

APPENDIX L

Traffic and Parking Impact  
Assessment



**TRAFFIC AND PARKING IMPACT ASSESSMENT OF  
THE PROPOSED REZONING OF  
397 CRAIGIE LEA LANE, NARROMINE**



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**Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness**

**Development Type:** Rezoning  
**Site Address:** 397 Craigie Lea Lane, Narromine  
**Prepared for:** Barnson  
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## 1 INTRODUCTION

McLaren Traffic Engineering was commissioned by Barnson to provide a traffic and parking impact assessment of the proposed rezoning of 397 Craigie Lea Lane, Narromine, from *RU1 Primary Production* to *E5 Heavy Industrial*. The proposed rezoning has the ultimate intention to facilitate an industrial subdivision on the land, as depicted in **Annexure A**.

### 1.1 *Description and Scale of Development*

The development has the following characteristics relevant to traffic and parking:

#### **Existing use of the site:**

- RU1 Primary Production zone;
- The current site is rural farmland with no existing buildings.

#### **Proposed use of the site:**

- Partial rezoning to *E5 Heavy Industrial*;
- An estimated maximum of 200 employees on-site at any one time.
- Future large lot industrial subdivision consisting of approximately 28 lots and internal 30m wide road reserves;
- All vehicle access to the subdivision will be from Craigie Lea Lane.

### 1.2 *State Environmental Planning Policy (Transport and Infrastructure) 2021*

The proposed subdivision development would qualify as a traffic generating development with relevant size and/or capacity under *Clause 2.122* of the *SEPP (Transport and Infrastructure) 2021*, as the proposal contains industrial lots with over 20,000m<sup>2</sup> in site area. Accordingly, formal referral to Transport for NSW (TfNSW) is necessary and the application will be assessed by Narromine Shire Council officers in conjunction with TfNSW officers.

The proposed development has frontage to a classified road and, therefore, qualifies as such with reference to *Clause 2.119* of *SEPP (Transport and Infrastructure) 2021*. The development, therefore, must satisfy that:

*(b) the safety, efficiency, and ongoing operation of the classified road will not be adversely affected by the development as a result of:*

*(i) the design of the vehicular access to the land.*

*(ii) the emission of smoke or dust from the development*

*(iii) the nature, volume or frequency of vehicles using the classified road to gain access to the land.*

The proposed site has a road frontage to Tomingley Road, a TfNSW Classified Regional Road (No. 89) and accordingly, Narromine Council must be satisfied that the development meets the above criteria. Further assessment in relation to *Clause 2.119* of the SEPP is detailed in **Section 4.5** of this report.

### 1.3 Site Description

The subject site includes one (1) lot legally identified as Lot 2 DP1294897, which is currently zoned *RU1 – Primary Production* under the *Narromine Local Environmental Plan 2011*, whilst the proposal seeks to rezone a portion of the land to *E5 – Heavy Industrial*. The subject site is currently occupied by agricultural farmland and has frontages to Craigie Lea Lane to the north and Tomingley Road to the east. However, there is no direct access to Tomingley Road from the site frontage.

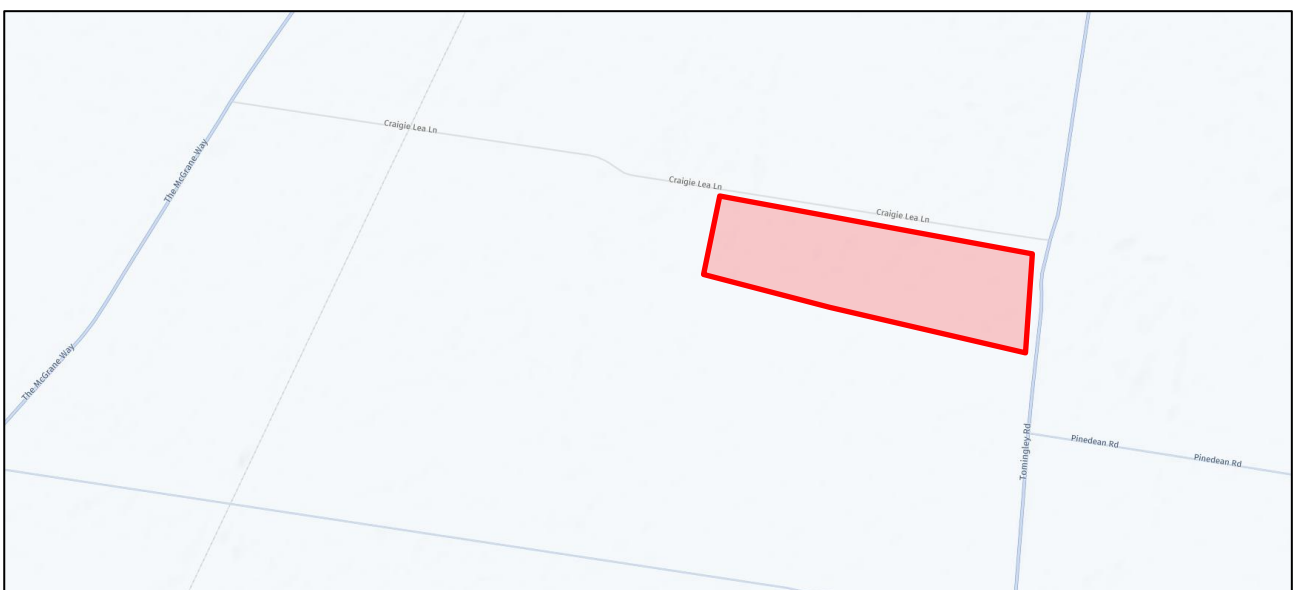
### 1.4 Site Context

The site's location is shown in an aerial photo, a street map, and a rezoning area plan in **Figure 1**, **Figure 2**, and **Figure 3**, respectively.



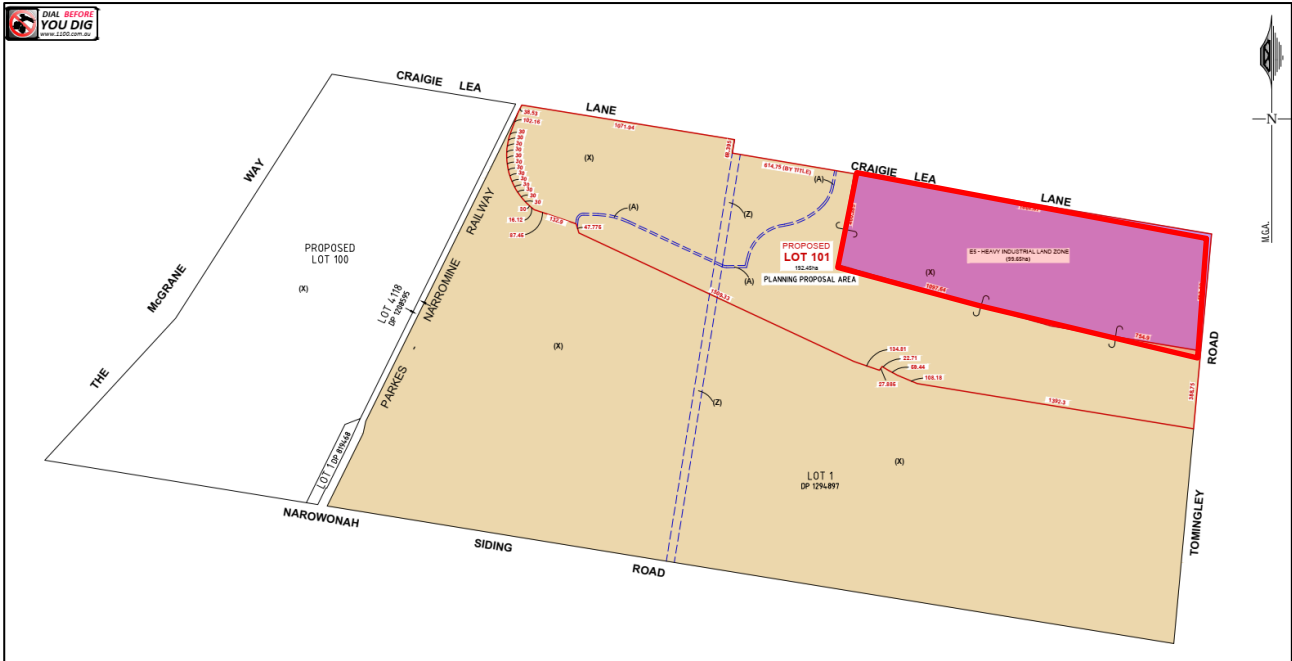
 Site Location

**FIGURE 1: SITE CONTEXT – AERIAL PHOTO**



 Site Location

**FIGURE 2: SITE CONTEXT – STREET MAP**



 Site Location

**FIGURE 3: SITE CONTEXT – REZONING AREA PLAN**

## **2 EXISTING TRAFFIC AND PARKING CONDITIONS**

### **2.1 Road Hierarchy**

The road network servicing the site has characteristics as described in the following sub-sections.

#### **2.1.1 Craigie Lea Lane**

- Unclassified LOCAL RURAL Access Road;
- Approximately 8m wide unsealed carriageway facilitating two-way traffic flow;
- Default rural 100km/h speed limit applies;
- No kerbs are provided on either side of the road and parking within the verge is unlikely to occur.

#### **2.1.2 Tomingley Road**

- TfNSW Classified REGIONAL Road (No. 89);
- Approximately 8m wide sealed carriageway facilitating one (1) traffic flow lane in each direction;
- Signposted 110km/h speed limit;
- No kerbs are provided on either side of the road and parking within the verge is unlikely to occur.

#### **2.1.3 The McGrane Way**

- TfNSW Classified Regional Road (No. 354);
- Approximately 8m wide sealed carriageway facilitating one (1) traffic flow lane in each direction;
- Signposted 110km/h speed limit;
- No kerbs are provided on either side of the road and parking within the verge is unlikely to occur.

### **2.2 Existing Traffic Management**

- Priority controlled intersection of Tomingley Road / Craigie Lea Lane;
- Priority controlled intersection The McGrane Way / Craigie Lea Lane.

