10, ‘SCHOOL’ linemarkings have been installed on both Wills Terrace (west of Todd Street), and Bath Street (north of Parsons Street). The markings extend into adjacent parking lanes and, a result, parked vehicles restrict the markings such that ‘HOOL’ will be displayed – reducing the effectiveness of the markings.
Recommendation 3: Review the requirement for the linemarked ‘SCHOOL’ markings. Consideration could be given to improved signage (i.e. replication of ‘Children Crossing’ warning signage within the median). Kerb protuberances to minimise pedestrian crossing distance and further highlight the presence of the refuge could also be provided.

4.1.2 PARKING SIGNAGE

Parking restriction signage is inconsistent, with many out-dated signs still in use (i.e. many signs do not comply with the relevant Australian Standard). For example, four types of ‘1P’ signage were identified throughout the CBD, as shown in Figure 11. Different ‘No Parking’, ‘No Standing’, ‘Bus Zone’, ‘2P’, ‘10 minute Parking’ and ‘Loading Zone’ signage is confusing for motorists and expiation notices served in relation to non-conforming signage could be subject to legal challenges (as has occurred in other states/territories within Australia).

![Figure 11 - Variations parking signage types within the CBD (note the final sign is the only type that complies with the current Australian Standards)](image)

Recommendation 4: Undertake an audit of parking signage within the CBD and replace old/damaged/non-conforming signs.

4.1.3 CYCLING FACILITIES

As noted above, cyclists are permitted to ride on footpaths within the CBD, however a proportion of cyclists will still prefer to utilise the road carriageway to undertake movements to, from and within the CBD. On-site observations confirmed that cyclists utilise both footpaths and roads (and many utilise both in one journey).

There are no designated/separated on-street facilities within the CBD for cyclists, despite a number of streets within the CBD having sufficient width to accommodate some form of cycling treatment. The majority of traffic lanes and on-street parking lanes in the CBD are wide and could be narrowed to provide additional space for
cycling facilities (either separated bicycle lanes or shared parking/bicycle lanes could be considered).

**Recommendation 5:** Consider provision of designated bicycle lanes (or shared parking/bicycle lanes) on CBD streets. It is recommended that a Cycling and Walking Plan be prepared for the overall CBD area to ensure bicycle facilities are provided in the most appropriate locations and do not conflict with the requirements of other users (particularly pedestrians in high activity areas).

### 4.1.4 PEDESTRIAN FACILITIES

As noted above, footpaths are provided on all roads and numerous pedestrian ramps and refuges are provided throughout the CBD. Notwithstanding this, the majority of pedestrian ramps would not conform with current Australian Standards (particularly in relation to access requirement for pedestrians with disabilities – i.e. tactile indicators are typically not provided). Furthermore, in many locations, pedestrian ramps are not appropriately aligned and do not direct pedestrians appropriately.

**Recommendation 6:** Undertake an audit of pedestrian ramps within the CBD to identify poorly aligned and non-conforming ramps. Undertake improvements to ensure pedestrian ramps and refuges conform with current standards.

### 4.2 INTERSECTIONS

#### 4.2.1 WILLS TERRACE / BATH STREET

It is understood that traffic issues are experienced at this intersection due to traffic build up caused by morning and afternoon pick-up / drop off of school children at Our Lady of the Sacred Heart Catholic College on Bath Street. An on-street “Kiss ‘n’ Go” No Parking Zone is provided for the College on the east side of Bath Street, just south of the intersection. This restriction applies from 7:45am to 8:30am and 2:45pm to 3:30pm on school days. A relatively high number of vehicles utilise this area during the restriction periods. Queues were occasionally observed extending onto the adjacent through lane in Bath Street, resulting in southbound through traffic being blocked. This causes vehicles to queue on Wills Terrace in the channelised right turning lane as they wait for Bath Street to clear. However, during the site inspection, the right turn queue on Wills Terrace did not extend into the through lane (i.e. eastbound traffic was not observed to be restricted by queues associated with the College). There is also the issue of westbound traffic on Wills Terrace being blocked by those wishing to turn left onto Bath Street. However, this was not a regular occurrence, only being observed to occur twice during the morning peak period and not at all during the afternoon peak period.

