SECAsolution
ACN: 164611652
Suite 1, 161 Scott Street
Newcastle NSW 2300
Ph: (02) 4032 7979
admin@secasolution.com.au

20 November 2017

P0889 ADG Wauchope Aged Care TIA

ADG Architects Pty Ltd
P O Box 457
Gosford NSW 2250

Attn: Anthony Kelly

Dear Anthony,

Proposed RACF and Subacute care facility, Johnstone Street and High Street, Wauchope NSW
Traffic Impact Assessment

With regards to the proposed 140 bed aged care facility off Johnstone Street and 40 bed subacute care facility off High Street, Wauchope we have completed our site investigations and reviewed the documentation provided. We have reviewed the access location and surveyed the operation of the road network in this location and provide the following traffic impact statement. This assessment has been prepared in accordance with the Austroads Guidelines and Table 2.1 of the RMS Guide to Traffic Generating Developments which provides the structure for the reporting of key issues to be addressed when determining the impacts of traffic associated with a development. This guide indicates that the use of this format and checklist ensures that the most significant matters are considered by the relevant road authority.

The report has also taken into consideration the Port Macquarie – Hastings Council DCP, SEPP for Seniors or People with a Disability 2004, and AS/NZS 2890 Parking Facilities which are the relevant planning controls for the project. The location of the site is shown below in Figure 1.

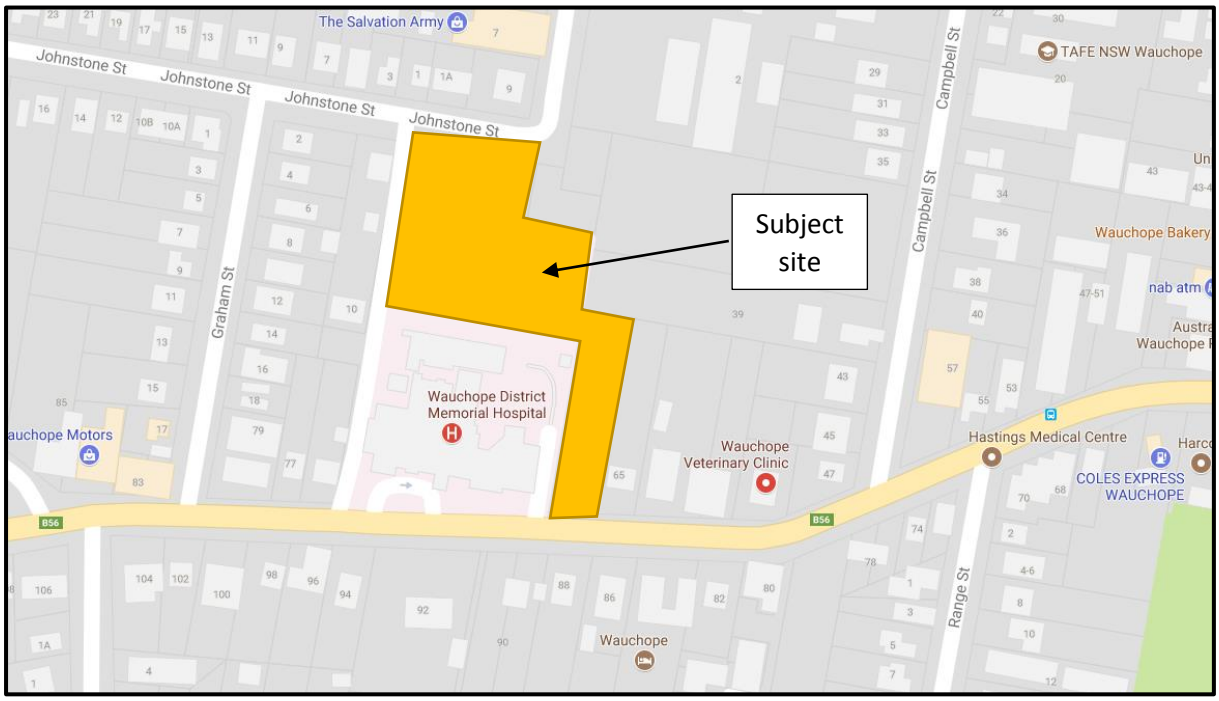

Figure 1 – Site location within the context of the local road network

Quality Traffic Advice

Item	Comment
Existing Situation	
2.1.1 Site Location and Access	The subject site is located between Johnstone Street and High Street in Wauchope. It is split into two separate components with the proposed residential aged care facility being located to the rear of the site with access off Johnstone Street only while the subacute care facility is located with direct access to High Street only. Service access is provided between both sites with entry from Johnstone Street and exit to High Street. The access to the different elements of the project will replace the existing access points to the site, which are available off both High Street and Johnstone Street.
2.2.1 Road Hierarchy	The main road through the locality is **High Street** to the immediate south of the site which provides a link to the centre of Wauchope to the east and forms part of the Oxley Highway (HW11). It connects with the Pacific Highway to the east for access through to Port Macquarie whilst to the west Walcha and the New England Highway. It forms part of the state road network in this location. In the locality of the subject site High Street provides a single lane of travel in both directions with kerb side parking permitted along both sides of the road for the majority of its length. It operates under the posted speed limit of 50 km/h and provides a footpath to both sides of the road. There are street lights along its length and it has a mixture of residential development and commercial / health care to both sides with direct vehicle access to the road via numerous driveways along its length. To the west of the site High Street provides access to the Wauchope District Memorial Hospital. **Graham Street** to the west of the site provides a connection between High Street and Johnstone Street and connects with both of these roads via simple give way controlled T-intersections. It provides a single lane of travel in both directions with kerb side parking permitted along both sides. There is a single footpath along the eastern side of the road only. **Johnstone Street** to the rear of the overall site provides access to the aged care facility and provides a single lane of travel in each direction and allows for kerb side parking along much of its length. There is a footpath along its boundary adjacent to the subject site allowing for a connection to Graham Street. It provides access to a number of individual residential lots as well as Wauchope Public School. It operates under the posted speed limit of 50 km/h with a 40 km/h school speed zone running along the site frontage.
2.2.2 Roadworks	During the site work (19th September 2017) there were no road works occurring within the general locality of the subject site. The road network in this location is mature and there is very limited opportunity for any significant road upgrades. Other than general

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	maintenance it is considered that no other road works will occur in this location.
2.2.3 Traffic Management Works	None currently noted. The road network in this location operates well with minimal delays so no road management works required.
2.2.4 Pedestrian and Cycling Facilities	There is a footpath to both sides of High Street running along the site frontage which provides access to the centre of Wauchope and the local shops / banks etc. in the centre of town. There are also footpaths along Johnstone Street adjacent to the site as well as Graham Street allowing for a full pedestrian connection to High Street external to the site. There are limited cycling facilities in this location with cyclists able to ride on the roads as required. Whilst traffic flows on High Street can be reasonably high in the peak periods, outside of the peaks the flows are lower and allow for safe cyclist use. The traffic flows on the other local side roads are much lower and cater for cyclists as required within the road pavement. A review of the Port Macquarie-Hastings Bike Plan indicates that there are no bike facilities proposed along Johnstone Street whilst those proposed along High Street would be under the control of the RMS.  *Figure 2 – extract from Wauchope Bike Paths*
2.2.5 Public Transport	There are no bus stops within the immediate vicinity of the subject site, however there are bus stops to the east and west of the site on High Street. Busways provides a service that connects along Johnstone Street and allows for a connection to Port Macquarie.
2.3 Traffic Flows	
2.3.1 Daily Traffic Flows	Traffic data was collected by Seca Solution as part of this project during a typical morning and afternoon peak period (18th and 19th September 2017) to obtain traffic flows in the vicinity of the site during a typical afternoon and morning peak period. These surveys also observed the impact of the school pick up to the rear of the site on Johnstone Street as well as the general operation of High Street.

