



TRAFFIC IMPACT ASSESSMENT

RESIDENTIAL SUBDIVISION

**LOT 100 IN DP 847510
523 RAYMOND TERRACE ROAD, CHISHOLM**

PREPARED FOR: ACG CLOVELLY ROAD PTY LTD

MARCH 2023

REF: 23/029

**TRAFFIC IMPACT ASSESSMENT
RESIDENTIAL SUBDIVISION****LOT 100 IN DP 847510
523 RAYMOND TERRACE ROAD, CHISHOLM
ACG CLOVELLY ROAD PTY LTD**

Intersect Traffic Pty Ltd (ABN: 43 112 606 952)

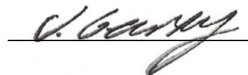
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Issue	Date	Description	By
A	10/03/23	Draft	JG
B	14/03/23	Edit	JG
D	16/03/23	Final Proof	JG
E	16/03/23	Approved	JG

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1.0 INTRODUCTION

Intersect Traffic Pty Ltd has been engaged by ACG Clovelly Road Pty Ltd to undertake a traffic impact assessment for the proposed subdivision of Lot 100 in DP 847510 – 523 Raymond Terrace Road, Chisholm. The proposed subdivision results in a residential lot yield of 108 residential lots, a road widening lot (Lot 315), two drainage lots (Lots 141 and 314) and a residue lot (pt Lot 507). The concept subdivision plan is provided within **Appendix 1**.

The subject land will need to gain access to the existing road network via internal roads of two (2) proposed residential subdivision developments to the east of the site through 581 Raymond Terrace Road & 547 Raymond Terrace Road (both approved developments) to the proposed Government Road north extension currently being constructed by Maitland City Council as part of the Raymond Terrace Road / Government Road intersection upgrade and signalisation as well as through the Sophia Waters Estate to McFarlanes Road. Therefore, this development cannot proceed until the road connections through these adjoining subdivisions are built. Road connections to the north and west will also be available via adjoining developments on 165 McFarlanes Road (DA lodged) and 507 Raymond Terrace Road (DA being prepared). The land area covered in the subdivision is within the Thornton North Urban Release Area within the Government Road Precinct 2 Plan.

The DCP Plan of the area and the Precinct Plan shown in **Appendix 3** has been provided to understand the context of the development. All new subdivision roads will be constructed to Maitland City Council Manual of Engineering Standards (MOES) requirements.

This report is required to support a development application to Maitland City Council as the consent authority. The report presents the findings of the traffic assessment and includes the following:

1. An outline of the existing situation in the vicinity of the site.
2. An assessment of the traffic impacts of the proposed development including the predicted traffic generation and its impact on existing road and intersection capacities.
3. Reviews parking, public transport, pedestrian and cycle way requirements for the proposed development, including assessment against Council and Australian Standards.
4. Presentation of conclusions and recommendation.

2.0 SITE DESCRIPTION

The site is located on the northern side of McFarlanes Road, Chisholm approximately 650 metres west of the Raymond Terrace Road / Government Road intersection. The site is approximately 800 metres east of the future Chisholm commercial precinct and 1.6 km north of the existing Thornton shopping centre. The development adjoins existing rural land to the north, south and east all of which will eventually be urban residential development as part of the Thornton North Urban Release Area (Thornton North URA) and to residential development to the south. The site currently contains a residential dwelling and associated structures with direct vehicular access to Raymond Terrace Road. **Figure 1** below shows the site location from a local context.

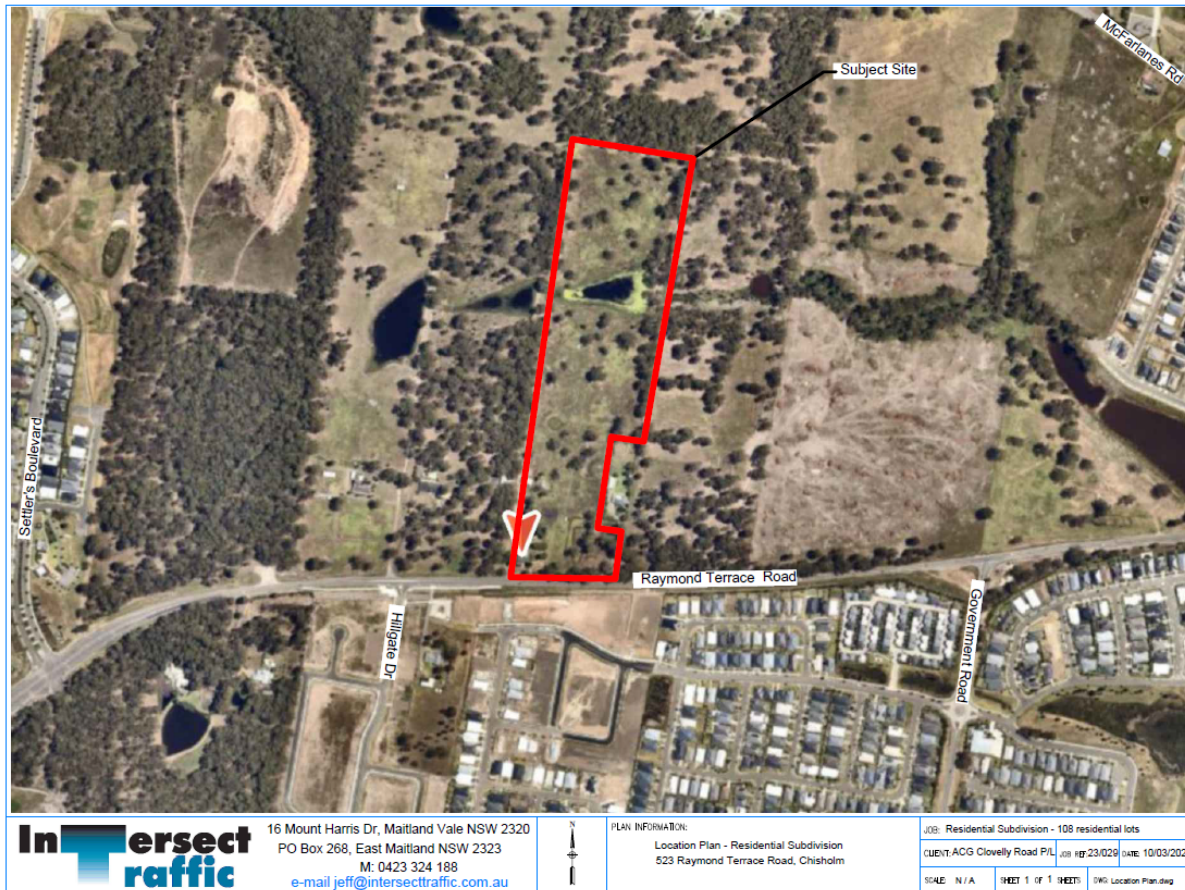


Figure 1 – Site Location

The site has the following property descriptors:

- ◆ Formal land title – Lot 100 in DP 847510.
- ◆ Street address - 523 Government Road, Chisholm.
- ◆ Development area of 10.22 hectares; and
- ◆ Land zoning - R1 General Residential pursuant to the Maitland LEP (2011)

The site is currently accessed via a rural residential vehicular crossing to Raymond Terrace Road. **Photograph 1** below shows the existing site while **Photograph 2** below shows the existing vehicular access at Raymond Terrace Road.