It was also observed that a number of parents utilised the Salvation Army off-street car park at the opposite corner of Wills Terrace and Bath Street to walk their children to
school. Should parking on this site not be available in the future (i.e. the owner takes actions to restrict parking or redevelops the site), there would likely be an additional demand for on-street parking in the vicinity of the College.

**Recommendation 7:** Consider the provision of an additional “Kiss ‘n’ Go” facility on the western side of Bath Street, south of the Emu Crossing. Approximately 25 m of on-street parking in this location could be designated as a “Kiss ‘n’ Go” facility between 7:45am to 8:30am and 2:45pm to 3:30pm on school days. At other times the existing parking controls could remain.

### 4.2.2 WILLIS TERRACE / HARTLEY STREET

The intersection of Wills Terrace and Hartley Street forms a four-way intersection with the Anzac Hill High School access point opposite Hartley Street. At most times of day it appeared that the intersection operated efficiently (as typically there are limited movements out of the access point). However, in the afternoon period, drivers turning right out of Hartley Street appeared to have difficulty entering the traffic stream due to increased left-out movements from the access point.

The 2004 traffic study recommended traffic signals be installed at this intersection. It is understood that a roundabout has also been considered by Council. Both treatments are not specifically warranted from a capacity perspective, however could provide other benefits at the intersection as well as the wider road network. Installation of signals would improve safety for pedestrian crossing movements (as discussed in the 2004 study, the adjacent Emu Crossing would be removed if signals were installed). A roundabout would not be as beneficial as a traffic signal in relation to accommodation of pedestrian movements (nor cyclist movements), however would be likely to result in lower overall delays for vehicles at the intersection.

**Recommendation 8:** Consider the installation of traffic signals at the intersection of Wills Terrace and Hartley Street to improve conditions for all road users in this location. Should a traffic signal not be financially viable, a roundabout could be installed as an alternative treatment which would improve general traffic conditions, however would not be as beneficial to pedestrians and cyclists (and depending on services infrastructure in the subject location may not offer a cost saving compared to signals).

### 4.2.3 WILLIS TERRACE / TODD STREET & PARSONS STREET / LEICHHARDT TERRACE

During the site inspection, works were being undertaken at or near these intersections (associated with the opening of the northern section of Todd Street). A detailed assessment was not undertaken of conditions at these intersections, as the previous traffic study associated with the Todd Street project considered previous conditions and made associated recommendations which are being adopted as part of the new works.
4.2.4 WILLS TERRACE / LEICHHARDT TERRACE / UNDOOLYA ROAD

The intersection of Wills Terrace, Leichhardt Terrace and Undoolya Road is controlled with traffic signals. The T-intersection accommodates all associated turning movements and pedestrian crossings are provided on all legs of the intersection. During site inspections it was observed that the traffic signals appear to operate relatively inefficiently and drivers, particularly on Leichhardt Terrace, experience longer queues and delays than would be expected for the level of traffic accommodated at the intersection. A review of the intersection’s signal phasing identifies that additional green time could be given to some movements (i.e. when the right turn from Wills Terrace into Leichhardt Terrace is permitted, left turns from Leichhardt Terrace to Wills Terrace could also be accommodated).

**Recommendation 9:** Liaise with the Department of Transport in relation to signal phasing at the intersection of Wills Terrace/Leichhardt Terrace/Undoolya Road. It is considered that additional movements (i.e. non-conflicting left and right turn movements) could be allowed simultaneously to reduce queuing and delays experienced at the intersection.

