

Our Ref: 16133

19 September 2016

Windsor Star Pty Ltd
Level 2, 72 Macquarie Street
PARRAMATTA NSW 2150

Attention: Mr Tom Copping

Dear Tom,

**RE: 360-378 WINDSOR ROAD, BAULKHAM HILLS
SUPPLEMENTARY TRAFFIC ASSESSMENT**

Further to my letter dated 19th July 2016, I understand the yields within the site have now changed.

The scheme summarised in the July 2016 letter comprised the yields shown in Table 1 below and this table also summarised the traffic likely to be generated by those yields.

Table 1: Traffic Generation from July 2016 Traffic Report

Land Use		Size	Traffic Generation Rates		Vehicle Movements (per hour)	
			Morning	Evening	Morning	Evening
Residential		294 units	0.19 per hour per unit	0.15 per hour per unit	56	44
Commercial		1153m ²	1.6 per hour per 100m ²	1.2 per hour per 100m ²	18	14
Retail		997m ²	2.3 per hour per 100m ²	4.6 per hour per 100m ²	23	46
Hotel/Pub		1153m ²	-	-	6	139
Community Centre / Library*	Assumed Library* area	1200m ²	0.25 per hour per 40 m ²	0.50 per hour per 40 m ²	8	15
	Assumed Community Centre*	1484m ²	3.75 per hour per 100m ²	7.5 per hour per 100m ²	56	111
Total					166	369

* The areas for the library and community facilities are only indicative at this stage and will effectively operate as a multiuse facility rather than the discrete uses indicated in the table. In the initial scheme, it was considered that there would be more community centre than

library. Subject to discussions with Council regarding the size and function of the facility, a further traffic investigation will need to be carried out at the Development Application stage to refine the traffic generation from the community facility.

I understand the latest scheme contains the following yields so I have updated Table 2 to reflect these amended yields and the associated traffic generation.

Table 2: Updated Traffic Generation September 2016

Land Use		Size	Traffic Generation Rates		Vehicle Movements (per hour)	
			Morning	Evening	Morning	Evening
Residential		200 units	0.19 per hour per unit	0.15 per hour per unit	38	30
Commercial		3829m ²	1.6 per hour per 100m ²	1.2 per hour per 100m ²	61	46
Retail		997m ²	2.3 per hour per 100m ²	4.6 per hour per 100m ²	23	46
Hotel/Pub		1153m ²	-	-	6	139
Community Centre / Library*	Assumed Library* area	1800m ²	0.25 per hour per 40 m ²	0.50 per hour per 40 m ²	11	23
	Assumed Community Centre*	700m ²	3.75 per hour per 100m ²	7.5 per hour per 100m ²	26	53
Total					166	336

* The areas for the library and community facilities are only indicative at this stage and will effectively operate as a multiuse facility rather than the discrete uses indicated in the table. In the initial scheme, it was considered that there would be more community centre than library. Subject to discussions with Council regarding the size and function of the facility, a further traffic investigation will need to be carried out at the Development Application stage to refine the traffic generation from the community facility.

As can be seen from a comparison of Tables 1 and 2 above, the traffic from the updated proposal should be no greater than the traffic generation of the previous scheme. Consequently, the results and conclusions of the letter dated 19th July 2016 (attached) are still robust.

We trust the above is clear but should you require anything further, please feel free to give me a call.

Yours sincerely,

Ken Hollyoak
Director

ATTACHMENT A

TTPP LETTER DATED 19th JULY 2016



360-378 Windsor Road, Baulkham Hills Proposed Mixed Use Development Planning Proposal Traffic Impact Assessment

Client // Dyldam (Windsor Star Pty Ltd)
Office // NSW
Reference // 15S1563000
Date // 16/02/16

360-378 Windsor Road, Baulkham Hills

Proposed Mixed Use Development

Planning Proposal Traffic Impact Assessment

Issue: B 16/02/16

Client: Dylidam (Windsor Star Pty Ltd)

Reference: 15S1563000

GTA Consultants Office: NSW

Quality Record


Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	16/02/16	Final	Oasika Faiz	Michael Lee	Ken Hollyoak	Ken Hollyoak
B	16/02/16	Final	Oasika Faiz	Michael Lee	Ken Hollyoak	

Table of Contents

1. Introduction	1
2. Existing Conditions	2
2.1 Site Description	2
2.2 Road Network	2
2.3 Traffic Volumes	3
2.4 Public Transport	4
2.5 Pedestrian and Cycle Infrastructure	5
2.6 Windsor Road Crash Statistics	6
3. Planning Proposal	8
3.1 Indicative Proposed Development Mix	8
3.2 Proposed Vehicle Access Points	8
3.3 Car Park Design	9
4. Traffic Impact Assessment	10
4.1 Traffic Generation	10
4.2 Distribution and Assignment	11
4.3 Traffic Capacity Analysis	11
5. Car Parking	16
5.1 Car Parking Requirements	16
6. Conclusion	18

Figures

Figure 2.1:	Subject Site and Its Environs	2
Figure 2.2:	Existing Peak Hour Traffic Volumes	4
Figure 2.3:	Hills Bus Network	5
Figure 2.4:	Cycling Map	6
Figure 2.5:	Reported Road Crashes on Windsor Road (1 January 2010 to 31 December 2014)	7
Figure 4.1:	2026 Future Base Case Traffic Glows (No Development Traffic)	13
Figure 4.2:	2026 Future Development Case Conditions (With Development Traffic)	14

Tables

Table 4.1:	Traffic Generation Estimates	10
Table 4.2:	Assumed Traffic Distribution	11
Table 4.3:	Directional Distribution (JTW)	11
Table 4.4:	Level of Service Criteria	12
Table 4.5:	Existing Condition Analysis Results	12
Table 4.6:	2026 Future Base Case Condition Analysis Results (No Development Traffic)	13
Table 4.7:	2026 Future Development Case Conditions Analysis Results (With Development Traffic)	15
Table 5.1:	Statutory Car Parking Requirements	16
Table 5.2:	RMS <i>Guide to Traffic Generating Developments</i> Car Parking Requirements	17

1. Introduction

This traffic impact assessment report accompanies a planning proposal for a proposed mixed use development at 360-378 Windsor Road, Baulkham Hills. The planning proposal will seek approval for an increase in height and floor space ratio (FSR) to the site. The proposed building envelopes provided with the planning proposal will support a total of up to 300 dwellings, 3,252m² of commercial/retail plus 450m² of hotel floor area are plus nine (9) hotel rooms.

