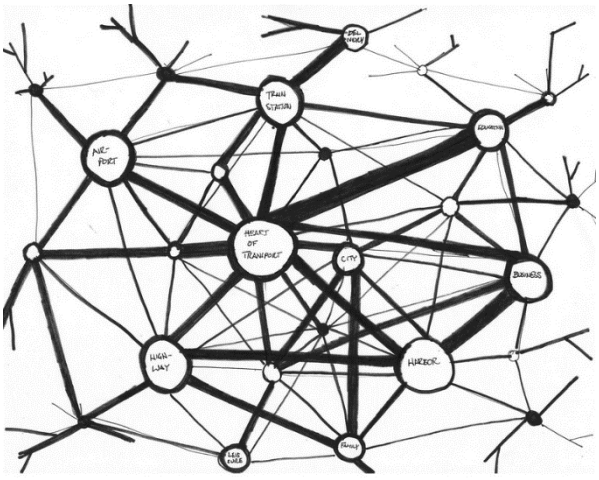
TSA

ABN: 79 943 737 368

TRAFFIC AND PARKING IMPACT STATEMENT

140 – 146 GLENHAVEN ROAD, GLENHAVEN (PROPOSED ALTERATIONS AND ADDITIONS TO EXISTING RETIREMENT VILLAGE)



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1. INTRODUCTION

The Practice of TSA have been commissioned by the Christian Brethren Community Services (CBCS) to prepare a Traffic and Parking Impact Assessment to accompany a Development Application (hereafter referred to as 'DA') lodged with The Hills Shire Council. The subject DA seeks consent for the expansion of an existing seniors' retirement village to incorporate an additional 12 residential dwellings on the north-western corner of the total land, located at 140 – 146 Glenhaven Road, Glenhaven.

The purpose of this correspondence is to assess and document the likely traffic implications associated with the proposed development and to recommend, where appropriate, treatments to alleviate such impacts. In undertaking our assessment, primary consideration has been given to the following issues:

- The safety and efficiency of the proposed access arrangements and the compliance with relevant Australian Standard requirements;
- Suitability and safety of the internal circulation, manoeuvring and parking arrangements as relevant to the site and local conditions;
- Existing road network conditions within the vicinity of the site including traffic volumes and general traffic safety;
- Identify existing and projected traffic generated by the site operations; and
- Assess the ability of the surrounding road network to accommodate additional traffic movements projected to be generated by the development.

Reference has been made to the following documents in this report:

- The Roads & Maritime Services' *Guide to Traffic Generating Developments*;
- State Environmental Planning Policy's (SEPP) *Housing for Seniors or People with Disability* (2004);
- Positive Traffic Pty Ltd.'s *Glenhaven Road Corridor Study* (November 2016);
- The Australian Standard for *Parking Facilities Part 1: Off Street Car Parking* (AS2890.1-2004); and
- State Environmental Planning Policy (Infrastructure) 2007.

This report should be read in conjunction with the architectural plans prepared by NBRS Architecture, reduced scale copies are to be submitted under a separate cover.

2. SITE DETAILS

2.1 Site Location

The subject land under consideration occupies the north-western portion of an existing retirement village site (Glenhaven Gardens), situated on the south-western corner of the T-junction of Glenhaven Road and Mills Road, Glenhaven. This location is shown in the context of the existing road network in **Figure 1** overleaf and in the local context in **Figure 2**.

2.2 Site Description

The consolidated site (including the area proposed to accommodate the subject development) provides a real property description of Lot 102 within DP 1205322 and a street address of 140 - 146 Glenhaven Road, Glenhaven. The allotment forms an irregular shaped parcel of land, providing an approximate principal frontage of 230m to Glenhaven Road and a secondary frontage of approximately 315m to Mills Road. Total site area is approximately 7.2ha.

