

Traffic Impact Assessment

2 - 8 Glenn Avenue, Northmead NSW 2152

June 2022



Type of Assessment: Traffic Impact Assessment Site Location: 2 - 8 Glenn Avenue, Northmead NSW 2152 Prepared for: Barry Rush and Associates Prepared by: APEX Engineers ABN 52 487 919 980

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TABLE OF CONTENTS

| 1. | Introc | luction | |
|----|------------------------------------|--|----|
| 2. | Background and Existing Conditions | | 5 |
| | 2.1 | Site Description and Local Road Network | 5 |
| | 2.2 | Details of the Proposed Development | 6 |
| | 2.3 | Public Transport Services | 6 |
| 3. | Parkir | g Provision Assessment | |
| 4. | Car Parking Design Review | | |
| | 4.1 | Regular Car Space Dimensions | 9 |
| | 4.2 | Disability Accessible Car Space Dimensions | 10 |
| | 4.3 | Lateral Clearances | 10 |
| | 4.4 | Gradients within Parking Modules | 10 |
| | 4.5 | Circulation / Vehicle Conflicts | 11 |
| | 4.6 | Gradient of Access Driveway | 11 |
| | 4.7 | Ramp Width and Grade | 11 |
| | 4.8 | Vehicle Manoeuvrability Conditions | 12 |
| | 4.9 | Pedestrian Sight Distance Availability | 16 |
| | 4.10 | Level Difference between the Driveway and the Adjacent Pathway | 17 |
| | 4.11 | Level Difference between the Car Spaces and the Adjacent Pathway | |
| 5. | Traffic | : Impact Assessment | |
| 6. | Conclusions | | |

LIST OF FIGURES AND TABLES

| Figure 1: Location of the subject site | 5 |
|---|----|
| Figure 2: Local public transport services | 7 |
| Figure 3: Proposed on-site car parking layout | 9 |
| Figure 4: Template of an 85 th percentile vehicle (AS2890.1-2004) | |
| Figure 5: Vehicle movements at the passing bay | |
| Figure 6: Entry and exit movements at car space 5 (similarly for car space 1) | |
| Figure 7: Entry and exit movements at car space 6 (similarly for car spaces 2, 3 and 7) | |
| Figure 8: Entry and exit movements at car space 8 (similarly for car space 4) | |
| Figure 9: Pedestrian sight distance requirement (AS 2890.1) | |
| Figure 10: Proposed preservation of the pedestrian sight envelop | 17 |
| Figure 11: Level difference between the driveway and the adjacent pathway | |
| Figure 12: AS 2890.1 crash barrier requirement | |
| Figure 13: Proposed crash barrier location | |



1. INTRODUCTION

APEX Engineers were engaged by Barry Rush and Associates to provide a traffic impact assessment as a part of the proposed seniors housing development, located at 2 - 8 Glenn Avenue in Northmead ('subject site').

This report has been structured into the following sections:

- Section 2 Describes the existing transport conditions in the locality and provides an overview of the proposed development;
- Section 3 Assesses the relevant statutory parking provision requirements applicable to the subject development;
- Section 4 Provides a review of the proposed car park design under the relevant Australian Standards;
- Section 5 Provides an estimate of the traffic impact anticipated to be generated by the proposed development on the surrounding local road network; and
- Section 6 Provides the summary and conclusions of the study.



2. BACKGROUND AND EXISTING CONDITIONS

2.1 Site Description and Local Road Network

The subject site is located at 2 - 8 Glenn Avenue in Northmead and currently includes 4 separate residential dwellings across a total area of 2,812.90m². The site vicinity is predominantly characterised by low-density residential dwellings.

At the site frontage, Glenn Avenue includes an undivided carriageway with unrestricted kerbside parking on both sides.

Figure 1 below highlights the site location from an aerial perspective.



Figure 1: Location of the subject site



2.2 Details of the Proposed Development

The subject proposal involves consolidating the existing 4 lots at 2 – 8 Glenn Avenue to construct a multi-dwelling seniors housing development under the State Environmental Planning Policy (Housing) 2021 (Housing SEPP).

The proposed development includes 16 dwellings (8 x 1-bedroom dwellings + 8 x 2bedroom dwellings). In addition, the proposal includes provision for 8 on-site car parking spaces (includes 4 disability accessible spaces) that will be accessed through a common one-way driveway off Glenn Avenue.