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	During the afternoon peak period it can be seen that the traffic flows on Johnstone Street are reflective of the demands created by the school pick up. Traffic was observed to arrive at the school from around 2.30 PM with parents / carers parking along both sides of Johnstone Street waiting for the school to finish. Once the school pick up activities had been completed, the traffic flows decreased to a minimum and are created by the local residential demands only with very little demand for through traffic movements. Once the school pick up activity had finished, the traffic flows on Johnstone Street adjacent to the site were less than 60 vehicles per hour 2-way. Traffic flows on High Street were much higher and were observed during the traditional afternoon peak and the morning peak period. During the afternoon peak hour (noted at 4.30 to 5.30 PM) the 2-way traffic flow on High Street was 789 vehicles with 482 westbound (61%) leaving Wauchope to travel along the Oxley Highway. During the morning peak hour (noted at 8.15 to 9.15) the 2-way flow was 1,008 with 697 eastbound (69%) towards Wauchope and Port Macquarie. Based on peak hour flows typically representing 10% of the daily flows it is considered that the daily traffic flows on High Street could be in the order of 9,000 vehicles. The morning survey on High Street also reviewed the traffic movements in and out of Graham Street and it could be seen that the traffic on Graham Street was primarily driven by parents who had dropped off school children. The 2-way flow on Graham Street between 8.15 and 9.15 was 194 vehicles with the vast majority of these being left in and left out (75% of the total movements), reflective of parents / carers diverting off High Street to drop children at the Wauchope Public School. Once the morning drop-off period at been completed, the traffic flows on High Street dropped off.
2.3.2 Daily Traffic Flow Distribution	The afternoon peak hour traffic flows along High Street show a strong bias in traffic movements westbound out of Wauchope, reflective of commuter traffic demands from both Wauchope and probably Port Macquarie further east of the locality. The reverse bias in traffic movements was observed along High Street (Oxley Highway) again reflective of commuter demands to the centre of Wauchope and beyond to Port Macquarie. Overall daily traffic flows are considered to be balanced in both directions.
2.3.3 Vehicle Speeds	No speed surveys were completed as part of the study work. It is considered that the majority of drivers drive at the posted speed limit on the local roads surrounding the subject site. Due to the 90-degree bend on Johnstone Street the traffic speeds are well within the posted speed limit of 50 km/h and less than 40 km/h during the school drop off period. The presence of parked cars to both sides of High Street discourages drivers from speeding in this location.

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2.3.4 Existing Site Flows	The rear of the site fronting Johnstone Street is currently occupied by an existing 100 bed nursing home and generates a low number of vehicles associated with staff and visitors. No vehicles were noted entering or exiting this site during the afternoon traffic surveys when the school pick up was occurring. Applying the RMS Guide to Traffic Generating Development rate for aged care facilities of 0.4 trips per unit in the PM peak would see the existing site generate 40 trips in the typical afternoon peak. This does not coincide with the local afternoon peak which is associated with the school. Based on this rate daily flows associated with the facility would be in the order of 210 vehicles per day. The front part of the site fronting High Street was vacant at the time of the surveys and was fenced off from all access.
2.3.5 Heavy Vehicle Flows	As High Street forms part of the Oxley Highway there were a number of heavy vehicles observed travelling in both directions. These included semi-trailers, buses and waste collection vehicles. Heavy vehicle movements represented less than 10% of the traffic flows along High Street.
2.3.6 Current Road Network Operation	The road network in the vicinity of the subject site currently operates very well, with minor delays only during the morning and afternoon peak period observed at the intersection of High Street and Graham Street. Outside of the school pick up (and drop off period) traffic flows on Johnstone Street are negligible. During the survey periods the traffic in both directions along High Street operates well with no noticeable delays or congestion noted. The only noticeable delays along High Street occur at the roundabout controlled intersection with Cameron Street and the pedestrian crossings in town create some delays for through traffic movements.
2.4 Traffic Safety and Accident History	Accident data from the RMS confirms that there are no major safety issues in the vicinity of the site. A review of the local road shows that the road is well laid out and visibility at the various intersections is good. Traffic speeds are within the posted speed limit and given the comparatively low traffic flows, especially outside of the peak hour on High Street, road safety in this location is good. It is considered that there are no specific road safety concerns in the locality of the subject site.
2.5 Parking Supply and Demand	
2.5.1 On-street Parking Provision	Parking is permitted along both sides of the local roads surrounding the subject site with appropriate signage to limit parking near intersections etc. There are also a number of driveways in the general locality to individual residential lots and the hospital fronting High Street which limit parking in certain locations.
2.5.3 Parking Demand and Utilisation	During the site work it was noted that for the school pick up period there were a number of cars parked along Johnstone Street associated with parents / carers picking up students. Once the

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	students had been picked up the cars moved away and once this activity was completed there were no cars parked on Johnstone Street. Parking along High Street was continual throughout the survey period in the morning and afternoon periods. This would appear to be associated with both staff and patient parking requirements for the hospital which provides a wide range of community health services. The local residential lots typically have off-street parking.
2.5.4 Set down or pick up areas	There are no designated set down areas in the immediate locality of the subject site on either High Street or Johnstone Street.
2.6 Public Transport	
2.6.1 Rail Station Locations	There is a train station in Wauchope approximately 600-700 metres from the subject site that provides a limited service for connections to North Coast NSW train services. Trains provide a service to the north and south for regional services.
2.6.2 Bus Stops and Associated Facilities	There are no bus stops in the immediate locality of the subject site. Buses are available on Johnstone Street (bus route 335W provided by Busways) which provide for local connections and access to Port Macquarie.
2.6.3 Pedestrians	There are pedestrian footpaths to both sides of High Street and along one side of both Johnstone Street and Graham Street that allows for pedestrian access between the subject site and the local attractions within Wauchope as required.
2.7 Other Proposed Developments	No other major development occurring in the immediate vicinity of the subject site.
The Development	
3.1 The Development	The proposal consists of a Residential Aged Care Facility with 140 beds proposed with parking on site with access to Johnstone Street only. This will replace the current 100 bed aged care facility on this site. For the site fronting High Street a 40-bed subacute care facility is proposed with on-site parking and access direct to High Street.
3.1.1 Nature of Development	The project consists of aged care facility and subacute care facility.
3.1.2 Access and Circulation Requirements	There will be an entry / exit provided to both High Street and Johnstone Street as part of the project and a vehicle connection will be provided through the site. The parking for the aged care facility fronts Johnstone Street and drivers will access the site from Johnstone Street as this will be the postal address for the aged care facility. The entry / exit fronting High Street allows for access to the on-site parking for the subacute care facility, but vehicles cannot be driven through the site to connect with Johnstone Street. The central part of the driveway between the two elements is one-way operational only southbound towards High Street. This driveway is primarily designed in this manner to allow for larger vehicles to service the site including waste collection vehicles and ambulances. These vehicles will enter the site via Johnstone

