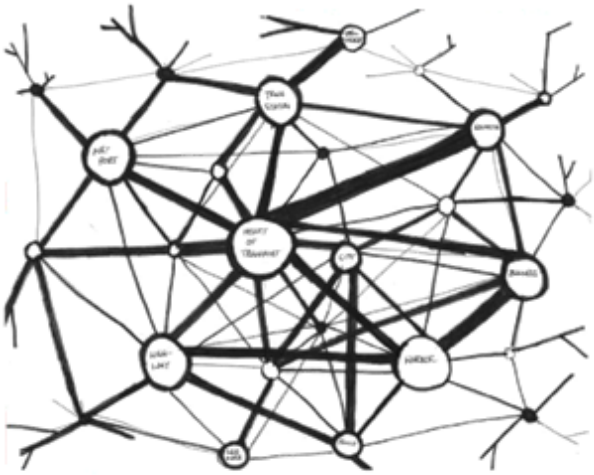
TSA

ABN: 79 943 737 368

TRAFFIC AND PARKING IMPACT STATEMENT

19 – 21 HARVEY AVENUE, MOOREBANK (PROPOSED RESIDENTIAL FLAT BUILDING DEVELOPMENT)



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1. INTRODUCTION

The Practice of TSA has been engaged by Mr. Andrew Hastie, to prepare a traffic and transport impact assessment accompanying a development application ('DA' or 'application') to be lodged with Liverpool City Council ('Council'). The subject DA proposes the demolition of an existing residential dwelling & associated outbuildings and the construction of a six storey residential flat building development containing 28 apartments (with 14 apartments allocated for "affordable housing" purposes) on land situated at 19 – 21 Harvey Avenue, Moorebank.

The general purpose of this report is to undertake an assessment of the potential traffic and transport related implications resulting from the proposed development and, where necessary, recommend suitable mitigating measures. To this end, this report:

1) Assesses the adequacy of the proposed off-street parking provision based on Liverpool City Council's parking standards and those of the Roads and Maritime Services;

2) Assesses the suitability of the proposed vehicular access arrangements having regard to the traffic conditions surrounding the site and the number of off-street parking spaces;

3) Reviews the architectural plans with respect to on-site vehicular manoeuvrability;

4) Examines the existing transport conditions in vicinity of the site, including the existing traffic network, traffic volumes and the available public transport network; and

5) Determines the likely traffic generation from the proposed development and assesses the ability of the surrounding road network to safely and efficiently accommodate this additional traffic.

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

- Roads and Maritime Services' *Guide to Traffic Generating* Developments;
- The State Environmental Planning Policy's (SEPP) *Affordable Rental Housing 2009*;
- Liverpool City Council's *Liverpool Development Control Plan 2008* (DCP 2008); and
- Australian Standard *Parking Facilities Part 1: Off-Street Parking* (AS 2890.1 - 2004) and *Part 6: Off-Street Parking for People with Disabilities* (AS2890.6 - 2009);

The report has been prepared in accordance with State Environmental Planning Policy (Infrastructure) 2007.

The report should be read in conjunction with architectural plans prepared by Algorry Zappia Associates.

2. SITE DETAILS

2.1 Site Location

The subject site is located on the southern side of Harvey Avenue, approximately midway between Dredge Avenue and Lucas Avenue, Moorebank. The site location is shown overleaf in the context of the existing surrounding road network in **Figure 1** and in an aerial context in **Figure 2**.

2.2 Site Description

The subject site comprises two lots providing a collective legal description of Lots 29 – 30 in DP 236405 No. 19 – 21 Harvey Avenue, Moorebank. The consolidated allotments form a regular shaped parcel of land providing a sole frontage to Harvey Avenue of approximately 38.0m and a depth of approximately 38.0m. The total site area is in the order of 1,373m^2.

2.3 Existing Uses

The subject site currently accommodates two detached residential dwellings serviced by separate vehicular access driveways connecting with Harvey Avenue at the north-western corner and centre of the northern property boundary. The existing on-site developments are proposed to be removed under the subject DA.