The proposed development would be accommodated in four new residential buildings with various heights and the retention the existing hotel building and its existing use as a hotel/pub.

GTA Consultants has been commissioned by Dyldam (Windsor Star Pty Ltd) to prepare this traffic impact assessment to accompany the planning proposal.

The remainder of the report is set out as follows:

- Chapter 2 discusses the existing road network conditions surrounding the site
- Chapter 3 describes the planning proposal
- Chapter 4 assesses examines the traffic impacts arising from the proposed development
- Chapter 5 assesses the parking demand, and
- Chapter 6 presents the conclusions of the investigation.

2. Existing Conditions

2.1 Site Description

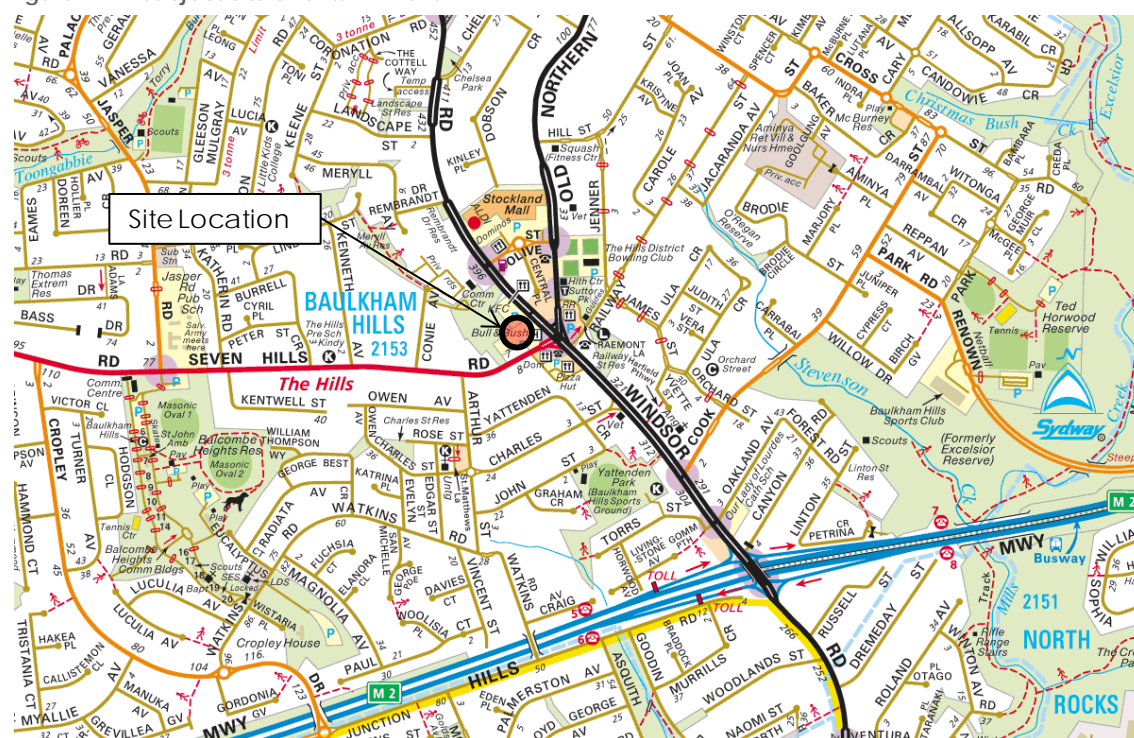
The subject site is located at 360-378 Windsor Road, Baulkham Hills. The site has a frontage to Windsor Road on its western boundary and Seven Hills Road on its southern boundary. The site currently has a land use classification as R1 General Residential and is occupied by the Bull 'n' Bush Hotel.

The subject site currently enjoys access from both Windsor Road and Seven Hills Road. These accesses permit left-in and left-out traffic movements to and from the adjacent public roads. In addition, the Windsor Road access also permits right turn traffic movement from Windsor Road into the subject site. It is noted that the existing Seven Hills Road access is located very close to the Seven Hills Road intersection with Windsor Road (approximately 45m).

The surrounding properties include retail and residential uses.

The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject Site and Its Environs



(Reproduced with permission from Sydway Publishing Pty Ltd)

2.2 Road Network

Below is a description of the local road network in the immediate vicinity of the subject site.

Windsor Road

Windsor Road is classified as a State Road and in the vicinity of the site is aligned in a north-west to south-east direction. It is a two-way divided road configured with a 5-lane, 19.5 metre wide

carriageway, set within an approximate 30 metre wide road reserve. The southbound approach contains three lanes including a bus lane.

At its intersection with the subject site, Windsor Road contains an additional southbound, right turn lane allowing vehicles to access the subject site from the north.

Kerbside parking is not permitted on Windsor Road in the vicinity of the site.

Old Northern Road

Old Northern Road is classified as a State Road and in the vicinity of the site is aligned in a north-south direction. It is a two-way road generally configured with a four-lane, 13 metre wide carriageway, set within an approximate 19.5 metre wide road reserve. At its intersection with Windsor Road, Old Northern Road widens to a six lane, 20 metre wide carriageway, set within an approximate 30 metre wide road reserve.

Old Northern Road includes two southbound bus lanes at the vicinity of its intersection with Windsor Road.

Seven Hills Road

Seven Hills Road is classified as a Regional Road and in the vicinity of the site is aligned in an east-west direction. It is a two-way road configured with five lanes at the frontage of the site within a 16 metre wide carriageway, set within an approximate 30 metre wide road reserve.

Further west of the site, Seven Hills Road narrows to a four-lane, 11.5 metre carriageway set within an approximate 20 metre wide road reserve.

At the frontage of the site, kerbside parking is not permitted. Further west, kerbside parking is permitted outside of clearway times.

In the vicinity of the site, kerbside parking is not permitted.

The following intersections currently exist in the vicinity of the site:

- Windsor Road-Seven Hills Road-Old Northern Road (signalised)
- Seven Hills Road-Connie Avenue (unsignalised)
- Windsor Road-Olive Road (signalised).