### **2.3 Existing Traffic Environment**

Turning movement counts traffic surveys were conducted at the intersections of Tomingley Road / Craigie Lea Lane and The McGrane Way / Craigie Lea Lane from 5:30 AM to 10:30 AM and 2:00 PM to 6:00 PM on Wednesday, 21 February 2024, representing a typical operating weekday. The full survey results are shown in **Annexure B** for reference.



### 2.3.1 Existing Road Performance

The performance of the surrounding intersections under the existing traffic conditions has been assessed using SIDRA INTERSECTION 9.1, **Table 1** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure C**.

**TABLE 1: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.1)**

Intersection	Peak Hour	Degree of Saturation <sup>(1)</sup>	Average Delay <sup>(2)</sup> (sec/veh)	Level of Service <sup>(3)(4)</sup>	Control Type	Worst Movement
<b>EXISTING PERFORMANCE</b>						
Cragie Lea Lane /Tomingley Road	AM	0.02	0.6 (Worst: 8.2)	<b>NA</b> (Worst: A)	Give Way	LT from Tomingley Road
	PM	0.02	0.9 (Worst: 8.8)	<b>NA</b> (Worst: A)		RT from Tomingley Road
The McGrane Way /Cragie Lea Lane	AM	0.02	0.5 (Worst: 7.8)	<b>NA</b> (Worst: A)	Give Way	LT from The McGrane Way
	PM	0.02	0.5 (Worst: 7.8)	<b>NA</b> (Worst: A)		LT from The McGrane Way

**Notes:**

- (1) The Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
- (2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
- (3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.
- (4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

As shown, the relevant intersections are currently performing at a high level of efficiency, with an overall or worst movement Level of Service “A” conditions in both the AM & PM peak hour periods. The Level of Service “A” performance is characterised by low approach delays and spare capacity.

### 2.4 Public Transport

The subject site is poorly serviced by public transportation. The nearest bus stops are in the Narromine town centre, approximately 5.5km to the north.

### 2.5 Future Road and Infrastructure Upgrades

The site is located adjacent to the Inland Rail termination of the Parkes to Narromine section, which is now operational, and the start of the Narromine to Narrabri project, which is still in its approval stage.

It has been advised that there are planned upgrades for Craigie Lea Lane to be widened and sealed due to the development of the adjacent Narrowah Materials Distribution Centre. It is proposed that Craigie Lea Lane will be a 12m wide carriageway facilitating one (1) traffic flow lane in each direction (3.5m wide each) with 2.5m wide shoulders on each side of the carriageway.

It has also been advised that Tomingley Road is being upgraded due to the Inland Rail project. The upgrades will involve a realignment and a CHR treatment at the Tomingley Road / Craigie Lea Lane intersection, which will be completed by others.

**Annexure D** provides a concept plan for the Tomingley Road / Craigie Lane intersection upgrade for reference, which the Council has provided.

### **3 PARKING ASSESSMENT**

#### **3.1 Council Parking Requirement**

Reference is made to the *Narromine Shire Council Development Control Plan 2011* (NSDCP), which designates the following parking rates applicable to the proposed development:

##### ***Chapter 5e) Industrial Development***

###### *Industrial buildings*

*1 space per 100m<sup>2</sup> of GFA plus 1 space per 40m<sup>2</sup> of office space  
GFA plus 1 space per 37m<sup>2</sup> of retail GFA.*

Car parking for each lot is to be provided by vehicular access from the proposed road, which circulates within the proposed future subdivision. It will be a requirement at the DA and CC stages of each lot to check parking provision, driveway location, and compliance, although the proposed lots would generally be able to accommodate suitable driveway locations and parking provision on each individual site.

#### **3.2 Parking for People with Disabilities**

NSDCP outlines that car parking for people with disabilities applicable to industrial developments shall comply with the rates outlined within the Building Code of Australia (BCA).

As such, reference is made to *Section D4D6* of the *Building Code of Australia* (BCA) as part of the *National Construction Code 2022* (NCC), which categorises an industrial building as a Class 8 building and therefore requires the provision of car parking for people with disabilities at a rate of:

*Class 5, 7, 8 or 9c                      1 accessible space for every 100 carparking  
spaces or part thereof.*

Each lot has the ability to provide compliant accessible spaces where needed and shall be assessed at the DA and CC stage of each lot.

#### **3.3 Bicycle & Motorcycle Parking Requirements**

The NSDCP does not provide rates of parking provision for bicycle or motorcycle parking. As such, the Narromine Shire Council does not require the provision of bicycle/motorcycle parking.

The site is not constrained by its ability to provide an adequate quantum of bicycle or motorcycle parking. The bicycle and motorcycle parking demands of the considered uses, if any, can be fully provided on-site.

### **3.4 Servicing & Loading**

The NDSCP does not provide specific requirements for servicing and loading of industrial lots. The McGrane Way and Tomingley Road are permitted to be accessed by Type 1 – A-Doubles and Modular B-Triples and Type 1 Rigid Truck and 2 Dog Trailers, in accordance with the TfNSW Road Train Map. The proposed future subdivision and upgraded Craigie Lea Lane should be designed to ensure these vehicles can access the site. It is reiterated that each individual lot is subject to its own development application to assess the specific loading requirements of each development. However, it is expected that all servicing and loading will be able to occur on-site given the large lot sizes.

### **3.5 Car Park Design & Compliance**

No compliance has been undertaken for the lots as each is subject to its own development application and the final design of the proposed subdivision, which will be subject to a future assessment. It is expected that the parking and manoeuvring areas of each lot will be able to satisfy the requirements of the relevant Australian Standards, including, but not limited to, *AS2890.1:2004 – Off-street parking*, *AS2809.2:2018 – Off-street commercial vehicle facilities* and *AS2890.6:2022 – Off-street parking for people with disabilities*.

The future subdivision will be designed to contain a 30m wide road reserve capable of facilitating vehicles up to a 36.5m AB-Triple. The largest size vehicle capable of servicing each individual lot should be determined at the relevant DA stages.

## 4 TRAFFIC ASSESSMENT

The impact of the expected traffic generation levels associated with the subject proposal is discussed in the following sub-sections.

### 4.1 **Traffic Generation**

Traffic generation rates for the relevant land uses are provided in the *RTA Guide to Traffic Generating Developments (2002)* and recent supplements as adopted by *Transport for NSW (TfNSW)* and are as follows:

#### 3.10 **Industry**

##### 3.10.1 *Factories*

*Daily vehicle trips = 5 per 100m<sup>2</sup> gross floor area*

*Evening peak hour vehicle trips = 1 per 100m<sup>2</sup> gross floor area*

The surveys underpinning the traffic generation rates outlined within the RTA Guide are taken from metropolitan areas with a much greater density than the proposed site. Given the rural nature of the site, a traffic generation rate based on a maximum number of employees is considered more relevant. Reference is made to *Table 3.4* from the RTA Guide (as extracted below in **Table 2**), which outlines the traffic generation distribution of industrial estates per 1000 employees.

**TABLE 2: RTA GUIDE – TABLE 3.4**

<b>Period</b>	<b>Cars/hr/1000 staff</b>	<b>CVs/hr/1000 staff <sup>(1)</sup></b>	<b>Total Vehicles</b>
7-8 am	100	1	101
8-9	307	11	<b>318</b>
9-10	206	28	234
10-11	108	33	141
11-12 pm	83	33	116
12-1	132	31	163
1-2	162	34	196
2-3	113	26	139
3-4	163	31	194
4-5	265	24	289
5-6	350	15	<b>365</b>
6-7	43	1	44
<b>Total</b>	<b>2032</b>	<b>268</b>	<b>2300</b>

**Note:** CVs refer to Commercial Vehicles

The resulting AM and PM peak hourly traffic generation is summarised in **Table 3**.

**TABLE 3: ESTIMATED TRAFFIC GENERATION**

Scale	Peak	Vehicle Type	Generation Rate	Trips
200 Employees Maximum	AM (8-9)	Car	307 per 1000 employees <sup>(1)</sup>	62 (50 in, 12 out)
		Truck	11 per 1000 employees <sup>(2)</sup>	2 (1 in, 1 out)
		<b>Total</b>	<b>308 per 1000 employees</b>	<b>64</b> <b>(51 in, 13 out)</b>
	PM (5-6)	Car	350 per 1000 employees <sup>(1)</sup>	70 (14 in, 56 out)
		Truck	15 per 1000 employees <sup>(2)</sup>	3 (1 in, 2 out)
		<b>Total</b>	<b>365 per 1000 employees</b>	<b>73</b> <b>(15 in, 58 out)</b>

**Notes:**

(1) 80% inbound and 20% outbound assumed for the AM peak period, and vice versa for the PM peak period.

Reference is made to the report titled *Narwonah Material Distribution Centre Review of Environmental Factors*, which outlines the following estimated traffic generation of the adjacent site:

**Traffic impacts**

*Construction*

*The McGrane Way – additional 21 vehicles (7 light vehicles and 14 heavy vehicles) daily*

*Tomingley Road – additional 11 vehicles (3 light vehicles and 8 heavy vehicles) daily*

*Operation*

*The McGrane Way – additional 14 vehicles (7 light vehicles and 7 heavy vehicles) daily*

*Tomingley Road – additional 6 vehicles (3 light vehicles and 3 heavy vehicles) daily*

For a conservative estimate, it has been adopted that 50% of daily vehicles will be generated within each peak hour, resulting in a peak hour traffic generation of **11** trips (4 light vehicles and 7 heavy vehicles) along McGrane Way and **6** trips (2 light vehicles and 4 heavy vehicles) along Tomingley Road in the construction period, which is the period which generates the most traffic.

As shown, the expected traffic generation associated with the proposed development is 64 vehicle trips in the AM peak period (51 in, 13 out) and 73 vehicle trips in the PM peak period (15 in, 58 out), whilst the cumulative traffic generation associated with the proposed development and the associated Materials Distribution Centre is **81** vehicle trips in the AM peak period and **90** vehicle trips in the PM peak period.

#### **4.2 Traffic Assignment**

The road network, traffic surveys and locations of residential areas surrounding the site have been assessed, and the following traffic assignment has been assumed for all traffic to and from the site:

- 75% to/from the north via Tomingley Road;
- 15% to/from the south via Tomingley Road;
- 10% to/from the southwest via The McGrange Way.