2.4 Surrounding Uses

The subject site is situated within a high density residential zoning (R4), where it is currently surrounded by a combination of single and double storey detached dwellings to the immediate north, south, east and west.

Non-residential development in the surrounding precinct in the vicinity of the site include Moorebank Shopping Centre, Nuwarra Public School and Southwestern Community Baptist Church located to the south and west.

FIGURE 1
SITE LOCATION – ROAD NETWORK CONTEXT

Source: Google Maps (Accessed 6/07/17)

FIGURE 2
SITE LOCATION – AERIAL CONTEXT

Source: Six Maps (Accessed 6/07/17)

3. PROPOSED DEVELOPMENT

3.1 Built Form

The subject DA proposes the demolition of existing site structures and the erection of a six storey residential flat building occupying the majority of the site, providing a total of 28 dwellings (half of which is designated for affordable housing purposes), with the following dwelling mix:

Affordable Housing Apartments
4 x 1 bedroom dwellings;
8 x 2 bedroom dwellings; and
2 x 3 bedroom dwellings.

Subtotal = 14 dwellings

Regular Apartments
4 x 1 bedroom dwellings;
8 x 2 bedroom dwellings; and
2 x 3 bedroom dwellings.

Subtotal = 14 dwellings
Total = 28 dwellings

The above development provides a total combined GFA of 2,291.60m^2. Two levels of basement parking containing 39 passenger vehicle parking spaces is proposed below the six levels of residential apartment building.

Vehicular connectivity between Harvey Avenue and the off-street parking provision is proposed to be facilitated by a single combined ingress/egress driveway servicing Harvey Avenue at the north-western corner of the site.

Pedestrian access is proposed via Harvey Avenue approximately central to the site frontage, being separate from the abovementioned vehicular access.

4. ACCESS ARRANGEMENTS & INTERNAL CONSIDERATIONS

4.1 Access Arrangements

4.1.1 Vehicular Access

Vehicular access to the development is proposed to be accommodated by a new 6.0m wide combined ingress/egress driveway connecting with Harvey Avenue at the north-western corner of the site.

In order to undertake an assessment of the proposed driveway design, reference is made to AS2890.1-2004. This Standard provides driveway design specifications based on the number of parking spaces accommodated on-site, the land-use proposed and the functional order of the frontage road. Based on the development parking provision of 39 car spaces, the residential nature of the land-use and the local (non-arterial) nature of Harvey Avenue, AS2890.1-2004 specifies, at minimum, a Category 1 type driveway be providing, comprising a combined ingress / egress driveway of between 3.0m – 5.5m in width. The proposed combined ingress / egress driveway arrangement therefore exceeds the minimum Standard requirement and is accordingly considered to be satisfactory.

The appropriateness of the proposed driveway location, from an operational traffic perspective, is largely dependent on the provision of adequate sight distance along the frontage road. Harvey Avenue provides a reasonably consistent vertical and horizontal alignment in the immediate vicinity of the site, thereby resulting in good sight distance being facilitated between the site access location and the frontage road, suitably complying with the minimum sight distance specifications of AS2890.1-2004 for a sign posted speed limit of 50km/h. In consideration of this and the above discussion, the proposed site access arrangements are considered to be satisfactory.

4.1.2 Pedestrian Access

Pedestrian access is proposed via Harvey Avenue approximately central to the site frontage, being separate from the abovementioned vehicular access. This access is proposed to be connectivity to a series of internal paths, within the residential flat building.

4.2 Parking Provision

4.2.1 Vehicular Parking

The subject development is proposed to provide a total of 39 passenger vehicle parking spaces comprising 32 resident and seven visitor spaces over two basement levels.