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	Street and proceed through the site in a forward direction to then exit onto High Street. The design of the driveway and internal driveway ensures that all vehicles can enter and exit in a forward direction.
3.2 Access	The new access driveways will replace the existing driveways that provides access to the site and all redundant cross overs will be removed. A new access driveway is provided on the north-eastern corner of the site fronting Johnstone Street allowing for entry movements only. It allows for direct access to the on-site car park area to the front of the new building and provides direct access to the drop off zone in front of the building (for a community bus). The access along the western boundary of the aged care facility allows for access direct to the staff parking area along the boundary of the building as well as access for service vehicles for both of the sites, including ambulance access. This driveway also allows for vehicles exiting the parking area to the front of the site. The access off High Street provides access to visitor parking spaces (10) to the front of the building only. The two sites will operate independently, however a service road connects through the site that will cater for service vehicles only. This access between the two sites will operate one-way only with service vehicles entering off Johnstone Street then exiting on to High Street, with all movements in a forward direction. This service road will also allow for the staff spaces (11 to 15) associated with the subacute care facility to exit the site onto High Street (with staff entering off Johnstone Street to enter these spaces).
3.2.1 Driveway Location	The driveway access points are in a similar location to the existing access points to the subject site off both High Street and Johnstone Street. There is a new driveway crossing being built in the north-east corner of the aged care facility to improve access and circulation for vehicles entering off Johnstone Street. All new driveway crossings will be designed and constructed in accordance with Council design requirements and all redundant crossings will be removed and new kerbing provided.
3.2.2 Sight Distances	Sight lines have been checked on site for the proposed new driveways. The posted speed limit on Johnstone Street is 50 km/h (40 km/h during school times) and the visibility has been checked on site. For a 50 km/h speed limit AS2890 indicates a desirable sight line distance of 69 metres. The measured sight distance on site was 75 metres to the right and 150 m or more to the left. For visibility to the right, it is noted that this allows for viewing a vehicle approaching just before the 90-degree bend on Johnstone Street and as such, the vehicle speeds are lower than 50 km/h, which is further reinforced during school drop off and pick up times when the limit of 40 km/h applies.

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	Visibility in both directions can be impacted upon by parked cars on both sides of the driveways, but this parking is typically only during the drop off and more specifically the pick-up time for the school. Outside of these school demands, there is very limited parking demand on street in this location. Visibility has also been checked for the new site access on High Street. The posted speed limit is 50 km/h and based on Austroads Guidelines (due to the higher order road) the sight line distance required is 90 metres minimum. The sight distance has been measured on site and 120 metres is available to the left and 150 metres to the right. It is noted that visibility can be impacted upon by parked cars, in a similar manner to the other driveways in this location. There is a high demand for on-street parking in this location and drivers exiting the driveways were observed to cross over the driveway slightly to ensure they can clearly see the road in both directions before entering the traffic stream.
3.2.3 Service Vehicle Access	The site will not require access for high volumes of service vehicles. Food and linen service will be provided primarily by HiAce style vans or SRV using the service bays provided adjacent to the two separate buildings. These vehicles will enter off Johnstone Street only and proceed through the site in a forward direction.
3.2.4 Queuing at entrance to site	Limited vehicle queues are expected at site entry / exit point on Johnstone Street due to the low overall flows from the site as well as very low flows on Johnstone Street. Any vehicle propped to turn right into the site will be clearly visible for vehicles travelling along Johnstone Street and the width of the road pavement permits a driver to manoeuvre past this propped vehicle if necessary and will not create any safety concerns. During the site visit no delays were observed. For the access on High Street, the traffic demands into the site will be very low, as it only provides access to 10 visitor spaces. For a driver propped on High Street waiting to turn right into the site, the forward visibility for traffic westbound on High Street is good, being able to observe the vehicle waiting to turn right into the site and adjust their vehicle speed accordingly. Given the low demand and low number of parking spaces it is considered that this right turn flow will be less than 10 vehicles per hour and as such limited queues will form for this movement.
3.2.5 Comparison with existing site access	Existing site access is similar in layout and characteristics to the proposed driveways.
3.2.6 Access to Public Transport	There are no bus stops in the immediate locality of the subject site. Buses are available on Johnstone Street (bus route 335W provided by Busways) which provide for local connections and access to Port Macquarie. A pedestrian path on High Street provides for access to bus stops to the west of the site whilst pedestrians can also walk along Johnstone Street to access the bus route in this location.

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3.3 Circulation	
3.3.1 Pattern of circulation	All vehicles can enter and exit the site in a forward direction and circulate around the carparks, exiting as required. The service road access through the site ensures that all service vehicles can enter and exit the site in a forward direction. There is a drop off zone within the site to the front of the building on Johnstone Street that allows for taxis and an ambulance as required and these vehicles can enter and exit off Johnstone Street in a forward direction. The ambulance bay for the subacute care unit has access off Johnstone Street and exit via High Street, with vehicles all operating in a forward direction.
3.3.2 Road width	The internal driveways have been designed in accordance with AS2890 and allow for two-way traffic movements as required. For the service vehicle access through the site, the driveway width is a minimum of 4.0 metres.
3.3.3 Internal Bus Movements	No internal bus movement will be required through the site. A small bus may access the site to pick up and drop of residents off Johnstone Street, using the drop off zone to the front of the building.
3.3.4 Service Area Layout	A service area is provided to the rear of the building off Johnstone Street, adjacent to the laundry and kitchen area. This service area accommodates a Small Rigid Vehicle and a small van such as a Toyota Hi-Ace. A service/refuse area for the subacute care unit allows for the waste collection vehicle. The ambulance service bay is located adjacent to this area.
3.4 Parking	
3.4.1 Proposed Supply	The parking supply for the development allows for a total of 67 marked spaces within the site, plus an ambulance parking bay and service bays.
3.4.2 Authority Parking	Under the Council DCP the parking for the Aged Care Living needs to be assessed under the *SEPP (Housing for Seniors or People with a Disability) 2004*. For the subacute care, the patient parking has been assessed under the same SEPP, and although a rate consistent with dementia care i.e. patients not driving could be applied, the higher rate of 1 space per 10 beds has been considered appropriate. The subacute care has 3 consultant rooms and these have been assessed against the Council DCP for medical consulting rooms. For the overall development the following parking rates have been applied: • 1 space per 10 beds for aged care unit (140 beds, 14 parking spaces) • 1 space per 2 staff for aged care facility (44 staff, 22 spaces) • 1 space per 10 beds for the subacute care units (50 beds, 5 spaces) • 1 per 2 staff for subacute care units (10 staff, 5 spaces) • 3 spaces per consulting room (3 rooms, 9 spaces)

