

# **TRAFFIC IMPACT ASSESSMENT**

#### RESIDENTIAL SUBDIVISION NORTHVIEW ESTATE STAGES 6 & 7

LOT 58 IN DP 1276946 212 – 216 QUEEN STREET, MUSWELLBROOK

PREPARED FOR: NORTHVIEW REIT PTY LTD

**OCTOBER 2024** 



REF: 23/019

In

TRAFFIC IMPACT ASSESSMENT. RESIDENTIAL SUBDIVSION – NORTHVIEW ESTATE STAGES 6 & 7. NORTHVIEW REIT PTY LTD

LOT 58 IN DP 1276946 212 – 216 QUEEN STREET, MUSWELLBROOK

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А	15/04/23	Draft	JG
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С	23/10/24	Final Proof / Amended Plan	JG
D	23/10/24	Approved	JG

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Date 23<sup>rd</sup> October 2024.

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## 1. INTRODUCTION

Intersect Traffic Pty Ltd (Intersect Traffic) was engaged by Northview REIT Pty Ltd to prepare a traffic impact assessment (TIA) for a proposed 58 lot residential subdivision on Lot 58 in DP 1276946 – 212 – 216 Queen Street, Muswellbrook. The proposal is an extension to the existing Northview residential estate and represents Stages 6 & 7 of the estate. The proposed subdivision plan is provided within *Appendix 1*.

Access to all of the lots of the proposed subdivision will be via an extension of Queen Street and Sepoy Crescent as well as an approved road within Stage 5 of the development as well as a new cul-de-sac public road.

The aim of this TIA is to determine the likely impact of the traffic generated by the development on the adjacent local road network and allow Muswellbrook Council to assess the merits of the development in an informed manner.

This report presents the findings of the traffic assessment and includes the following:

- 1. An outline of the existing situation near the site.
- 2. An assessment of the traffic impacts of the proposed development including the predicted traffic generation, trip distribution and its impact on existing road and intersection capacities.
- 3. An assessment of the proposed subdivision access and layout.
- 4. A review of parking, public transport, pedestrian, and cycleway requirements for the proposed development, including assessment against Council and TfNSW standards and requirements.
- 5. A presentation of conclusions and recommendations.

### 2. SITE DESCRIPTION

The subdivision site lies on the northern approach to Muswellbrook adjacent to both the New England Highway and the Hunter Rail Line approximately 2.7 kilometres northeast of the centre of the Muswellbrook CBD. The property is part of an urban release area for the township of Muswellbrook. The main access to the arterial road network (New England Highway) for the estate traffic with an origin / destination to the CBD and north and west of Muswellbrook is via Queen Street, Cook Street, Sowerby Street and Hill Street to Bridge Street (New England Highway). Bridge Street being the main street of the Muswellbrook CBD. Traffic with an origin / destination south and east is likely to use Queen Street, Coal Road, and Victoria Street to bypass the main street. The site is bounded by large rural properties to the north and east and the early stages of the Northview residential estate to the south and west. The site does not contain any structures and is predominantly cleared grazing land. *Figure 1* below shows the location of the subdivision in the context of the surrounding development.



Figure 1 Site Location Plan

The site contains the following property descriptors:

- Formal land title of Lot 58 in DP 1276946,
- Residential address of 212 216 Queen Street, Muswellbrook,
- Lot area of approximately 22 hectares, and
- Land zoning of R1 General Residential and R5 Large Lot Residential within the Muswellbrook LEP (2009).

**Photograph 1** below shows the existing site from Queen Street whilst **Photograph 2** shows the existing site from Sepoy Crescent.



Photograph 1 -Devel

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-Development site from Queen Street.



Photograph 2Development site from Sepoy Crescent.





### 3. ROAD NETWORK IMPROVEMENTS

There are no known future road network upgrades that will increase the capacity of the road network near the site. Maintenance and rehabilitation works would be undertaken in future in line with Muswellbrook Shire Council works programs.