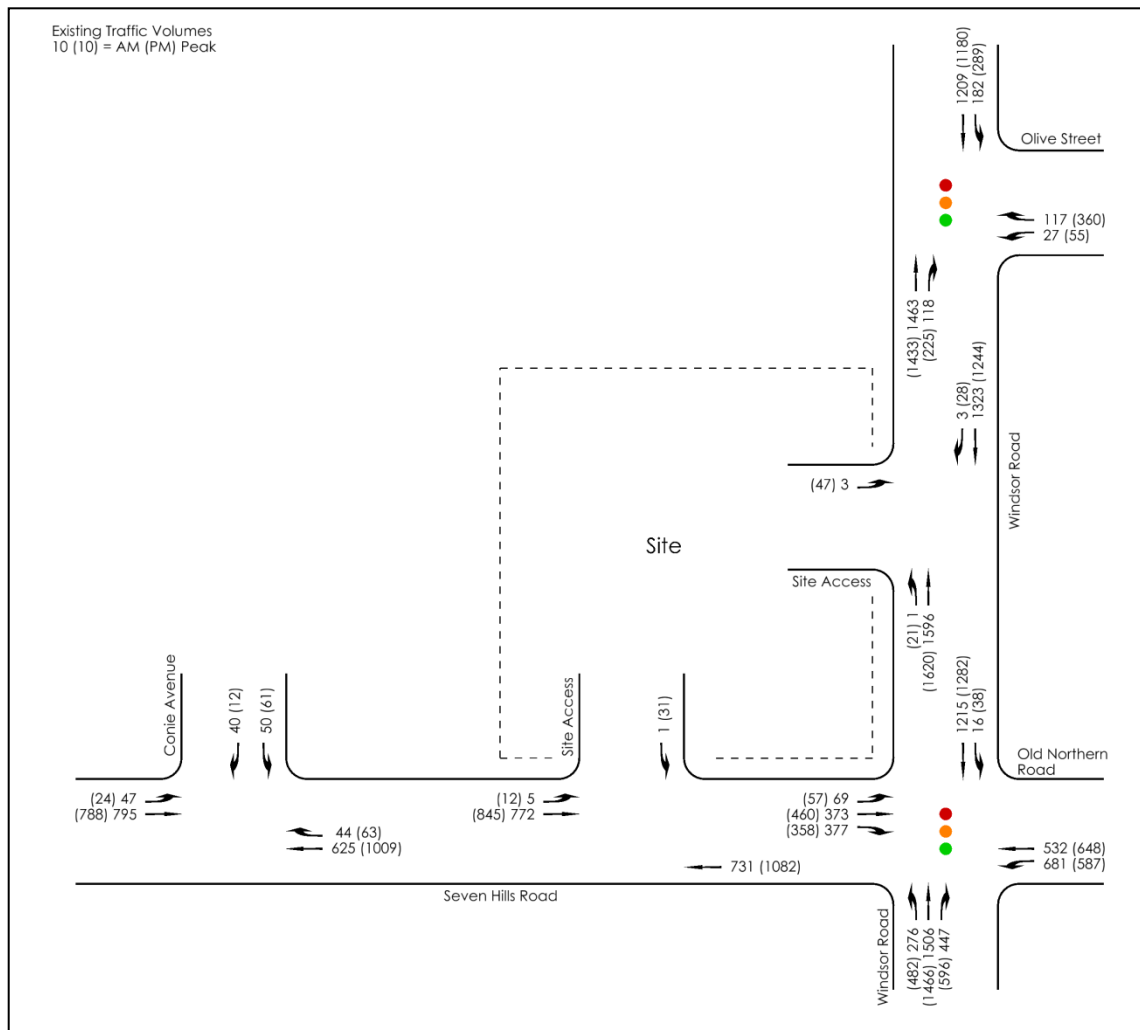
2.3 Traffic Volumes

Intersection turning movement counts were conducted on Thursday 14 May 2015 during the following peak periods:

- 7:00am and 9:00am, and
- 4:00pm and 6:00pm.

The morning and evening peak hour traffic volumes are summarised in Figure 2.2.

Figure 2.2: Existing Peak Hour Traffic Volumes

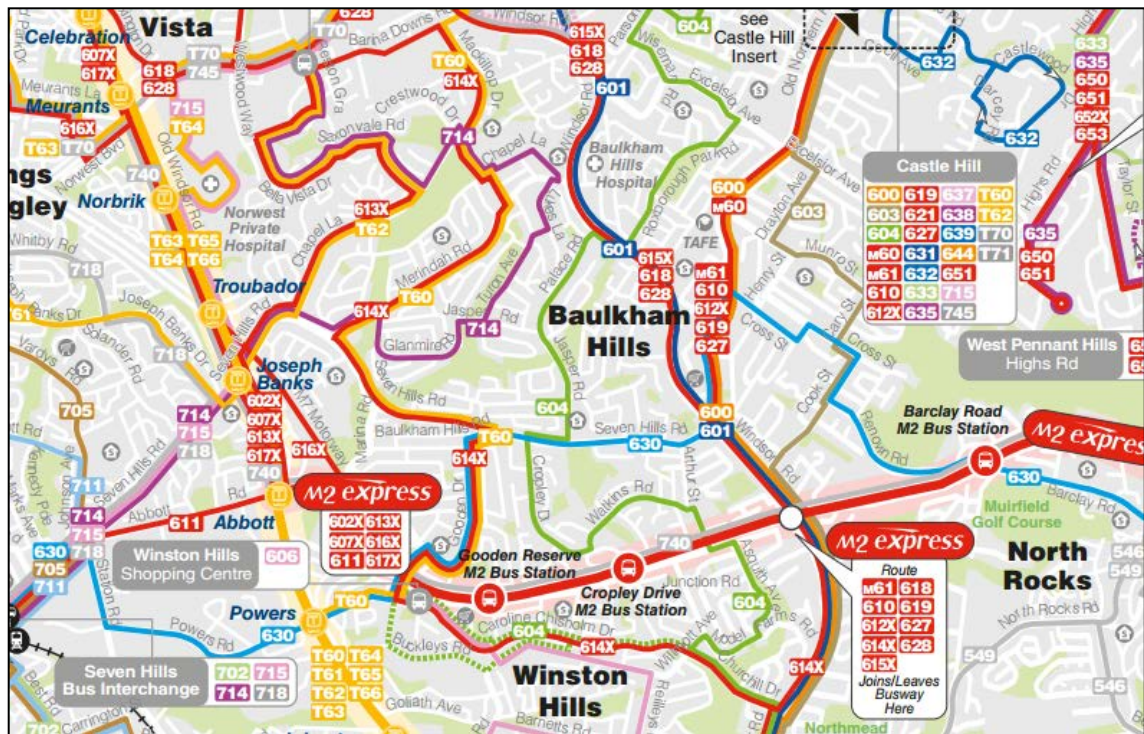


2.4 Public Transport

In terms of public transport, the site can be accessed by regular scheduled bus services. Several bus routes are serviced by bus stops located adjacent to the site on Seven Hills Road and Windsor Road. Additional bus services are available via Old Northern Road and Windsor Road within 150 to 200m from the site.

