

**TRAFFIC AND TRANSPORT ASSESSMENT
REPORT
FOR
PLANNING PROPOSAL TO EXPAND
THE IN3 HEAVY INDUSTRIAL
AND ENVIRONMENTAL CONSERVATION ZONE
MALDON BRIDGE ROAD
MALDON**

Ref. 21005r

12 March 2021

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1.0 INTRODUCTION

1.1 Introduction

This report documents the findings of a traffic assessment for the expansion of the IN3 Heavy Industrial and Environmental Conservation zones in Maldon Bridge Road, Maldon. **Figure 1** shows the location.

The traffic assessment has been undertaken as part of planning proposal for the rezoning of the land prepared by GLN Planning on behalf of Boral.

1.2 Planning Proposal

The planning proposal seeks to amend *Wollondilly Local Environmental Plan 2011* (Wollondilly LEP 2011) to rezone land that is currently RU2 Rural Landscape to IN3 Heavy Industrial and E2 Environmental Conservation and introduce minimum lot size controls at 40-45 Maldon Bridge Road and Staff Road, Maldon.

The existing Boral operations at Maldon are primarily located east of Maldon Bridge Road on land zoned IN3 Heavy Industrial under Wollondilly LEP 2011. The Boral operation manufactures, processes and stores materials used in the construction industry. Boral has a rail siding from the Southern Main Rail Line so that the use can operate as a transport distribution terminal and it has funded the roundabout at the intersection of Maldon Bridge Road and Picton Road to accommodate heavy vehicles, including B doubles at the site. The planning proposal seeks to rezone residue land zoned RU2 Rural Landscapes on the western side of Maldon Bridge Road and Staff Road that has historically been associated with the Boral operation, including land use as a concrete batching plant and both previous (now demolished) and existing workers cottages that enjoy existing use rights.

1.3 This Report

This report examines the traffic impacts of;

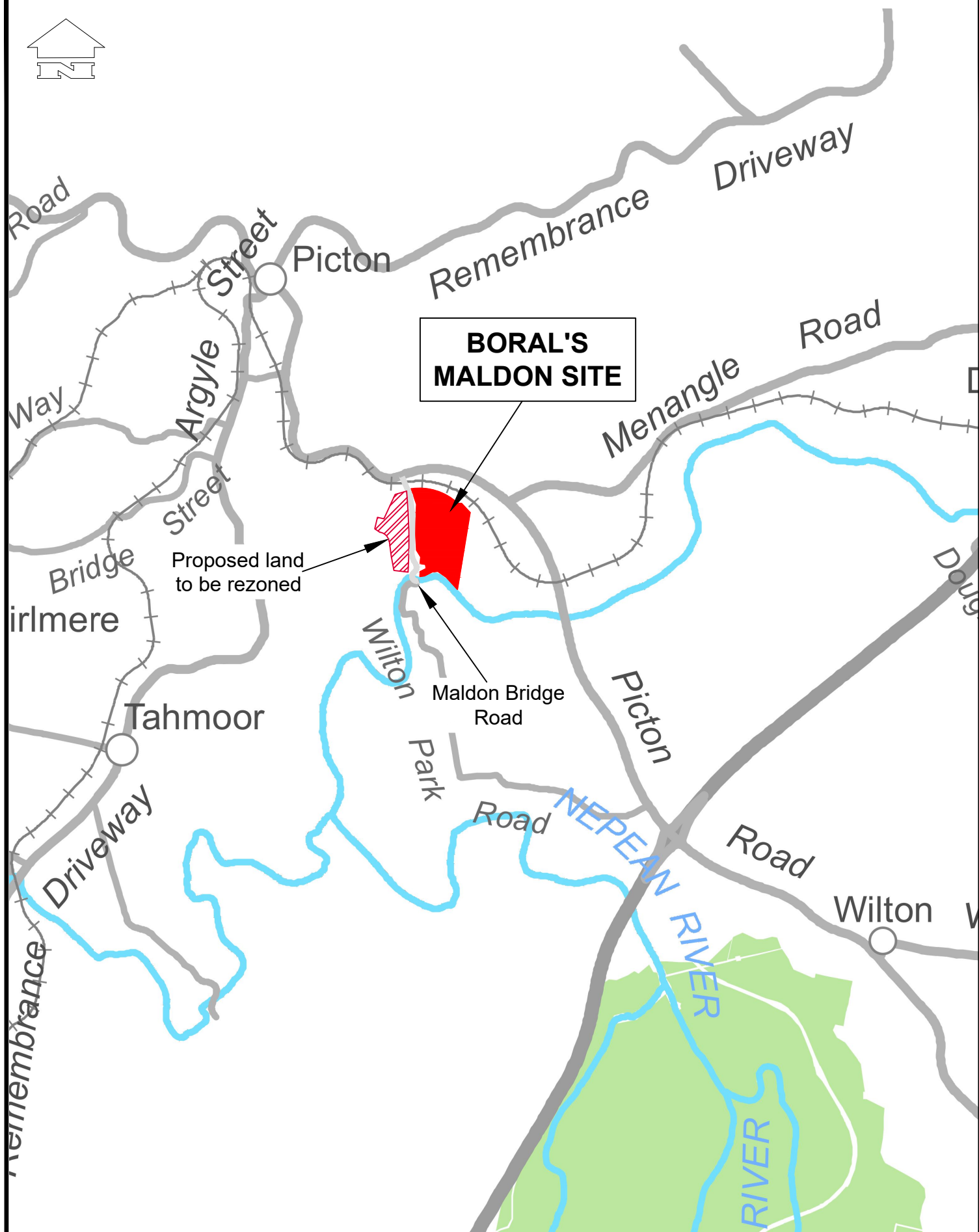
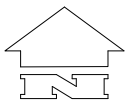
- The existing Boral Operation at Maldon, together with a current Development Application before Wollondilly Council for proposed alterations and additions; and
- The future traffic generation of the proposed rezoned land.