It has been advised that the vast majority of the employees will reside in either Narromine or Dubbo, and as such, 75% of traffic has been assigned to the north via Tomingley Road.

Heavy vehicle traffic is likely to be evenly distributed across the network, depending on the final industrial uses on the subject site. The TfNSW Heavy Vehicle Restrictions control heavy vehicle travel routes. Any heavy vehicles that need to travel through the Narromine township can follow the approved TfNSW Road Train and Heavy Vehicle routes, which are approved to accommodate specific heavy vehicles.

#### **4.3 Traffic Impact**

The traffic generation outlined in **Section 4.1 & 4.2** above, including the cumulative traffic generation and assignment of the adjacent development, has been added to the recorded traffic volumes. SIDRA INTERSECTION 9.1 was used to assess the intersection's performance. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load. The results of this assessment are shown in **Table 4**.

**TABLE 4: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.1)**

Intersection	Peak Hour	Degree of Saturation <sup>(1)</sup>	Average Delay <sup>(2)</sup> (sec/veh)	Level of Service <sup>(3)(4)</sup>	Control Type	Worst Movement
<b>EXISTING PERFORMANCE</b>						
Cragie Lea Lane /Tomingley Road	AM	0.02	0.6 (Worst: 8.2)	<b>NA</b> (Worst: A)	Give Way	LT from Tomingley Road
	PM	0.02	0.9 (Worst: 8.8)	<b>NA</b> (Worst: A)		RT from Tomingley Road
The McGrane Way /Cragie Lea Lane	AM	0.02	0.5 (Worst: 7.8)	<b>NA</b> (Worst: A)	Give Way	LT from The McGrane Way
	PM	0.02	0.5 (Worst: 7.8)	<b>NA</b> (Worst: A)		LT from The McGrane Way
<b>FUTURE (POST-DEVELOPMENT) PERFORMANCE</b>						
Cragie Lea Lane /Tomingley Road	AM	0.04	3.5 (Worst: 7.8)	<b>NA</b> (Worst: A)	Give Way	LT from Tomingley Road
	PM	0.05	3.5 (Worst: 8.4)	<b>NA</b> (Worst: A)		LT from Tomingley Road
The McGrane Way /Cragie Lea Lane	AM	0.02	1.9 (Worst: 7.8)	<b>NA</b> (Worst: A)	Give Way	LT from The McGrane Way
	PM	0.02	1.9 (Worst: 7.8)	<b>NA</b> (Worst: A)		LT from The McGrane Way

**NOTES:** Refer to Table 1.

As shown, the intersections of Tomingley Road / Cragie Lea Lane and The McGrane Way / Cragie Lea Lane all retain the same overall level of service of “A” under future conditions with minimal delays and additional capacity, indicating that the proposed development will have no adverse impact on the existing road network.

A review of publicly available crash data indicates there is no cluster within the vicinity of the site.

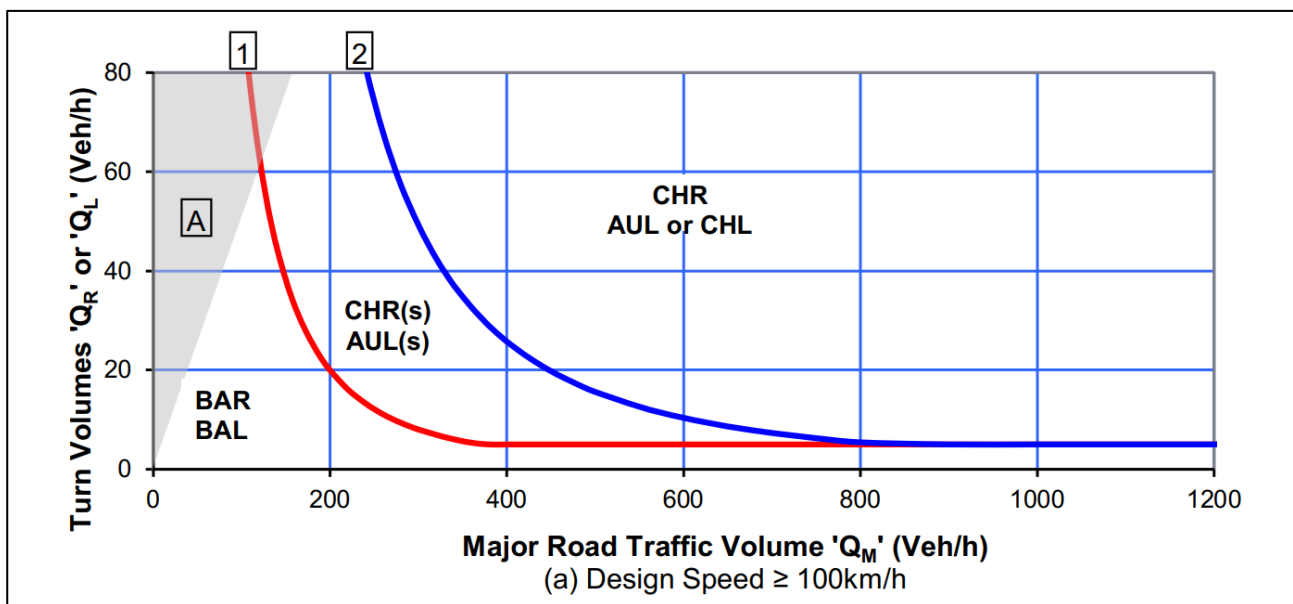


#### 4.4 Tomingley Road / Cragie Lea Lane Turn Warrant

Reference is made to *Austrroads Guide to Traffic Management Part 6: Intersections, Interchanges, and Crossings*, which outlines intersection turn warrants. Turn treatments can consist of basic left and right turn treatment and short or full-length left/right turn deceleration lanes. Consideration is given to the road design speed and traffic volumes.

The underlying basis for turn warrants is the cost-benefit ratio, whereby the cost of providing the infrastructure upgrade is lower than the cost incurred due to crash costs over a particular design life.

Referring to *Figure 3.25 of Austrroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings* as shown in **Figure 4** below. The applicable left and right turn treatments for Tomingley Road into Cragie Lea Lane are summarised in **Table 5**.

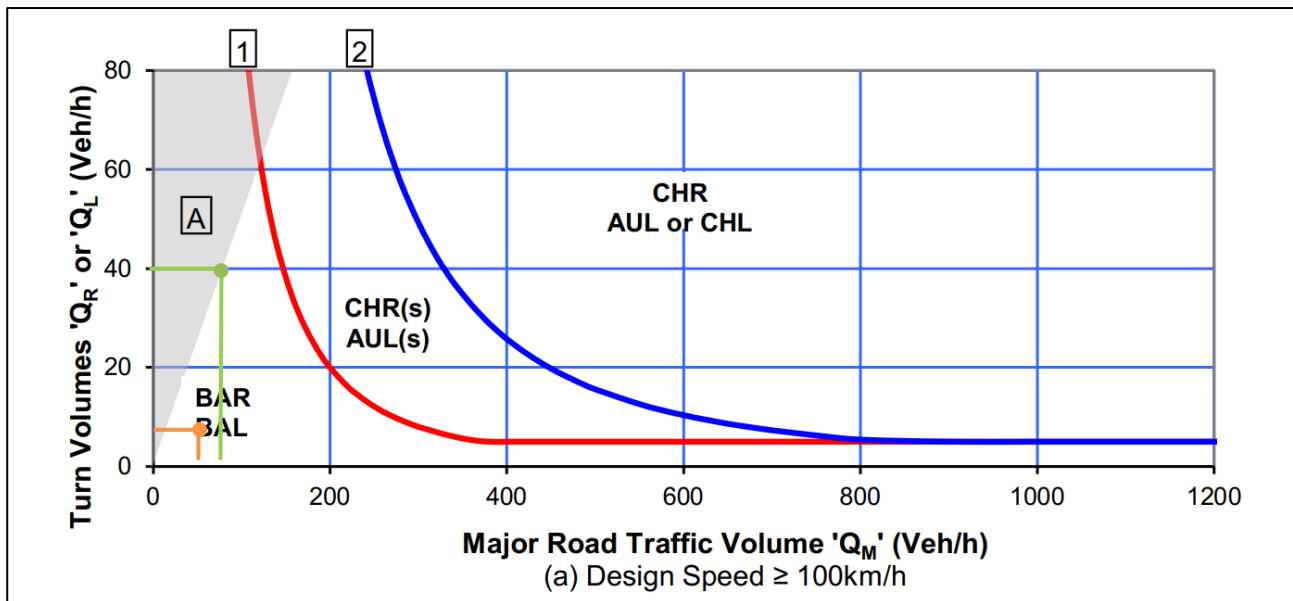


**FIGURE 4: AUSTRROADS TURN TREATMENTS**

**TABLE 5: AUSTRROAD TURN WARRANT ASSESSMENT**

Scenario	Peak Period	Turn	Turn Volume	$Q_M$ Value	Turn Warrant Treatment
Future Conditions	AM	Left Turn ( $Q_L$ )	9	30	BAL
	PM		5	34	BAL
	AM	Right Turn ( $Q_R$ )	41	57	BAR
	PM		16	66	BAR

The worst-case scenario occurs during the AM peak period, and the resultant warrant assessment during this period is depicted in **Figure 5**.



**FIGURE 5: TREATMENT REQUIREMENT**

As shown above, a Basic Right (BAR) and Basic Left (BAL) intersection turn treatment is the minimum treatment warranted as part of the proposed development based on the estimated traffic volumes.

It has been advised that the intersection is being upgraded to contain a CHR treatment (as seen within the concept in **Annexure D**), which will include a 200m long auxiliary right-turn lane as shown and a BAL treatment. This design has been prepared by others, and it is expected that it will meet the relevant AUSTROAD and Council design requirements. The proposed CHR exceeds the minimum treatment requirement under the above Warrant Assessment.

#### **4.5 SEPP (Transport and Infrastructure) 2021 Clause 2.119**

The proposed development has frontage to Tomingley Road, a classified road (No. 89) and as such, an assessment against the criteria in *Clause 2.119 of SEPP (Transport and Infrastructure)* is presented below. The relevant items raised in *Clause 2.119* are presented below (italicised) with MTE response after that.