2.3 Public Transport Services

The subject site is located within <100m (1-minute walk) from bus stops on Glenn Avenue that service bus route 606 (Winston Hills to Parramatta) in both directions. This service has a frequency of 20-30 minutes.

Figure 2 shows the local public transport network map for the subject site.





Figure 2: Local public transport services



3. PARKING PROVISION ASSESSMENT

In relation to independent living units, Section 108(2)(j) of the State Environmental Planning Policy (Housing) 2021 (Housing SEPP) states a requirement of 1 car space for every 5 dwellings when the development application is made by a social housing provider (which is the case for the current proposal).

Applying the above rate to the proposed development with 16 dwellings leads to a parking requirement of 4 car spaces (rounded up). The current proposal provides 8 on-site car spaces (including 4 disability accessible car spaces), which satisfies the relevant minimum parking requirement.



4. CAR PARKING DESIGN REVIEW

This section provides a review of the proposed on-site car parking design against the minimum requirements in the Australian Standards (AS 2890.1:2004 and AS 2890.6:2009). This section shall be read in conjunction with the complete site layout plans submitted as a part of the application.



Figure 3 illustrates the proposed on-site car parking layout plan at the subject site.

Figure 3: Proposed on-site car parking layout

4.1 Regular Car Space Dimensions

Based on AS 2890.1:2004, 90-degree car spaces which are categorised under user class 1A (residential parking) are required to be 2.4m wide by 5.4m long with 5.8m of aisle width. All four of the regular car space dimensions and aisle widths have been designed to comply with the above-identified AS 2890.1 requirements.



4.2 Disability Accessible Car Space Dimensions

Based on AS 2890.6:2009, the disability accessible car spaces should be designed as follows:

- The disability accessible car parking space should be designed at 2.4m width and 5.4m length (with 5.8m aisle width);
- A shared space of equal dimensions shall be provided adjacent to the car parking space; and
- Both the car parking space and the shared space should indicate appropriate linemarkings. The shared space should include a bollard in order to prevent motorists from parking at this location.

All four of the proposed disability accessible car spaces comply with the above requirements.

4.3 Lateral Clearances

Based on AS 2890.1 – 2004, when car spaces are located adjacent to vertical obstructions (>150mm high), a further 300mm clearance is required beyond the minimum car space width for door opening. This requirement has been satisfied at car spaces 1 and 5.

At blind aisles (end of an aisle), AS 2890.1 requires the aisle to be extended by an additional 1m in order to allow reverse exit manoeuvres by the vehicles parked in the corner spaces. This required 1m extension is available within the proposed design (adjacent to car spaces 4 and 8).

4.4 Gradients within Parking Modules

AS 2890.1 states that parking modules, at maximum, should have a grade of 1 in 16 (measured in any direction other than parallel to the angle of parking). In addition, AS 2890.6 states that the disability accessible car parking space and the shared area shall not exceed the grade of 1:40 in any direction. The proposed car parking modules are at grade and therefore comply with the above requirements.



4.5 Circulation / Vehicle Conflicts

Based on AS 2890.1, the proposed access to the car parking area (off Glenn Avenue) is categorised under access category 1 (<25 car spaces, frontage road local). Therefore, the entry/exit combined access points should provide at least 3m in width.

However, provision has been made at the driveway entry point (first 6m length) to accommodate two-way movements (i.e., a width of 6.1m – which includes the 5.5m minimum two-way width + 300mm clearance on either side from obstructions). This vehicle storage bay at the driveway entry point will ensure that the motorists entering the car park from Glenn Avenue can give way to another motorist exiting the car park (thus preventing vehicles queuing backs to the frontage road).

4.6 Gradient of Access Driveway

In relation to the gradient of the access driveway, AS 2890.1 requires the first 6m into the car park to include a maximum grade of 5% (1 in 20). The first 6m into the proposed car park (off Glenn Avenue) includes a grade of 5%.

4.7 Ramp Width and Grade

AS 2890.1-2004 states the grade requirements for straight ramps at private or residential car parks as follows:

(i) Longer than 20 m—1 in 5 (20%) maximum.