2.3 Existing Use

The north-eastern portion of the consolidated site currently accommodates Glenhaven Gardens Retirement Village, which comprises 10 blocks containing 24 residential dwellings in detached and attached forms, a hostel and an intensive care unit, serviced by an internal circulating roadway connecting with the main vehicular driveway off Mills Road at the eastern property alignment. Further, two separate exit driveways for emergency vehicles are currently provided off Glenhaven Road at the northern property alignment.

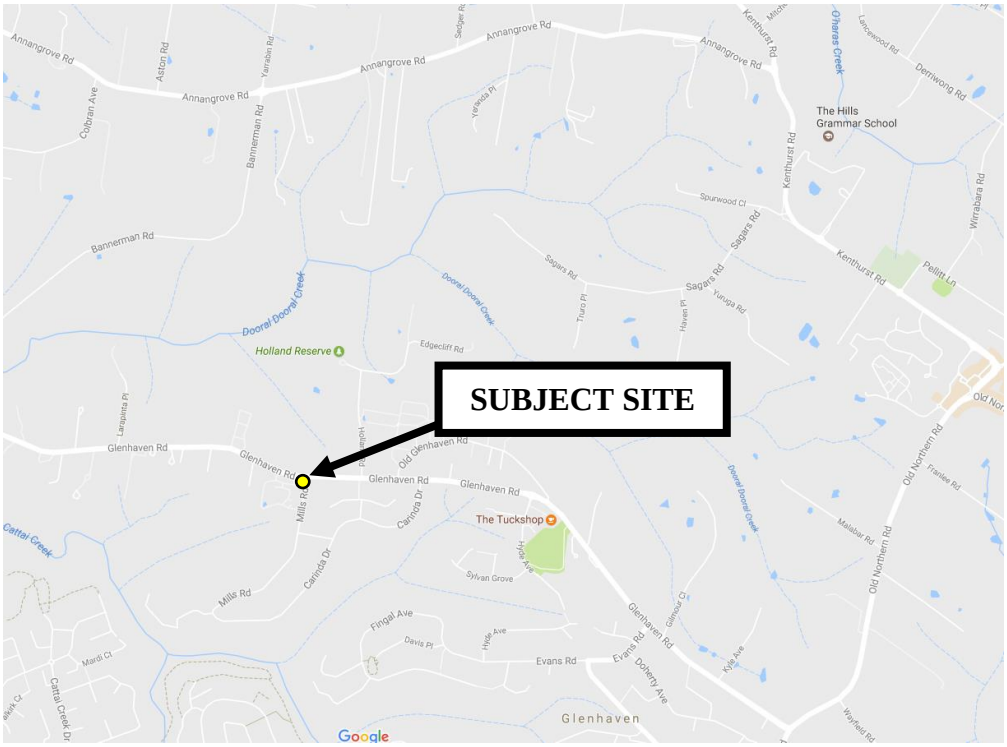
The north-western portion of the site currently accommodates a two-storey rural residential dwelling serviced by an existing driveway off Glenhaven Road. It is noted from the architectural plans that the proposed development is to occupy the land between the northern site boundary and the existing detached dwelling. Further, the existing driveway off Glenhaven Road is proposed to be replaced by a new driveway at the same location, which is intended to service both the proposed and existing development.

The southern portion of the site is populated by trees and vegetation.

2.4 Surrounding Uses

The site is located within a peri-rural area at the fringe of the North Kellyville Precinct. In this regard, surrounding sites primarily accommodate similar rural residential land-uses to that contained within the subject site.

FIGURE 1
SITE LOCATION – ROAD NETWORK CONTEXT



Source: Google Maps (Accessed 26/05/17)

FIGURE 2
SITE LOCATION – AERIAL CONTEXT

Source: Six Maps (Accessed 26/05/17)

3. PROPOSED DEVELOPMENT

3.1 Built Form

The subject proposal involves the construction of an additional 12 residential dwellings in attached and detached forms, occupying the north-western portion of the site between the existing residence and the northern property boundary. The new dwellings are proposed to be serviced by an internal private road network comprising the following sections:

- A north/south aligned road providing a carriageway width of 6.5m;
- An east/west aligned road providing a carriageway width of 6.5m; and
- A north/south aligned circulating road providing a carriageway width of 6.0m.