*(a) where practicable and safe, vehicular access to the land is provided by a road other than the classified road, and*

**MTE Response:** The subject site has access solely from Craigie Lea Lane and, therefore, satisfies this requirement.

*(b) the safety, efficiency, and ongoing operation of the classified road will not be adversely affected by the development as a result of:*

*i. the design of the vehicular access to the land.*

**MTE Response:** The proposed access is from a road other than the classified road. **Section 4** demonstrates that the proposed driveway will have no adverse impact on the surrounding road network, including the classified road.

*ii. the emission of smoke or dust from the development*

**MTE Response:** For others to address.

*iii. the nature, volume or frequency of vehicles using the classified road to gain access to the land.*

**MTE Response:** **Section 4** outlines the expected peak hour traffic generation and impact on the surrounding intersections. The site's traffic generation will have no adverse impact on the surrounding intersections.

## 5 RESPONSE TO TfNSW COMMENTS

This section responds to TfNSW's comments in a letter dated 22 December 2023 for project reference WST22/00007/05. TfNSW's comments relevant to traffic and parking are shown below (italicised), followed by MCLaren Traffic Engineering's (MTE) response.

1. ***Traffic Impact Study (TIS):*** *To enable an understanding of the impacts that this future PP and its future development will have on the classified road network, the local road connections with classified roads and how the PP will support public transport a TIS should be provided. This will need to examine any potential transport related implications of the future development of the land and:*

- a) *Be prepared by a suitably qualified consultant.*

**MTE Response:** MCLaren Traffic Engineering has prepared this report and is suitably qualified.

- b) *Address the applicable criteria/key issues in Table 2.1 of the RTA's Guide to Traffic Generating Developments.*

**MTE Response:** This TPIA has been prepared to address the applicable criteria/key issues outlined within *Table 2.1 of the RTA Guide to Traffic Generating Developments (2002)*.

- c) *Have regard for the Austroads publications, particularly the Austroads Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments and Part 3: Traffic Studies and Analysis Methods.*

**MTE Response:** The relevant Austroads Guides have been considered.

- d) *Provide an assessment of the suitability of local road connections to the classified road network and determine if any upgrades are necessary (noting the requirements in Point 2 below)/ This assessment should be based on current traffic counts during the AM and PM peaks and be calibrated with on-site observations. The trip distributions used in this assessment must be supported by valid justifications. This would include an explanation of the assumed travel patterns to access services and facilities as well as a turn warrant assessment based on maximum vehicle numbers generated. The assessment/identification of appropriate turn treatments is to be carried out in accordance with Austroads Guide to Traffic Management – Part 6 Intersections, Interchanges and Crossings Management (ARDG Part 6) and shall:*

- *include volume plots on Figure 3.25 (a) in ARDG Part 6;*
- *be based on the AM and PM peak period; and*

- *be supported with current traffic count data. Dates and times for the collected data shall be provided along with the traffic counts.*

**MTE Response:** See **Section 2.3** and **Section 4**.

- e) *Provide details on all vehicles that will be accessing the site (e.g. type, size, etc) and routes that will be taken (i.e. from the north, south, east and west).*

**MTE Response:** See **Section 3.4** and **4**.

- f) *Provide trip generation rates for the future development including details on how the rates used have been determined.*

**MTE Response:** See **Section 4.1**.

- g) *Provide an assessment/explanation of assumed travel patterns (i.e. trip distributions) to access services.*

**MTE Response:** See **Section 4.2**.

- h) *Ensure that the estimated traffic generated by the future development of the land (broken down into estimated light and heavy vehicles) considers the range of permissible types of development within the new zoning.*

**MTE Response:** **Section 4.1** outlines the estimated traffic generation by light vehicles and heavy vehicles. It should be noted that this is a conservative estimate as the highest industrial use from the RTA Guide has been applied with the data extrapolated to be per employee rather than per GFA, which is the most appropriate approach for this subject site.

- i) *Include an assessment of the cumulative traffic impacts (e.g. from adjacent and future developments).*

**MTE Response:** **Section 4** considers the cumulative traffic impacts from the adjacent Narwonah Material Distribution Centre using the traffic generation outlined within the report titled *Narwonah Material Distribution Centre Review of Environmental Factors*.

- j) *Identify appropriate measures to mitigate any adverse impacts as a result of the PP and the future development the PP will facilitate on the classified road network.*

**MTE Response:** SIDRA modelling of the future scenario (post-development) indicates that there will be no adverse impact on the classified road as a result of the proposed cumulative developments along Cragie Lea Lane.

Furthermore, the Austroads turn warrants suggest the intersection should provide a Basic Left (BAL) turn treatment, and a Basic Right (BAL) turn treatment as a result of the estimated future traffic volumes along the classified road. However, it has been advised that the intersection of Tomingley Road / Craigie Lea Lane will be upgraded as part of the adjacent development to have a CHR, which is a superior treatment.

*k) Detail appropriate arrangements to support public transport. It is important to ensure that future occupants will have access to bus infrastructure for their transportation needs*

**MTE Response:** Given the site location and proposed use, it is not economically feasible to provide public transport to/from the subject site.

*l) Detail on if and how other sustainable modes of travel are to be incorporated into the future PP/development of the land.*

**MTE Response:** It is considered highly unlikely that other sustainable modes of travel will be utilised given the site location and proposed use and, therefore, are not incorporated within the development of the land.

## 6 CONCLUSIONS

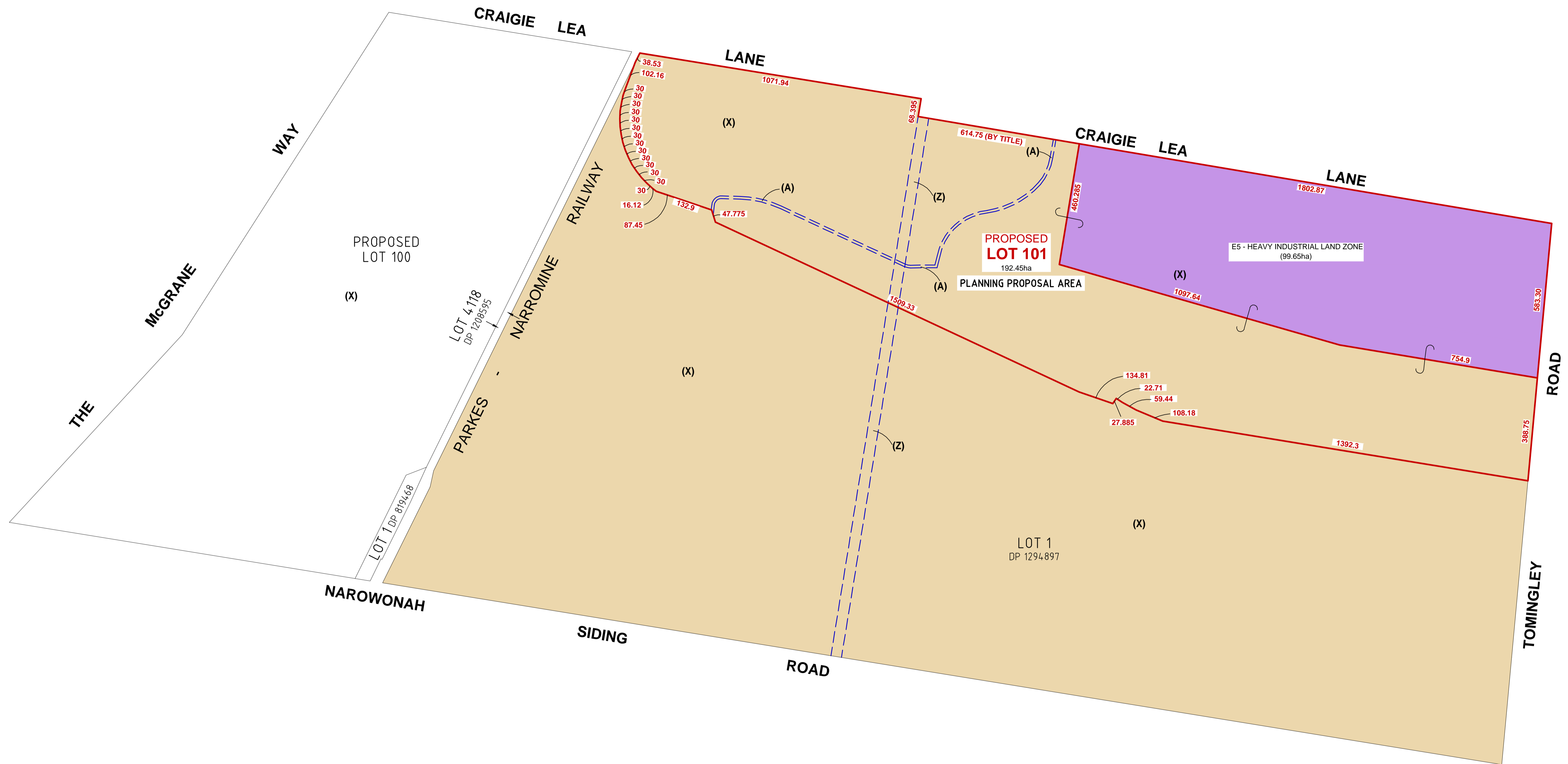
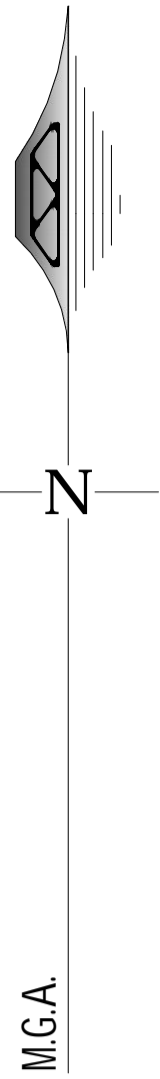
In view of the foregoing, the subject rezoning proposal at 397 Craigie Lea Lane, Narromine, in order to facilitate an industrial subdivision (as depicted in **Annexure A**) is fully supportable in terms of its traffic and parking impacts. The following outcomes of this traffic and parking impact assessment are relevant to note:

- a) Car parking for each lot is to be provided by vehicular access from the proposed internal road which circulates within the site. It will be a requirement at DA and CC stage of each lot to check parking provision, driveway location and compliance, although the proposed lots would generally be able to accommodate suitable driveway locations and suitable parking provision on each individual site.
- b) Council's DCP does not require the provision of bicycle or motorcycle parking facilities.
- c) The proposed plans have not been assessed by MTE against the relevant sections of AS2890.1:2004, AS2890.2:2018 and AS2890.6:2022 as a part of this traffic and parking impact assessment. Compliance of each individual development is to be undertaken during each lots Development Application and again during the Construction Certificate stage.
- d) The traffic generation of the proposed rezoned land (assuming a maximum on-site population of 200 people) has been estimated to be some **64** trips in the AM peak period (51 in, 13 out) and **73** trips in the PM peak period (15 in, 58 out). The cumulative traffic generation associated with the proposed development and the adjacent Materials Distribution Facility is in the order of **81** vehicle trips in the AM peak period and **90** vehicle trips in the PM peak period. The impacts of the traffic generation have been modelled using SIDRA INTERSECTION 9.1, indicating that there will be no adverse impact to the performance of the intersections as a result of the generated traffic.
- e) A BAR and BAL intersection turn treatment at the intersection of Craigie Lea Lane / Tomingley Road is warranted as part of the proposed development. It has been advised that this intersection will be upgraded to include a CHR treatment by others, which exceeds the minimum treatment requirements as a result of the cumulative traffic generated by the proposed development and the adjacent development.