This traffic impact assessment has been prepared in accordance with the Transport for NSW (former RTA/RMS) Guide to Traffic Generating Developments, October 2002 and addresses all relevant issues as outlined in Table 2.1 of the Guide.

Other relevant standards/guidelines adopted and used during the traffic assessment include:

- Austroads Guide to Traffic Management and, in particular, Part 12 – Traffic Impacts of Developments; and
- Transport for NSW Austroads Guide Supplements – Austroads Guide to Traffic Management.

The traffic modelling undertaken as part of this assessment has used SIDRA 9 software, which is a Transport for NSW approved traffic model for intersection analysis.



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FIGURE 1

MALDON REZONING

LOCATION

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The remaining sections of this report document the following;

- Section 2 describes the Boral Site operation, including the proposed additions, as well as details of the rezoning proposal;
- Section 3 examines the existing traffic conditions in the area;
- Section 4 documents the assessment of the cumulative traffic impacts of the Boral operation and the rezoning proposal; and
- Section 5 presents the conclusions.

2.0 BORAL'S OPERATION AND REZONING PROPOSAL

2.1 Boral Existing Operation

Boral has a number of business units on the Maldon site which generally operate independently of each other under separate development consents. The Cement Works is located on the northern part of the site. The Rail Terminal is located on the southern boundary of the Cement Works. A concrete batching plant is located on the western side of Maldon Bridge Road.

The site is accessed off Maldon Bridge Road via a roundabout off Picton Road, Maldon. The roundabout formed part of the intersection upgrade, as part of the Rail Terminal consent.

The Rail Terminal has been in operation since 2013 and the Cement Works has been operating since the 1950s.

The Quarry stockpiling facility is positioned adjacent on the western side of the Maldon rail siding which allows for the transport of quarry product via rail.

The Cement Works operates 24 hours, 7 days and the Concrete Batching Plant between 6.00am to 6.00pm Monday to Saturday. The Rail Terminal hours are as follows;

- Train unloading and stockpiling: Monday to Sunday 24 hours.
- Truck loading and despatch: Monday to Saturday 5:00 am to 10:00 pm.
- Maintenance: Monday to Sunday 24 hours.