Photograph 1 – Existing site.



Photograph 2 – Existing vehicular access.

3.0 EXISTING ROAD NETWORK

In terms of the local road network, the roads most likely to be impacted by the additional traffic generated by the proposed development will be Raymond Terrace Road and Government Road.

Raymond Terrace Road in the vicinity of the site is a classified main road (MR104) under the care and control of TfNSW providing a single travel lane in both directions constructed to a typical rural standard. Lane widths are between 3.2 and 3.5 metres. The road would perform the function of a sub-arterial road connecting Maitland to Raymond Terrace. On inspection the road was observed to be in good condition with an 80 km/h speed zoning. With further development in the area the future speed zoning of Raymond Terrace Road is likely to be reduced further to 60 km/h.

Government Road is a local road under the care and control of Maitland City Council which under a functional road hierarchy would perform the function of a collector road as it collects and distributes traffic from the Chisholm, Thornton, Somerset Park, Thornton North, Duckenfield and Berry Park areas to the sub-arterial and arterial road networks at Raymond Terrace Road and the New England Highway. On inspection Government Road was observed to be generally in good condition with much of Government Road having been upgraded in recent years. It provides a single lane of traffic in each direction though additional lanes have been provided at the major intersections along its length while a 50 km/h speed zoning also exists along its length.

The Raymond Terrace Road / Government Road intersection is currently being upgraded to a four leg signalised intersection with a northern extension of Government Road being provided for connection to developments in the Thornton North URA.

Photograph 3 below shows Raymond Terrace Road along the site frontage while **Photograph 4** shows Government Road looking south near Raymond Terrace Road and **Photograph 5** shows the Raymond Terrace Road / Government Road intersection upgrade under construction.



Photograph 3 – Raymond Terrace Road along site frontage.



Photograph 4 – Government Road looking south from Raymond Terrace Road



Photograph 5 – Raymond Terrace Road / Government Road upgrade under construction.

4.0 ROAD NETWORK IMPROVEMENTS

As part of the original planning for the Thornton North Urban Release Area a traffic study was undertaken by Parsons Brinckerhoff (2003) to inform the Thornton North Masterplan and it is understood this report has been reviewed by Maitland City Council. This study assessed the regional transport and traffic impacts of the urban release area and identified the road and intersection upgrades required to mitigate the traffic impacts. These road and intersection upgrades were then included within the Thornton North S94 Contributions Plan (2008) so that all developers could pay their fair and reasonable contribution to the works.

Administration of the developer contributions plan is the responsibility of Maitland City Council who must also organise and plan the construction works once development has reached the stage that triggers the required works. It is concluded that for this development payment of the required developer contributions ensures that the external road network is upgraded to a suitable standard to cater satisfactorily for additional traffic generated by the subdivision. A grant from the State Government to partially fund the Raymond Terrace Road / Government Road signalised intersection was announced mid-June 2019 and its design has been finalised by Maitland City Council and construction of the intersection upgrade has just commenced. The latest schedule of works available for the developer contribution plan sourced from Maitland City Council's website is reproduced below. It is also noted the developer contributions plan includes for additional cycleways in the area as shown below.

It is noted that the developer contributions plan for the Thornton North area provides for contributions to the following road upgrades relevant to the road network around the site:

1. Raymond Terrace Road – upgrading to four lanes.
2. Raymond Terrace Road – McFarlanes Road intersection improvement (completed); and
3. Raymond Terrace Road / Government Road upgrading – (proposed signals commenced).

THORNTON NORTH CYCLEWAYS

Location			Est. Capital Cost	Est. Land Cost	Total Cost	Estimated Timing
Thornton R2	TN36	Somerset Dve to Raymond Terrace Road	\$180,300	\$0	\$180,300	1500 lots
Thornton R2 - Supp	TN36S	Thornton Station to Raymond Terrace Road	\$412,300	\$0	\$412,300	3000 lots
Scenic S5	TN37	Metford Station to Raymond Terrace Road	\$250,000	\$20,000	\$270,000	4500 lots
TOTAL			\$842,600	\$20,000	\$862,600	

Cycleways					
Facilities		Location	Est. Capital Cost	Est. Land Cost	Total Cost
Thornton R2	TN33	Somerset Drive to Raymond Terrace Road	\$195,859	\$0	\$195,859
Thornton R2 - Supp	TN34	Thornton Station to Raymond Terrace Road	\$447,880	\$0	\$447,880
Scenic S5	TN35	Metford Station to Raymond Terrace Road	\$271,574	\$21,726	\$293,300
TOTAL			\$915,313	\$21,726	\$937,039

THORNTON NORTH ROADS AND TRAFFIC FACILITIES

Services / Facilities		Location	Description	Est. Capital Cost	Est. Land Cost	Total Cost	Estimated Timing
Road Upgrades	TN38	Raymond Terrace Road	Intersection 4 to Haussman Drive	\$5,992,357	\$767,604	\$6,759,961	Stage 1
	TN39		Haussman to The Boulevarde	\$10,896,727	\$303,002	\$11,199,729	Stage 1
	TN40		The Boulevarde to Government Road	\$6,969,829	\$1,212,007	\$8,181,836	Stage 2
	TN41		Government Road to McFarlanes Road	\$6,984,612	\$686,804	\$7,671,416	Stage 2
	TN42	Haussman Drive	Raymond Terrace Road to Railway Avenue	\$14,503,670	\$3,313,871	\$17,817,541	Stage 1
	TN44	Thornton Road	Railway Avenue and Glenwood Drive	\$7,151,104	\$59,828	\$7,210,932	Stage 1
	TN45	McFarlanes Road	Government Road to TN52	\$6,349,640	\$579,568	\$6,929,208	Stage 2
	TN46	Government Road	Raymond Terrace Road to Sommerset Drive	\$1,674,814	\$246,651	\$1,921,465	Stage 1
Intersections	TN47	Raymond Terrace Road / New Intersection West		\$1,216,758	\$0	\$1,216,758	Stage 1
	TN48	Haussman Drive / Raymond Terrace Road		\$2,020,919	\$0	\$2,020,919	Stage 1
	TN49	The Boulevarde / Raymond Terrace Road		\$1,246,019	\$0	\$1,246,019	Stage 1
	TN50	Raymond Terrace Road / Government Road		\$2,140,733	\$0	\$2,140,733	Stage 2
	TN51	Raymond Terrace Road / McFarlanes Road		\$1,432,678	\$0	\$1,432,678	Stage 2
	TN52	McFarlanes Road / The Boulevarde		\$1,179,791	\$0	\$1,179,791	Stage 2
	TN53	Haussman Drive / Taylor Avenue		\$1,981,514	\$4,944	\$1,986,458	Stage 1
	TN54	Railway Avenue / Glenroy Street		\$3,794,138	\$2,197,475	\$5,991,613	Stage 1
	TN55	Huntingdale Drive / Thornton Drive		\$1,137,841	\$0	\$1,137,841	Stage 1
	TN56	Thornton Road / Glenwood Drive		\$3,678,586	\$498,199	\$4,176,785	Stage 1
New Roads	TN58	The Boulevarde (additional 4.0m wide median)		\$1,354,847	\$754,000	\$2,108,847	Stages 1,2
	TN59	Fringe Road (additional 6.0m reserve, 1.5m for shared way and 2.5m parking lane)		\$2,583,849	\$120,000	\$2,703,849	Stages 1,2
TOTAL				\$85,573,074	\$10,743,953	\$96,317,027	