**ANNEXURE A: PROPOSED PLANS  
(3 SHEETS)**





- (A) RIGHT OF ACCESS 10 WIDE (VIDE DP 1294897)
- (X) LAND EXCLUDES MINERALS & IS SUBJECT TO RESERVATIONS & CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT
- (Z) LAND EXCLUDES MINERALS (S.171 CROWN LANDS ACT, 1989)

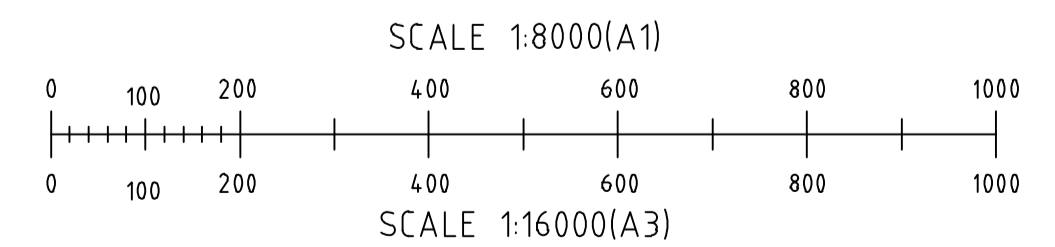
**PROPOSED REZONE AREA PLAN**

REDUCTION RATIO 1:8,000 @ A1  
1:16,000 @ A3

NOTES:

- THE BOUNDARY INFORMATION SHOWN ON THIS PLAN BEEN PLOTTED AS REQUIRED UNDER DIVISION 1, SECTION 9.1(1) OF THE "SURVEYING AND SPATIAL INFORMATION REGULATION 2017". IT HAS NOT BEEN DETERMINED BY AN ACCURATE BOUNDARY SURVEY.
- A DETAIL & LEVEL SURVEY IS NOT A "LAND SURVEY" AS DEFINED BY THE SURVEYING AND SPATIAL INFORMATION ACT 2002. IF ANY CONSTRUCTION OR DESIGN WORK WHICH RELIES ON CRITICAL SETBACKS FROM THE STREET OR BOUNDARIES IS PLANNED, IT WOULD BE IMPERATIVE TO CARRY OUT FURTHER SURVEY WORK TO DETERMINE THE BOUNDARY DIMENSIONS.
- BARNSON TAKES NO RESPONSIBILITY FOR LOSSES, DAMAGES OR INJURIES TO ANY PERSON OR ORGANISATION THAT MAY OCCUR DUE TO THE RELIANCE ON THIS PLAN

LEGEND	
	SUBJECT CADASTRAL BOUNDARIES
	E5 - HEAVY INDUSTRIAL LAND ZONE
	RU1 - PRIMARY PRODUCTION LAND ZONE



ISSUED TO CLIENT



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Rev	Date	Description
A	4-12-2023	ISSUED TO CLIENT
B	6-02-2024	PROPOSED ZONES UPDATED

Project  
**PROPOSED PLAN OF SUBDIVISION OVER LOT 2 IN DP 1294897**  
 Site Address  
 CRAIGE LEA LANE  
 NARROMINE NSW 2821  
 Client  
 NARROMINE SHRIE COUNCIL

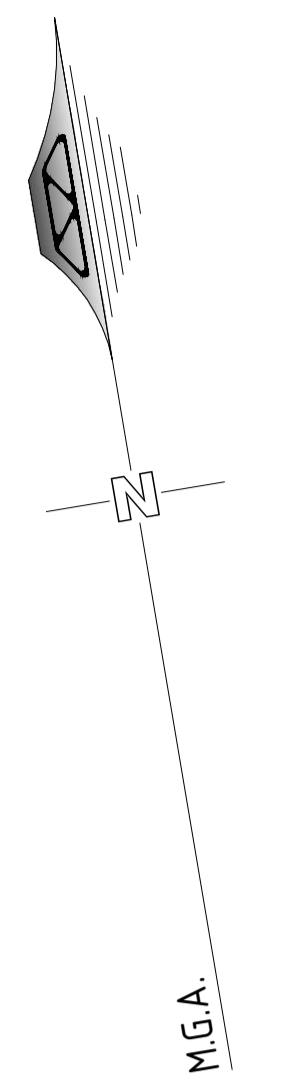
Drawing Title  
**PROPOSED REZONE AREA PLAN**  
 Survey RB  
 Drawn JS  
 Check RB  
 Original Sheet Size A1  
 Revision A

Certification  
 Project No  
 Drawing No

40038  
P03



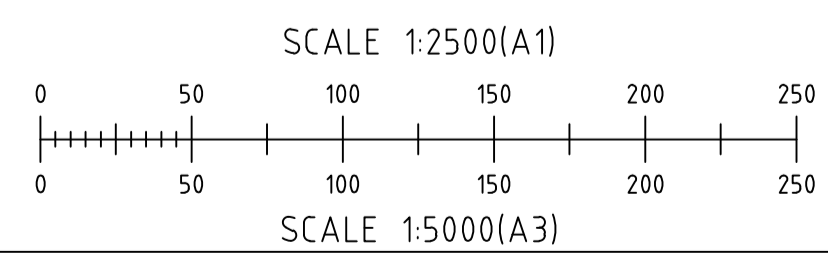
THIS IS A DRAFT PLAN ONLY AND IS SUBJECT TO FINAL SURVEY



**KEY**

- CONSTRAINTS MAP - BLUEGRASS
- CONSTRAINTS MAP - HABITAT FEATURES
- CONSTRAINTS MAP - TECs FUTURE EXPANSION
- CONSTRAINTS MAP - TECs SUBJECT SITE

**PROPOSED PLAN OF SUBDIVISION**  
REDUCTION RATIO 1:2,500 @ A1  
1:5,000 @ A3



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Rev	Date	Description
A	27-10-2023	ISSUED TO CLIENT
B	8-12-2023	UPDATED PLAN

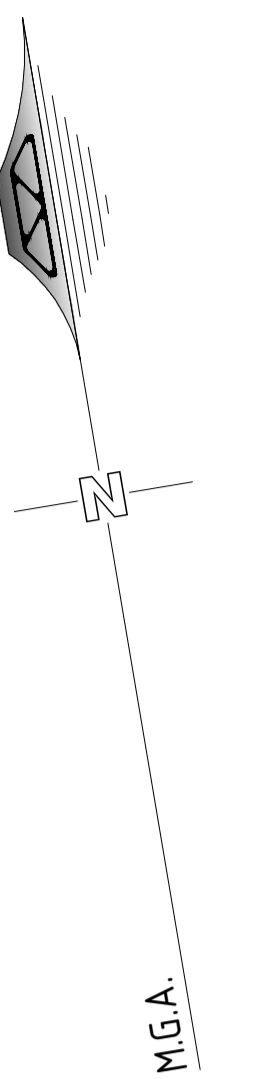
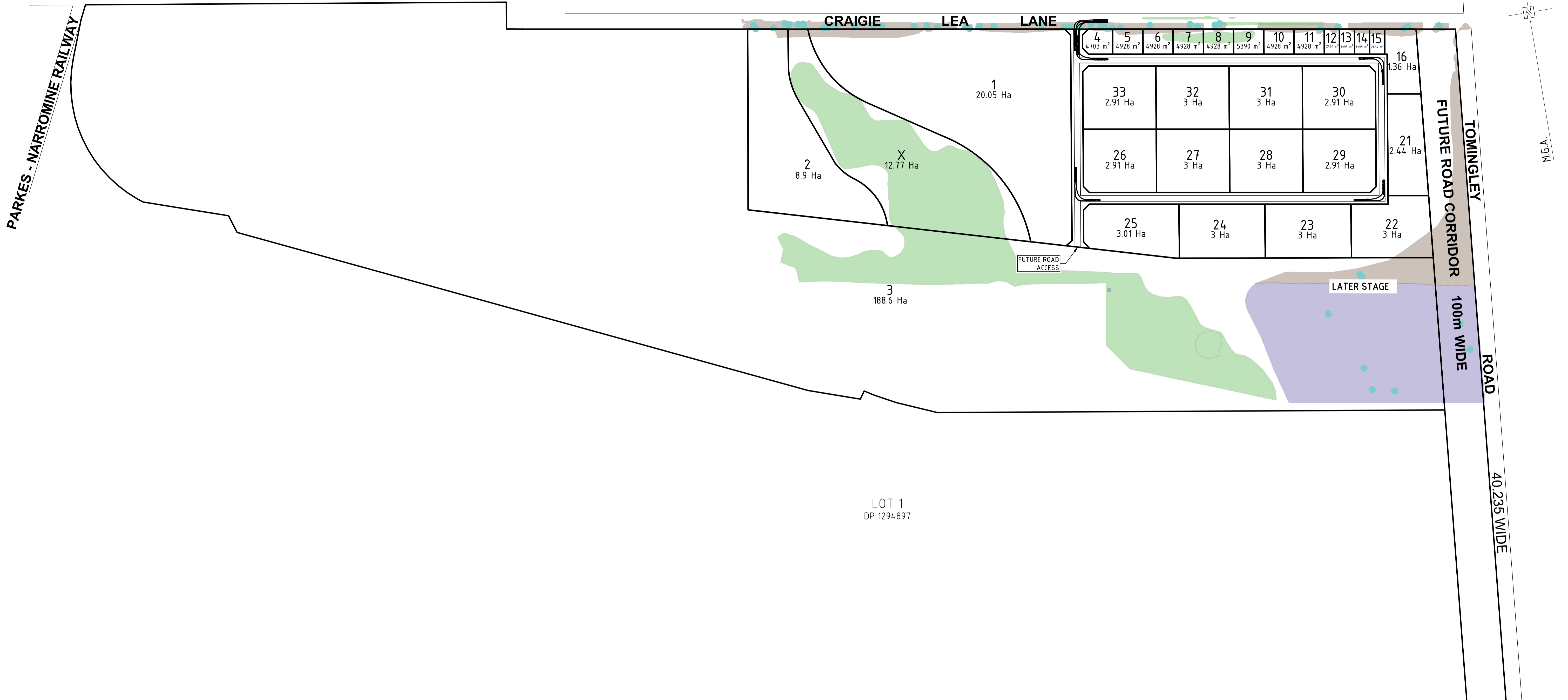
Project  
**PROPOSED SUBDIVISION OVER PROPOSED LOT 101**  
Site Address  
397 CRAIGIE LEA LANE  
NARROMINE NSW 2821  
Client  
NARROMINE SHIRE COUNCIL