Affordable Housing 2009 SEPP Requirements

Clause 10 Parts 1 and 2 of *Affordable Rental Housing 2009* SEPP state the following with respect to residential flat building developments:

(1) This Division applies to development for the purposes of dual occupancies, multi dwelling housing or residential flat buildings if:

(a) The development concerned is permitted with consent under another environmental planning instrument, and

(b) The development is on land that does not contain a heritage item that is identified in an environmental planning instrument, or an interim heritage order or on the State Heritage Register under the Heritage Act 1977.

(2) Despite subclause (1), this Division does not apply to development on land in the Sydney region unless all or part of the development is within an accessible area.

Clause 4(1) of the Affordable Housing SEPP defines 'accessible area' as *land that is within:*

(a) 800 metres walking distance of a public entrance to a railway station or a wharf from which a Sydney Ferries ferry service operates, or

(b) 400 metres walking distance of a public entrance to a light rail station or, in the case of a light rail station with no entrance, 400 metres walking distance of a platform of the light rail station, or

(c) 400 metres walking distance of a bus stop used by a regular bus service (within the meaning of the Passenger Transport Act 1990) that has at least one bus per hour servicing the bus stop between 06.00 and 21.00 each day from Monday to Friday (both days inclusive) and between 08.00 and 18.00 on each Saturday and Sunday.

The closest bus stop is located within approximately 395m walking distance from the site, along the northern side of Maddecks Avenue. This bus stop services bus route 902 which operate between Liverpool and Holsworthy. This service provides an approximate frequency of 30 minutes during weekday commuter peaks and a 60 minute frequency during other periods. It operates between approximately 5.30am - 9.30pm on weekdays, 6.30am - 6.30pm Saturdays and 8.00am – 6.30pm Sundays. The subject site is therefore located within an accessible area as defined by the SEPP.

Accordingly, the subject site is 'accessible area' and the following parking rates from Clause 14(2)(i) therefore apply to the affordable housing component of the proposed development:

- 4 x 1 bedrooms @ 0.5 spaces per dwelling = 2 spaces
- 8 x 2 bedrooms @ 1.0 spaces per dwelling = 8 spaces
- 2 x 2 bedrooms @ 1.5 spaces per dwelling = 3 spaces
- Total = 13 spaces

The subject proposal is therefore required to provide 13 on-site car parking spaces dedicated to the affordable housing component of the proposed development in accordance with the parking requirements specified within SEPP 2009.

Council DCP Requirements

Liverpool City Council provides locally sensitive parking requirements relevant to the subject development within Part 1 of DCP 2008:

1 space per small dwelling (< 65sqm) or 1 bedroom
1.5 spaces per medium dwelling (65 - 110sqm) or 2 bedrooms

2 spaces per large dwelling (> 110sqm) or 3 or more bedrooms
1 visitor car space for every 4 dwellings or part thereof

Based on the proposed regular apartment development yield of 4 x 1-bedroom dwellings, 8 x 2-bedroom dwellings and 2 x 3-bedroom dwellings, the following calculations are provided:

(1 x 4) + (1.5 x 8) + (2 x 2) + (14/4) = 24 spaces

The proposed development is required to provide 24 spaces to service residents/visitors of the regular apartments in accordance with DCP 2008.

Off-Street Parking Requirement Summary.

In consideration of the above assessment, the proposed development is required to provide a total of 37 off-street passenger vehicle parking spaces comprising 13 spaces for the affordable housing component and 24 spaces for the regular apartment component.

The proposed parking provision of 39 spaces therefore readily complies with the relevant parking requirements specified within SEPP 2009 and Council's DCP.

4.3 Internal Circulation

Upon entry into the site via the access driveway, vehicles will proceed in a forward direction along the internal roadway / ramp adjacent to the northern site boundary to connect with the basement level parking area. Vehicular connectivity between the two basement levels is facilitated by an internal ramp located at the south-western corner of the basement parking area.

The basement parking areas are proposed to comprise a series of standard 90 degree angled parking rows, serviced by single internal manoeuvring / circulating aisle.