Thornton North Road & Traffic Facilities						
Facilities		Location	Description	Est. Capital Cost	Est. Land Cost	Total Cost
Road Upgrades	TN36	Raymond Terrace Road	Harvest Boulevard to Haussman Drive	\$5,992,357	\$767,604	\$6,759,961
	TN37		Haussman Drive to Settlers Boulevard	\$10,896,727	\$303,002	\$11,199,729
	TN38		Settlers Boulevard to Government Road	\$6,969,829	\$1,212,007	\$8,181,836
	TN39		Government Road to McFarlanes Road	\$6,984,612	\$686,804	\$7,671,416
	TN40	Haussman Drive	Raymond Terrace Road to Railway Avenue	\$14,503,670	\$3,313,871	\$17,817,541
	TN41	Thornton Road	Railway Avenue to Glenwood Drive	\$7,151,104	\$59,828	\$7,210,932
	TN42	McFarlanes Road	Raymond Terrace Road to TN49	\$6,349,640	\$579,568	\$6,929,208
	TN43	Government Road	Raymond Terrace Road to Somerset Drive	\$1,674,814	\$246,651	\$1,921,465
Intersections	TN44	Raymond Terrace Road / Harvest Boulevard		\$1,216,758	\$0	\$1,216,758
	TN45	Raymond Terrace Road / Haussman Drive		\$2,020,919	\$0	\$2,020,919
	TN46	Raymond Terrace Road / Settlers Boulevard		\$1,246,019	\$0	\$1,246,019
	TN47	Raymond Terrace Road / Government Road		\$2,140,733	\$0	\$2,140,733
	TN48	Raymond Terrace Road / McFarlanes Road		\$1,432,678	\$0	\$1,432,678
	TN49	McFarlanes Road / Settlers Boulevard		\$1,179,791	\$0	\$1,179,791
	TN50	Haussman Drive / Taylor Avenue		\$1,981,514	\$4,944	\$1,986,458
	TN51	Railway Avenue / Glenroy Street		\$3,794,138	\$2,197,475	\$5,991,613
	TN52	Huntingdale Drive / Thornton Drive		\$1,137,841	\$0	\$1,137,841
	TN53	Thornton Road / Glenwood Drive		\$3,678,586	\$498,199	\$4,176,785
New Roads	TN54	Government Road / Thornclyffe Avenue / Darlaston Avenue		\$641,324	\$0	\$641,324
	TN55	Government Road / Hillgate Drive		\$641,324	\$0	\$641,324
New Roads	TN56	Settlers Boulevard (additional 4.0m wide median)		\$1,354,847	\$754,000	\$2,108,847
	TN57	Fringe Road (additional 6.0m reserve, 1.5m for shared way and 2.5m parking lane)		\$2,583,849	\$120,000	\$2,703,849
TOTAL				\$85,573,074	\$10,743,953	\$96,317,027

5.0 TRAFFIC VOLUMES

Intersect Traffic has undertaken traffic counts at the Raymond Terrace Road / McFarlanes Road intersection on Wednesday 1st March 2023 and Thursday 2nd March 2023 to update current traffic volume data in the area during likely peak AM and PM traffic periods. The traffic count data collected during these counts are shown in **Appendix 2**. It is noted at the time of the work the Raymond Terrace Road / Government Road intersection upgrade had commenced so counts at this intersection were not able to be undertaken. However, the design of the signals was based on traffic volumes for the completion of the whole of the Thornton North URA. It is unlikely that lot yields used in this design modelling will be realised and thus it is reasonable to conclude that this signalised intersection will be capable of catering for the development traffic from this subdivision.

Intersect Traffic also undertook traffic counts at the Raymond Terrace Road / Settlers Boulevard intersection most recently in October 2017 with the data collected from these counts shown in **Appendix 2** as well.

To determine the 2033 AM and PM peak hour traffic volumes the 2023 AM and PM peak hour traffic volumes in **Appendix 2** for Raymond Terrace Road a background traffic growth rate of 3.0% per annum has been used. This growth rate of 3.0% has been adopted as the base growth rate factor of background traffic in this analysis as it comprises a 2.0% average increase in traffic over time and the addition of a further 1.0% increase / allowance for adjacent developments impacting on Raymond Terrace Road.

The resultant AM and PM 2023 and 2033 peak hour background traffic volumes for Raymond Terrace Road are presented in **Table 1** below. These AM and PM mid-block peak hour traffic volumes have been adopted for assessment purposes.

Table 1 – 2023 and 2033 AM & PM peak hour traffic volumes.

Road	Section	2023		2033	
		AM (vtph)	PM (vtph)	AM (vtph)	PM (vtph)
Raymond Terrace Road	West of Government Road	1296	1267	1742	1702
Raymond Terrace Road	East of Government Road	1036	1028	1392	1382

6.0 ROAD CAPACITY

The capacity of urban roads is generally determined by the capacity of intersections. However, Table 4.3 of the RTA’s *Guide to Traffic Generating Developments* provides some guidance on mid-block capacities for urban roads for a level of service C. This table is reproduced below.

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

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
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Source: - RTA’s *Guide to Traffic Generating Developments* 2019

Based on these tables it is considered that Raymond Terrace Road as a major sub-arterial road would have a two way mid-block capacity of up to 1,800 vtpm if a level of service LoS C was considered acceptable, however on major arterial roads lane capacities of up to 1,100 vtpm have been accepted by TfNSW and thus the likely two-way mid-block capacity for Raymond Terrace Road would be 2,200 vtpm for a LoS D;

The highest peak hour mid-block two-way traffic volume determined for 2023 or 2033 for Raymond Terrace Road is 1,742 vtpm west of Government Road (refer to **Section 5**) which is below the road network capacity threshold determined above. Therefore, it can be concluded that there is spare mid-block two-way road capacity within the road network to cater for additional development.

7.0 ALTERNATIVE TRANSPORT MODES

Hunter Valley Buses operates service route 189 Stockland’s Greenhills to Thornton (**Figure 2** below) within the vicinity of the development site. Route 189 runs along Raymond Terrace Road and down Government Road along the Raymond Terrace Road frontage of the subject site. Currently the nearest bus stops are on Raymond Terrace Road near Settlers Boulevard and on Government Road near Somerset Drive some 750 metres and 1.6 km’s respectively from the site. With future development in the Thornton North area however this may change in the future with additional bus stops and amended routes likely to result in bus stops not only near the site but within the site on the major east west distributor road through the site.