Drawing Title		Certification	
<b>PROPOSED PLAN OF SUBDIVISION</b>			
Survey	RB	Original Sheet Size	A1
Drawn	JS	Project No	37228
Check	RB	Drawing No	P03
		Revision	B

37228  
P03



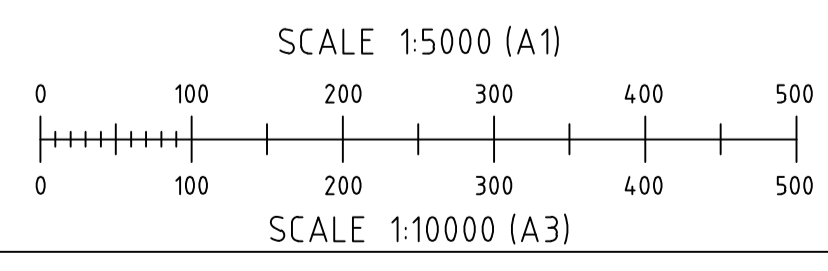
THIS IS A DRAFT PLAN ONLY AND IS SUBJECT TO FINAL SURVEY



**KEY**

	CONSTRAINTS MAP - BLUEGRASS
	CONSTRAINTS MAP - HABITAT FEATURES
	CONSTRAINTS MAP - TECs FUTURE EXPANSION
	CONSTRAINTS MAP - TECs SUBJECT SITE

**PROPOSED PLAN OF SUBDIVISION**  
REDUCTION RATIO 1:5,000 @ A1  
1:10,000 @ A3



**ISSUED TO CLIENT**



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web barnson.com.au

Rev	Date	Description
A	8-12-2023	ISSUED TO CLIENT

Project  
**PROPOSED SUBDIVISION OVER PROPOSED LOT 101**  
Site Address  
397 CRAIGIE LEA LANE  
NARROMINE NSW 2821  
Client  
NARROMINE SHIRE COUNCIL

Drawing Title		Certification	
<b>PROPOSED PLAN OF SUBDIVISION OVERALL SITE PLAN</b>			
Survey	RB	Original Sheet Size	A1
Drawn	JS		
Check	RB	Revision	A

Project No **37228**  
Drawing No **P04**



**ANNEXURE B: TRAFFIC SURVEY DATA  
(2 SHEETS)**



**TRANS TRAFFIC SURVEY**  
TURNING MOVEMENT SURVEY

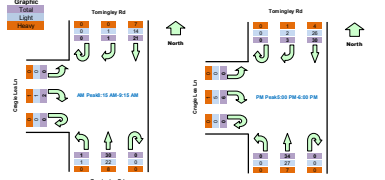
Intersection of Craigie Lea Ln and Tomingley Rd, Narmoo

Date: 22/02/2024	Time: 2:45-3:45 PM	Location: Tomingley Rd	Survey Period: AM	Survey Start: 5:30 AM-10:30 PM
Client: Warrumbidgee Council	Project: Narmoo	East: Tomingley Rd	Survey Period: PM	Survey Start: 12:30 PM-5:30 PM
Subcontractor: Narmoo	Client: Warrumbidgee Council	West: Tomingley Rd	Survey Period: AM	Survey Start: 5:30 AM-10:30 PM
Customer: MLC	Client: Warrumbidgee Council	West: Tomingley Rd	Survey Period: PM	Survey Start: 12:30 PM-5:30 PM

All Vehicles		Time								Hourly Total	
Period Start	Period End	U	R	SS	U	NB	L	U	R	L	Peak
5:30	5:45	0	0	2	0	1	0	0	0	0	29
5:45	6:00	0	0	2	0	2	0	0	0	1	27
6:00	6:15	0	2	4	0	1	0	0	0	0	30
6:15	6:30	0	5	1	0	2	0	0	0	0	30
6:30	6:45	0	1	5	0	1	0	0	0	0	33
6:45	7:00	0	1	6	0	1	0	0	0	0	33
7:00	7:15	0	0	3	0	4	0	0	0	0	36
7:15	7:30	0	0	3	0	8	0	0	0	0	42
7:30	7:45	0	0	2	0	4	0	0	1	0	50
7:45	8:00	0	4	3	0	4	0	0	0	0	54
8:00	8:15	0	0	7	0	6	0	0	0	0	54
8:15	8:30	0	1	5	0	13	0	0	0	0	55
8:30	8:45	0	2	0	7	0	0	2	0	0	46
8:45	9:00	0	0	5	0	6	0	0	0	0	47
9:00	9:15	0	0	9	0	4	1	0	0	0	48
9:15	9:30	0	0	5	0	4	0	0	1	0	40
9:30	9:45	0	0	8	0	3	1	0	0	0	45
9:45	10:00	0	0	6	0	4	0	0	0	0	44
10:00	10:15	0	0	1	0	7	0	0	0	0	0
10:15	10:30	0	0	6	0	9	0	0	0	0	0
14:00	14:15	0	0	0	0	6	0	0	0	0	36
14:15	14:30	0	0	4	0	4	0	0	0	0	36
14:30	14:45	0	1	4	0	7	0	0	0	0	43
14:45	15:00	0	0	1	0	5	0	0	0	0	44
15:00	15:15	0	0	4	0	4	0	0	0	0	42
15:15	15:30	0	1	4	0	5	0	3	0	0	47
15:30	15:45	0	1	8	0	3	0	0	1	0	53
15:45	16:00	0	0	5	0	3	0	0	0	0	51
16:00	16:15	0	0	6	0	5	0	0	2	0	58
16:15	16:30	0	0	8	0	11	0	0	0	0	62
16:30	16:45	0	0	5	0	6	0	0	0	0	56
16:45	17:00	0	0	7	0	7	0	1	0	0	60
17:00	17:15	0	1	5	0	8	0	0	3	0	73
17:15	17:30	0	1	5	0	7	0	0	2	0	0
17:30	17:45	0	1	10	0	10	0	1	0	0	0
17:45	18:00	0	0	10	0	9	0	0	0	0	0

Peak Time		Time								Hourly Total	
Period Start	Period End	U	R	SS	U	NB	L	U	R	L	Peak
8:15	9:15	0	1	21	0	30	1	0	2	0	55
17:00	18:00	0	0	30	0	34	1	0	0	0	65

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.



Light Vehicles		Time								Hourly Total	
Period Start	Period End	U	R	SS	U	NB	L	U	R	L	Peak
5:30	5:45	0	0	2	0	1	0	0	0	0	29
5:45	6:00	0	0	1	0	2	0	0	0	1	27
6:00	6:15	0	2	4	0	1	0	0	0	0	30
6:15	6:30	0	4	1	0	2	0	0	0	0	30
6:30	6:45	0	1	4	0	1	0	0	0	0	33
6:45	7:00	0	1	3	0	0	0	0	0	0	33
7:00	7:15	0	0	2	0	4	0	0	0	0	36
7:15	7:30	0	0	1	0	6	0	0	0	0	42
7:30	7:45	0	0	2	0	3	0	0	1	0	50
7:45	8:00	0	2	3	0	4	0	0	0	0	54
8:00	8:15	0	0	7	0	6	0	0	0	0	54
8:15	8:30	0	1	2	0	8	0	0	0	0	55
8:30	8:45	0	0	2	0	4	0	0	0	0	46
8:45	9:00	0	0	4	0	6	0	0	0	0	47
9:00	9:15	0	0	6	0	4	1	0	0	0	48
9:15	9:30	0	0	3	0	3	0	0	1	0	40
9:30	9:45	0	0	7	0	3	1	0	0	0	45
9:45	10:00	0	0	5	0	2	0	0	0	0	44
10:00	10:15	0	0	1	0	6	0	0	0	0	0
10:15	10:30	0	0	5	0	6	0	0	0	0	0
14:00	14:15	0	0	0	0	2	0	0	0	0	36
14:15	14:30	0	0	3	0	4	0	0	0	0	36
14:30	14:45	0	1	3	0	6	0	0	0	0	43
14:45	15:00	0	0	1	0	5	0	0	0	0	44
15:00	15:15	0	0	4	0	3	0	0	0	0	42
15:15	15:30	0	1	4	0	5	0	0	1	0	47
15:30	15:45	0	0	6	0	3	0	0	1	0	53
15:45	16:00	0	0	4	0	2	0	0	0	0	51
16:00	16:15	0	0	5	0	3	0	0	2	0	58
16:15	16:30	0	0	7	0	10	0	0	0	0	62
16:30	16:45	0	0	5	0	4	0	0	0	0	56
16:45	17:00	0	0	6	0	4	0	1	0	0	60
17:00	17:15	0	1	5	0	7	0	0	3	0	73
17:15	17:30	0	0	4	0	4	0	0	1	0	0
17:30	17:45	0	1	9	0	10	0	0	1	0	0
17:45	18:00	0	0	9	0	9	0	0	0	0	0