The basement parking and circulation area has been designed in accordance with AS2890.1-2004 and AS2890.6-2009 providing the following minimum dimensions:

- Standard parking space width = 2.4m;
- Disabled parking space width = 2.4m (with adjoining 2.4m wide shared area when not provided within an manoeuvring aisle);
- Additional space width where parking space adjoins an obstruction = 0.3m; Parking space length = 5.4m;
- Parking aisle width = 5.8m;
- Motorcycle parking space width = 1.2m;
- Motorcycle parking space length = 2.5m;
- Two-way straight roadway = 5.5m;
- Parking aisle extension adjoining end parking space = 1.0m;

- Headroom = 2.2m (2.5m above disabled spaces);

- Maximum grade throughout parking module = 1 in 20; Maximum ramp grade = 1 in 4; and

- Maximum ramp grade for the first 6m inside the site = 1 in 20; and Maximum change in grade = 1 in 8.

The above compliance with the relevant AS2890.1-2004 and AS2890.6-2009 specifications is anticipated to result in safe and efficient internal manoeuvring and parking space accessibility. The proposed internal circulation arrangements are therefore considered to be satisfactory.

In order to further assess the internal passenger vehicle manoeuvrability within the parking areas, this Practice has undertaken a desktop analysis of the ability of passenger vehicles to manoeuvre throughout the basement parking levels. This assessment has concluded that passenger vehicles are able to manoeuvre throughout the internal circulation areas with a reasonable level of safety and efficiency and opposing vehicle movements are able to be accommodated where necessary.

5. EXISTING TRANSPORT CONDITIONS

5.1 Surrounding Road Network

The following provides a summary of the surrounding road network in the vicinity of site.

Harvey Avenue performs a residential access road function under the care and control of Liverpool City Council. It provides a northwest / southeast connection between Dredge Avenue and Lucas Avenue, with which it forms T-junctions with both under major/minor priority control, with Harvey Avenue forming the subordinate route.

Harvey Avenue provides an 8.0m wide pavement providing one through lane of traffic in conjunction with parallel parking along both alignments. Adjacent to the subject site, the Harvey Avenue horizontal alignment provides a 90 degree curve. Although not sign posted, traffic flow within Harvey Avenue is governed by the standard local road speed limit of 50km/h consistent with State Government Policy.

Lucas Avenue performs a local access function to abutting developments and intersecting side roads under the care and control of Liverpool City Council. It services connectivity between the local road, Dredge Avenue in the northwest and the collector road, Maddecks Avenue in the southeast. In the vicinity of the subject site, Lucas Avenue provides an 8.0m wide carriageway providing one through lane of traffic in each direction in conjunction with parallel parking along both alignments. Traffic flow is governed by a sign posted speed limit of 50km/h, however a 40km/h school zone speed limit applies to a majority of the route during school start and finish periods associated with Nuwarra Public School located to the south.