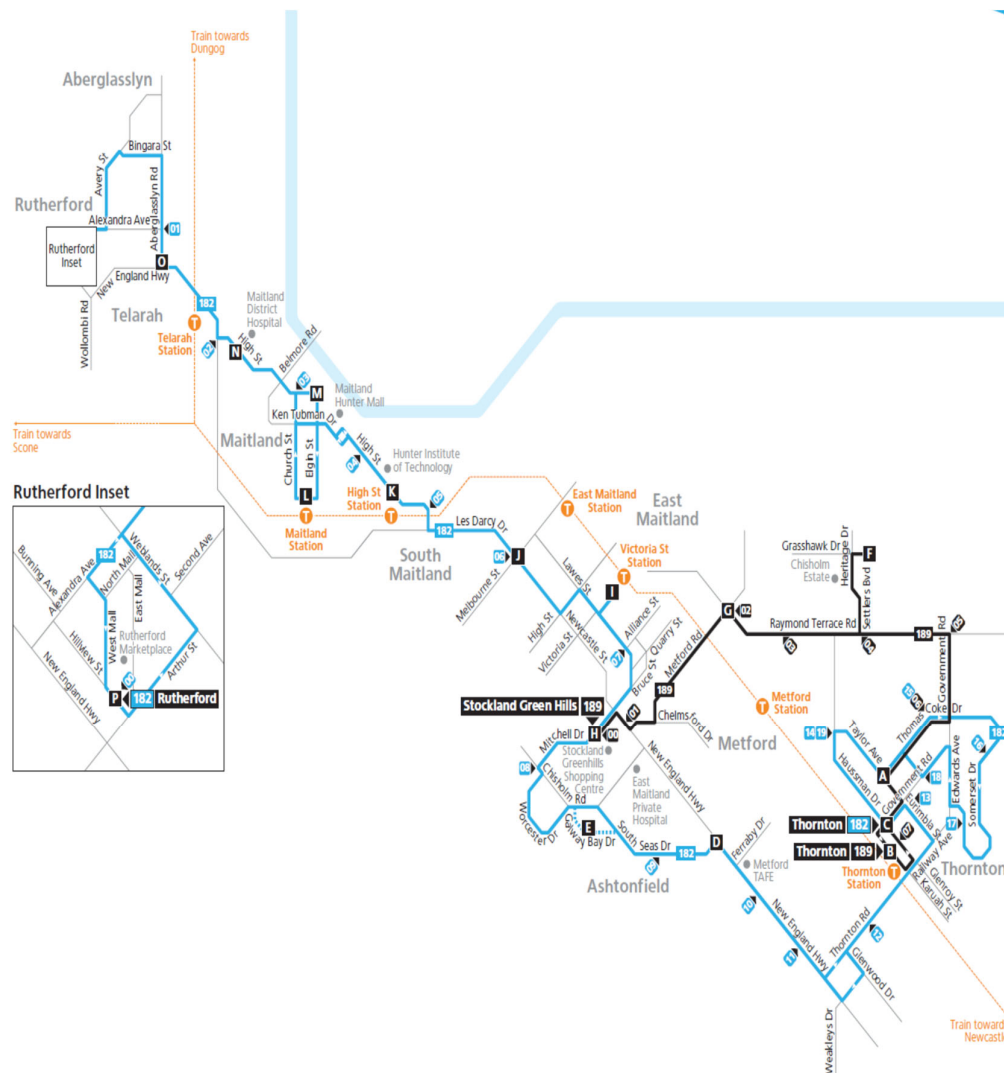


Figure 2 – Hunter Valley Buses Service Route 189

The nearest hardstand pedestrian footpath is a new 2.5-metre-wide concrete shareway / pedestrian footpath along the southern side of Raymond Terrace Road opposite the site (see Photograph 6 below). This isolated section of off-road pedestrian / cycle path was constructed as part of the subdivision works opposite the site and it would be expected that this pathway would continue to be extended both east towards a similar pathway on Government Road and west towards Settlers Boulevard with Raymond Terrace Road upgrading works required within the Thornton North developer contributions plan that will occur as further development occurs in the area. Signalised pedestrian crossing facilities for both Raymond Terrace Road and Government Road are to be provided in the signalisation upgrade of the Raymond Terrace Road / Government Road intersection approximately 600 metres east of the site.

Further south, existing off-road shared pedestrian / bicycle paths run along the western side of Government Road south of its intersection with Raymond Terrace Road connecting to existing on and off-road cycle ways within the Thornton residential areas providing access to the Thornton Shopping Centre, Thornton Railway Station and Thornton Industrial Area. **Figure 3** below shows the existing on road (blue) and off road (red) cycleways in Thornton, south of the development. The nearest cycleway is in Government Road, Thornton approximately 3.0 kilometres south of the site.

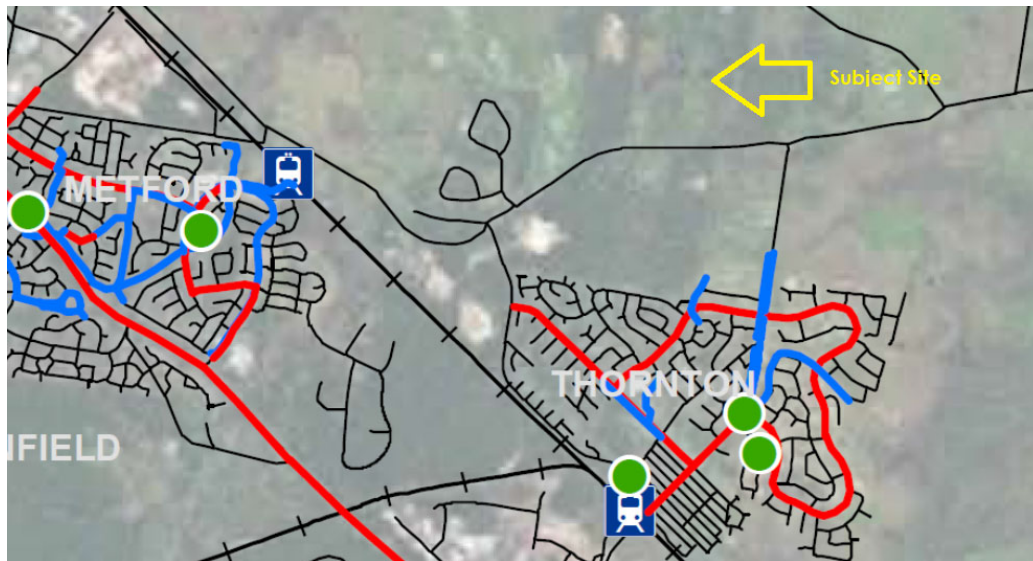


Figure 3 – Thornton Cycle Ways south of the subject site



Photograph 6 – Shared Pathway Raymond Terrace Road opposite site.