4.2.5 PARSONS STREET / RAILWAY TERRACE

The intersection of Parsons Street and Railway Terrace forms a four-way intersection controlled by priority (Stop signs and holding bar) with all relevant movements accommodated. Priority controlled four-way intersections experience higher conflict risk than T-intersections and four-way intersections with higher order traffic control treatments. The crash statistics indicate that this intersection experiences a relatively high number of crashes compared to others within the CBD.

In addition, the intersection of Parsons Street and Railway Terrace is located in close proximity (50 m) to the Stuart Highway/Parsons Street/Whittaker Street intersection. This results in limited storage distance on the Parsons Street approach to the Stuart Highway and the potential for vehicles to queue on Parsons Street across its intersection with Railway Terrace. However, during site inspections (including during the PM peak), no queues across this intersection were observed.

A high number of vehicles on Railway Terrace (both north and south) were observed to undertake wide turns, when turning left onto Parsons Street. This can be attributed to the lack of lane delineation of Railway Terrace and Parsons Street (East) despite there being sufficient width for separate lanes. Public transport buses were observed to travel from Parsons Street (West) to Railway Terrace (South). Most drivers generally appeared to obey the ‘Stop’ requirements on the non-priority legs.

A number of movements on the non-priority legs could be restricted which would reduce the number of conflict points and improve safety conditions at the intersection. It is understood some concern has been raised by businesses in relation to restriction
of movements, however it is expected that the restriction of some movements would have minimal impact on adjacent businesses.

**Recommendation 10:** Consider the restriction of right-out and/or straight through movements from the non-priority legs at the intersection of Parsons Street/Railway Terrace. To ensure that businesses will not be excessively impacted, a detailed traffic study, including a number plate survey, is recommended. The study could also consider in detail the interaction between the subject intersection and the adjacent signalised intersection on the Stuart Highway.

In addition to the above, the delineation of the traffic lanes on Parsons Street at the intersection is relatively poor. A right turn lane for movements into Railway Terrace (south) has been marked on the western side of the intersection, however a delineation treatment does not continue across the intersection and eastbound drivers on Parsons Street are essentially directed towards the on-street parking lane. Furthermore, the lack of continuity lines for the right turn lane appears to encourage drivers to store further back than required when undertaking this movement, which results in reduced queuing distance (back to the signals at the Stuart Highway).

**Recommendation 11:** Improve delineation on Parsons Street in the vicinity of its intersection with Railway Terrace. A (painted) median treatment should be continued from the existing right turn lane across the intersection (with continuity lines where turns are permitted) to ensure through-bound drivers are appropriately directed.

Pedestrian ramps are provided at the intersections, however are aligned poorly (refer Figure 12). The ramps direct pedestrians into the centre of the intersection, not to an opposing, aligned ramp. The ramps do not conform with the requirements of current Australian Standards and present a particular hazard for pedestrians with disabilities and/or mobility issues.

**Recommendation 12:** Reconstruct pedestrian ramps, in accordance with the requirements of the relevant Australian Standard, to appropriately define pedestrian travel paths.
4.2.6 PARSONS STREET / BATH STREET, PARSONS STREET / HARTLEY STREET & GREGORY TERRACE / HARTLEY STREET

The roundabouts at these intersections seemed to be constructed correctly, and are consistent in design. Pedestrians are adequately catered for, and bus and truck turns appeared to be adequately accommodated.

4.2.7 GREGORY TERRACE / BATH STREET

The previous 2004 traffic study identified that traffic signals were present at the Gregory Terrace / Bath Street intersection. Since the preparation of the previous study, the signals have been removed and a roundabout has been constructed at the intersection. When the intersection was signalised, there were two traffic lanes for the approach and exit of each leg. During the construction of the new roundabout, traffic islands have been installed next to kerbs to restrict traffic to a single lane on each approach and departure, as shown in Figure 13.
The pedestrian refuge within the central island on the Gregory Terrace (western leg) is wider than the adjacent pedestrian ramps (refer Figure 14). While this is a relatively minor issue, it could create confusion for vision impaired pedestrians.
Recommendation 13: Review the refuge opening width and narrow to align with the adjacent pedestrian ramps.