A review of the bus network available in the vicinity of the site is shown in Figure 2.3.

Figure 2.3: Hills Bus Network



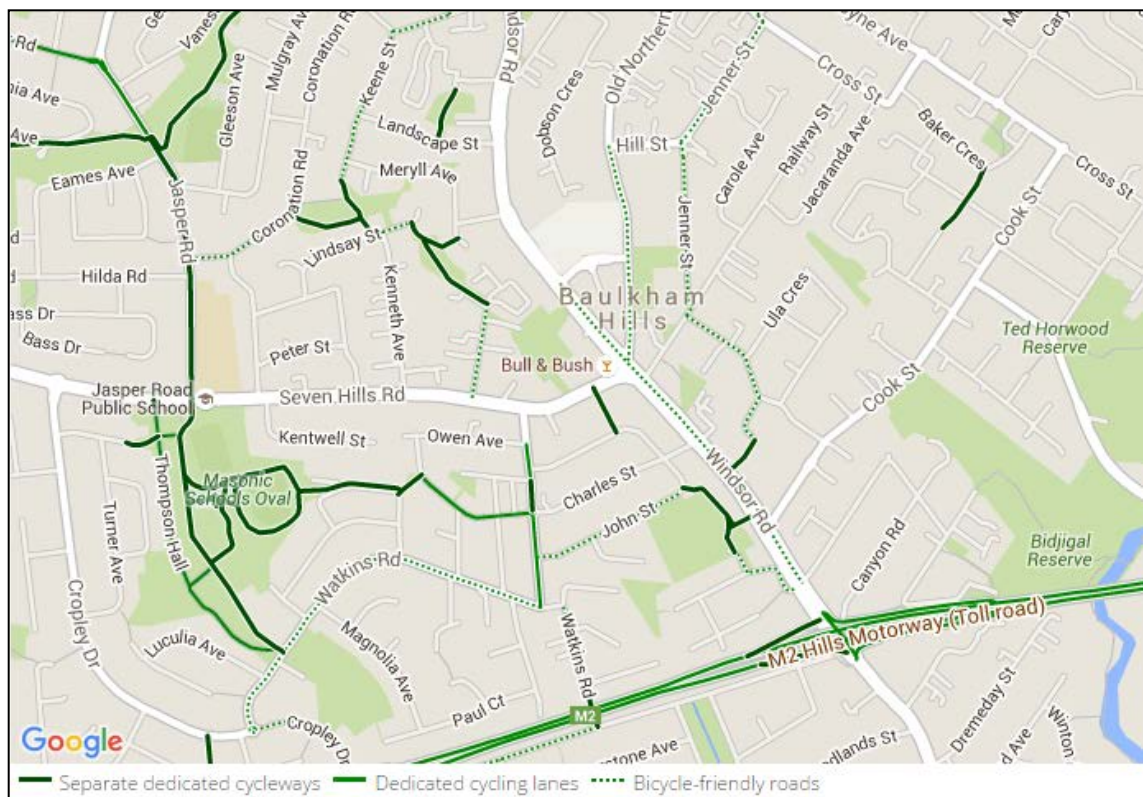
Source: <http://www.cdcbus.com.au/>, accessed 21/09/2015

2.5 Pedestrian and Cycle Infrastructure

Pedestrian paths are located on most roads adjacent to the side with path widths varying between 1m and 4.5m. The footpaths adjacent to the existing hotel are approximately 4 to 4.5m wide, on both Windsor Road and Seven Hills Road.

Cycling routes are available in the vicinity of the site. The location and type of cycling routes at Baulkham Hills are shown in Figure 2.4.

Figure 2.4: Cycling Map



Source: <http://www.sydneycycleways.net/map/>, accessed 21/09/2015

2.6 Windsor Road Crash Statistics

Crash data for the section of Windsor Road between Seven Hills Road and Olive Street has been obtained from Roads and Maritime Services (RMS).

The crash data relates to the latest five year period to 31 December 2014.

Within this period, the section of Windsor Road between Seven Hills Road and Olive Street has a total of four report crashes. The reported crashes do not include any fatalities. The reported crashes involved one crash resulting in at least one road user sustaining personal injuries and three property damage crashes.

Figure 2.5 presents the locations and summary of the reported crashes.

Figure 2.5: Reported Road Crashes on Windsor Road (1 January 2010 to 31 December 2014)



3. Planning Proposal

3.1 Indicative Proposed Development Mix

A planning proposal has been prepared for lodgement with The Hills Shire Council. The planning proposal will seek approval for additional FSR and height for which building envelopes have been prepared to demonstrate the scale of the proposed development.

The planning proposal relates to a proposed mixed use development including residential, retail, commercial and hotel/pub uses. The proposed development would be accommodated in four buildings of various heights and the part retention of the existing heritage building on the corner of Windsor Road and Seven Hills Road.

Following the approval of the planning proposal, a subsequent detailed development application for the proposed buildings will be submitted to Council for approval, which will confirm the exact residential apartment numbers and mix.

For traffic analytical purposes, below is a summary of the indicative development yield:

- 300 residential dwellings including:
 - 60 x 1-bedroom units
 - 210 x 2-bedroom units
 - 30 x 3-bedroom units
- 2,277m² of retail use
- 976m² of commercial use, and
- 451m² of hotel/pub.

The development yield is subject to further amendments, however it is not expected that it would vary to the point that it would affect the findings of this assessment. The development will be confirmed in a detailed development application at a later date.

The above development mix includes Council's requirement for five per cent of all residential units to be accessible units, that is, a minimum of 15 accessible units.