8.0 DEVELOPMENT PROPOSAL

The proposal involves the subdivision of 523 Raymond Terrace Road creating 108 new residential allotments. The concept subdivision plan is shown in **Appendix 1**.

Connection to the external road network for this section of the subdivision is to be via internal roads to adjoining subdivisions which are proposed or under construction and connect to:

- a) Government Road (northern extension) and then on to Raymond Terrace Road at their proposed signalised intersection, currently under construction.
- b) Internal roads to Greystones Road and then on to McFarlanes Road at the constructed T-intersection and further to Duckenfield Road at Morpeth to the north or at the recently constructed T-intersection at Raymond Terrace Road / McFarlanes Road; and
- c) A future connection to Steamcruiser Drive and Settler's Boulevard within the adjoining Waterford subdivision, then to either Raymond Terrace Road or McFarlanes Road via Settler's Boulevard. Note this connection currently has land owner constraints precluding the connection therefore has been ignored in this assessment.

All roads and infrastructure required internally will be constructed by the developer to Maitland City Council Manual of Engineering Standards (MOES) requirements.

The major intersection of Raymond Terrace Road / Government Road has been designed to cater for all traffic generated by the Thornton North URA including the development site and is currently being constructed as a signalised intersection by Maitland City Council to TfNSW standards. The Raymond Terrace Road / McFarlanes Road T-intersection has recently been upgraded as part of the Sophia Waters residential estate road works. Any works required by the developer for these intersections and other works listed in the tables above would only be via a developer contribution in accordance with the current developer contributions plan.

9.0 TRAFFIC GENERATION

The *RTA's Guide to Traffic Generating Development's* provides specific advice on the traffic generation potential of various land uses. However, TfNSW released a Technical Direction (TDT 2013/4) releasing the results of updated traffic surveys and, as a result, amended land use traffic generation rates. In regard to low density residential dwellings the following amended advice is provided within the Technical Direction.

Rates.

Daily vehicle trips = 10.7 per dwelling in Sydney, 7.4 per dwelling in regional areas

Weekday average evening peak hour vehicle trips = 0.99 per dwelling in Sydney (maximum 1.39), 0.78 per dwelling in regional areas (maximum 0.90).

Weekday average morning peak hour vehicle trips = 0.95 per dwelling in Sydney (maximum 1.32), 0.71 per dwelling in regional areas (maximum 0.85).

*(The above rates do **not** include trips made internal to the subdivision, which may add up to an additional 25 %).*

Notwithstanding Maitland City Council have previously advised that they require the following rates to be used for development in the Thornton URA;

- ◆ 9.0 trips per dwelling.
- ◆ 0.85 vtph per dwelling – AM weekday peak.
- ◆ 0.9 vtph per dwelling – PM weekday peak.

Therefore, based on this advice and that the subdivision provides 108 new residential allotments the likely traffic generation figures (rounded up) for the proposal is as follows.

Daily vehicle trips = 108 x 9 = 972 vtpd.
 PM peak hour = 108 x 0.9 = 98 vtph.
 AM peak hour = 108 x 0.85 = 92 vtph.

10.0 TRIP DISTRIBUTION

Before carrying out any traffic assessment the additional external peak hour traffic generated by the development needs to be distributed through the adjoining road network. This involves making a number of assumptions as to distribution patterns to and from the development. In distributing the peak hour traffic through the adjacent road network, the following assumptions have been made for this site based on an assessment of origins and destinations as well as a review of manual traffic count data previously collected at the Raymond Terrace Road / Government Road intersection:

- ◆ All traffic will utilise the signalised Raymond Terrace Road / Government Road intersection to access the sub-arterial road network at Raymond Terrace Road.
- ◆ 40% of traffic will have origin / destinations south on Government Road at Raymond Terrace Road and the New England Highway / M1 Motorway at Thornton / Beresfield.
- ◆ 30% of traffic will have origin / destinations on Raymond Terrace Road west at this intersection.
- ◆ 30% of traffic will have origin / destinations on Raymond Terrace Road east of this intersection.
- ◆ 80% of trips are outbound and 20% inbound in the AM peak and 30% outbound and 70% inbound in the PM peak given this is a residential subdivision.

The resulting development traffic trip distribution for the proposed development will be as shown in **Figure 4** below. Again, it is noted that the under-construction Raymond Terrace Road / Government Road traffic signals has been designed to cater for all the traffic generated by the development utilising the current road structure plan for the Thornton North URA.

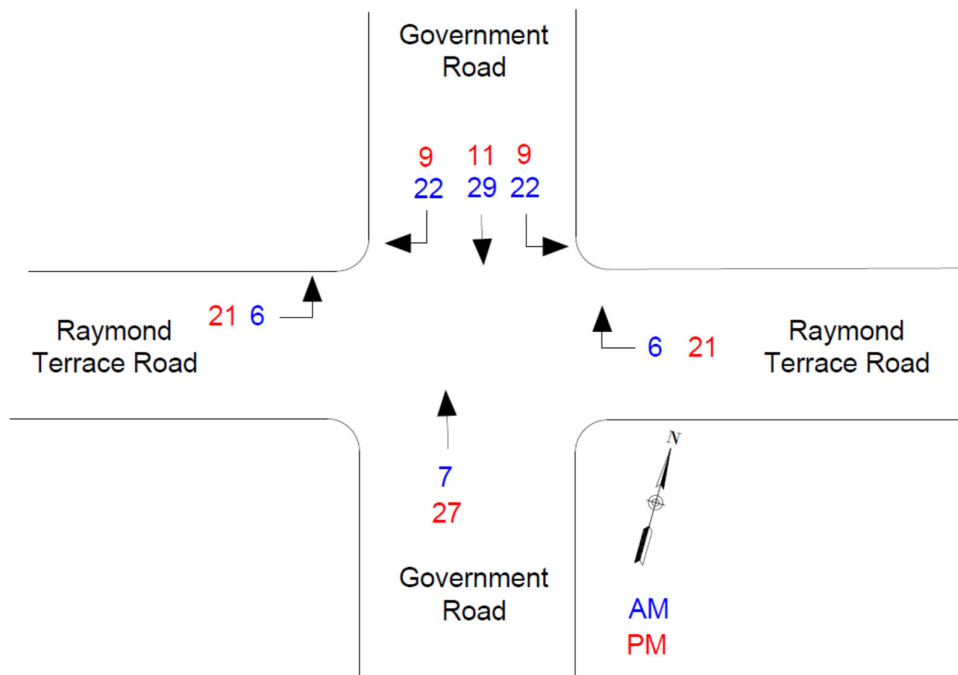


Figure 4 – Development Traffic Trip Distribution with Government Road connection.

11.0 TRAFFIC IMPACTS

11.1 Road Network Capacity

It has previously been shown in **Section 6** of this report that the local road network is currently operating within its technical mid-block capacity. The addition of the traffic generated from this development onto the existing traffic volumes determined in **Section 5** will not result in the capacity thresholds determined in **Section 6** to be reached in 2023. In 2033 with 3% per annum background traffic growth on the road network added to the development traffic over a ten-year period these road capacity thresholds are still not reached. This is demonstrated in **Table 2** below for the AM and PM peak periods.