### 4. EXISTING ROAD NETWORK

Queen Street near the site is a local collector road therefore is under the care and control of Muswellbrook Shire Council. While providing vehicular access to properties along its length it also collects and distributes traffic from the northern residential areas of Muswellbrook to the arterial road network through Muswellbrook i.e., New England Highway via other roads such as Cook Street, Sowersby Street, Hill Street, Coal Road, and Victoria Street.

Queen Street is a sealed two lane two-way urban road with a 13-metre-wide pavement between kerb and gutter providing one travel lane (3.5 metres wide) and a parking lane (3 metres wide) in each direction. The road is not centre line marked and a 50 km/h speed limit exists near the site. A Local Area Traffic Management scheme is in place in Queen Street with road narrowing's and speed control humps provided at regular spacings from Cook Street to the existing temporary culde-sac head at the end of Queen Street.

**Photographs 3 and 4** below show Queen Street near the site at Lonhro Place and immediately south of Sepoy Crescent. At the time of inspection, Queen Street was observed to be in good condition.



Photograph 3 Queen Street near Lonhro Place.





Photograph 4 Queen Street south of Sepoy Street with LATM facility.

Sepoy Crescent is a local urban street with its main function to provide vehicular access to properties along its length. It too is under the car and control of Muswellbrook Shire Council. Sepoy Crescent has an 11-metre-wide sealed pavement between kerb and gutter providing a travel lane (3 metres wide) and a parking lane (2.5 metres wide) in both directions. A 50 km/h speed zoning applies to the road and as shown in **Photograph 5** below was observed to be in good condition.



Photograph 5 Sepoy Crescent near the site.



### 5. TRAFFIC VOLUMES

Intersect Traffic engaged Northern Transport Planning and Engineering (NTPE) to undertake traffic counts on Queen Street approximately 50 metres north of Cook Street. The traffic classifier count was undertaken for 24 hours each day over a 7-day week, ending Wednesday 5<sup>th</sup> April 2023 for both northbound and southbound traffic. The traffic count results are presented in *Appendix 2*.

Upon examination of the counts, it was determined that the peak hour periods occurred on Tuesday between 8.00 am - 9.00 am and Wednesday between 5.00 pm - 6.00 pm and that the heavy vehicle component of the counts were approximately 2% of total traffic.

Predicted two-way mid-block 2024 and 2034 traffic volumes were calculated using a background traffic growth rate of 1.5% per annum as recommended by TfNSW for use in the Hunter region. Based on this assumption the 2023 and 2033 two-way mid-block peak hour traffic volumes on Queen Street are as follows:

2024

- AM peak = 142 vtph
- PM peak = 153 vtph.

2034

- AM peak = 168 vtph
- PM peak = 178 vtph.

### 6. ROAD CAPACITIES

The capacity of the road network is generally determined by the capacity of intersections. However, the *RTA's Guide to Traffic Generating Developments* provides some guidance on midblock capacities and likely levels of service. For urban roads *Table 4.3* of the *RTA's Guide to Traffic Generating Developments*, reproduced below, provides guidance on mid-block capacities for a level of service (LoS) C.

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)				
Median or inner lane:	Divided Road	1,000			
	Undivided Road	900			
Outer or kerb lane:	With Adjacent Parking Lane	900			
	Clearway Conditions	900			
	Occasional Parked Cars	600			
4 lane undivided:	Occasional Parked Cars	1,500			
4 lane undivided:	Clearway Conditions	1,800			
4 lane divided:	Clearway Conditions	1,900			

Table 4.3 Typical mid-block capacities for urban roads with interrupted flow

Source: - RTA's Guide to Traffic Generating Developments (2002).

Noting the one-way mid-block capacity from the above table for undivided inner lane or outer lane or kerb lane with adjacent parking is 900 vtph and for roads with one lane each way a two-way mid-block capacity of 1,800 vtph for a LoS C would apply. This would mean that the two-way mid-block capacity of the New England Highway is 1,800 vtph. However, as Queen Street is primarily a residential street the environmental capacity of the street also needs to be considered to ensure the residential amenity for residents living on Queen Street is maintained at an acceptable level. The environmental capacity thresholds are contained in Table 4.6 of *RTA's Guide to Traffic Generating Developments*, reproduced below.