Currently there is a total of 77 employees on the site.

2.2 Boral's Current Development Proposal

Boral's current development proposal is for proposed alterations and additions which will be located on the southern section of the Boral site, on the eastern side of Maldon Bridge Road.

The development proposal includes:

- A new blending plant incorporating a coating plant which can produce up to 250,000 tpa of blended product; and
- Additional, formalised stockpiling for product unloaded from trains brought into site, as well as associated stormwater management structures.

The development proposal will require one (1) additional full time employee.

Material blended within the plant will comprise of aggregate (crushed rock) from Peppertree Hard Rock Quarry (which will be brought in via the train) and cement from Boral's cement operations at Berrima. Stabiliser (a Boral Cement stabiliser used as a binder in road stabilisation products) will be delivered to the plant in 25-28 tonne tankers at a rate of no more than one to two cement truck deliveries per week. Some product will also be delivered from other Boral quarries by road.

The blended product will be produced on demand. The product will be discharged directly from the plant into trucks for delivery to customers or temporarily stockpiled overnight. All product produced by the blending plant will be transported by truck.

Table 2.1 shows the proposed tonnages and one way truck movements generated by the proposed blending plant.

Trucks delivering product to the site by road (quarry products and cement) for use in the proposed blending plant would, on most occasions, also take out material produced by the blending plant.

TABLE 2.1

BLENDING PLANT, TONNAGE AND ONE WAY TRUCK LOADS

	Tonnes	Truck dispatches (one way) based on (32t truck)
Annual	250,000t	7,813
Daily Max	1,800t	56
Daily Average	800t	25
Hourly Max	400t	13

2.3 Rezoning Proposal

The planning proposal identifies an indicative 12.43 hectares of area to be zoned as IN3 (Heavy Industrial) and 10.927 hectares as potential Environmental Conservation Zone.

All of this land is located on the western side of Maldon Bridge Road with a frontage to Maldon Bridge Road and Staff Road. **Figure 2** shows the Rezoning Proposal.

A portion of the IN3 land (i.e. 1 hectare site) is already occupied by a Boral Concrete Batching Plant.

Therefore, the future area that could be developed as Heavy Industrial (IN3 land) is 11.43 hectares.



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FIGURE 2
MALDON REZONING
REZONING PROPOSAL

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3.0 EXISTING ROAD NETWORK AND TRAFFIC CONDITIONS

3.1 Existing Road Network

The principal roads that provide access to Boral's Maldon site include Maldon Bridge Road and Picton Road. Both of these roads are approved 25-26 metre long B-double routes.

Maldon Bridge Road, a local council road, forms a T-junction intersection with Picton Road and is a dead end road approximately 1.0km south of Picton Road. While not signposted, the speed limit in Maldon Bridge Road is 60km/h.

A rail level crossing is located in Maldon Bridge Road some 90 metres south of Picton Road. Controls include flashing lights, boom gates, advance signage and road marking.

Picton Road, which is a state road, links the town of Picton to Hume Motorway and further to the east links to Princes Highway, north of Wollongong.

In the section between Maldon Bridge Road and Hume Motorway, Picton Road is constructed as a 2-3 lane rural road with wide sealed shoulders, centreline and edgeline road markings and guidepost and reflectors. Auxiliary or turning lanes are provided at intersections including at Menangle Road, Allied Mills Access Road, Wilton Park Road and On and Off Ramps to Hume Motorway.

The section of Picton Road from Hume Motorway to the west for a distance of 2.6kms incorporates two lanes travelling towards the Motorway (i.e. easterly direction) with a single through lane between this point and Maldon Bridge Road. A single through lane is provided in the opposite direction (i.e. western direction) between the Motorway and Maldon Bridge Road.

The speed limit in this section of Picton Road is a mixture of 80km/h and 100km/h.