Table 2 - Road Capacity Assessment

Road	Section	2023+ development		2033 + development		Capacity (vtp/h)	Development Traffic	
		AM (vtp/h)	PM (vtp/h)	AM (vtp/h)	PM (vtp/h)		AM (vtp/h)	PM (vtp/h)
Raymond Terrace Road	West of Government Road	1324	1297	1770	1732	2200	28	30
Raymond Terrace Road	East of Government Road	1064	1058	1420	1412	2200	28	30

Therefore, it is reasonable to conclude that the local road network has sufficient spare capacity to cater for the proposed development.

11.2 Intersection Capacity

The traffic generated from this development will have an impact on a number of intersections including the recently upgraded Raymond Terrace Road / McFarlanes Road T-intersection and the existing Raymond Terrace Road / Government Road T-intersection currently being upgraded to a signalised four-way cross intersection. The proposed intersection at Raymond Terrace Road / Government Road is diagrammatically shown below in **Figure 5**. Both this intersection and the recently upgraded Raymond Terrace Road / McFarlanes Road intersection have been designed to cater for the additional traffic generated by all the new allotments within the Thornton North URA and both intersections are included within the Thornton North Developer Contributions Plan.

As this development cannot proceed until the Raymond Terrace Road / Government Road intersection is constructed and connections to the intersection through adjoining developments to the east of the site are constructed it is reasonable to assume then that it is implied that Council accepts that the design is compliant to the standards required and it is understood it has also been designed to cater for full development of the Thornton North Urban Release Area of which this subdivision is part of. Therefore, the payment of the required Thornton North URA development contributions as per the adopted developer contributions plan therefore represents the developments fair and reasonable contribution to the required local and state road network upgrades to cater for the additional traffic generated by the development of land within the Thornton North URA.

Therefore, it is reasonable to conclude the proposed development will subject to the continued implementation of the Thornton North URA Developer Contributions Plan not adversely impact on the operation of the adjoining intersections on the local and state road network.

11.4 Off-Street Car Parking

As a residential subdivision the development itself does not generate any on-site parking demand. However future development of each of the allotments will generate a parking demand and on-site car parking will need to be further assessed at the development application stage for the development of each individual allotment.

11.5 Internal Road layout

The proposed internal road layout will be constructed in accordance with Maitland City Council's Manual of Engineering Standards road types and dimensions table and general best practice for intersection control. It will also generally be in accordance with the Chisholm Central Precinct 7 plan which requires a Collector road along the southern side of the drainage lot 141 and structure plan covering the site as shown in **Appendix 3**.

12.0 PEDESTRIAN & CYCLE FACILITIES

As a residential subdivision the proposal is likely to generate additional pedestrian and bicycle traffic. Provision of pedestrian pathways / cycleways within the subdivision would provide benefit to pedestrians / cyclists and will need to be provided in accordance with Maitland City Council's subdivision standards and in accordance with Council's DCP requirements. Part F.7 of the DCP deals with the Thornton North Release Area and specifically in regard to pedestrian and cycle facilities states within the Transport Movement Hierarchy.

2) The overall pedestrian and cycleway links should be consistent with the Thornton North Area Pedestrian and Cycle Links and Recreation and Community Facilities Plan.

The proposed development complies with this through the provision of a 2.5m shared pathway along the southern side of the drainage lot 141. Overall, it is concluded a suitable pedestrian and cycleway network can be provided within the subdivision to Maitland City Council's requirements and it would be expected will be required by conditions of consent as appropriate for the development.

13.0 PUBLIC TRANSPORT FACILITIES

The proposed development will generate some additional public transport usage particularly in regard to school bus services. From a review of the plans, it would appear that all lots would be within 400 metres from existing bus routes along Raymond Terrace Road and McFarlanes Road. All lots would also be within 400 metres of the proposed collector and distributor roads through the site therefore these roads would be suitable bus routes. Therefore, in the future, once demand for school services is established and further development occurs to the west, it is envisaged that some bus routes may need to be changed and it is likely the internal collector and/or distributor roads will become part of a future bus route loop.

The provision of shelters and seats for new and existing bus stops does not appear to be part of the Thornton North developer contributions plan so it would not be expected that such facilities would be required within this subdivision until such time as a demand for the public transport route is established. However, if required based on any advice from Transport NSW and Hunter Valley Buses appropriate conditions of consent would be agreeable.

14.0 DCP REQUIREMENTS

The *Maitland DCP (2011) Part F.7 – Thornton North Release Area* provides specific requirements in terms of the transport movement hierarchy within the release area and specifically within each of the precincts. The transport movement hierarchy within the DCP states.

Each Precinct Plan is to include an overall transport movement hierarchy showing the major circulation routes and connections to achieve a simple and safe movement system for private vehicles, public transport, pedestrians, and cyclists.

- 1. The overall movement hierarchy for each Precinct Plan should be consistent with the Thornton North Area Road Network Plan.*
- 2. The overall pedestrian and cycleway links should be consistent with the Thornton North Area Pedestrian and Cycle Links and Recreation and Community Facilities Plan.*
- 3. The primary access for residential development in Stage 1 of the Thornton North Urban Release Area is to be provided off Raymond Terrace Road or Government Road.*
- 4. A perimeter road (with development on one side only) shall be provided around the edge of the Thornton North Urban Release Area where it adjoins flood prone land.*
- 5. Perimeter roads should also be used adjacent to open space, and areas of high bushfire risk and visual significance.*
- 6. No new lot shall have direct vehicular access to Raymond Terrace Road, Government Road or McFarlanes Road.*
- 7. Subdivisions adjacent to main roads such as Raymond Terrace Road should orientate allotments and dwellings to face the main road, with suitable internal roads providing access, and suitable landscaping separating the allotment boundaries and main road.*

The latest Precinct Plan is provided within **Appendix 3**. It has been advised by ADW Johnson that the subdivision plan for the site will be consistent with the approved Transport Management hierarchy.

15.0 CONCLUSIONS

This traffic impact assessment for a proposed 108 lot residential subdivision of Lot 100 in DP 847510 – 523 Raymond Terrace Road, Chisholm has concluded:

- ◆ Existing traffic volumes on the local and state road network are within the technical two-way mid-block capacity standards for urban roads determined by Austroads and TfNSW.
- ◆ The local and state road network is currently operating with satisfactory levels of service and acceptable delay for motorists.
- ◆ The local and state road network has capacity to cater for additional traffic associated with new development in the area.
- ◆ The proposed subdivision is likely to generate an additional 92 vtpm during the AM peak traffic period and 98 vtpm during the PM peak traffic period.
- ◆ The local and state road network has sufficient spare capacity to cater for the development traffic generated by this development and other developments in the area without adversely impacting on the levels of service experienced by motorists on the road network through to at least 2033 subject to suitable upgrading of the Raymond Terrace Road / Government Road intersection to a signalised intersection, which is currently under construction.
- ◆ The Raymond Terrace Road / Government Road intersection is identified within the Thornton North Developer Contributions Plan for upgrading along with a number of other external roads and intersections within the Thornton North area. Payment of the proposed subdivision's development contributions would represent the development's fair and reasonable contribution to the required

upgrading works at the intersection ensuring the external road network is upgraded as required to cater for additional traffic from this and other developments in the area.