Road class	Road type	Maximum Speed (km/hr)	Maximum peak hour volume (veh/hr)		
	Access way	25	100		
Local	Christ	40	200 environmental goal		
	Street	40	300 maximum		
0 1 1	<u>.</u>	50	300 environmental goal		
Collector	Street	50	500 maximum		

Table 4.6 Environmental capacity performance standards on residential streets

Note: Maximum speed relates to the appropriate design maximum speeds in new residential developments. In existing areas maximum speed relates to 85th percentile speed.

Source: - RTA's Guide to Traffic Generating Developments (2002).

Therefore, as a local collector road, Queen Street would have an environmental capacity threshold of 500 ytph. This has been adopted as the road capacity for Queen Street in this assessment. Based on the traffic data collected and shown in Section 5 the local road network (Queen Street) is currently operating well below its environmental capacity threshold therefore has significant spare capacity to cater for additional development in the area.

### 7. ALTERNATE TRANSPORT MODES

Osborn's Transport operates public bus services in the region. A public bus service, Route 419 (Queen Loop) already services the development site stopping in Lonhro Place adjacent to the site. This service includes 6 services weekdays and 4 on Saturdays connecting to the Muswellbrook train station, areas of the CBD as well as 3 other bus route services and many suburban areas. Figure 2 below shows an extract of the town bus routes. It is concluded the site therefore already has excellent access to public transport services in Muswellbrook.

Being within a newer residential area in Muswellbrook there is typically a 1.2-metre-wide concrete pedestrian pathway constructed along on side of the road only. This is on the eastern side of Queen Street and the northern side of Sepoy Crescent but only extends approximately 700 metres along Queen Street with no pedestrian footpaths provided in the older residential areas of Queen Street between Holdsworth Crescent and Cook Street. In this area pedestrian would use the wellmaintained grass verges in Queen Street. The concrete pedestrian footpaths near the site are shown in *Photographs 2, 3, 4 & 5* above.

There was no formal on, or off-street cycleways observed within close vicinity of the site though an off-road shared concrete pathway exists along the northern side of Cook Street which appears to connect the Muswellbrook CBD area to the recreational fields in Theis Crescent. This is however in excess of 2.2 km from the site. The cycleway in Cook Street is shown in **Photograph 6** below.



Off-road cycleway - Cook Street **Photograph 6** 







The proposed development involves the subdivision of the 26.5-hectare rural property into residential allotments, including some large lot residential lots. The concept subdivision plan is provided in *Appendix 1*. Access to the site will be provided via extensions of Queen Street and Sepoy Street and two new public roads.

The specific details of the development are:

- Subdivision of the development lot into 58 residential lots ranging in size from 700 m<sup>2</sup> to 6 ha.
- Extension and construction of two existing public roads (Queen Street and Sepoy Crescent) to the site.
- Construction of two (2) new public roads constructed to Muswellbrook Council requirements providing vehicular access to the new residential lots from either Queen Street or Sepoy Crescent, and
- Drainage, services, and landscape works.

### 9. TRAFFIC GENERATION

The *RTA's Guide to Traffic Generating Development's* and TfNSW's *Technical Direction TDT* 2013/04 provides specific advice on the traffic generation potential of various land uses. Regarding low density residential dwellings, the following advice is provided within the TDT for regional areas.

#### Rates:

Daily vehicle trips = Average 7.4 per dwelling in regional areas. PM peak (1) hour = Average 0.78 per dwelling in regional areas. AM peak (1) hour = Average 0.71 per dwelling in regional areas.

The additional traffic generated on the network by the proposed subdivision can be calculated as shown below, rounded up.

Daily trips	= 58 x 7.4 vtpd
	= 430 vtpd.
PM peak hour trips	= 58 x 0.78 vtph
	= 46 vtph.
AM peak hour trips	= 58 x 0.71 vtph
	= 42 vtph.

It is however noted that the approved stages 4 and 5 of Northview Estate were not on line when the traffic counts were undertaken and with a yield of 98 lots the following additional traffic needs to be considered in this assessment to determine the cumulative impact on traffic of all known developments in the area. The traffic likely to be generated by stage 4 & 5 of Northview Estate is calculated as follows.