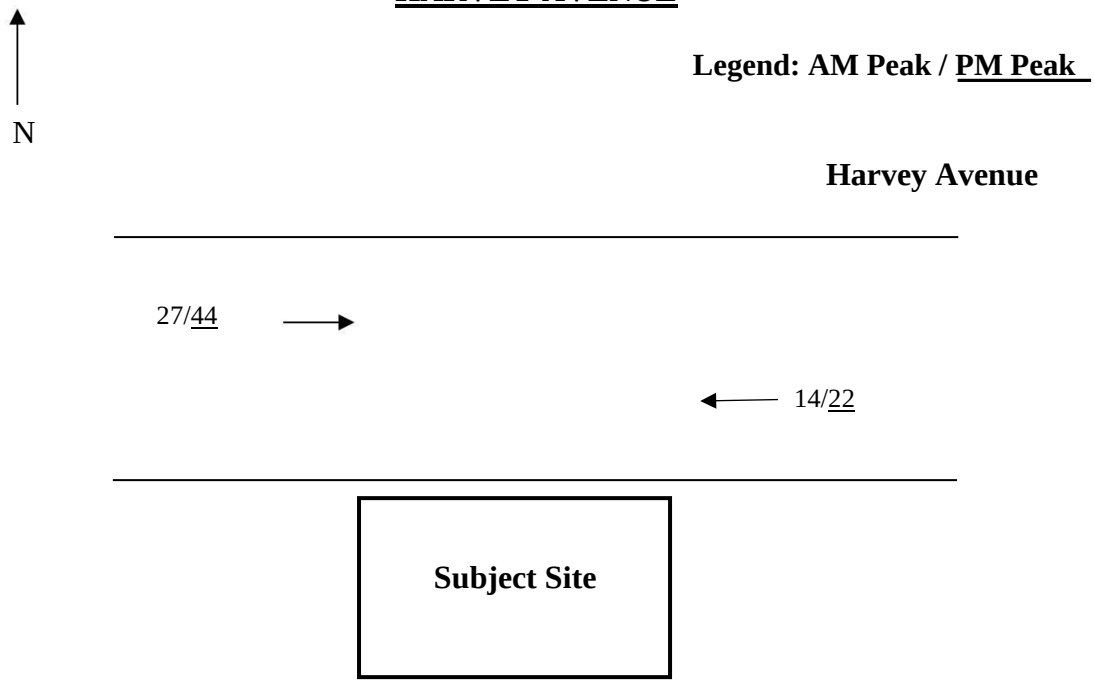
Dredge Avenue performs a local access function under the care and control of Liverpool City Council. It forms an east/west alignment, intersecting with Stockton Avenue under a single lane roundabout (which in turn facilitates a northerly connection with Newbridge Road) at its western extremity and terminating in a cul-de-sac at its eastern extremity. Dredge Avenue provides an 8.0m wide carriageway providing one through lane of traffic in each direction in conjunction with parallel parking along both alignments. Whilst not sign posted, traffic flow within this local road is governed by the standard local road speed limit of 50km/h consistent with State Government Policy.

5.2 Existing Traffic Volumes

This Practice has undertaken observations of traffic demands within Harvey Avenue immediately adjacent to the subject site during weekday peak commuter periods on Thursday, 27th of June 2017. Harvey Avenue was observed to accommodate particularly low traffic demands immediately adjacent to the site, whereby two directional hourly traffic demands are less than 100 vehicles.

Figure 2 overleaf provides a graphical representation of the surveyed peak hour traffic volumes, whilst full details are available upon request.

FIGURE 2
EXISTING WEEKDAY PEAK TRAFFIC VOLUMES
HARVEY AVENUE



5.3 Existing Road Network Performance

In order to undertake an assessment of the midblock capacity of the adjoining frontage road (Harvey Avenue) surveyed in the immediate vicinity of the subject site, reference is made to the Roads & Maritime Services' *Guide to Traffic Generating Developments*. This *Guide* indicates that a two way two lane urban road accommodating less than 200 vehicles per hour in each direction provides a Level of Service (LoS) 'A'

The Roads & Maritime Services define a route LoS of 'A' as indicating *"free or stable flow where drivers are reasonably unaffected by others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is high, and the general level of comfort and convenience provided is good".*

The above Roads & Maritime Services LoS definition is commensurate with the overall traffic conditions observed by this Practice immediately adjoining the subject site. In this regard, motorists have generally been observed to access and vacate the adjoining developments within the surrounding residential precinct with a reasonable level of safety and efficiency.

5.4 Public Transport & Non Car Travel

5.4.1 Bus

In the vicinity of the site, Transdev NSW operates Bus Route 902 between Liverpool and Holsworthy. The closest stops are located along both sides of Maddecks Avenue, approximately 400m walking distance to the southeast of Harvey Avenue.