- ◆ The proposed access arrangements for the development are suitable for the type of development and the road environment in the vicinity of the site.
- ◆ That future development of the new allotments would be able to accommodate the required on-site car parking and the development will not generate an unacceptable on-street car parking demand that would adversely impact on the local road network.
- ◆ Suitable pedestrian and cycleway networks are to be provided within the development to ensure compliance with the requirements of the *Maitland DCP (2011) Part F.7 – Thornton North Release Area* and the current *Precinct Plan*.
- ◆ The proposed development will generate additional public transport usage particularly in regard to school bus services. Therefore, in the future, once demand for school services is established it is envisaged that some bus routes may need to be changed and it is likely the internal collector and distributor roads will become part of a future bus route loop. Suitable reserve width has been provided to accommodate bus routes.
- ◆ The proposed transport management hierarchy within the subdivision plan is consistent and compliant with the transport management hierarchy requirements within the *Maitland DCP (2011) Part F.7 – Thornton North Release Area* and the current *Precinct Plan*.
- ◆ The internal road layout proposed will be compliant with Maitland City Council's Manual of Engineering Standards.

16.0 RECOMMENDATION

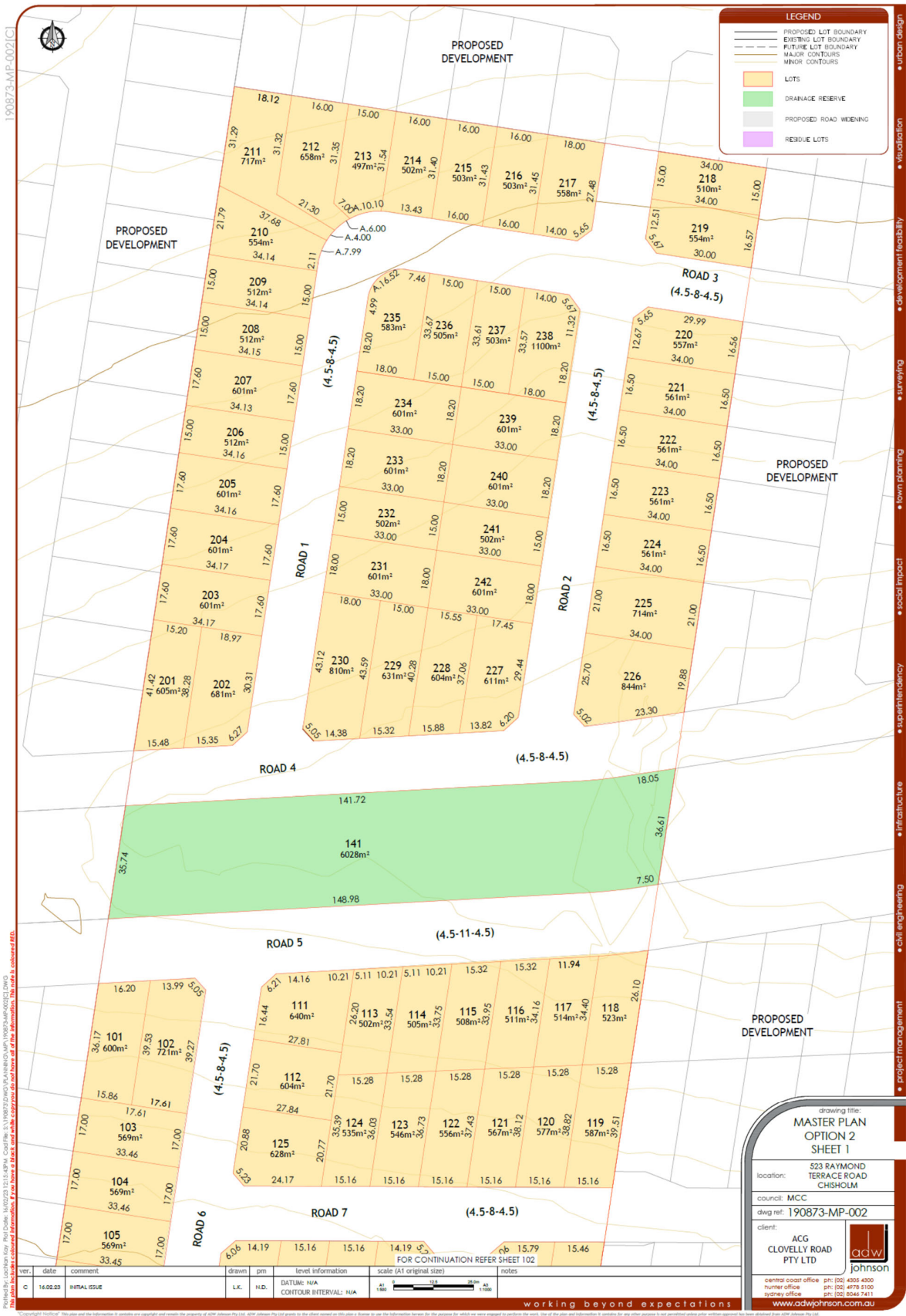
Having carried out this traffic impact assessment for the proposed 108 lot residential subdivision of Lot 100 in DP 847510 – 523 Raymond Terrace Road, Chisholm it is recommended that subject to the signalisation of the Raymond Terrace Road / Government Road intersection, currently under construction, being completed the proposal can be supported from a traffic impact perspective as it will not adversely impact on the local and state road network and complies with all relevant Maitland City Council, Australian Standard and TfNSW requirements.



JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

APPENDIX 1

Subdivision Plan





190873-MP-003(A)

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ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	14.02.23	INITIAL ISSUE	L.K.	N.D.	DATUM: N/A CONTOUR INTERVAL: N/A	AS 1:500	