(ii) Up to 20 m long—1 in 4 (25%) maximum. The allowable 20 m maximum length shall include any parts of grade change transitions at each end that exceed 1 in 5 (20%).

(iii) A stepped ramp comprising a series of lengths each exceeding 1 in 5 (20%) grade shall have each two lengths separated by a grade of not more than 1 in 8 (121/2%) and at least 10 m long.

Furthermore, where the difference in grade between two sections of ramp or floor is greater than 1:8 (12.5 percent) for a summit grade change, or greater than 1:6.7 (15 percent) for a sag grade change, the ramp must include a transition section of at least 2 metres to prevent vehicles scraping or bottoming.



The length of the proposed driveway ramp is less than 20m and it includes a maximum grade of 12.5%% - thus complying with the AS 2890.1 requirements. The grade transitions along the ramp does not exceed 12.5% for a summit grade changes, or 15% for sag grade changes.

The proposed driveway ramp into the car park is one-way. Accordingly, this proposed one-way driveway ramp is designed at 3.6m width (3m minimum ramp width + 300mm clearance on either side from obstructions).

4.8 Vehicle Manoeuvrability Conditions

In order to investigate the anticipated manoeuvrability conditions of vehicles at critical locations, swept path assessments were undertaken using AutoTURN software (the industry standard vehicle swept path assessment software). **Figure 4** illustrates the template of the 85th percentile vehicle (B85 vehicle) used to simulate the swept paths (it is noted that this 85th percentile vehicle template is developed according to the dimensions specified in AS 2890.1-2004).



Figure 4: Template of an 85th percentile vehicle (AS2890.1-2004)



Figures 5-8 illustrate the results obtained from the swept path analysis.

It is noted that the Blue and Cyan colour lines in the swept paths indicate the front and rear tyre tracks of the vehicle, respectively, while the Black colour of the swept paths indicate the vehicle body (the Green colour line indicated the centreline of the swept path while the dashed Red colour lines indicate the 300mm vehicle body clearance envelop).

As can be seen from **Figure 5**, a vehicle can conveniently exit the site while another vehicle is waiting within the proposed passing bay.

Figure 6 shows the anticipated manoeuvres of a vehicle using one of two car spaces immediately adjacent to the ramp connection. Due to the configuration of the ramp connection, the vehicles at these spaces will require one correction when exiting. This level of manoeuvrability is considered acceptable for low turnover residential developments, where the drivers will be regular users who are familiar with the layout of the car park.

Figures 7 and 8 show the anticipated manoeuvres of vehicles using the remaining car spaces. These vehicles do not require any correctional manoeuvres.





Figure 5: Vehicle movements at the passing bay





Figure 6: Entry and exit movements at car space 5 (similarly for car space 1)



Figure 7: Entry and exit movements at car space 6 (similarly for car spaces 2, 3 and 7)





Figure 8: Entry and exit movements at car space 8 (similarly for car space 4)

4.9 Pedestrian Sight Distance Availability

AS 2890.1 requires a sight triangle of 2.5m length by 2m width, to be provided at the site egress location, to ensure sufficient sight distance availability for pedestrians. This requirement is illustrated in **Figure 9**.



Figure 9: Pedestrian sight distance requirement (AS 2890.1)

The following figure illustrates the preservation of pedestrian sight triangles at the proposed sight access point off Glenn Avenue. It is noted that since the first 6m of the



driveway is designed to cater for tow way movements, the pedestrian sight triangle is only required towards the left-hand side of a vehicle exiting the site. As can be seen, this sight triangle can be fully preserved within the proposed design.



Figure 10: Proposed preservation of the pedestrian sight envelop

4.10 Level Difference between the Driveway and the Adjacent Pathway

At the location shown highlighted in **Figure 11**, the driveway is approx. 150mm lower than the adjacent pathway. AS2890.1 requires provision of 300mm clearance to the minimum driveway width when the driveway is located adjacent to an obstruction that is taller than 150mm. As such, the proposed driveway (3m wide) includes a 300mm clearance from adjacent elevated pathway in the form of a 150mm high concrete kerbline. This kerbline provides the required minimum lateral driveway clearance and will prevent vehicles side swiping on the adjacent vertical structure.