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	• 1 space per 2 staff for consulting rooms (6 staff, 3 spaces)
3.4.3 Parking Layout	The parking layout is in accordance with AS2890 and provides marked disabled parking spaces across the 2 sites. Under AS2890, the parking for the aged care facility is class 1A, giving parking spaces 2.4 metres wide and 5.4 metres long, together with aisle width of 5.8 metres. For the subacute unit, the parking class from AS2890 is 3, giving parking space width of 2.6 metres, length 5.4 metres and aisle width of 5.8 metres.
3.4.4 Parking Demand	Applying the SEPP and the Council DCP as appropriate, it is considered that the parking demand will be for 58 vehicles. With the provision of 67 spaces on site it is considered that the parking demand can be accommodated on site in accordance with these codes.
3.4.5 Service Vehicle Parking	Parking for an ambulance will be provided adjacent to the subacute building entry together with a general use loading bay. Note that the service road through the site does not allow for light vehicle use except for 5 staff spaces. There is a loading area to the rear of the aged care facility adjacent to the laundry and kitchen. Ambulance drop off / pick up can occur to the front of this building accessed off Johnstone Street. Waste collection vehicles will enter off Johnstone Street, stand within the site to collect the waste with staff on-site to co-ordinate the waste collection and then exit on to High Street.
3.4.6 Pedestrian and Bicycle Facilities	Pedestrians demands will be minimal however residents shall be able to access the road frontage on both Johnstone Street and High Street from the building entry. Staff cycling to work will be able to park within the site footprint, with bike parking available within the building or the car park as required. A bike stand will be provided to facilitate this as appropriate.
Traffic Assessment	
4.1 Traffic Generation	Aged care and subacute units are low generators of traffic. The updated RMS Guide to Traffic Generating Developments indicates a PM peak hour rate of: • 0.4 could be applied to seniors living It is recognised by the Guide that the peak traffic associated with such developments does not generally coincide with the AM peak on the road network. For the development of 140 beds this indicates a peak hour value of 56 vehicle trips in the PM peak. Daily traffic flows are given as: • 2.1 per unit by the RMS. Applying this rate gives in the order of 294 vehicle movements per day i.e.147 in and 147 out per day. Given the proposed development is an increase of only 40 beds over the existing situation, the *additional trips* would be 16

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	vehicles trips in the PM peak with an increase of 84 trips daily ie 42 in and 42 out. For the acute care unit, there is no specific traffic rate provided by the RMS Guide. It is considered that this will be a relatively low generator of traffic and a value of 30 trips per hour has been assumed for this assessment i.e. 15 in and 15 out per hour. Assuming peak hour flows represent 10% of the daily flows the site could generate some 300 vehicle movements per day. Thus, for the total site there could be some 594 vehicles movements per day generated however only 384 of these are additional over the existing situation with 46 vph during the evening peak.
4.1.1 Other Developments	No other significant developments noted within the locality of the site.
4.1.3 Daily and Seasonal Factors	There will be limited daily and seasonal variation in traffic movements. The nature of the development generates traffic movements 7 days a week.
4.1.4 Pedestrian Movements	It is considered that there could be some pedestrian movements generated by the development and these can be accommodated within the existing footpaths on High Street as per the existing situation. It is considered that this will be the major pedestrian link for the whole of the project site, due to it providing a direct route between the site and the centre of Wauchope.
4.2 Traffic Distribution and Assignments	The majority of the traffic movements will be to and from the east of the site, towards the centre of Wauchope and further to connect with Port Macquarie to the east and the Pacific Highway. For the residential aged care facility, it is considered that the majority of the traffic will use Graham Street to connect with Johnstone Street to access the site. For the subacute facility is expected that the majority of the traffic movements will be via the driveway access connecting direct to High Street.
4.2.1 Origin / destinations assignment	90% of the traffic is expected to have a destination / origin to the east towards the centre of Wauchope and beyond and with the majority of the traffic generated by the aged care facility it is considered that the majority of the traffic will utilise the intersection of Graham Street and High Street for this route. Applying the traffic distribution and assignment above together with consideration to the access layout for each site, gives the following breakdown of traffic movements to / from the site. Although the traffic associated with the RACF does not typically coincide with the AM peak it has been assigned to the local roads at this time to assess the performance of key intersections and provides a robust assessment. In the AM peak 90% of RACF traffic associated with the development has been assumed to be inbound whilst in the PM peak a 40/60 inbound/outbound split has been allowed to provide for shift change and visitors.

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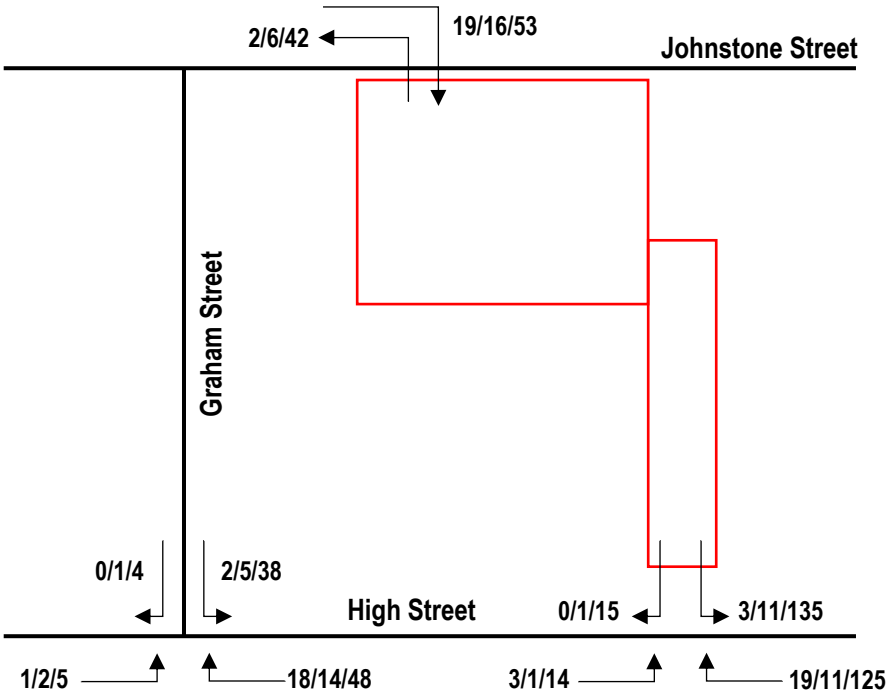 *Figure 3 - Distribution of traffic flows associated with the proposed development (AM/PM/Daily).*	
4.3 Impact on Road Safety	It is considered that the proposed development will have an acceptable impact upon road safety in the vicinity of the site. For the aged care facility off Johnstone Street, this is replacing an existing facility that has a driveway access direct off this road. Johnstone Street in this location carries very low traffic flows and is located on a straight section of road, allowing for good visibility in both directions. It is noted that during the school pick up time, there are a number of vehicles parked along Johnstone Street in the vicinity of the site frontage which will be impacted upon by the additional driveway. However, it is considered that during this timeframe the extent of traffic generated by the aged care facility and the subacute facility will be relatively low with the school pick up period typically occurring between 2.30 and 3.15 as observed on site. For the site access on High Street, the site access has been assessed against the requirements of Austroads and the sight lines exceeds the requirements of this guide, indicating that road safety will not be compromised. There are a number of similar driveways in this location and drivers on High Street observe the posted speed limit, due to the interaction between the driveways, parked cars and turning traffic.
4.4 Impact of Generated Traffic	
4.4.1 Impact on Daily Traffic Flows	The total development is expected to generate in the order of 384 additional vehicle movements per day. This is considered to have an acceptable impact upon the local road network. Based on traffic data collected as part of this project, the existing daily traffic flows along High Street are in the order of 9,000