It is noted that The Hills Shire Council has developed a draft masterplan for the Baulkham Hills Town Centre. The draft masterplan identifies opportunities for further development within the town centre. One of the key investigation sites is the Bull and Bush Precinct, which is the subject site of this traffic assessment. The draft masterplan envisages that the Bull and Bush Precinct could be redeveloped to accommodate 200 residential apartments and 4,000m² of retail and commercial uses.

The planning proposal is generally consistent with the draft masterplan envisaged level of development for the subject site.

3.2 Proposed Vehicle Access Points

At present, the site is accessed from Windsor Road and Seven Hills Road. The existing Windsor Road access permits left-in and left-out as well as right-in traffic movements to and from Windsor Road. The Seven Hills Road access permits left-in and left-out traffic movements to and from Seven Hills Road.

It is proposed to be retained these accesses to serve the proposed development on the subject site.

The Seven Hills Road access is proposed as a secondary access while the Windsor Road access is proposed to be the primary access. The secondary access on Seven Hills Road would also provide access for service vehicles to the site. The proposed primary access on Windsor Road is proposed to be generally retained in its current configuration (i.e. permitting left-in and left-out traffic movements from and to Windsor Road as well as the right turn in from Windsor Road), however it is proposed to relocate this access further south along Windsor Road by approximately 30m to provide additional separation between the proposed Windsor Road access and the existing signalised Olive Street signalised intersection on Windsor Road. Similarly, the existing Seven Hills Road access is also proposed to be retained, but relocated approximately 10m further west from Windsor Road.

Whilst RMS has a preference to restrict access onto primary roads where an alternative suitable access is available, the existing access on Seven Hills Road is too close to the Windsor Road intersection to be able to safely accommodate the traffic anticipated from the development on its own. It is therefore, in this instance the intention to retain the Windsor Road access and use the Seven Hills Road as a secondary access.

From Figure 2.5, the current location of the access on Windsor Road has only one road crash occurring in the last five years. This only crash appears to be a random event. As such, at this location it does not appear to have any safety issues.

3.3 Car Park Design

The detailed design of the car park will be carried out at the development application stage. However, it is proposed that the car park and associated elements such as car parking space dimensions, circulation aisles and ramp would be designed in accordance with the relevant Australian Standard for car parking facilities, namely AS2890.1: 2004 and AS2890.6:2009.

It is proposed to design the residential component of the car park to comply with a Class 1A car park facility as specified in the Australian Standard. The Australian Standard indicates that Class 1A car parking facility can be provided for residential developments and employee parking i.e. generally low turnover long term parking. Class 1A car parking space dimensions are to be 2.4m wide by 5.4m long with an aisle width of 5.8m. Car parking spaces for the retail uses would be designed as a Class 3A parking facility, while car spaces for the hotel use would be designed as a Class 2 parking facility.

4. Traffic Impact Assessment

4.1 Traffic Generation

Traffic generation estimates for the proposed development have been sourced from *RMS Guide to Traffic Generating Developments 2002* and from the revised generation rates for residential and commercial land use in the *Guide to Traffic Generating Developments* technical direction (TDT 2013/04).

Estimates of peak hour traffic volumes resulting from the proposal are set out in Table 4.1.

Table 4.1: Traffic Generation Estimates

Land Use	Size	Traffic Generation Rates		Vehicle Movements	
		Morning	Evening	Morning	Evening
Residential	60 No. One bedroom	0.09 per hour per bedroom	0.07 per hour per bedroom	5 vph	4 vph
	210 No. Two bedroom	0.09 per hour per bedroom	0.07 per hour per bedroom	38 vph	29 vph
	30 No. Three bedroom	0.09 per hour per bedroom	0.07 per hour per bedroom	8 vph	6 vph
Commercial	2,277m ²	1.6 per hour per 100m ²	1.2 per hour per 100m ²	36 vph	27 vph
Retail [1]	976m ²	2.3 per hour per 100m ²	4.6 per hour per 100m ²	23 vph	45 vph
Hotel/Pub [2]	451m ²	-	-	6 vph	139 vph
Total				116 vph	250 vph

[1] It is assumed that in the morning peak period, the retail land use will generate approximately 50% of the traffic generated during the evening peak period.

[2] It is assumed that the future hotel/pub will generate the same traffic volumes as existing hotel/pub.

It is noted that the existing hotel/pub on the site, known as the Bull and Bush Hotel, continues to be trading at present. The existing total floor area of the hotel/pub has been estimated to be approximately 1,340m². From the traffic surveys conducted in May 2015, it was found that the existing hotel/pub use generates approximately 6 vehicles per hour (vph) and 139 vph during the morning and evening peak periods respectively. Although, the hotel has been retained in the proposed development scheme, but its floor area would be significantly reduced (to approximately 451m²). This traffic assessment has not discounted the estimated development traffic for the hotel/pub to take into account the reduction of hotel/pub floor area. It has been assumed the proposed hotel/pub although smaller continues to generate the same level of traffic. This is considered to be a conservative assumption in terms of traffic generation.

On this basis, Table 4.1 indicates that the proposed development is expected to generate 116 vph in the morning peak hour and 250 vph in the evening peak hour (including the development traffic arising from the proposed hotel use).

4.2 Distribution and Assignment

Table 4.2 presents the proportion of traffic in the inbound and outbound directions for each of the peak periods.

Table 4.2: Assumed Traffic Distribution

Land Uses	Morning Peak Period			Evening Peak Period		
	In	Out	Two-Way	In	Out	Two-Way
Residential	20%	80%	100%	80%	20%	100%
Commercial	80%	20%	100%	20%	80%	100%
Retail	80%	20%	100%	50%	50%	100%
Hotel/Pub	Per Survey			Per Survey		

In consideration of the distribution of the above traffic generation to the wider road network, 2011 Journey To Work (JTW) census data was assessed for the residential and commercial land uses. The JTW data provides an estimation of where people live and work in Baulkham Hills are travelling to and from. With consideration for the hierarchy of the roads in the vicinity of the site, the directional distribution that has been derived from the JTW data for the residential and commercial uses of the subject site are presented in Table 4.3.

Table 4.3: Directional Distribution (JTW)

To/From	Residential Trips	Commercial Trips
North (via Windsor Road)	6%	14%
East (via Old Northern Road)	14%	38%
South (via Windsor Road)	71%	33%
West (via Seven Hills Road)	9%	15%
Total	100%	100%

The JTW split above indicates that a large portion of residential traffic travels long distances and therefore south to access the M4 Motorway. In comparison a greater number of people from nearer suburbs work in the Baulkham Hills area and travel to work from all directions.