Figure 11: Level difference between the driveway and the adjacent pathway

4.11 Level Difference between the Car Spaces and the Adjacent Pathway

A level difference of approx. 1.2m exists between car spaces 5-8 and the adjacent pedestrian path. In such situations, AS 2890.1 requires provision of a 1.3m high barrier to prevent vehicles from running over the edge of the raised parking level. This barrier shall be designed structurally for loading requirements of AS 1170.1. This requirement from AS 2890.1 is extracted in **Figure 12**.



Figure 13 shows the plan and section view of the proposed crash barrier which satisfies the relevant AS 2890.1 requirement.

2.4.5.3 Barriers

Barriers shall be constructed to prevent vehicles from running over the edge of a raised platform or deck of a multi-storey car park including the perimeter of all decks above ground level. They are required wherever the drop from the edge of the deck to a lower level exceeds 600 mm. At drops between 150 mm and 600 mm, wheel stops (see Clause 2.4.5.4) shall be provided. Barriers shall comply with the following requirements:

- (a) They shall be designed structurally for the loading requirements of AS/NZS 1170.1.
- (b) If at the end of a parking space, they shall be at least 1.3 m high so that drivers of cars backing into the space can see the barrier above the rear of the car. NOTE: The upper portion of such a barrier may be a light structure provided for sighting purposes only.
- (c) They shall not be made from brickwork, unreinforced concrete or other materials likely to shatter on impact.

Figure 12: AS 2890.1 crash barrier requirement



Figure 13: Proposed crash barrier location



5. TRAFFIC IMPACT ASSESSMENT

A traffic impact assessment was undertaken to determine the potential impacts caused by the proposed development upon the local road network. According to the Guide to *Traffic Generating Developments (RMS 2002)*, housing for aged and disabled persons include the following trip generation features:

- Daily vehicle trips = 1-2 per dwelling, and
- Evening peak hour vehicle trips = 0.1-0.2 per dwelling

Applying the higher end of the above rates to the proposed development which includes 16 dwellings, leads to the following trip generation levels:

- o 32 daily trips, and
- o 4 evening peak hour trip.

The above trips will manifest as turning movements at the midblock of Glenn Avenue, at the site frontage.

The above-determined peak hour trips are minor not expected to have any noteworthy impacts on the existing traffic operations on Glenn Avenue, particularly since there will likely be no net difference between the traffic generating potential of the proposal compared to that of the existing 4 residential dwellings within this site (based on the RMS Guide, a residential dwelling generates, on average, 0.85 trips in each peak hour period. Applying this to the existing 4 residential dwellings within the subject site leads to 4 trips, which is equivalent to the trip generation potential of the proposal).

The proposed development will likely improve the existing traffic operations on Glenn Avenue by consolidating the existing 4 vehicle crossovers to a single two-way driveway at the subject site. This will also enable the addition of more kerbside parking spaces along the eastern side of Glenn Avenue.



6. CONCLUSIONS

APEX Engineers were engaged by Barry Rush and Associates to provide a traffic impact assessment as a part of the proposed seniors housing development, located at 2 - 8 Glenn Avenue in Northmead.

The subject site is serviced by one bus route, which can be accessed from bus stops located on Glenn Avenue, within a 100m (1-minute walk) of the subject site.

Based on the parking rates prescribed in Section 108(2)(j) of the State Environmental Planning Policy (Housing) 2021 (Housing SEPP), the proposed development should provide 4 car parking spaces. The proposed development includes provision for 8 car spaces (including 4 disability accessible car spaces) – which satisfies the relevant minimum parking provision requirement.

The proposed car parking design was assessed with reference to AS 2890.1 and AS 2890.6. It was found that the proposed car park design is compliant with the relevant design requirements. The swept path assessments carried out reveal sufficient manoeuvrability conditions for vehicles using the proposed car park.

The daily and evening peak hour trip generations for the proposed development were determined from the trip rates provided in the Guide to Traffic Generating Developments (RMS, 2002) for housing for the elderly. Based on these rates, the proposed development is estimated to generate 4 trips in the evening peak hour and 32 daily trips. This number of trips are considered minimal and are unlikely to eventuate into any noticeable impacts on the local road network particularly since there will likely be no net difference between the traffic generating potential of the proposal compared to that of the existing 4 residential dwellings within this site.



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