The abovementioned internal road network is proposed to provide connectivity between a new access driveway off Glenhaven Road, albeit restricted to left turn movements only, at the north-western corner of the site with resident garages associated with each new dwelling and the existing internal circulating road currently servicing the existing development.

4. ACCESS & INTERNAL CONSIDERATIONS

4.1 Access Arrangements

Vehicular access to the subject dwellings and ancillary garage parking areas is proposed to be facilitated as follows:

- A new 8.6m wide combined ingress/egress driveway connecting with Glenhaven Road at the north-western corner of the site, approximately 166m west of Mills Road; and

- An existing 7.0m wide combined ingress/egress driveway connecting with Mills Road at the south-eastern corner of the site, approximately 130m south of Glenhaven Road.

With respect to the new access driveway off Glenhaven Road, a channelised treatment is proposed to provide a left in / left out only turning restriction. This restriction is proposed to be facilitated by the following:

- A triangular island between the edge of the driveway and extending approximately 3.5m into the property from the northern site boundary;

- The splaying of the driveway to accommodate the island at the gutter crossing;

- The provision of an 'All Traffic Left' sign within the egress lane of the driveway located within the island; and

- The provision of a 'No Right Turn' sign within the island facing eastbound public road traffic flow.

The prohibition of right turn movements at the new access driveway means that residents/visitors travelling to the site via the eastbound Glenhaven Road travel lane are required to make a right turn at the Mills Road junction and thence access the site via the existing driveway off Mills Road. Similarly, residents/visitors departing the site towards the east towards Dural are required to egress via the existing Mills Road driveway and make a right turn at its junction with Glenhaven Road.

Recent observations of Glenhaven Road in the immediate vicinity of Mills Road indicates that there is good sight distance and gaps within the Glenhaven Road traffic flow to enable drivers to undertake right turn manoeuvres at this junction safely and efficiently, provided normal care and sensible driving behaviour is exercised. It is noted that the sight distance at the proposed new driveway location at the north-western corner of the site is somewhat limited by the curve within Glenhaven Road, approximately 100m to the west of this driveway. As such, the proposed left in/left out restriction at this access point is intended to improve the overall safety with respect to entering and exiting the site.

In order to examine the suitability of the proposed access arrangements, reference is made to AS2890.1-2004. This Standard provides driveway design requirements based on a number of site and access roadway characteristics such as the development land-

use, the number of parking spaces serviced by the driveway and the functional order of the frontage road. Based on the proposed and existing access driveways servicing a combined total parking provision that is well below 100 parking spaces associated with residential development and the local (non-arterial) functional order of Glenhaven Road and Mills Road, Tables 3.1 and 3.2 of AS2890.1-2004, require a Category 1 type driveway, which recommends a minimum combined ingress / egress driveway width of between 3.0 – 5.5 metres. Accordingly, the proposed and existing driveway dimensions exceeds the minimum requirements and is therefore considered to be satisfactory.

4.2 Parking Provision

11 of the 12 additional dwellings (Units 2 – 12) are proposed to be provided with a single garage, in addition to the off-street parking opportunities available between the garage and the layback of each dwelling (i.e. the driveway). Unit 1 is provided with a double garage, with a paved layback capable of accommodating two open parking spaces in tandem. The proposed development is to be serviced by a total parking provision of 26 spaces.

The State Environmental Planning Policy *Housing for Seniors or People with Disability* 2004 (SEPP 2004) specify the following sensitive parking requirements for self-contained dwellings within Clause 50 Part h:

> *A minimum of 0.5 car spaces for each bedroom where the development application is made by a person other than a social housing provider*

Application of the abovementioned parking rate to the proposed development yield of 12 three bedroom self-care dwellings, results in a minimum parking requirement of 18 spaces. Whilst it is noted that SEPP 2004 does not provide any parking requirements with respect to visitors, it is acknowledged that some level of visitor parking should be provided. The Roads & Maritime Services' *Guide to Traffic Generating Developments* provides the following visitor parking requirements for resident funded self-contained dwellings:

1 visitor space per 5 dwellings

Considering that the subject proposal involves the provision of 12 additional dwellings, a total of 2.4 (adopt 3) visitor spaces is therefore required in accordance with the Roads & Maritime Services requirements. Based on the subject proposal providing a total of 26 car parking spaces for the additional dwellings, compliance with SEPP 2004 and Roads & Maritime Services parking requirements is readily achieved.