6. DEVELOPMENT TRAFFIC GENERATION & IMPACTS

6.1 Projected Development Traffic Generation

In order to estimate the existing traffic generation of the development, reference is made to the Roads & Maritime Services' (RMS) *Guide to Traffic Generating Developments*. This publication provides average traffic generation rates for a range of land uses based on extensive surveys undertaken throughout the Sydney metropolitan area. The following rates are provided pertinent to the various components of the proposed mixed use development:

> ***Medium Density Residential Flat Building***
> *Smaller units and flats (up to two bedrooms):*
> *Weekday peak hour vehicle trips = 0.4-0.5 per dwelling.*
> *Larger units and town houses (three or more bedrooms):*
> *Weekday peak hour vehicle trips = 0.5-0.65 per dwelling.*

Adopting the higher rates and based on a development yield of 8 one-bedroom residential apartments, 16 two-bedroom residential apartments and 1 three-bedroom residential apartment, the proposed mixed use development is projected to generate a maximum of 15 peak hour vehicle trips.

Further to the above, as mentioned in Section 2.3 of this report, the subject site currently accommodates two detached residential dwellings. According to the *Guide to Traffic Generating Developments*, a single residential dwelling generates an average of 0.85 peak hour trips. As such, the two existing dwellings currently on-site is estimated to have a peak hour traffic generation of 1.7 (say two) vehicle trips. The net traffic generation resulting from the proposal is therefore more likely to be in the order of 13 vehicular movements during peak periods.

6.2 Traffic Impact

The proposed development has been projected to generate in the order of 13 additional vehicle trips to and from the subject development above that which is currently generated during peak hours. This represents one additional vehicle movement every 4
- 5 minutes during peak periods. The previous assessment contained within this report has revealed that the immediately adjoining road network currently operates with low traffic demands during peak periods resulting in drivers experiencing a good level of service with sufficient capacity to accommodate larger traffic volumes. The abovementioned low level of additional traffic is anticipated to have negligible impacts on the operation of the surrounding road network and nearby intersections.

The impact of the subject development is therefore most likely to be a factor of the level of safety afforded by the site access arrangements. In this regard, Section 4 of this report presents that the consistent vertical and horizontal alignment of Harvey Avenue in the vicinity of the site is envisaged to result in good sight distance provisions between the site access and the frontage road thereby allowing vehicle movements to be capable of occurring to and from the site in a safe manner.

6.3 Environmental Capacity

The Roads & Maritime Services provide environmental capacity performance standards to measure the level of amenity experienced by the general community, not just motorists. The Roads & Maritime Services specify an environmental capacity for local roads of 300 vehicles in both directions in any one hourly period. The existing surveyed peak hourly traffic demands of Harvey Avenue are less than 100 vehicles per hour. This existing demand, coupled with the additional 13 peak hour vehicles likely to be generated by the proposed development, maintains the identified desirable threshold for local roads of 200 vehicles per hour. In this regard, it is reiterated that the proposed development is unlikely to generate any noticeable impacts for traffic flow within Harvey Avenue, nor is the existing residential amenity likely to be noticeably compromised.

7. CONCLUSION

This Practice has undertaken an assessment of the likely traffic implications resulting from a proposed residential apartment development accommodating 28 apartments (14 of which are assigned as affordable housing) at 19 - 21 Harvey Avenue, Moorebank. Based on this assessment, the following can now be concluded:

- The proposed access, internal circulation and manoeuvring arrangements are capable of providing for safe and efficient vehicular movements during peak times;

- The proposed parking provision suitably conforms to the intentions of the Affordable Housing SEPP 2009 and DCP 2008 with respect to residential flat developments;

- The immediately adjoining road network currently operates with a good level of service during peak periods;

- The proposed development is expected to generate 13 additional peak hour vehicle trips to and from the site, over and above that currently generated by existing site improvements; and

- The subject development is therefore not projected to have any unreasonable impacts on the level of safety and efficiency afforded by the surrounding road network as well as environmental amenity within the surrounding precinct.

Having regard to the above, we do not consider that there are any traffic related issued that should prevent Council's approval of the subject DA. Accordingly, from a traffic perspective, we recommend that action to Council.