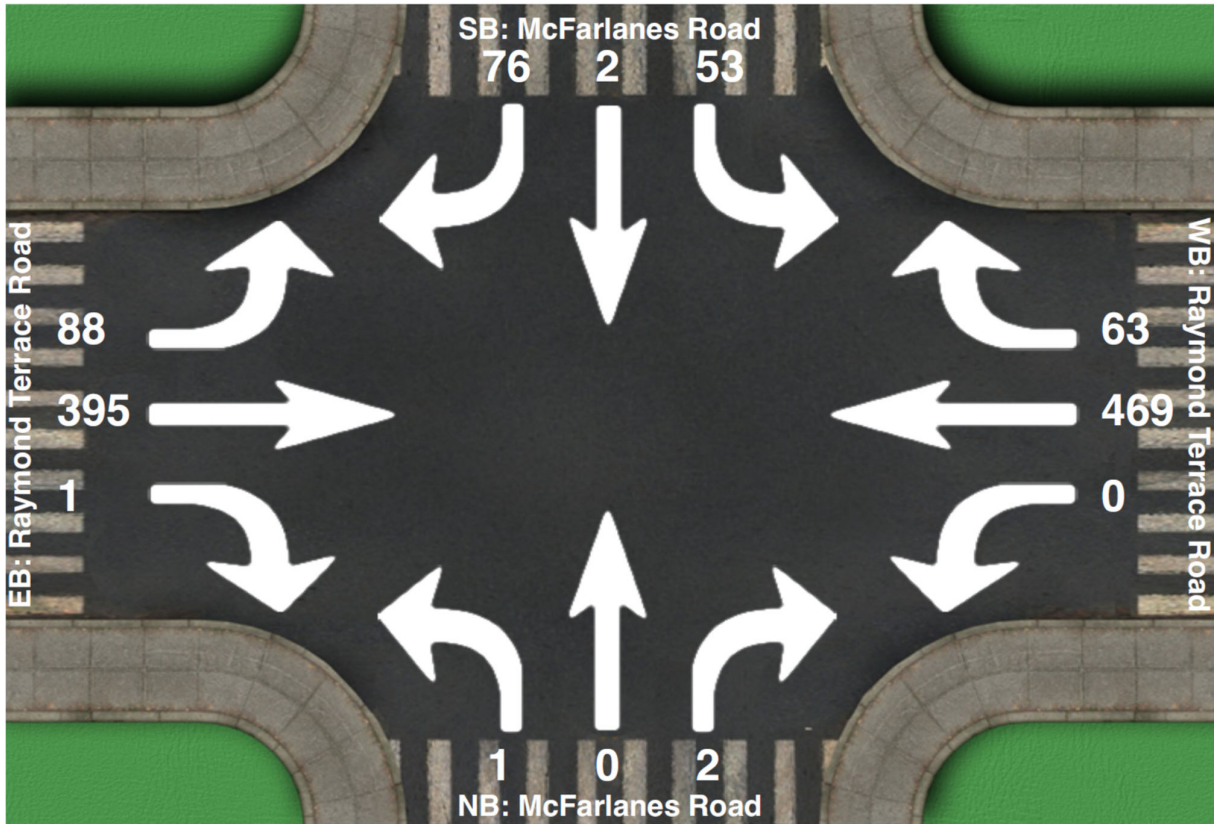
working beyond expectations

APPENDIX 2

Traffic Count Data

Intersection Peak Hour

Location: McFarlanes Road at Raymond Terrace Road, Chisholm
GPS Coordinates: Lat=-32.761903, Lon=151.660669
Date: 2023-03-01
Day of week: Wednesday
Weather:
Analyst: Jeff



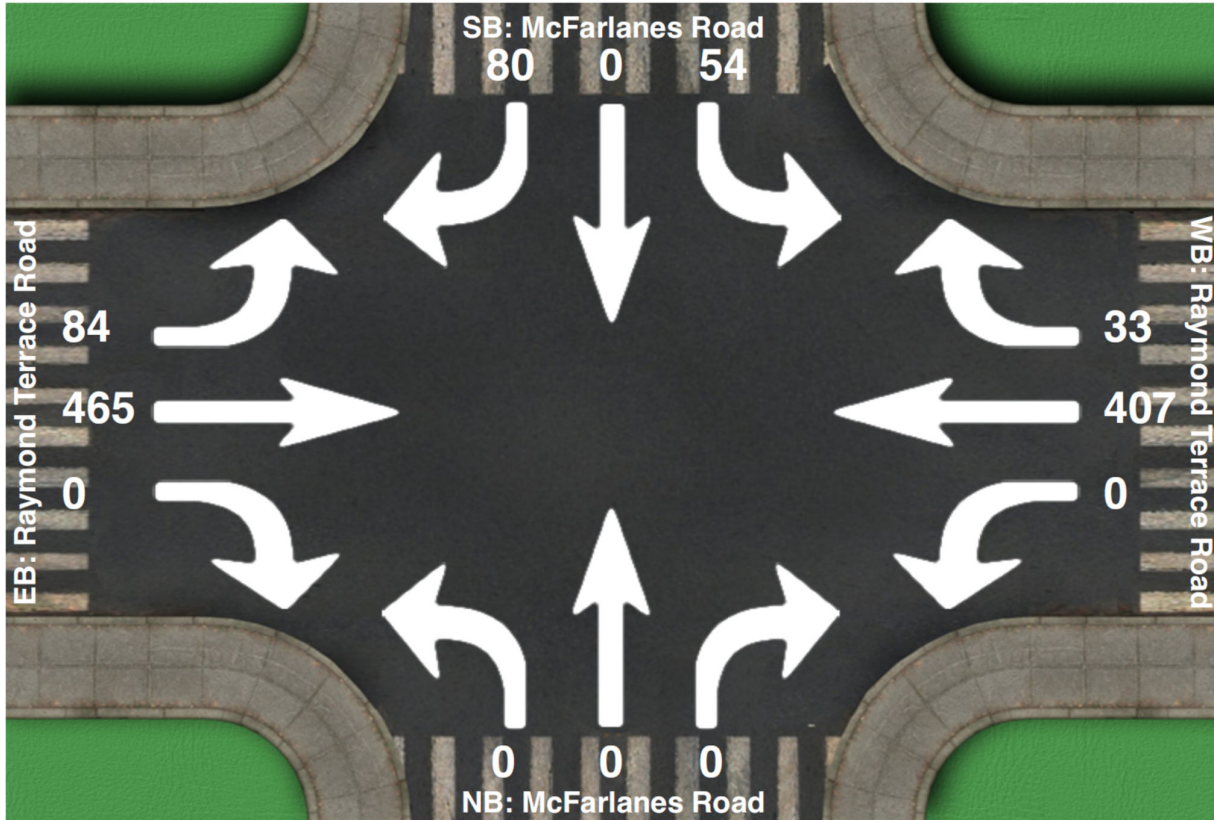
Intersection Peak Hour

15:00 - 16:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	53	2	76	0	469	63	1	0	2	88	395	1	1150
Factor	0.78	0.25	0.79	0.00	0.86	0.68	0.25	0.00	0.50	0.65	0.89	0.25	0.92
Approach Factor	0.80			0.85			0.75			0.86			

Intersection Peak Hour

Location: McFarlanes Road at Raymond Terrace Road, Chisholm
GPS Coordinates: Lat=-32.739095, Lon=151.642150
Date: 2023-03-02
Day of week: Thursday
Weather:
Analyst: Jeff



Intersection Peak Hour

08:00 - 09:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	54	0	80	0	407	33	0	0	0	84	465	0	1123
Factor	0.79	0.00	0.87	0.00	0.77	0.92	0.00	0.00	0.00	0.64	0.92	0.00	0.89
Approach Factor	0.88			0.79			0.00			0.95			

APPENDIX 3

DCP & PRECINCT PLANS