4.3 Internal Circulation

Upon entry to the site, vehicles are able to proceed in forward direction to access the resident and visitor parking provision. Single resident garage and open visitor spaces form minimum dimensions of 3.4m wide x 6.1m, whilst double resident garages form minimum dimensions 5.9m (internal width) x 6.1m long. The proposed parking provision is to be serviced by an adjoining internal roadway that provides a minimum

width of 6.0m. Access movements to/from these spaces could involve a forward manoeuvre to access the garage and open off-street parking spaces and a reversing manoeuvre to exit the site, which is common for similar size residential land use developments. The design of the parking spaces and internal road layout exceeds the minimum dimensions specified within AS2890.1-2004 and accordingly is considered to be satisfactory with regard to passenger vehicle manoeuvrability.

In order to further assess the suitability of the proposed internal roadway width, reference is made to the Roads & Maritime Services' *Guide to Traffic Generating Developments*. This publication states that '*in instances where traffic volumes are low streets may be designed with a width of 3 to 3.5 metres*'. Whilst the Roads & Maritime Services does not specifically clarify what 'low' traffic volumes are, it is noted that it states that '*depending on the number of passing opportunities a 3 to 3.5 metres wide carriageway is best suited to an average of less than 100 houses*'.

The Roads & Maritime Services within their updated surveys (2013/04a) indicate that dwelling houses for aged individuals generate in the order of 0.4 peak hour trips. The access road is therefore likely to generate an additional five peak hour vehicle trips, based on the construction of 12 new dwellings. It is therefore considered that the internal roadway will accommodate significantly less traffic than that generated by 100 houses. Accordingly, the proposed carriageway width of the internal road readily complies with the road width specified within the Roads & Maritime Services guide for low traffic volume environments.

In addition to the above, it is acknowledged that this Practice has previously prepared an internal traffic and safety management plan in relation to the existing internal road network servicing the development, which contains measures that could be adopted to better manage traffic and pedestrian safety on site. Such a traffic and safety management plan can be implemented as a condition of consent, if required by Council.

5. EXISTING TRAFFIC CONDITIONS

5.1 Existing Surrounding Road Network Function and Control

The following subsections of the report provide a description of these roads and the surrounding road network.

Glenhaven Road performs a local collector function under the care and control of The Hills Shire Council. In this regard, it provides east/west connectivity between Old Northern Road in the east and Samantha Riley Drive/Green Road in the west. Glenhaven Road generally forms a 9.0m wide carriageway within a 16.0m wide road reservation. It provides one through lane of traffic in each direction, with formalised kerb and guttering along the site frontage and unsealed shoulders along the northern side, directly opposite the site.

Glehaven Road forms a T-junction with Mills Road at the north-eastern corner of the site under major/minor priority control with Glenhaven Road forming the priority route. Traffic flow is governed by a sign posted speed limit of 60km/hr.

Mills Road performs rural residential access function under the care and control of The Hills Shire Council. It primarily has a north/south alignment, providing a link between Glenhaven Road in the north and Carinda Drive in the south. Between Mills Road and Carinda Drive, it intersects with Temora Road, which facilitates another easterly link to Carinda Drive and Glenhaven Road in the north.

Mills Road provides a 13.0m wide carriageway accommodating one though lane of traffic in each direction in conjunction with parallel parking along both kerb alignments. Traffic flow is governed by a sign posted speed limit of 50km/hr.