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	vehicles per day and these could increase to 9,384 assuming all traffic associated with the development use High Street. With peak hour flows being in the order of 950 vehicles per hour 2-way (maximum of 697 eastbound), the RMS Guide to Traffic Generating Development indicates that the road would operate at a level of service of C (less than 900 vph per direction), indicating a good level of service with some minor delays and congestion. These delays would be associated with vehicles turning into the various driveways along its length, cars manoeuvring in and out of kerb side parking and interaction with side roads. Level of C is defined as being in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. Whilst no daily limit is provided, it is considered that as the flows are within acceptable limits during the peak hours then the daily flows are also acceptable. The traffic flows on both Johnstone Street and Graham Street are much lower. Both of these roads are residential roads and the RMS Guide indicates these roads have an environmental goal of 300 vehicles per hour (2-way) and 500 vehicles per hour maximum. Johnstone Street carries less than 60 vehicles per hour outside of the school periods and the additional traffic movements generated by the project site will ensure that the total traffic flows will be well under 300 vehicles per hour (worst case increase of 21 vehicles being 16 additional RACF and 5 associated with staff accessing parking for the subacute facility). Graham Street carries around 200 vehicles in the morning peak hour (majority of traffic associated with school activities) and the traffic associated with the development is less than 100 per hour ensuring that the desirable environmental limit of 300 vehicles per hour will not be exceeded.
4.4.2 Peak Hour Impacts on Intersections	The key intersection that could be impacted upon by the development is the T intersection connecting High Street with Graham Street. Currently drivers experience low delays for the right turn out at this intersection, with all other movements generally experiencing very limited delays. Outside of the peak periods these delays would be lower still. It is considered that the potential for 46 traffic movements associated with the proposed overall development in the afternoon peak hour will have a minimal and acceptable impact upon the operation of these intersection. A Sidra intersection analysis has been completed at this intersection and confirms the existing operations and the impact of the additional traffic is still well within acceptable limits described by the Roads and Maritime Services Guide to Traffic Generating Developments. The results of the Sidra analysis are presented below.
4.4.3 Impact of Construction Traffic	All construction work will be contained on site except for the works on the new driveways and removal of all redundant driveways on High Street and Johnstone Street.

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	Construction traffic movements associated with the development will need to be managed and a construction traffic management plan will be required as part of the detailed design process for the site. This will be developed in accordance with RMS Guidelines and will include details on truck numbers and access routes. No construction zone will be required for the project on the site frontage to High Street.
4.4.4 Other Developments	No other developments noted within the vicinity of the subject site.
4.5 Public Transport	
4.5.1 Options for improving services	No requirements to improve services.
4.5.2 Pedestrian Access to Bus Stops	The existing bus routes are located within the centre of Wauchope and existing pedestrian access is along the side of the roads. This can be accommodated on High Street as per the existing situation with pedestrians able to use these footpaths to access the town centre. The potential pedestrian demands created by the development shall not be significant and do not require any upgrades for pedestrians in the locality of the subject site.
4.6 Recommended Works	
4.6.1 Improvements to Access and Circulation	No improvements for access to the internal car park the layout is in accordance with AS2890 and allows for ease of access for all users with allowance for service vehicles as required.
4.6.2 Improvements to External Road Network	None required as the future traffic flows associated with the development will be very low.
4.6.3 Improvements to Pedestrian Facilities	No upgrades required.
4.6.4 Effect of Recommended Works on Adjacent Developments	No impact as no external works recommended.
4.6.5 Effect of Recommended Works on Public Transport Services	Nil
4.6.6 Provision of LATM Measures	None required
4.6.7 Funding	No external road upgrades required.

Intersection Analysis

The operation of the intersection of High Street with Graham Street has been assessed with the standard computer program Sidra. The results of the Sidra assessment are presented below. The results confirm that the existing intersection operates very well with minimal delays and the additional traffic generated by the development of the subject site will have a minimal and acceptable impact upon the delays and queues at this intersection.

The Sidra modelling below has been completed based on the peak hour flows during the morning as this is when most vehicles will be turning right into Graham Street. During the evening peak hour, most vehicles associated with this site will turn left out of Graham Street onto High Street which is not a critical movement. Traffic flows along High Street including the demands for right turn movements at this intersection are less during the evening peak and therefore the intersection would operate to a higher standard during this time.

Table 1 – Existing operation of intersection of High Street and Graham Street (2017 AM peak).

Approach	Level of Service	Ave. Delay (s)	Queue (m)
High Street east (westbound)	A	1.2	2.6
Graham Street	A	8.9	4.7
High Street west (eastbound)	A	0.4	0.0

The Sidra modelling above shows that the intersection of High Street and Graham Street currently operates well within its capacity during the morning peak hour, with very minimal delays and congestion on all movements. The morning peak has been considered as this is when the demands for right turning traffic movements at this intersection are greatest, due to parents travelling towards the nearby school. During the evening peak, the demands for right turning vehicles and through traffic along High Street are less than those in the morning. The intersection of High Street and Graham Street would therefore operate to a higher standard during the evening peak.

The intersection was then modelled allowing for the additional traffic associated with the development with the results provided below.

Table 2 –Operation of intersection of High Street and Graham Street (2017 AM with Full Development).

Approach	Level of Service	Ave. Delay (s)	Queue (m)
High Street east (westbound)	A	2.0	4.8
Graham Street	A	9.0	4.8
High Street west (eastbound)	A	0.5	0.0

The results above show that the additional traffic associated with the proposed development will have a negligible impact on the operation of this intersection with only very minor increases in the average delays and queuing. This intersection will continue to operate well within its capacity with an overall Level of Service A.