4.2.8 GREGORY TERRACE / TODD STREET

This intersection of Gregory Terrace and Todd Street connects directly to the Todd Mall. A high number of pedestrian movements were observed across Gregory Terrace (i.e. to/from the Mall). Pedestrian refuges have been installed on Gregory Terrace to the east and west of the intersection. However, these refuges are quite a distance from the entrance to the mall and many pedestrians (particularly on the western side) did not utilise the refuges and crossed closer to the intersection. It would be desirable that the refuges be provided closer to the pedestrian desire lines.

A pedestrian refuge is also provided on Todd Street (Figure 15), however it is only linemarked – i.e. a raised median island has not been installed. This presents a higher conflict risk between vehicles and the holding bars and signage provided within the median and as well as a lower level of pedestrian protection.
Figure 15 – Pedestrian access on Todd Street (south of the intersection)

**Recommendation 14:** Review pedestrian facility provision at the intersection of Todd Street and Gregory Terrace. Refuges should be provided closer to pedestrian desire lines, however turning requirements of buses and commercial vehicles will need to be considered. Kerb protuberances to minimise pedestrian crossing distances could also be provided.

In addition to the above, whilst not specifically warranted to accommodate the existing traffic volumes, signalisation of the intersection could provide improved pedestrian level of service and safety, as well as reduced conflict risk associated with right turn movements from Todd Street into Gregory Terrace.

**Recommendation 15:** Consider the installation of a traffic signal at the intersection of Todd Street and Gregory Terrace. A pedestrian ‘scatter’ phase could be adopted (where pedestrian can cross the intersection in all directions) to maximise pedestrian level of service.

### 4.2.9 STOTT TERRACE / BATH STREET, STOTT TERRACE / HARTLEY STREET & STOTT TERRACE / TODD STREET

The layouts of the three signalised intersections on Stott Terrace are very similar. For each intersection, there is a two lane approach for each leg, with the left lane providing for traffic turning left and travelling straight, and the right lane providing for vehicles travelling straight and turning right. The current lane configuration is acceptable for Stott Terrace, where two lanes are provided along the length of the
road. However, on Bath Street, Hartley Street and Todd Street, only one lane is provided in each direction further out from the intersections, and there is no line marking or signage to guide vehicles to merge back into one lane (in some instances vehicles in the kerbside lane are directed towards on-street parking in close proximity to the intersections). For instance, vehicles in the left lane travelling southbound along Bath Street have only 10 metres to merge right and avoid vehicles parked in a loading zone once they cross the intersection.

**Recommendation 16:** Liaise with the Department for Transport in relation to the higher crash rates experienced at the signalised intersections on Stott Terrace. Consideration should be given to separation of through movements and right turn movements on the minor approaches (Bath Street, Hartley Street and Todd Street) to allow altered phasing and reduce rear end conflicts. Furthermore, dual lanes are not required on Stott Terrace to accommodate the existing traffic volumes and similar alteration of lane arrangements could be undertaken for Stott Terrace approaches. Consideration should also be given to the provision of separated bicycle lanes on each approach. Review of commercial vehicle turn paths will be required at these intersections to ensure such alterations can be accommodated within the road reserves (some increases to corner radii may be required to accommodate such vehicles).

### 4.3 MID-BLOCK

#### 4.3.1 WILLS TERRACE

Traffic movements on Wills Terrace generally appeared to be accommodated safely and efficiently. It was noted that taper lengths for the right turn lanes for Todd Street and Leichhardt Terrace are very short. It would be desirable to increase the taper lengths to conform with current guidelines, however the proximity of the two intersections as well as the adjacent pedestrian refuge restrict the ability to do so. In the longer term, particularly if a roundabout is installed at the intersection of Hartley Street/Wills Terrace, right turns into and out of Todd Street could be restricted which would allow extension of the right turn lane for movements into Leichhardt Terrace and both the short tapers could be addressed.