5.2 Existing Surrounding Road Network Function and Control

It is understood based on the outcomes of *Glenhaven Road Corridor Study* undertaken in November 2016 on behalf of The Hills Shire Council and recent discussions with Council's Infrastructure Manager that Glenhaven Road is proposed to be upgraded to comprise a four lane undivided carriageway to better accommodate future traffic demands. Further, the *study* recommends as one of its options a roundabout treatment at the junction of Glenhaven Road and Mills Road to better manage the safety of right turn movements out of Mills Road, which is assessed to have a poor level of service 'F' under the current priority intersection control. It is noted based on recent discussions with Council that a dual lane circulating roundabout is preferred based on future traffic demands and alignment with the future upgrade of Glenhaven Road.

5.3 Traffic Volumes

In order to obtain an indication of the existing performance of the adjoining surrounding road network, reference is made to recent peak hour traffic surveys commissioned by this Practice at the junction of Glenhaven Road and Mills Road. These peak morning and afternoon traffic surveys were undertaken between 7.00am – 9.00am and 4.00pm – 6.00pm (with peak hour identified to be 7:45am – 8:45am and 5:00pm – 6:00pm) on the 2nd of May 2017.

Figure 3 below provides a graphical representation of the surveyed peak hour traffic volumes, whilst full details are available upon request.

FIGURE 3: EXISTING PEAK HOUR TRAFFIC VOLUMES JUNCTION OF GLENHAVEN ROAD AND MILLS ROAD (7.45AM – 8.45AM AND 5.00PM – 6.00PM)

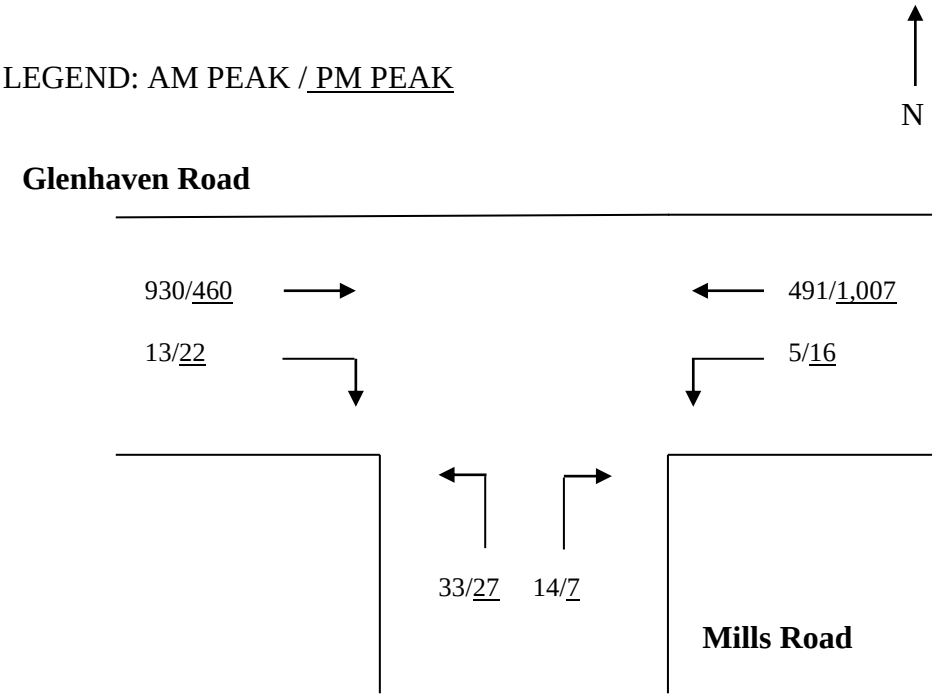


Figure 3 indicates the following:

- Glenhaven Road operates bidirectional traffic demands in the order of 1,400 – 1,600 vehicles per hour during peak periods commensurate with its higher order collector road function. Traffic volumes with Glenhaven Road are tidal, with eastbound movements dominating during the AM peak and westbound movements dominating during the PM peak; and

- Bidirectional traffic demands within Mills Road are low with peak hour traffic demands being less than 100 vehicle movements.