Peak Time		Time								Hourly Total	
Period Start	Period End	U	R	SS	U	NB	L	U	R	L	Peak
8:15	9:15	0	1	14	0	25	1	0	3	0	54
17:00	18:00	0	2	26	0	27	0	0	5	0	60

Heavy Vehicles		Time								Hourly Total	
Period Start	Period End	U	R	SS	U	NB	L	U	R	L	Peak
5:30	5:45	0	0	0	0	0	0	0	0	0	0
5:45	6:00	0	0	1	0	0	0	0	0	0	0
6:00	6:15	0	0	0	0	0	0	0	0	0	0
6:15	6:30	0	1	0	0	0	0	0	0	0	0
6:30	6:45	0	0	1	0	0	0	0	0	0	0
6:45	7:00	0	0	3	0	1	0	0	0	0	0
7:00	7:15	0	0	1	0	0	0	0	0	0	0
7:15	7:30	0	0	2	0	2	0	0	0	0	0
7:30	7:45	0	0	0	0	2	0	0	0	0	0
7:45	8:00	0	2	0	0	0	0	0	0	0	0
8:00	8:15	0	0	0	0	0	0	0	0	0	0
8:15	8:30	0	0	3	0	5	0	0	0	0	0
8:30	8:45	0	0	0	0	3	0	0	1	0	0
8:45	9:00	0	0	1	0	0	0	0	0	0	0
9:00	9:15	0	0	3	0	0	0	0	0	0	0
9:15	9:30	0	0	2	0	0	0	0	0	0	0
9:30	9:45	0	0	1	0	0	0	0	0	0	0
9:45	10:00	0	0	1	0	2	0	0	0	0	0
10:00	10:15	0	0	0	0	1	0	0	0	0	0
10:15	10:30	0	0	1	0	3	0	0	0	0	0
14:00	14:15	0	0	0	0	4	0	0	0	0	0
14:15	14:30	0	0	1	0	0	0	0	0	0	0
14:30	14:45	0	0	1	0	2	0	0	0	0	0
14:45	15:00	0	0	0	0	4	0	0	0	0	0
15:00	15:15	0	0	0	0	1	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0	2	0	0
15:30	15:45	0	1	2	0	0	0	0	0	0	0
15:45	16:00	0	0	1	0	1	0	0	0	0	0
16:00	16:15	0	0	1	0	2	0	0	0	0	0
16:15	16:30	0	0	1	0	1	0	0	0	0	0
16:30	16:45	0	0	0	0	2	0	0	0	0	0
16:45	17:00	0	0	1	0	3	0	0	0	0	0
17:00	17:15	0	0	0	0	1	0	0	0	0	0
17:15	17:30	0	1	1	0	2	0	0	1	0	0
17:30	17:45	0	0	1	0	0	0	0	0	0	0
17:45	18:00	0	0	2	0	3	0	0	0	0	0

Peak Time		Time								Hourly Total	
Period Start	Period End	U	R	SS	U	NB	L	U	R	L	Peak
8:15	9:15	0	0	0	0	0	0	0	0	0	0
17:00	18:00	0	1	4	0	7	0	0	1	0	13



**ANNEXURE C: SIDRA RESULTS  
(8 SHEETS)**

# MOVEMENT SUMMARY

Site: 01 [EX AM Tomingley Rd / Cragie Lea Ln (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Tomingley Road / Cragie Lea Lane  
 Existing Conditions  
 AM Peak Period  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Veh. ]	[ Dist ]									
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Tomingley Road (S)															
1	L2	All MCs	1	0.0	1	0.0	0.020	8.2	LOS A	0.0	0.0	0.00	0.02	0.00	60.9
2	T1	All MCs	32	26.7	32	26.7	0.020	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	108.8
Approach			33	25.8	33	25.8	0.020	0.3	NA	0.0	0.0	0.00	0.02	0.00	106.1
North: Tomingley Road (N)															
8	T1	All MCs	22	33.3	22	33.3	0.014	0.0	LOS A	0.0	0.1	0.01	0.03	0.01	108.1
9	R2	All MCs	1	0.0	1	0.0	0.014	7.7	LOS A	0.0	0.1	0.01	0.03	0.01	65.6
Approach			23	31.8	23	31.8	0.014	0.4	NA	0.0	0.1	0.01	0.03	0.01	105.0
West: Cragie Lea Lane (W)															
10	L2	All MCs	1	0.0	1	0.0	0.003	4.7	LOS A	0.0	0.1	0.13	0.51	0.13	53.4
12	R2	All MCs	2	50.0	2	50.0	0.003	5.3	LOS A	0.0	0.1	0.13	0.51	0.13	47.7
Approach			3	33.3	3	33.3	0.003	5.1	LOS A	0.0	0.1	0.13	0.51	0.13	49.4
All Vehicles			59	28.6	59	28.6	0.020	0.6	NA	0.0	0.1	0.01	0.05	0.01	99.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: Z:\Jobs\2024\240015\SIDRA\24\_03\_01.sip9



# MOVEMENT SUMMARY

Site: 01 [EX PM Tomingley Rd / Cragie Lea Ln (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Tomingley Road / Cragie Lea Lane  
 Existing Conditions  
 PM Peak Period  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Veh. ]	[ Dist ]									
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Tomingley Road (S)															
1	L2	All MCs	1	0.0	1	0.0	0.021	8.2	LOS A	0.0	0.0	0.00	0.02	0.00	60.9
2	T1	All MCs	36	20.6	36	20.6	0.021	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	109.0
Approach			37	20.0	37	20.0	0.021	0.2	NA	0.0	0.0	0.00	0.02	0.00	106.6
North: Tomingley Road (N)															
8	T1	All MCs	32	13.3	32	13.3	0.020	0.0	LOS A	0.0	0.2	0.03	0.06	0.03	107.7
9	R2	All MCs	3	33.3	3	33.3	0.020	8.8	LOS A	0.0	0.2	0.03	0.06	0.03	64.3
Approach			35	15.2	35	15.2	0.020	0.8	NA	0.0	0.2	0.03	0.06	0.03	101.5
West: Cragie Lea Lane (W)															
10	L2	All MCs	1	0.0	1	0.0	0.006	4.7	LOS A	0.0	0.2	0.14	0.52	0.14	53.4
12	R2	All MCs	6	16.7	6	16.7	0.006	5.0	LOS A	0.0	0.2	0.14	0.52	0.14	51.2
Approach			7	14.3	7	14.3	0.006	5.0	LOS A	0.0	0.2	0.14	0.52	0.14	51.5
All Vehicles			79	17.3	79	17.3	0.021	0.9	NA	0.0	0.2	0.03	0.09	0.03	95.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: Z:\Jobs\2024\240015\SIDRA\24\_03\_01.sip9

# MOVEMENT SUMMARY

Site: 02 [EX AM The McGrane Way / Cragie Lea Ln (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

The McGrane Way / Cragie Lea Ln  
 Existing Conditions  
 AM Peak Period  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Veh. ]	[ Dist ]									
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: The McGrane Way (S)															
2	T1	All MCs	22	23.8	22	23.8	0.014	0.0	LOS A	0.0	0.0	0.01	0.03	0.01	98.7
3	R2	All MCs	1	0.0	1	0.0	0.014	7.4	LOS A	0.0	0.0	0.01	0.03	0.01	63.7
Approach			23	22.7	23	22.7	0.014	0.3	NA	0.0	0.0	0.01	0.03	0.01	96.3
East: Cragie Lea Lane (E)															
4	L2	All MCs	2	0.0	2	0.0	0.002	4.7	LOS A	0.0	0.1	0.11	0.50	0.11	56.4
6	R2	All MCs	1	0.0	1	0.0	0.002	4.7	LOS A	0.0	0.1	0.11	0.50	0.11	56.3
Approach			3	0.0	3	0.0	0.002	4.7	LOS A	0.0	0.1	0.11	0.50	0.11	56.4
North: The McGrane Way (N)															
7	L2	All MCs	1	0.0	1	0.0	0.020	7.8	LOS A	0.0	0.0	0.00	0.02	0.00	86.6
8	T1	All MCs	31	34.5	31	34.5	0.020	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	98.9
Approach			32	33.3	32	33.3	0.020	0.3	NA	0.0	0.0	0.00	0.02	0.00	98.5
All Vehicles			58	27.3	58	27.3	0.020	0.5	NA	0.0	0.1	0.01	0.05	0.01	93.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: Z:\Jobs\2024\240015\SIDRA\24 03 01.sip9

# MOVEMENT SUMMARY

Site: 02 [EX PM The McGrane Way / Cragie Lea Ln (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

The McGrane Way / Cragie Lea Ln  
 Existing Conditions  
 PM Peak Period  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Veh. ]	[ Dist ]									
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: The McGrane Way (S)															
2	T1	All MCs	28	25.9	28	25.9	0.018	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	98.9
3	R2	All MCs	1	0.0	1	0.0	0.018	7.4	LOS A	0.0	0.1	0.01	0.02	0.01	63.9
Approach			29	25.0	29	25.0	0.018	0.3	NA	0.0	0.1	0.01	0.02	0.01	97.0
East: Cragie Lea Lane (E)															
4	L2	All MCs	1	0.0	1	0.0	0.002	4.6	LOS A	0.0	0.0	0.10	0.51	0.10	56.5
6	R2	All MCs	1	0.0	1	0.0	0.002	4.7	LOS A	0.0	0.0	0.10	0.51	0.10	56.3
Approach			2	0.0	2	0.0	0.002	4.7	LOS A	0.0	0.0	0.10	0.51	0.10	56.4
North: The McGrane Way (N)															
7	L2	All MCs	1	0.0	1	0.0	0.016	7.8	LOS A	0.0	0.0	0.00	0.03	0.00	86.2
8	T1	All MCs	23	40.9	23	40.9	0.016	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	98.5
Approach			24	39.1	24	39.1	0.016	0.3	NA	0.0	0.0	0.00	0.03	0.00	97.9
All Vehicles			56	30.2	56	30.2	0.018	0.5	NA	0.0	0.1	0.01	0.05	0.01	94.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: Z:\Jobs\2024\240015\SIDRA\24\_03\_01.sip9