**Recommendation 17:** Consider the restriction of right turn movements into and out of Todd Street at its intersection with Wills Terrace. This would allow an increase in the right turn storage lane associated with the Wills Terrace/Leichhardt Terrace/Undoolya Road intersection and removal of the two existing short tapers. This recommendation would be of particular relevance if a roundabout is installed at the Hartley Street/Wills Terrace intersection (which would allow drivers to turn left out of Todd Street and then “u-turn” at the roundabout to head east along Undoolya Road or south along Leichhardt Terrace).
4.3.2 GREGORY TERRACE

Vehicular movements in mid-block locations generally appeared to be adequately and appropriately accommodated. However, in regards to pedestrian movements on Gregory Terrace, there are two (apparent) pedestrian refuges in the median, between Bath Street and Hartley Street. In one location, there are no pedestrian ramps provided, and parking is allowed on one side of the road (refer Figure 17). In the second location, one pedestrian ramp is provided, however it is not aligned with the gap in the median, and there is motorcycle parking on the opposite side of the road (refer Figure 18). The refuges in the median encourage pedestrians to cross Gregory Terrace at these two locations. However, by channelling pedestrians into and around parked cars and motorcycles, vehicles travelling along Gregory Terrace will have their vision partially obscured by the parked vehicles, and thus there is a greater conflict risk between vehicles and pedestrians.
Figure 17 – Pedestrian refuge with no ramps and parking allowed opposite

Figure 18 – Refuge does not line up with the pedestrian ramp and motorcycle parking is permitted on the opposite side

**Recommendation 18:** Construct pedestrian ramps aligned on both sides of existing pedestrian refuges. Parking (both car and motorcycle) should be restricted, not only where ramps are provided, but for a sufficient distance to
ensure adequate sight distances between pedestrians and drivers. Consideration could be given to provision of kerb protuberances to minimise pedestrian crossing distances.

4.3.3 STOTT TERRACE

No specific issues were identified with the mid-block sections of Stott Terrace. However, it was noted that, despite being classed as a key bicycle route for the township, no on-street facilities have been provided for cyclists. Additionally, it was noted that the traffic volumes experienced on Stott Terrace could be accommodated within single lanes in each direction (particularly mid-block, additional turn lanes would still be required at the signalised intersections).

**Recommendation 19:** As per Recommendation 16, liaise with the Department of Transport in relation to the treatment of Stott Terrace. Dual lanes in both directions are not warranted to accommodate existing volumes and the provision of single lanes would provide the potential for provision of dedicated bicycle lanes on Stott Terrace.

4.3.4 BATH STREET

A pedestrian refuge has been provided on Bath Street, between Gregory Terrace and Parsons Street, to accommodate movements between two shopping centres. However, to the south of the pedestrian access point there is a gap in the median to accommodate a service pit which would appear to some pedestrians to provide a refuge point. However, there are no pedestrian ramps on either side of the road, and parking is provided on the east side of Bath Street (refer Figure 19).

![Figure 19 – Service pit in median on Bath Street](image)
Recommendation 20: Alter the median opening around the service pit to discourage pedestrians from utilising it as a refuge (a removal barrier could be considered, however care should be taken to ensure treatments do not present a hazard to road users).

The median islands provided in this section of Bath Street terminate suddenly and the delineation of the approaches to the medians are poor (refer Figure 20).

Figure 20 – Median termination on Bath Street between Parsons Street and Gregory Terrace

Recommendation 21: Linemark angled approaches to the median islands to improve delineation of the commencement of the islands (i.e. the centreline should not direct drivers into the median).