5.4 Assessment of Road Network Performance

In order to estimate the existing peak efficiency of the adjoining road network, a SIDRA analysis has been undertaken of the surveyed junction of Glenhaven Road and

Mills Road in the immediate vicinity of the subject site. SIDRA is an advanced analytical tool for evaluation of alternative intersection designs in terms of capacity, level of service, a wide range of performance measures including delay, queue length, and number of stops. Key indicators of SIDRA include level of service which is a summary indicator ranging from A to F with A representing optimum intersection performance, and degree of saturation which represents a ratio of the demand of an approach to its capacity.

SIDRA uses detailed analytical traffic models coupled with an iterative approximation method to provide estimates of the abovementioned key indicators of capacity and performance statistics. Other key indicators provided by SIDRA are average vehicle delay, the number of stops per hour and the degree of saturation. Degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Degree of saturation is a useful and professionally accepted measure of intersection performance. SIDRA provides analysis of the operating conditions that can be compared to the performance criteria set out in **Table 1** (adapted from the Roads & Maritime Services' Guide *to Traffic Generating Developments*).

TABLE 1
LEVELS OF SERVICE CRITERIA FOR INTERSECTION

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	Less than 14	Good Operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & Spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	> 70	Extra capacity required	Extreme delay, traffic signals or other major treatment required

The existing conditions have been modelled utilising the peak hour traffic volumes presented within **Figure 3**. **Table 2** provides a summary of the SIDRA output data.

TABLE 2 SIDRA NETWORK MODELLING ANALYSIS EXISTING CONDITIONS		
Intersection	**AM Peak**	**PM Peak**
Mills Road South		
Average Vehicle Delay	23.4	26.3
Degree of Saturation	0.11	0.11
Level of Service	B	B
Glenhaven Road East		
Average Vehicle Delay	5.6	5.6
Degree of Saturation	0.25	0.53
Level of Service	A	A
Glenhaven Road West		
Average Vehicle Delay	9.5	16.2
Degree of Saturation	0.49	0.29
Level of Service	B	B
Total Intersection		
Average Vehicle Delay	23.4	26.3
Degree of Saturation	0.11	0.11
Level of Service	B	B

Table 2 indicates that the surveyed junction is currently operating with a level of service (LoS) of 'B' during both peak periods, representing good operating conditions with spare capacity. It is noted that the above SIDRA results presented within **Table 2** reflects the worst movement (being right turn movements out of Mills Road) identified which have been used to represent the truc LoS at this junction.

5.5 Public Transport and Pedestrian Infrastructure

The closest bus stops to the subject site are located along the northern side of Glenhaven Road and both sides of Mill Road adjacent to the north-western and south-eastern corners of the site respectively. These bus stops service a single route (Route 603) operated by Hillsbus which runs between Rouse Hill town centre and Parramatta via Kellyville, Glenhaven and Castle Hill. It generally provides 30 minute frequencies during weekdays which extend to 60 minutes on weekends and public holidays.

Paved footpaths are provided along the southern side of Glenhaven Road and the western side of Mills Road adjacent to the property boundaries. Our observations of pedestrian activity in the immediate vicinity of the site indicates that pedestrian movements along the existing footpaths and across Glenhaven Road and Mills Road is low. As such, the demand/requirement for pedestrian crossing facilities across Glenhaven Road and Mills Road from the site is also considered to be low and unnecessary.

6. PROJECTED TRAFFIC CONDITIONS

6.1 Traffic Generation

The proposed development involves the provision of 12 additional self-care dwellings for seniors. In order to undertake an assessment of the traffic generating ability of the subject development, reference is once again made to the Roads & Maritime Services *Guide to Traffic Generating Developments (Technical Direction 2013/04a).* This publication provides the following average traffic generation rates for detached and medium density residential developments based on extensive surveys undertaken throughout Sydney metropolitan area:

Housing for Seniors

- *Weekday peak hour trips = 0.4 trips per dwelling*
- *Weekday daily peak trips = 2.1 per dwelling*

Application of the above rates to the proposed 12 residential units results in a maximum peak hour traffic generation of five vehicle trips to and from the subject site over and above the existing site generation.