The Picton Road/Maldon Bridge Road intersection (**Figure 3**) was upgraded by Boral as part of the Rail Terminal Consent to provide a large single lane roundabout with a left turn auxiliary slip lane in the eastern approach of Picton Road, into Maldon Bridge Road. The speed limit in Picton Road at the roundabout is 80km/h and street lighting is provided at the roundabout, together with appropriate signage.

The other intersections in this section of Picton Road are subject to sign control (stop or give way) on the intersecting side road.

3.2 Existing Traffic Conditions

Traffic counts were undertaken at the intersection of Picton Road and Maldon Bridge Road on Wednesday 11 March 2020, from 5.30am to 9.30am and 3.30pm to 7.00pm. These times cover the main shift times at Boral's Maldon site.

Table 3.1 summarises the hourly traffic volumes using the Picton Road – Maldon Bridge Road roundabout intersection for each approach during the 5.30am – 9.30am and 3.30pm to 7.00pm periods.

Reference to Table 3.1 shows that the traffic volumes using Picton Road are relatively tidal with the eastbound direction the heaviest in the AM period and the westbound direction the heaviest in the PM period.

In the AM period, eastbound volumes range between 487 vehicles per hour (vph) and 584vph while westbound volumes range between 187vph and 428vph.



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FIGURE 3

MALDON REZONING

**TRAFFIC MANAGEMENT AT PICTON ROAD /
MALDON BRIDGE ROAD INTERSECTION**

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In the PM period, eastbound volumes range between 302vph and 442vph, while westbound volumes range between 587vph and 755vph.

Maldon Bridge Road carries relatively light traffic volumes generally associated with the existing operations in both directions in both the AM and PM periods. Northbound volumes in the AM and PM periods were 26-29vph and 18-46vph respectively. Southbound volumes in the same periods were 31-44vph (AM) and 9-25vph (PM).

TABLE 3.1

**WEEKDAY AM AND PM TRAFFIC VOLUMES USING PICTON ROAD
AND MALDON BRIDGE ROAD**

	Picton Road			Maldon Bridge Road		
	East bound	West bound	Total (both directions)	North bound	South bound	Total (both directions)
5.30-6.30am	536	187	723	26	43	69
6.30-7.30am	490	340	830	29	44	73
7.30-8.30am	584	368	952	27	38	65
8.30-9.30am	487	428	915	27	31	58
3.30-4.30pm	442	587	1029	41	23	64
4.30-5.30pm	404	726	1130	46	25	71
5.30-6.30pm	302	755	1057	18	9	27
6.30-7.00pm	104	236	340	8	2	10

Source: Traffic Counts – Wednesday 11 March 2020

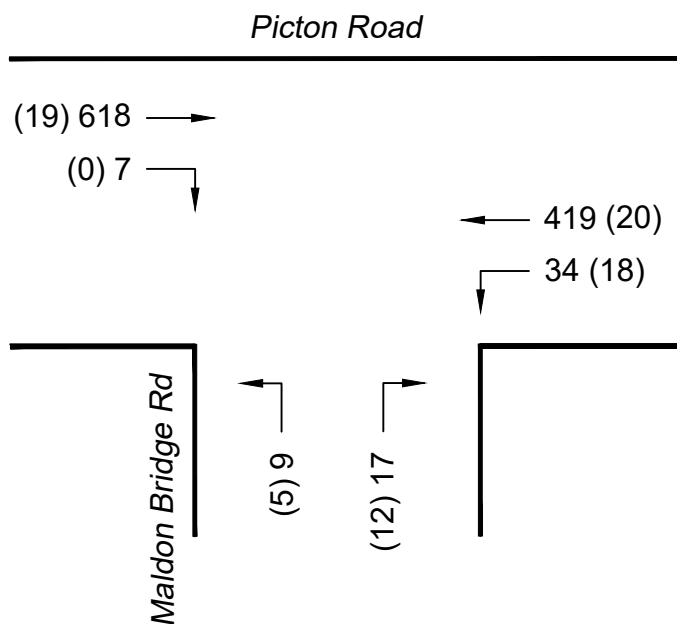
The peak hours at the intersection occurred between 7.45am – 8.45am and 4.45pm – 5.45pm. **Figure 4** shows the traffic volumes using the roundabout during these periods.