In relation to the retail trips, it has been assumed that this traffic would be distributed evenly to the surrounding road network. Thus, 25 per cent in each direction has been assumed.

4.3 Traffic Capacity Analysis

The operation of the key intersections within the study area have been assessed using SIDRA INTERSECTION 6.1, a computer based modelling package which calculates intersection performance.

RMS defines how efficient an intersection is operating using level of service which is directly related to the delay experienced by traffic travelling through the intersection. Table 4.4 shows the relationship between traffic delays and the level of service.

Table 4.4: Level of Service Criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Source: RTA's (now known as Roads and Maritime Services, RMS) *Guide to Traffic Generating Developments*

4.3.1 Existing Conditions

Intersection analysis of existing traffic condition has been conducted using traffic volumes shown in Figure 2.2. The existing case traffic models have been calibrated to match traffic conditions observed on site so to provide a good basis for which future operation of the nearby intersections can be assessed.

The analysis results are presented in Table 4.5.

Table 4.5: Existing Condition Analysis Results

Intersection	Intersection Type	Morning Peak Period		Evening Peak Period	
		Average Delays (s)	LoS	Average Delays (s)	LoS
Windsor Rd-Seven Hills Rd	Signal	50	D	70	E
Windsor Rd-Olive St	Signal	8	A	20	B
Seven Hills Rd-Conie Ave	Priority	49	D	68	E
Windsor Rd Access Intersection	Priority	22	B	24	B
Seven Hills Rd Access Intersection	Priority	6	A	6	A

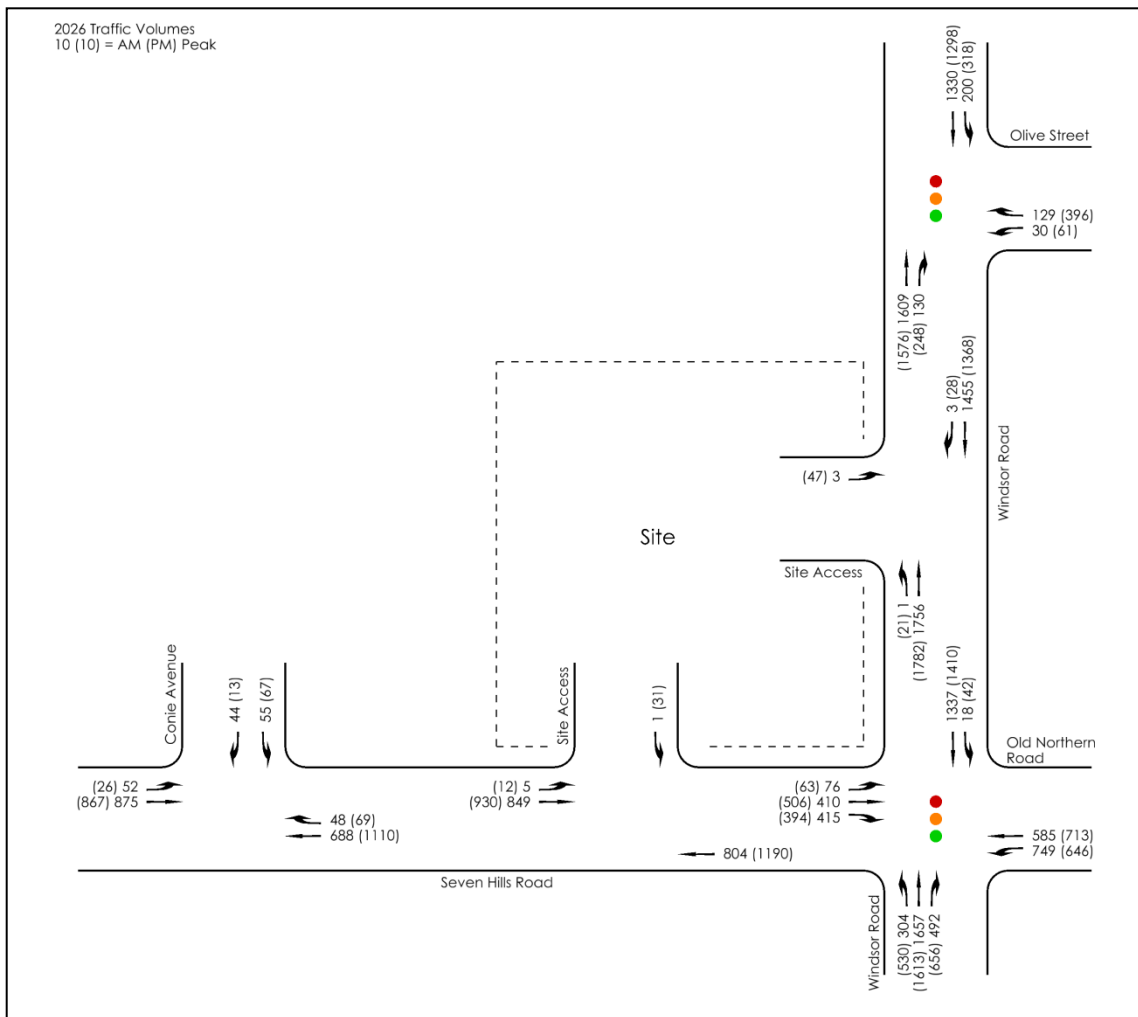
The analysis indicates that the Seven Hills Road intersections with Windsor Road and Conie Avenue operate at above traffic capacity under existing traffic conditions.

4.3.2 2026 Future Base Case Conditions (No Development Traffic)

The analysis was repeated for the 10 year future condition (without any development traffic), assuming that all intersections would continue to operate with its current configuration. This analysis also assumed the same traffic signal cycle and phase times as those for the existing conditions.

The 10 year (year 2026) future traffic has been determined by applying an average growth rate of one per cent per annum to the background traffic. This rate has been estimated by an assessment of the most recent 10 year Average Annual Daily Traffic (AADT) data provided by RMS. The resultant future base case traffic flows are shown in Figure 4.1.

Figure 4.1: 2026 Future Base Case Traffic Glows (No Development Traffic)



Intersection analysis was repeated for the future base case traffic conditions (no development traffic) using future base case traffic flows shown in Figure 4.1. The results are presented in Table 4.6.