	Daily trips	= 98 x 7.8 vtpd
		= 765 vtpd.
PM peak hou	r trips	= 98 x 0.78 vtph
		= 77 vtph.
AM peak hou	r trips	= 98 x 0.71 vtph
		= 70 vtph.

### **10. TRIP DISTRIBUTION**

Before carrying out any traffic assessment the additional peak hour traffic generated by the development needs to be distributed through the adjoining road network. Based on the traffic counts the trip distribution and likely origin / destinations of traffic using the development is as follows:

- In the AM 80% of traffic will be outbound and in the PM 70% of traffic will be inbound,
- Origins / destinations will be 40% east / 20% west of the site / 40% to CBD.

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Therefore, the adopted development traffic trip distribution at the critical Queen Street / Cook Street intersection for this assessment is shown in *Figure 3* below, while the trip distribution for stages 4 & 5 of Northview Estate is shown in *Figure 4*.





### **11. TRAFFIC IMPACT ASSESSMENT**

#### 11.1 Road Network Capacity

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This TIA has determined in *Section 6* that the existing road network around the site is currently operating well below its technical capacity and subject to satisfactory intersection performance has spare capacity to cater for additional traffic generated by the subdivision.

**Section 10** of this TIA determined that the proposed development of the 56-lot residential subdivision is likely to generate an additional 42 vtph in the AM peak and 46 vtph in the PM peak, while approved stages 4 & 5 of Northview Estate is likely to generate an additional 70 vtph in the AM peak and 77 vtph in the PM peak on the local road network. This will result in the following maximum two-way mid-block AM and PM peak hour traffic volumes on Queen Street post development and in 2033 (1.5 % p.a. traffic growth rate) as shown in **Table 1** below.

*Table 1* shows that two-way mid-block traffic volumes on Queen Street, even with the cumulative impacts of other known developments, will remain well below the environmental capacity threshold of 500 vtph as determined in *Section 6*.

#### Table 1 – Two-way mid-block Road Capacity Assessment

Road	Section			2033 + development		Capacity	Capacity Development Traffic		Cumulative Traffic	
		AM (vtph)	PM (vtph)	AM (vtph)	PM (vtph)	(vtph)	AM (vtph)	PM (vtph)	AM (vtph)	PM (vtph)
Queen Street	north of Cook Street	252	274	277	298	500	42	46	70	77

Therefore, it is concluded that there is sufficient spare capacity within the immediate local road network to cater for the proposed residential subdivision without the need to upgrade the adjoining road network.

#### **11.2** Intersection Capacity

The existing intersections impacted by the development will be those along Queen Street through to and including Cook Street. The greatest impact the development traffic will have will be on the Queen Street / Cook Street intersection due to the traffic volumes on Cook Street. However, it is noted with Queen Street only likely to have a peak 2034 two-way mid-block traffic volume of 298 vtph post development and Cook Street likely to have something similar or only slightly higher, the intersection would still fall within the capacity thresholds for uninterrupted flow conditions as shown below in the table sourced from *Austroads Guide to Traffic Management – Part 6 Intersections, Interchanges and Crossings (2007)*.

Major road type <sup>1</sup>	Major road flow (vph) <sup>2</sup>	Minor road flow (vph) <sup>3</sup>
	400	250
Two-lane	500	200
	650	100
	1000	100
Four-lane	<mark>1</mark> 500	50
	2000	25

Notes:

1. Major road is through road (i.e. has priority).

2. Major road flow includes all major road traffic with priority over minor road traffic.

3. Minor road design volumes include through and turning volumes.

Source: - Austroads Guide to Traffic Management – Part 6 Intersections, Interchanges and Crossings (2007)

The Guide states if traffic volumes fall below these thresholds there is no need for detailed analysis of the intersections. This is consistent with observations made during peak hour site inspections where uninterrupted flow conditions were observed to be occurring at all the intersections along Queen Street including at Cook Street. As traffic is further dispersed through the many traffic routes available beyond Cook Street it is reasonable to conclude the development traffic will not adversely impact on any of these intersections.