A review has previously been undertaken of a potential Wombat Crossing in Bath Street, including consideration of pedestrian and vehicle volumes experienced in this location. The review recommended that the Wombat Crossing be provided and based on on-site observations this recommendation is supported.

Recommendation 22: Install a Wombat Crossing between the two shopping centres on Bath Street to improve pedestrian priority and accessibility in this location.

4.3.5 HARTLEY STREET

Two pedestrian crossing points (refuges) are provided on Hartley Street, outside the Yeperenye shopping centre, as shown in Figure 21. During the site inspection, the southern crossing was rarely utilised, as the majority of pedestrians crossed north of
the shopping centre. A number of pedestrians were, however, observed crossing Hartley Street further south (adjacent the Subway outlet), where no refuge is provided.

![Image of the shopping centre](image)

**Figure 21 – Median on Hartley Street outside the Yeperenye shopping centre**

**Recommendation 23:** Install a Wombat Crossing in the location of the existing northern pedestrian refuge from the Yeperenye Shopping Centre.

**Recommendation 24:** Close the southern pedestrian refuge at the Yeperenye Shopping Centre and install a new pedestrian refuge with associated ramps and kerb protuberances further south (near the Subway outlet).

**Recommendation 25:** In the longer term, review the potential provision of a Shared Zone between Parsons Street and Gregory Street.

An inconsistent median treatment occurs on Hartley Street between Parsons Street and Gregory Terrace. The wide medians abruptly change into a thin median as illustrated in Figure 22. The narrower median could also present a trip hazard should pedestrians cross in this section of the road.
Recommendation 26: Remove the narrow section of median on Bath Street and install a wider median treatment consistent with the adjacent medians on Bath Street.

4.3.6 LEICHHARDT TERRACE

On Leichhart Terrace, there is a narrow turning bay provided for entry into the public carpark east of Leichhardt Terrace (between Parsons Street and Gregory Terrace as shown in Figure 23). It was observed that vehicles were unable to fit entirely within the lane, causing vehicles travelling along Leichhardt Terrace to slow down in order to avoid collisions.
**Recommendation 27:** Narrow the widths of the through lanes on Leichhardt Terrace adjacent the right turn storage lane for the off-street parking area to allow provision of a 2.8 m (minimum) width storage lane.

In addition, the overall treatment of the road cross section along Leichhardt Terrace is consistent. A number of median islands and turn lanes are provided, with short sections of the road in between these treatments separated by a linemarked centreline. While this does not appear to present a significant safety issue, drivers are essentially forced to ‘weave’ along the road. It is possible that this may provide some traffic calming benefit, however over-attention to the road alignment could also distract drivers from other features and road users (including pedestrians crossing the road).
5.0 SUMMARY

The results of this study indicate that current traffic flows within the CBD are, for the most part, appropriately accommodated within the current network. The grid layout of the CBD road network generally provides direct routes for drivers to their specific destinations, however the closure of Todd Street (mall) does result in some circuitous routes being required in the north-western section of the CBD.

The majority of intersections within the CBD accommodate the existing traffic flows with relatively low levels of queuing and delays. However, in a number of locations improvements could be made to improve the safety and efficiency of the accommodation of vehicular, cyclist and pedestrian movements.

An assessment of the existing traffic crash statistics over the last five years identified that in most locations crash rates are not significant, however a number of locations could benefit from treatment to minimise conflict risk. Intersections within the CBD controlled by roundabouts generally experience lower crash rates than unsignalised or signal controlled intersections (as would be expected). The only intersections which are considered to have high numbers of crashes are the signalised intersections on Stott Terrace and the priority controlled four-way intersection of Parsons Street/Railway Terrace. Mid-block locations with central medians are also associated with lower crash statistics compared to locations with traffic lanes only separated by linemarked centrelines.