Table 4.6: 2026 Future Base Case Condition Analysis Results (No Development Traffic)

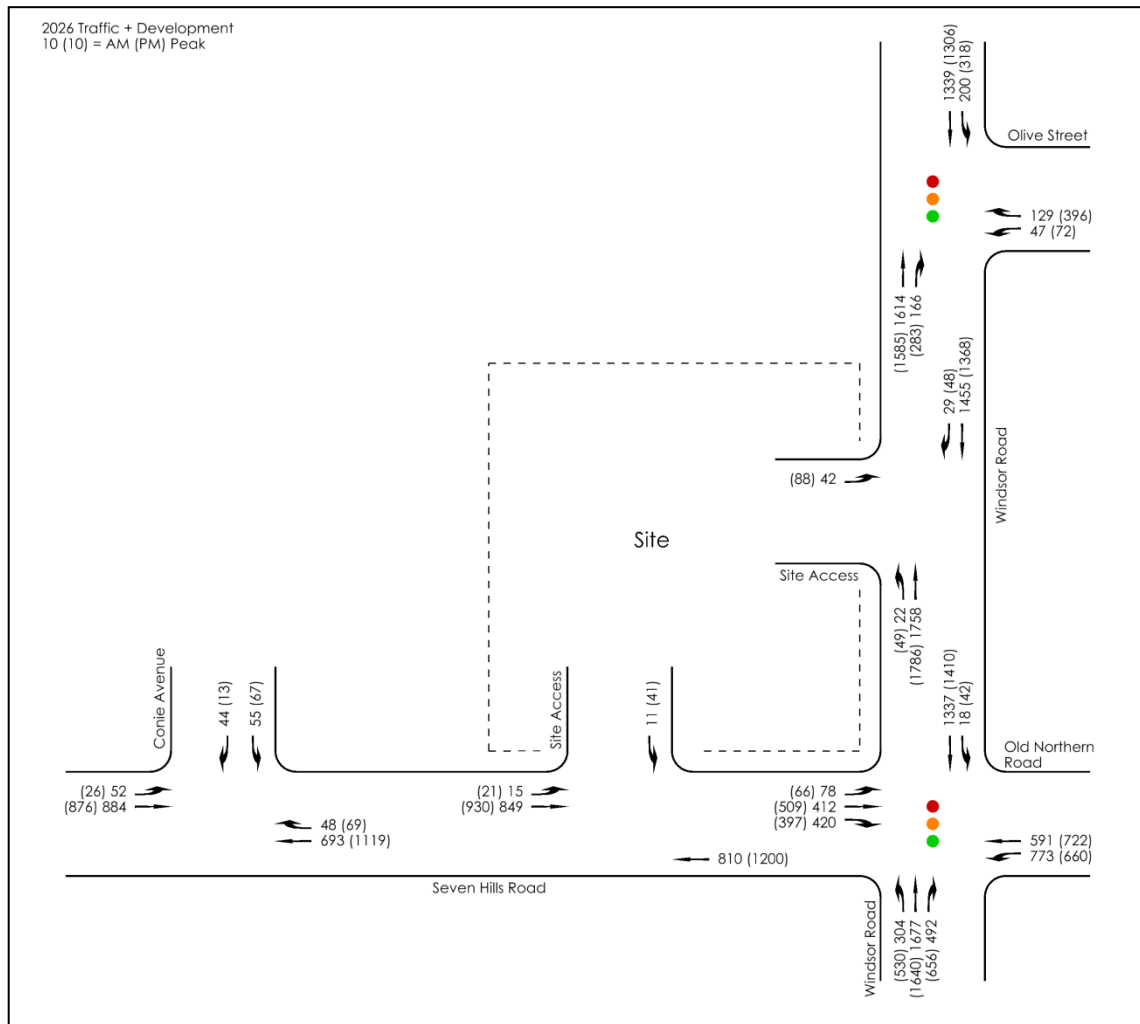
Intersection	Intersection Type	Morning Peak Period		Evening Peak Period	
		Average Delays (s)	LoS	Average Delays (s)	LoS
Windsor Rd-Seven Hills Rd	Signal	74	F	117	F
Windsor Rd-Olive St	Signal	9	A	28	B
Seven Hills Rd-Conie Ave	Priority	95	F	127	F
Windsor Rd Access Intersection	Priority	28	B	32	C
Seven Hills Rd Access Intersection	Priority	6	A	6	A

Table 4.6 indicates that growth in the background traffic alone would trigger the two Seven Hills Road intersections with Windsor Road and Conie Avenue to operate with LoS F in both peak periods.

4.3.3 2026 Future Development Case Conditions (With Development Traffic)

Development traffic arising from the proposed development has been assigned to the local road network as discussed in Sections 4.1 and 4.2. The resultant traffic flows are shown in Figure 4.2.

Figure 4.2: 2026 Future Development Case Conditions (With Development Traffic)



Intersection analysis for the future development case traffic condition has been repeated using traffic flows shown in Figure 4.2. The analysis results are presented in Table 4.7.

Table 4.7: 2026 Future Development Case Conditions Analysis Results (With Development Traffic)

Intersection	Intersection Type	Morning Peak Period		Evening Peak Period	
		Average Delays (s)	LoS	Average Delays (s)	LoS
Windsor Rd-Seven Hills Rd	Signal	76	F	123	F
Windsor Rd-Olive St	Signal	13	A	33	C
Seven Hills Rd-Conie Ave	Priority	104	F	136	F
Windsor Rd Access Intersection	Priority	32	C	39	C
Seven Hills Rd Access Intersection	Priority	6	A	6	A

Table 4.7 indicates that following the completion of the proposed development the intersection of Windsor Road with Olive Street and the two site accesses would continue to operate well with accepted traffic delays and level of service.

In addition, it is noted that at the Windsor Road access the maximum 95th percentile queue for the right turn movement from Windsor Road into the site is expected to be approximately one vehicle long. At present, there is sufficient queue storage for approximately three vehicles. As such, it is expected that the right turn movement queues would be such that in the future it would not block the adjacent (southbound) through traffic lane along Windsor Road.

The Seven Hills Road intersections with Conie Avenue and Windsor Road would continue to operate at unacceptable level of service if these intersections continue to operate under existing configurations.