To assess the existing operational capacity of the Picton Road/Maldon Bridge Road roundabout intersection during the AM and PM peak hours, traffic modelling using the SIDRA 9.0 traffic model was undertaken.

SIDRA is a suitable model to assess the operational performance of intersections. Criteria for interpreting an intersection controlled operation are Level of Service (LS), Degree of Saturation (DS) and Average Vehicle Delay (AVD). For intersections under Priority/Stop Sign control and Roundabout Control, Average Vehicle Delay for Individual Movements is relevant.

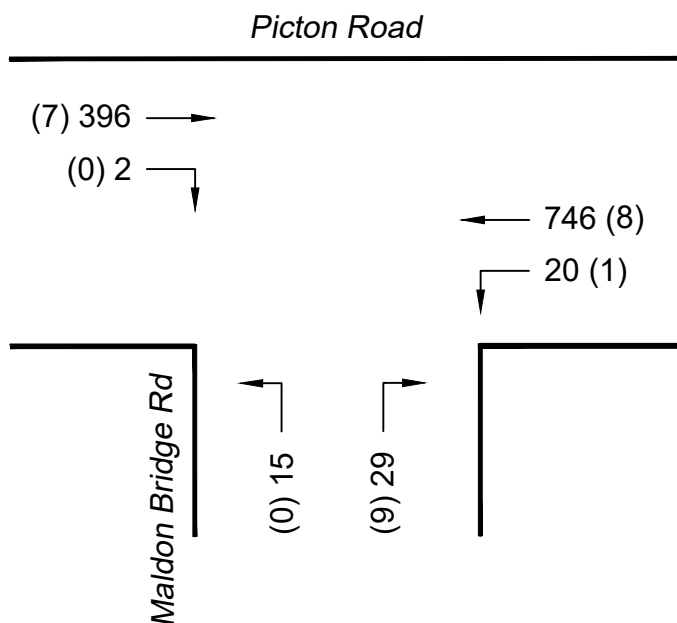
Table 3.2 is reproduced from the RTA's Guide to Traffic Generating Developments (October 2002) and provides an explanation of the various levels of service for intersections.

A Level of Service D or better (i.e. A, B, C or D) is generally considered to be a minimum design requirement for intersections. The level of service for intersections controlled by Give Way/Stop Signs or under Roundabout Control is determined from the movement with the highest average vehicle delay.



AM PEAK HOUR

7:45am - 8:45am



PM PEAK HOUR

16:45pm - 17:45pm

KEY

344 TOTAL VEHICLES
(27) HEAVY VEHICLES

SOURCE

TRAFFIC COUNTS WEDNESDAY 11 MARCH 2020

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FIGURE 4

MALDON REZONING

**EXISTING AM AND PM PEAK HOUR
TRAFFIC VOLUMES**

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TABLE 3.2**LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS**

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Intersection is oversaturated	Oversaturated, requires other control mode

Source: Table 4.2 Guide to Traffic Generating Developments October 2002. Roads and Traffic Authority

The traffic intersection performance modelling has been undertaken using the existing traffic volumes determined by traffic counts and shown in **Figure 4** as well as the geometry of the Picton Road/Maldon Bridge Road roundabout intersection.

Table 3.3 shows the results of the modelling for both peak periods. Reference to Table 3.3 shows that the roundabout intersection currently operates at a Level of Service A operation, which is a very good level of service in both peak hours with low vehicle delays. The right turn out of Maldon Bridge Road experiences the highest delays, which are in the order of 10.6 to 12.1 seconds per vehicle. These are relatively low vehicle delays and these delays and the level of service indicate that the intersection has plenty of spare capacity.

Extracts of the SIDRA Modelling Outputs are included in Appendix 1.