Overall, it is concluded that the proposed development will not adversely impact on existing intersections on the adjoining local road network.

#### 11.3 On-Site Car Parking

The development as a residential subdivision does not generate an immediate on-site parking demand however future development of the individual allotments will generate such a demand. The allotments with a minimum lot size of 700 m<sup>2</sup> are large enough to ensure on-site parking provisions can be accommodated within the lots. Future development on the individual allotments will need to comply with the Muswellbrook Council DCP regarding the provision of on-site car parking.

#### 11.4 Alternative Transport Modes

It has been determined in **Section 7** that the site is already well serviced by public transport and there is little in the way of pedestrian and cycle way infrastructure in the area, except in the immediate vicinity of the site. The additional alternative transport demand from this relatively small residential development is not considered sufficient for there to be a nexus for the provision of external pedestrian and cycle way infrastructure aside from the pedestrian paths required to be provided within the new subdivision works as determined by Council.

#### 11.5 Subdivision Design

The subdivision design is provided in *Appendix 1*. The internal layout consists of an extension of Queen Street and Sepoy Street as well as a new cul-de-sac road as the site is the last stage of the Northview residential estate. Three (3) new T-intersections have been provided within the subdivision.

There appeared no constraints to suitable sight distance being available at the new intersections and standard BAL / BAR intersections within the subdivision are adequate as the new intersections will operate with uninterrupted flow conditions given the very minimal traffic volumes on the roads. The subdivision roads will need to comply with the Muswellbrook Shire Council DCP Section 5 Subdivision and Council's Natspec Design and Construction Standards. The road reserve widths are the same as the current residential development therefore are assumed to comply with Muswellbrook Shire Council DCP - *Section 5.5.1 - Local Street Design* requirements and will be specified within conditions of consent for any consent issued for the development.

Overall, it is concluded that the internal road layout and subdivision design is satisfactory and compliant with current best practice and Muswellbrook Shire Council requirements.

## **12. CONCLUSIONS**

This traffic impact assessment for a proposed 58 lot residential subdivision of Lot 58 in DP 1276946 – 212 – 216 Queen Street, Muswellbrook known as Northview Estate Stages 6 & 7 has concluded the following:

- The existing state road network is operating below its technical capacity and has capacity to accommodate additional traffic from the subdivision.
- Using rates contained within the TfNSW's TDT 2013/04 it is estimated that the development will generate an additional 415 vtpd or 42 vtph in the AM peak and 46 vtph in the PM peak on the local road network. Approved Stages 4 & 5 of Northview Estate currently under construction will also generate an additional 765 vtpd or 70 vtph in the AM peak and 77 vtph in the PM peak on the local road network.
- There is sufficient spare capacity within the immediate road network to cater for the proposed residential subdivision as well as the approved Stages 4 & 5 of Northview Estate without the need to upgrade the adjoining local and state road network.
- The proposed development will not adversely impact on existing intersections on the adjoining local road network.
- The development as a residential subdivision does not generate an immediate on-site parking demand however future development of the individual allotments will generate such a demand. The allotments with a minimum size of 700 m<sup>2</sup> are large enough to ensure onsite parking provisions can be accommodated.
- The development is already serviced by a suitable public transport (bus service) operated by Osborn Buses.
- The additional alternative transport demand from this relatively small residential development is not considered sufficient for there to be a nexus for the provision of external pedestrian and cycle way infrastructure aside from the pedestrian paths required to be provided within the new subdivision works as determined by Council.
- The internal road layout and subdivision design is satisfactory and compliant with Muswellbrook Shire Council requirements and current best practice.

### **13. RECOMMENDATION**

Having carried out this traffic impact assessment of a proposed 58 lot residential subdivision on Lot 58 in DP 1276946 – 212 – 216 Queen Street, Muswellbrook known as Northview Estate Stages 6 & 7 it is recommended that the subdivision can be supported from a traffic impact perspective as the local road network has sufficient capacity to cater for the additional demand generated by the development. Therefore, the subdivision will not adversely impact on the local and state road network and complies with the relevant requirements of Muswellbrook Shire Council, TfNSW and Austroads.