In relation to the Conie Avenue intersection, The Hills Shire Council has identified a number of road upgrades within the Baulkham Hills town centre to facilitate future redevelopment of the town centre. These road improvements include the signalisation of the Conie Avenue intersection which would be undertaken through Section 94A funding.

GTA has reviewed the impact of implementing traffic signals at the Conie Avenue intersection with Seven Hills Road. From additional intersection analysis, following the completion of the proposed development the proposed signalisation of Conie Avenue would result in the intersection operating at a LOS A with minimal delay in both peak periods.

The proposed upgrade of Windsor Road and Seven Hills Road is not known at this stage. Council is in the process of consulting various stakeholders include RMS in relation to the form of the intersection upgrade for this intersection.

Regardless of the option it is expected that there would be sufficient performance improvements to accommodate the development traffic from the subject site.

5. Car Parking

5.1 Car Parking Requirements

The car parking provision requirements for different development types are set out in The Hills Shire Council's Development Control Plan 2012. A review of the car parking requirement rates and the development yield schedule results in a parking requirement for the proposed development is summarised in Table 5.1 below.

Table 5.1: Statutory Car Parking Requirements

Use	Size	Statutory Minimum Parking Rate	Minimum Parking Requirement
Residential			
1-bedroom	60 units	1 space per 1-bedroom unit	60
2-bedroom	210 units	1.5 space per 2-bedroom unit	315
3-bedroom	30 units	2 space per 3-bedroom unit	60
Visitor	300 units	2 spaces per 5 bedroom unit	120
Residential Sub-total			555
Retail	2,277m ²	1 space per 18.5m ²	123
Commercial	976m ²	1 space per 40m ²	24
Non-Residential Sub-total			147
Hotel/ Pub [1]	451m ²	1 space per 1.85m ² of service area in bar and lounge plus 1 space per 2 employees	245
Hotel Sub-total			245
Total			947

[1] The number of hotel rooms has not yet been determined. As such, to be conservative, the rate for bar/lounge parking has been assumed for the whole building.

Based on the above, the proposed development could be required to provide a minimum of 947 car parking spaces including:

- 555 residential spaces
- 147 retail and commercial spaces, and
- 245 hotel/pub spaces.

It is considered that the above DCP parking requirement is excessive.

Table 5.2 provides an assessment of parking requirements using parking provisional for residents and visitors set out in the *RMS Guide to Traffic Generating Developments*.

Table 5.2: RMS Guide to Traffic Generating Developments Car Parking Requirements

Unit Type	No. of Units/ GFA	RMS Minimum Car Parking Requirements	
		Provision Rates	Required Parking
Residential Use			
- 1-bedroom	60 units	0.6 space per dwelling	36
- 2-bedroom	210 units	0.9 spaces per dwelling	189
- 3-bedroom	30 units	1.4 spaces per dwelling	42
- Subtotal (residential tenants only)	300 units	-	267
- Visitors	-	0.2 spaces per dwelling	60
Total Requirement			327

From Table 5.2, it can be seen that the RMS guidelines require a minimum of 327 car parking spaces to be provided. This compares to 555 residential car parking spaces stipulated in the DCP.

Similar, the parking requirement for the Hotel/pub is considered to be excessive considering that its area and provision of services will reduce compared to existing conditions. Currently the existing development (including the drive thru bottle shop which will be demolished) contains approximately 100 car parking spaces for 1,340m² of floor area including nine hotel rooms and 680m² of bar area. This is approximately one car parking space per 13.4m² of total floor area. Assuming this rate continues to be applicable for the proposed development, a requirement for 34 car parking spaces would be required for the hotel/pub land uses. The proposed development is not expected to exceed existing usage rates.

As such, a minimum of 508 car parking spaces for the whole development is considered to be sufficient.

Given that the quantum and types of uses are not known at this stage, it is recommended that the parking provision be further reviewed at the development application stage to inform the detailed design.

6. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

- i The subject site is located at 360-378 Windsor Road, Baulkham Hills.
- ii The subject site is currently occupied by the Bull and Bush Hotel.
- iii For traffic analytical analysis, this traffic assessment assumes the site would be developed to accommodate approximately 300 residential apartments, 2,277m² of retail floor area, 976m² of commercial floor area and 451m² of hotel/pub use.
- iv The existing uses on the site has been surveyed to generate approximately 6 and 139 vehicle movements per hour during the morning and evening peak periods respectively.
- v Following the completion of the proposed development, the site is expected to generate up to 250 and 116 vehicle movements per hour in the morning and evening peak periods respectively.
- vi There is adequate capacity in the surrounding road network to cater for the traffic generated by the proposed development, following road upgrade works proposed by Council at the Conie Avenue and Windsor Road intersections with Seven Hills Road. Road upgrades have been identified as items in the Draft Baulkham Hills Masterplan, currently under development.
- vii The hypothetical development scenario for subject site could generate a parking requirement of 947 car parking spaces using existing parking provision rates in the existing development control plan.
- viii It is considered that the existing development control plan's required parking provision is excessive. It is recommended that parking provision be further reviewed during the development application stage.

Melbourne
A Level 25, 55 Collins Street
PO Box 24055
MELBOURNE VIC 3000
P +613 9851 9600
E melbourne@gta.com.au

Sydney
A Level 6, 15 Help Street
CHATSWOOD NSW 2067
PO Box 5254
WEST CHATSWOOD NSW 1515
P +612 8448 1800
E sydney@gta.com.au

Brisbane
A Level 4, 283 Elizabeth Street
BRISBANE QLD 4000
GPO Box 115
BRISBANE QLD 4001
P +617 3113 5000
E brisbane@gta.com.au

Canberra
A Tower A, Level 5,
7 London Circuit
Canberra ACT 2600
P +612 6243 4826
E canberra@gta.com.au

Adelaide
A Suite 4, Level 1, 136 The Parade
PO Box 3421
NORWOOD SA 5067
P +618 8334 3600
E adelaide@gta.com.au

Gold Coast
A Level 9, Corporate Centre 2
Box 37, 1 Corporate Court
BUNDALL QLD 4217
P +617 5510 4800
F +617 5510 4814
E goldcoast@gta.com.au

Townsville
A Level 1, 25 Sturt Street
PO Box 1064
TOWNSVILLE QLD 4810
P +617 4722 2765
E townsville@gta.com.au

Perth
A Level 27, 44 St Georges Terrace
PERTH WA 6000
P +618 6361 4634
E perth@gta.com.au