Following inspection of the CBD road network and consideration of issues raised, a number of recommendations have been made in relation to the improve the safety and efficiency of accommodation of pedestrian, cyclist and vehicular movements. A number these recommendations will require further (detailed) traffic analysis to ensure any impacts resulting from the recommended improvements are adequately considered prior to potential implementation.
APPENDIX A

CRASH STATISTIC MAPS
APPENDIX B

ALICE SPRINGS CBD TRAFFIC STUDY 2013
RECOMMENDATIONS
2013 ALICE SPRINGS CBD TRAFFIC STUDY
SUMMARY OF RECOMMENDATIONS

Recommendation 1: Relocate 60km/h signs for drivers exiting the CBD to the departure sides of relevant intersections.

Recommendation 2: Review the appropriateness of the 40 km/h speed limit within the School Zone. Consideration could be given to a lower speed limit in within the School Zone (i.e. 25 km/h as applied in some other areas in Australia).

Recommendation 3: Review the requirement for the linemarked ‘SCHOOL’ markings. Consideration could be given to improved signage (i.e. replication of ‘Children Crossing’ warning signage within the median). Kerb protuberances to minimise pedestrian crossing distance and further highlight the presence of the refuge could also be provided.

Recommendation 4: Undertake an audit of parking signage within the CBD and replace old/damaged/non-conforming signs.

Recommendation 5: Consider provision of designated bicycle lanes (or shared parking/bicycle lanes) on CBD streets. It is recommended that a Cycling and Walking Plan be prepared for the overall CBD area to ensure bicycle facilities are provided in the most appropriate locations and do not conflict with the requirements of other users (particularly pedestrians in high activity areas).

Recommendation 6: Undertake an audit of pedestrian ramps within the CBD to identify poorly aligned and non-conforming ramps. Undertake improvements to ensure pedestrian ramps and refuges conform with current standards.

Recommendation 7: Consider the provision of an additional “Kiss ‘n’ Go” facility on the western side of Bath Street, south of the Emu Crossing. Approximately 25 m of on-street parking in this location could be designated as a “Kiss ‘n’ Go” facility between 7:45am to 8:30am and 2:45pm to 3:30pm on school days. At other times the existing parking controls could remain.

Recommendation 8: Consider the installation of traffic signals at the intersection of Wills Terrace and Hartley Street to improve conditions for all road users in this location. Should a traffic signal not be financially viable, a roundabout could be installed as an alternative treatment which would improve general traffic conditions, however not be as beneficial to pedestrians and cyclists (and depending on services infrastructure in the subject location may not offer a cost saving compared to signals).

Recommendation 9: Liaise with the Department of Transport in relation to signal phasing at the intersection of Wills Terrace/Leichhardt Terrace/Undoolya Road. It is considered that
additional movements (i.e. non-conflicting left and right turn movements) could be allowed simultaneously to reduce queuing and delays experienced at the intersection.

**Recommendation 10:** Consider the restriction of right-out or straight through movements from the non-priority legs at the intersection of Parsons Street/Railway Terrace. To ensure that businesses will not be excessively impacted, a detailed traffic study, including a number plate survey, is recommended. The study could also consider in detail the interaction between the subject intersection and the adjacent signalised intersection on the Stuart Highway.

**Recommendation 11:** Improve delineation on Parsons Street in the vicinity of its intersection with Railway Terrace. A (painted) median treatment should be continued from the existing right turn lane across the intersection (with continuity lines where turns are permitted) to ensure through-bound drivers are appropriately directed.

**Recommendation 12:** Reconstruct pedestrian ramps, in accordance with the requirements of the relevant Australian Standard, to appropriately define pedestrian travel paths.

**Recommendation 13:** Review the refuge opening width and narrow to align with the adjacent pedestrian ramps.

**Recommendation 14:** Review pedestrian facility provision at the intersection of Todd Street and Gregory Terrace. Refuges should be provided closer to pedestrian desire lines, however turning requirements of buses and commercial vehicles will need to be considered. Kerb protuberances to minimise pedestrian crossing distances could also be provided.