# MOVEMENT SUMMARY

Site: 01 [FU AM Tomingley Rd / Cragie Lea Ln (Site Folder: Future)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Tomingley Road / Cragie Lea Lane  
 Future Conditions  
 AM Peak Period  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Total HV ]	[ Total HV ]				[ Veh. veh ]	[ Dist ]				
			veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Tomingley Road (S)															
1	L2	All MCs	11	10.0	11	10.0	0.025	7.8	LOS A	0.0	0.0	0.00	0.17	0.00	74.7
2	T1	All MCs	32	26.7	32	26.7	0.025	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	87.7
Approach			42	22.5	42	22.5	0.025	1.9	NA	0.0	0.0	0.00	0.17	0.00	84.1
North: Tomingley Road (N)															
8	T1	All MCs	22	33.3	22	33.3	0.038	0.1	LOS A	0.2	1.3	0.12	0.39	0.12	76.5
9	R2	All MCs	43	2.4	43	2.4	0.038	5.7	LOS A	0.2	1.3	0.12	0.39	0.12	56.5
Approach			65	12.9	65	12.9	0.038	3.8	NA	0.2	1.3	0.12	0.39	0.12	62.0
West: Cragie Lea Lane (W)															
10	L2	All MCs	14	15.4	14	15.4	0.016	5.8	LOS A	0.1	0.5	0.12	0.54	0.12	52.6
12	R2	All MCs	6	50.0	6	50.0	0.016	6.3	LOS A	0.1	0.5	0.12	0.54	0.12	45.3
Approach			20	26.3	20	26.3	0.016	5.9	LOS A	0.1	0.5	0.12	0.54	0.12	50.1
All Vehicles			127	18.2	127	18.2	0.038	3.5	NA	0.2	1.3	0.08	0.34	0.08	65.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: Z:\Jobs\2024\240015\SIDRA\24 03 01.sip9

# MOVEMENT SUMMARY

Site: 01 [FU PM Tomingley Rd / Cragie Lea Ln (Site Folder: Future)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Tomingley Road / Cragie Lea Lane  
 Future Conditions  
 PM Peak Period  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Veh. ]	[ Dist ]									
			veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Tomingley Road (S)															
1	L2	All MCs	5	20.0	5	20.0	0.024	8.4	LOS A	0.0	0.0	0.00	0.09	0.00	77.0
2	T1	All MCs	36	20.6	36	20.6	0.024	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	98.5
Approach			41	20.5	41	20.5	0.024	1.1	NA	0.0	0.0	0.00	0.09	0.00	95.1
North: Tomingley Road (N)															
8	T1	All MCs	32	13.3	32	13.3	0.029	0.1	LOS A	0.1	0.8	0.09	0.22	0.09	93.7
9	R2	All MCs	17	18.8	17	18.8	0.029	6.5	LOS A	0.1	0.8	0.09	0.22	0.09	63.7
Approach			48	15.2	48	15.2	0.029	2.3	NA	0.1	0.8	0.09	0.22	0.09	80.5
West: Cragie Lea Lane (W)															
10	L2	All MCs	49	4.3	49	4.3	0.049	5.7	LOS A	0.2	1.4	0.12	0.55	0.12	52.4
12	R2	All MCs	19	16.7	19	16.7	0.049	5.7	LOS A	0.2	1.4	0.12	0.55	0.12	52.2
Approach			68	7.7	68	7.7	0.049	5.7	LOS A	0.2	1.4	0.12	0.55	0.12	52.3
All Vehicles			158	13.3	158	13.3	0.049	3.5	NA	0.2	1.4	0.08	0.33	0.08	67.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: Z:\Jobs\2024\240015\SIDRA\24\_03\_01.sip9

# MOVEMENT SUMMARY

Site: 02 [FU AM The McGrane Way / Cragie Lea Ln (Site Folder: Future)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

The McGrane Way / Cragie Lea Ln  
 Future Conditions  
 AM Peak Period  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Total HV ]	[ Total HV ]				[ Veh. veh ]	[ Dist ]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: The McGrane Way (S)															
2	T1	All MCs	22	23.8	22	23.8	0.023	0.1	LOS A	0.1	0.7	0.09	0.24	0.09	85.2
3	R2	All MCs	14	30.8	14	30.8	0.023	6.2	LOS A	0.1	0.7	0.09	0.24	0.09	60.8
Approach			36	26.5	36	26.5	0.023	2.4	NA	0.1	0.7	0.09	0.24	0.09	73.8
East: Cragie Lea Lane (E)															
4	L2	All MCs	7	42.9	7	42.9	0.007	5.9	LOS A	0.0	0.2	0.11	0.52	0.11	51.9
6	R2	All MCs	1	0.0	1	0.0	0.007	4.8	LOS A	0.0	0.2	0.11	0.52	0.11	58.7
Approach			8	37.5	8	37.5	0.007	5.7	LOS A	0.0	0.2	0.11	0.52	0.11	52.7
North: The McGrane Way (N)															
7	L2	All MCs	1	0.0	1	0.0	0.020	7.8	LOS A	0.0	0.0	0.00	0.02	0.00	86.6
8	T1	All MCs	31	34.5	31	34.5	0.020	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	98.9
Approach			32	33.3	32	33.3	0.020	0.3	NA	0.0	0.0	0.00	0.02	0.00	98.5
All Vehicles			76	30.6	76	30.6	0.023	1.9	NA	0.1	0.7	0.05	0.18	0.05	78.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Organisation: MCLAREN TRAFFIC ENGINEERING | Licence: NETWORK / 1PC | Processed: Friday, 1 March 2024 11:51:19 AM

Project: Z:\Jobs\2024\240015\SIDRA\24\_03\_01.sip9

# MOVEMENT SUMMARY

Site: 02 [FU PM The McGrane Way / Cragie Lea Ln (Site Folder: Future)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

The McGrane Way / Cragie Lea Ln  
 Future Conditions  
 PM Peak Period  
 Site Category: (None)  
 Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Veh. ]	[ Dist ]									
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: The McGrane Way (S)															
2	T1	All MCs	28	25.9	28	25.9	0.022	0.0	LOS A	0.0	0.4	0.05	0.12	0.05	94.3
3	R2	All MCs	6	50.0	6	50.0	0.022	6.7	LOS A	0.0	0.4	0.05	0.12	0.05	63.5
Approach			35	30.3	35	30.3	0.022	1.2	NA	0.0	0.4	0.05	0.12	0.05	86.7
East: Cragie Lea Lane (E)															
4	L2	All MCs	14	30.8	14	30.8	0.011	5.9	LOS A	0.0	0.4	0.10	0.53	0.10	51.6
6	R2	All MCs	1	0.0	1	0.0	0.011	4.8	LOS A	0.0	0.4	0.10	0.53	0.10	60.0
Approach			15	28.6	15	28.6	0.011	5.8	LOS A	0.0	0.4	0.10	0.53	0.10	52.1
North: The McGrane Way (N)															
7	L2	All MCs	1	0.0	1	0.0	0.016	7.8	LOS A	0.0	0.0	0.00	0.03	0.00	86.2
8	T1	All MCs	23	40.9	23	40.9	0.016	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	98.5
Approach			24	39.1	24	39.1	0.016	0.3	NA	0.0	0.0	0.00	0.03	0.00	97.9
All Vehicles			74	32.9	74	32.9	0.022	1.9	NA	0.0	0.4	0.04	0.17	0.04	79.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2024 Akcelik and Associates Pty Ltd | sidrasolutions.com

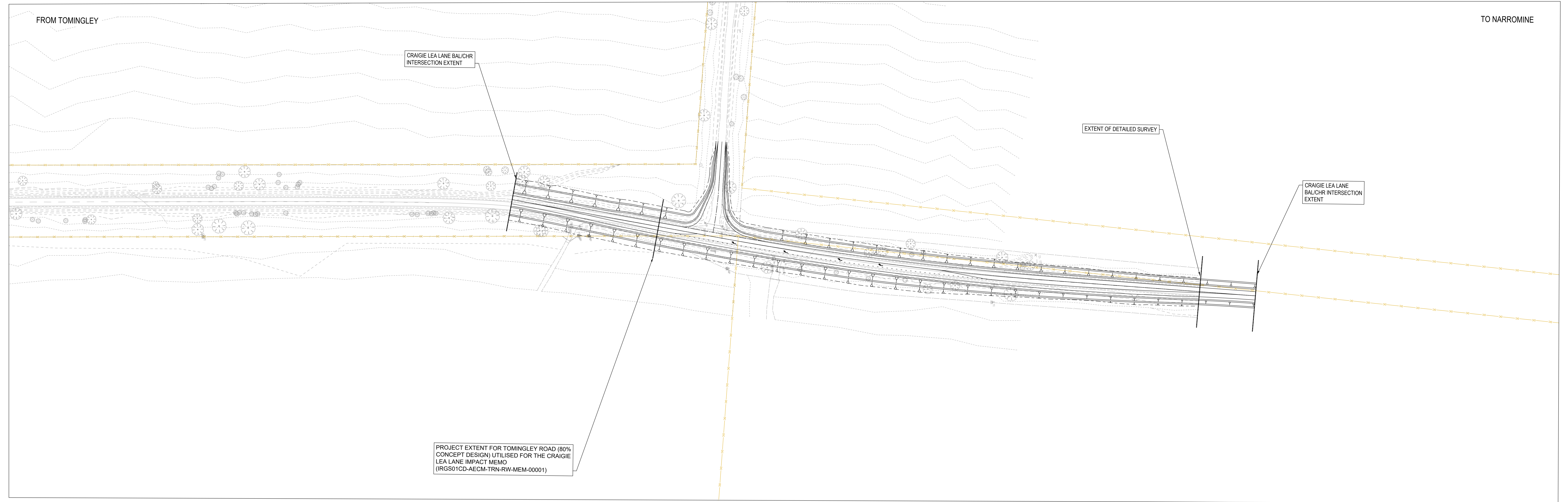
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**ANNEXURE D: TOMINGLEY ROAD / CRAIGIE LEA LANE  
UPGRADE CONCEPT  
(1 SHEET)**





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GRADE SEPARATING ROAD INTERFACES
CRAIGIE LEA LANE INTERSECTION SKETCH

DOCUMENT NO.