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# **APPENDIX 1** DEVELOPMENT PLANS











# APPENDIX 2 TRAFFIC DATA

ite 1 (	QUEEN ST	50 M NORT	H OF COOP	K ST [50]				Northboun	d	
Day	Thu	Fri	Sat	Sun	Mon	Tue	Wed	W/Day	W/End	7 Day
Time	30/03/23	31/03/2023	1/04/2023	2/04/2023	3/04/2023	4/04/2023	5/04/2023	Ave.	Ave.	Ave
0:00	2	1	4	4	3	4	1	2	4	3
1:00	0	2	2	2	2	0	0	1	2	1
2:00	1	0	4	0	0	0	0	0	2	1
3:00	1	1	0	0	0	1	4	1	0	1
4:00	2	2	3	1	0	1	2	1	2	2
5:00	2	4	2	3	5	4	2	3	3	3
5:00	17	15	10	10	21	13	12	16	10	14
7:00	27	31	12	10	36	23	31	30	11	24
8:00	36	32	22	16	31	43	37	36	19	31
9:00	32	34	33	29	38	34	36	35	31	34
0:00	25	39	37	31	35	33	31	33	34	33
1:00	34	51	57	58	26	44	39	39	58	44
2:00	36	95	44	53	26	39	45	48	49	48
3:00	41	63	49	33	39	46	38	45	41	44
4:00	44	44	39	31	45	39	34	41	35	39
5:00	76	48	49	48	93	88	78	77	49	69
6:00	95	61	34	48	90	92	102	88	41	75
7:00	66	54	44	38	86	91	80	75	41	66
8:00	58	59	43	33	47	71	71	61	38	55
9:00	52	43	31	27	33	41	38	41	29	38
0:00	32	20	15	12	22	16	14	21	14	19
1:00	16	15	10	9	10	12	16	14	10	13
2:00	8	14	8	4	0	4	6	6	6	6
23:00	0	4	4	1	2	0	4	2	3	2
Fotal	703	732	556	501	690	739	721	717	529	663
		Average Wo	eek Day				Summary from	to		
<sup>100</sup> 90						AM Peak				51



te 1	QUEEN ST 50 M NORTH OF COOK ST [50]					Southbound				
Day	Thu	Fri	Sat	Sun	Mon	Tue	Wed	W/Day	W/End	7 Day
Time	30/03/23	31/03/2023	1/04/2023	2/04/2023	3/04/2023	4/04/2023	5/04/2023	Ave.	Ave.	Ave
0:00	0	0	4	2	1	1	2	1	3	1
1:00	3	3	2	2	4	1	0	2	2	2
2:00	1	0	2	1	0	0	0	0	2	1
3:00	4	0	1	0	2	4	1	2	1	2
4:00	11	13	5	4	11	10	15	12	5	10
5:00	42	37	20	19	38	40	34	38	20	33
5:00	29	29	16	12	36	36	33	33	14	27
7:00	59	52	19	9	56	56	73	59	14	46
8:00	71	75	44	35	94	97	85	84	40	72
9:00	44	46	34	42	46	44	54	47	38	44
0:00	38	36	46	42	33	37	36	36	44	38
1:00	33	62	52	44	31	33	33	38	48	41
2:00	32	61	44	41	27	38	32	38	43	39
3:00	24	42	34	27	31	50	30	35	31	34
4:00	38	42	36	31	42	43	37	40	34	38
5:00	55	50	30	47	67	46	55	55	39	50
6:00	54	33	39	28	52	60	39	48	34	44
7:00	53	42	35	37	43	67	71	55	36	50
8:00	42	50	31	20	26	51	33	40	26	36
9:00	25	20	21	19	16	21	25	21	20	21
0:00	17	11	11	3	6	5	14	11	7	10
1:00	5	16	9	7	6	11	9	9	8	9
2:00	3	7	7	1	4	4	1	4	4	4
3:00	1	6	2	1	0	0	2	2	2	2
<b>fotal</b>	684	733	544	474	672	755	714	712	509	654
Average Week Day						Summary				
						from to				