**Recommendation 15:** Consider the installation of a traffic signal at the intersection of Todd Street and Gregory Terrace. A pedestrian ‘scatter’ phase could be adopted (where pedestrian can cross the intersection in all directions) to maximise pedestrian level of service.

**Recommendation 16:** Liaise with the Department for Transport in relation to the higher crash rates experienced at the signalised intersections on Stott Terrace. Consideration should be given to separation of through movements and right turn movements on the minor approaches (Bath Street, Hartley Street and Todd Street) to allow altered phasing and reduce rear end conflicts. Furthermore, dual lanes are not required on Stott Terrace to accommodate the existing traffic volumes and similar alteration of lane arrangements could be undertaken for Stott Terrace approaches. Consideration should also be given to the provision of separated bicycle lanes on each approach. Review of commercial vehicle turn paths will be required at these intersections to ensure such alterations can be accommodated within the road reserves (some increases to corner radii may be required to accommodate such vehicles).

**Recommendation 17:** Consider the restriction of right turn movements into and out of Todd Street at its intersection with Wills Terrace. This would allow an increase in the right turn storage lane associated with the Wills Terrace/Leichhardt Terrace/Undoolya Road.
intersection and removal of the two existing short tapers. This recommendation would be of particular relevance if a roundabout is installed at the Hartley Street/Wills Terrace intersection (which would allow drivers to turn left out of Todd Street and then “u-turn” at the roundabout to head east along Undoolya Road or south along Leichhardt Terrace).

**Recommendation 18:** Construct pedestrian ramps aligning on both sides of existing pedestrian refuges. Parking (both car and motorcycle) should be restricted not only where ramps are provided but for a sufficient distance to ensure adequate sight distances between pedestrians and drivers. Consideration could be given to provision of kerb protuberances to minimise pedestrian crossing distances.

**Recommendation 19:** As per Recommendation 16, liaise with the Department of Transport in relation to the treatment of Stott Terrace. Dual lanes in both directions are not warranted to accommodate existing volumes and the provision of single lanes would provide the potential for provision of dedicated bicycle lanes on Stott Terrace.

**Recommendation 20:** Alter the median opening around the service pit to discourage pedestrians from utilising it as a refuge (a removal barrier could be considered, however care should be taken to ensure treatments do not present a hazard to road users).

**Recommendation 21:** Linemarked angled approaches to the median islands to improve delineation of the commencement of the islands (i.e. the centreline should not direct drivers into the median).

**Recommendation 22:** Install a Wombat Crossing between the two shopping centres on Bath Street to improve pedestrian priority and accessibility in this location.

**Recommendation 23:** Install a Wombat Crossing in the location of the existing northern pedestrian refuge from the Yeperenye Shopping Centre.

**Recommendation 24:** Close the southern pedestrian refuge at the Yeperenye Shopping Centre and install a new pedestrian refuge with associated ramps and kerb protuberances further south (near the Subway outlet).

**Recommendation 25:** In the longer term, review the potential provision of a Shared Zone between Parsons Street and Gregory Street.

**Recommendation 26:** Remove the narrow section of median on Bath Street and install a wider median treatment consistent with the adjacent medians on Bath Street.

**Recommendation 27:** Narrow the widths of the through lanes on Liechhardt Terrace adjacent the right turn storage lane for the off-street parking area to allow provision of a 2.8 m (minimum) width storage lane.
ALICE SPRINGS CBD TRAFFIC STUDY
KEY RECOMMENDATIONS

- Consider roundabout or traffic signals
- Provide additional miss 'N' go on western side of road
- Undertake detailed study & consider turn restrictions
- Review signal phasing
- Consider shared zone
- Install new pedestrian refuge
- Install roundabout crossing
- Improve pedestrian safety & consider signalisation
- Liaise with Department for Transport in regards to reducing crash rates

+ Undertake CBD parking signage audit
+ Undertake CBD cycling and walking study