Photo 1 – View looking west along Johnstone Street showing typical cross section – subject site is to left hand side of photo

Photo 2 – View north along Johnstone Street showing footpath adjacent to school to connect to Waugh Street

Photo 3 – View along Johnstone Street showing footpath along site frontage

Photo 4 – View to right for drivers exiting the proposed exit to the Aged Care Facility on Johnstone Street

Photo 5 – View to left for drivers exiting the proposed exit to the Aged Care Facility on Johnstone Street

Photo 6 - View to right for drivers exiting the driveway onto High Street from subacute care facility

Photo 7 - View to left for drivers exiting the driveway onto High Street from subacute care facility

Photo 8 – View west along High Street showing typical cross section and on-street parking demand. Subject site to right hand side of photo

Conclusion

From the site work completed and the review of the project, it is considered that the proposed re-development of the site off Johnstone Street with a 140 bed residential aged care facility and the subacute care facility off High Street will have a minimal impact upon the overall road network within the general vicinity of the site. The RACF replaces the existing 100 bed facility. The traffic generated by the proposal is low with additional traffic associated with the RACF and subacute facility accessing local streets less than 25vph which will not create any significant delays or congestion on the local road network.

Parking for the proposed Residential Aged Care Facility is in accordance with the SEPP Housing for Seniors or People with a Disability 2004 whilst the subacute care facility has been assessed and is in accordance with the Council DCP. The site access points are similar to the existing driveway access point on Johnstone Street and High Street and can operate in a safe manner.

It is therefore concluded that the development should be approved on traffic, access and parking grounds.