6.2 Traffic Impact

The subject development is therefore calculated from the above rates to generate up to an additional five peak hour vehicle trips to and from the site which will be required to be absorbed into the present level of traffic flows on Glenhaven Road and Mills Road. It has previously been presented that the adjoining road network operates with a good level of service with spare capacity. Accordingly, the previously presented level of additional traffic, representing 1 vehicle trip every 12 minutes during peak periods, is not considered to have any tangible impacts on the efficiency of the surrounding road network or alter the existing amenity experienced by surrounding residents.

In addition to the above, it is noted that our observations of traffic conditions within the adjoining road network is such that that there are frequent gaps to allow the above site access manoeuvres to be undertaken without any significant delay and without measurable impacts to traffic flow within Glenhaven Road and turning movements and its junction with Mills Road.

The potential for impacts associated with the subject development are therefore solely focused on the safety and efficiency afforded by the proposed site access arrangements. In this regard, the consistent vertical and horizontal alignment of the frontage roads in the vicinity of the site results in a good level of sight distance to and from the proposed and existing access driveways. It has been previously mentioned that right turn movements to and from the site are to be prohibited from the new north-western driveway off Glenhaven Road. Access to/from the site to/from the eastbound Glenhaven Road travel lane are required to utilise the existing Mills Road access driveway by undertaking the necessary right turn at the junction of Glenhaven Road and Mills Road. Such an arrangement is considered to be most appropriate for the following reasons:

1) Better sight distance at the junction of Glenhaven Road and Mills Road than the new driveway location at Glenhaven Road;
2) Glenhaven Road is understood to be upgraded to a four-lane undivided carriageway in the future. As such, there is insufficient carriageway width to accommodate an exclusive right turn lane into the site; and
3) The junction of Glenhaven Road and Mills Road is understood to incorporate a dual lane circulating roundabout to replace the current priority intersection control in the future. Such a measure would better assist residents/visitors turning movements to/from Mills Road via Glenhaven Road, thereby facilitating safer and more efficient access to the site.

In consideration of the above discussion on site access management measures, the impact of the additional peak hour traffic on the surrounding road network is considered to be insignificant and aligned with future changes in the road configuration.

7. CONCLUSION

This correspondence provides an assessment of the likely traffic implications associated with the proposed alterations and additions to an existing retirement village to incorporate an additional 12 residential dwellings at 140 - 146 Glenhaven Road, Glenhaven. In retrospect to the findings of this assessment, the following conclusions can be surmised:

- The proposed site access arrangements suitably accord with the relevant requirements of AS2890.1-2004 and accordingly are considered to provide motorists with safe and efficient means with which to enter and exit the site;

- The internal circulation arrangements are considered to provide passenger vehicles with satisfactory manoeuvring areas;

- The proposed parking provision suitably complies with the relevant requirements for resident and visitor parking outlined in SEPP's *Housing for Seniors or People with Disability* (2004);

- The proposed left in/left out arrangement at the new access driveway off Glenhaven Road is considered an appropriate restriction, with the junction of Glenhaven Road and Mills Road servicing the existing driveway off Mills Road being better suited to accommodating right turn movements in a safe and efficient manner;

- The surrounding road network currently provides motorists with a reasonable level of safety and efficiency with spare capacity;

- The proposed development is projected to generate up to five additional peak hour vehicle trips to and from the site based on Roads & Maritime Services' *Guide to Traffic Generating Developments (Technical Direction 2013/04a)*; and

- The surrounding road network is considered to be capable of accommodating the proposed additional traffic projected to be generated by the subject development.

Based on the assessment and the conclusions contained herein, we consider that there are no traffic issues that should prevent approval of the application.

It would be appreciated if the information contained within this correspondence could be incorporated in Council's assessment of the subject application