Sean Morgan

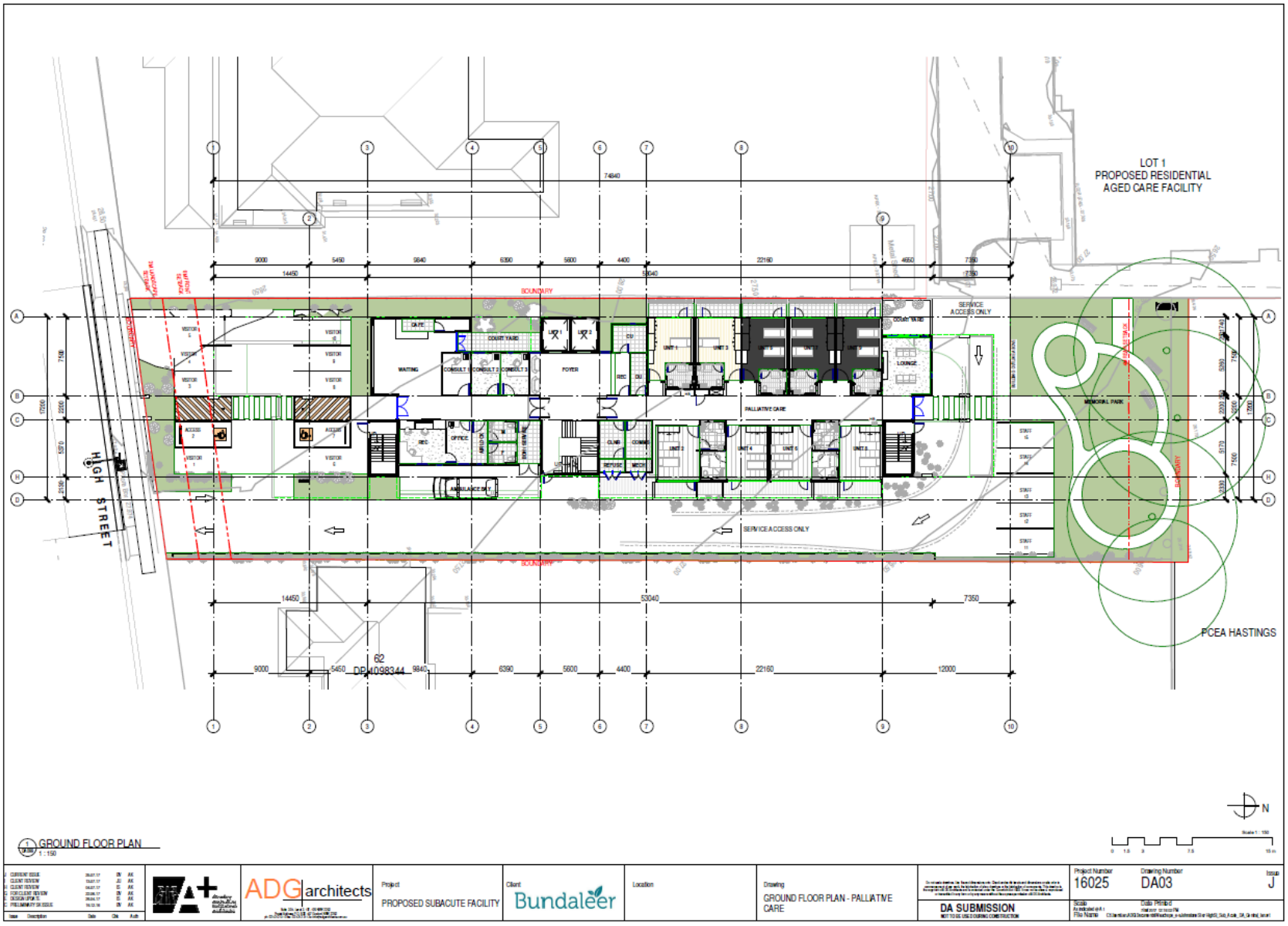
Director

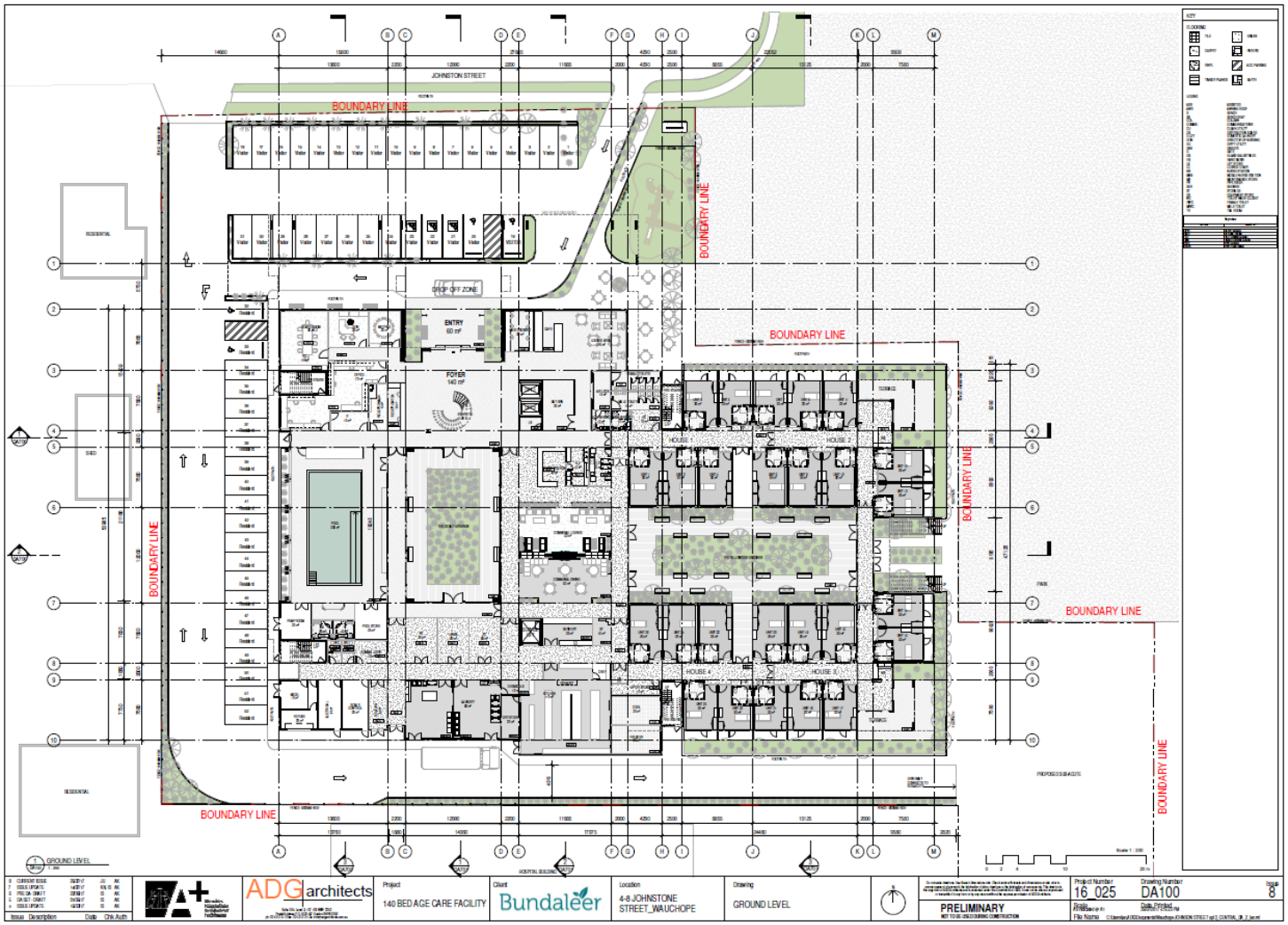
Attachment A – Site plan

Attachment B – Accident Data

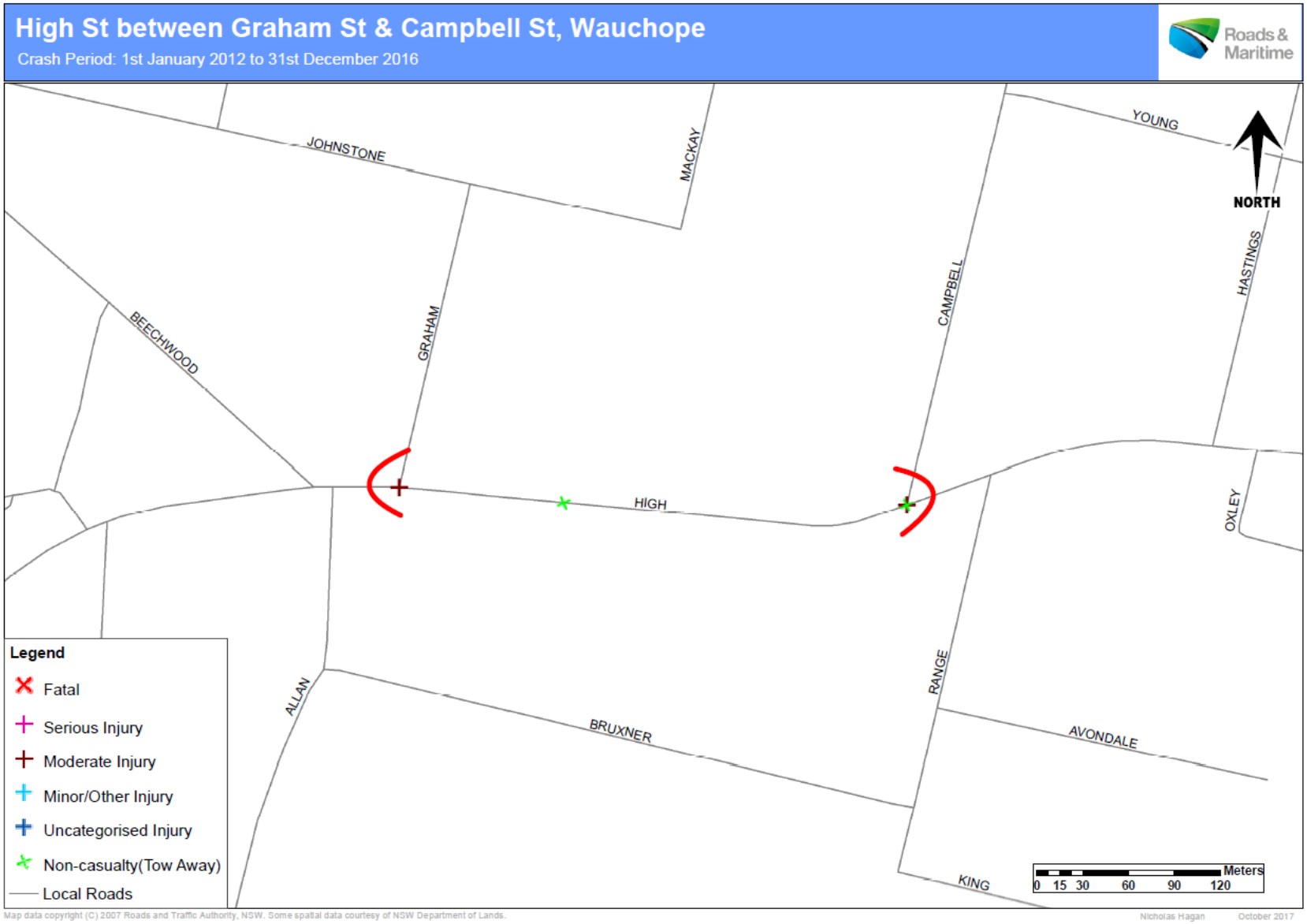
Attachment B – Survey Data

Attachment A – Site Plan





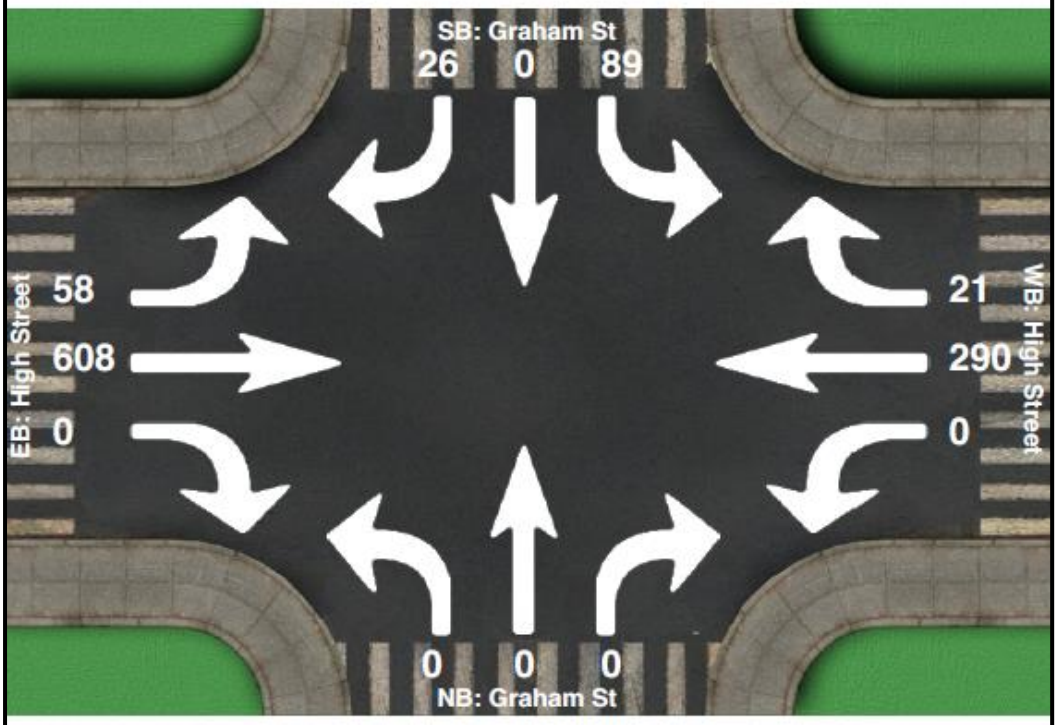
Attachment B – Accident Data



Attachment C – Survey Data

Intersection Peak Hour

Location: Graham St at High Street , Wauchope
GPS Coordinates:
Date: 2017-09-19
Day of week: Tuesday
Weather:
Analyst: SM

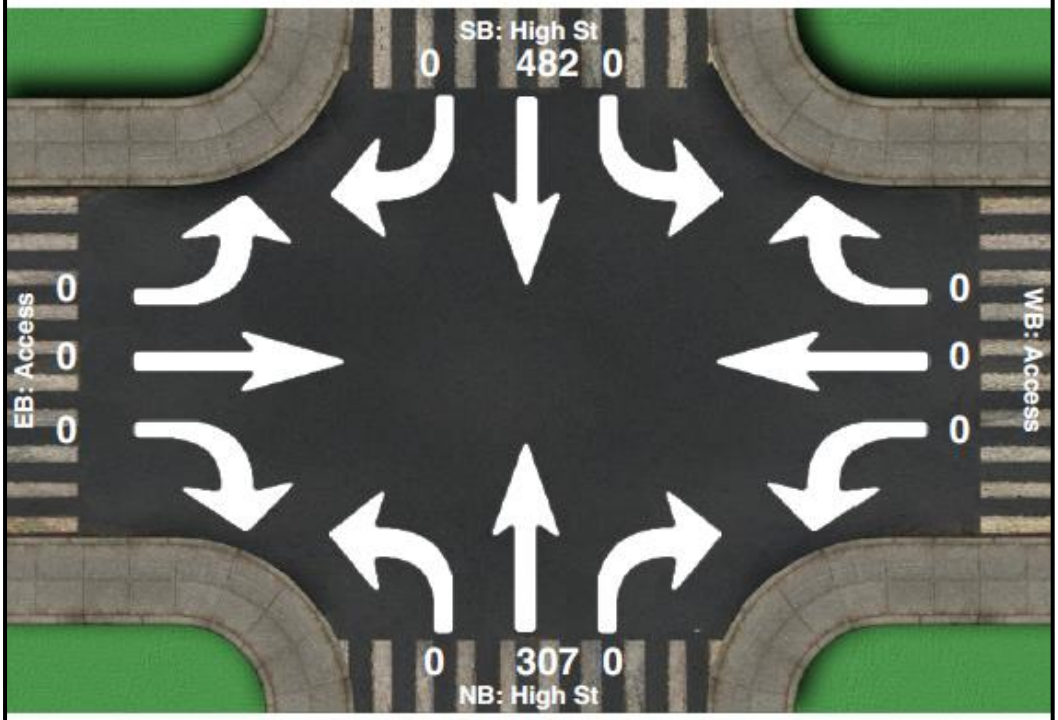


Intersection Peak Hour

08:15 - 09:15

Intersection Peak Hour

Location:	High St at Access, Wauhope
GPS Coordinates:	
Date:	2017-09-18
Day of week:	Monday
Weather:	
Analyst:	SM

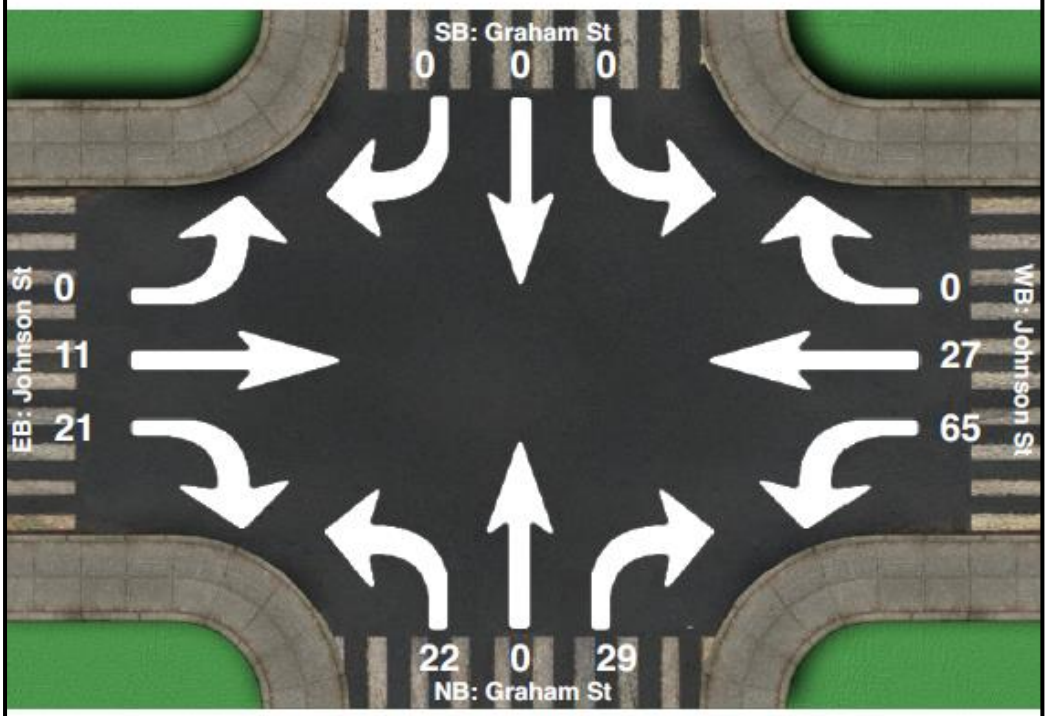


Intersection Peak Hour

16:30 - 17:30

Intersection Peak Hour

Location:	Graham St at Johnson St, Was hope
GPS Coordinates:	
Date:	2017-09-18
Day of week:	Monday
Weather:	
Analyst:	SM



Intersection Peak Hour

14:45 - 15:45