TABLE 3.3

**SIDRA TRAFFIC MODELLING FOR ROUNDABOUT AT
PICTON ROAD/MALDON BRIDGE ROAD INTERSECTION FOR EXISTING
CONDITIONS IN AM AND PM PEAK HOURS ON A WEEKDAY**

	LS	DS	AVD (Seconds)	95th% Queue Length (metres)	Worst Movement for Vehicle Delay
AM Peak Hour	A	0.399	10.6 (4.1)	13.2	Right turn from Maldon Bridge Road
PM Peak Hour	A	0.419	12.1 (4.2)	16.5	Right turn from Maldon Bridge Road

Where:

LS –

DS –

AVD –

95th% Queue Length –

Worst Movement for vehicle delay –

Level of Service of Intersection

Degree of Saturation

Average Vehicle Delay in seconds. Value in brackets is for all vehicles. Value not bracketed is for Movement with Highest Delay

Longest 95th% Queue Length for any movement in metres

Movement with highest Average Vehicle Delay

Table 3.4 shows the number of times the rail level crossing in Maldon Bridge Road was closed to traffic during the weekday morning (5.30am – 9.30am) and afternoon (3.30pm – 7.00pm) periods as recorded on Wednesday 11 March 2020.

Reference to Table 3.4 shows that the level crossing closures ranged between 3 to 6 occasions in any one hour period, with the total duration of these closures per hour ranging between 1 minute 44 seconds up to 6 minutes 33 seconds.

Queue lengths in Maldon Bridge Road were also recorded when the level crossing operated. Over the full 4 hour AM period northbound queue lengths ranged between 0-2 vehicles and southbound queue lengths ranged between 0-4 vehicles.

During the 3 ½ hour PM period no queues occurred in either direction when the rail level crossing was closed.

TABLE 3.4

**RAIL LEVEL CROSSING CLOSURES IN MALDON BRIDGE ROAD
DURING AM AND PM PERIODS ON A WEEKDAY**

Time	Level Crossing No. of Closures	Total Duration of Level Crossing Closures
5.30am-6.30am	4	4 minutes, 39 seconds
6.30am-7.30am	4	2 minutes, 49 seconds
7.30am-8.30am	5	2 minutes, 51 seconds
8.30am-9.30am	6	6 minutes, 33 seconds
3.30pm-4.30pm	5	6 minutes, 20 seconds
4.30pm-5.30pm	3	5 minutes, 5 seconds
5.30pm-6.30pm	3	1 minutes, 44 seconds
6.30pm-7.00pm	3	2 minutes, 4 seconds

Source: Traffic Counts – Wednesday 11 March 2020

3.3 Bus Routes

Bus routes that operate along Picton Road include the 901 bus service which operates between Wilton/Douglas Park to Picton. This route provides a limited service on Monday to Fridays with limited stops along the route.

3.4 Bicycle Routes

There are no formal bike routes at Maldon. Experienced cyclists can use the road verge along Picton Road, although the width of the sealed shoulders in Picton Road are variable.

3.5 Future Proposals

TfNSW proposes to provide a future bypass of Picton Town Centre and has undertaken a Strategic Corridor Options Study (Picton Bypass. Strategic Corridor Options Report. TfNSW December 2020).

The study examined 14 corridor options and identified a preferred option (Corridor 9) for community consultation and further development.

Corridor 9 will provide a road link between Picton Road, approximately 450 metres north west of Maldon Bridge Road and Remembrance Driveway approximately 300 metres south of Wonga Road. New intersections will be provided in Picton Road and Remembrance Driveway.

The corridor which is shown in an extract in Appendix 2 does not impact on the land proposed to be rezoned, in Maldon Bridge Road.

3.6 Future Traffic Growth

The Strategic Corridor Options Report also identified future traffic growth on the road network around Picton, between 2018 and 2036, based on the planned future development around Picton Town Centre and the Wilton Priority Growth Area.

For Picton Road near Maldon, daily traffic growth is estimated to increase from 12,110 vehicles per day (vpd) in 2018 to 20,200 vehicles per day (vpd) in 2036.

As the Boral Maldon site is identified as Employment Land in the Wilton Growth Area, it could be assumed that the traffic inputs from this proposed rezoning area were accounted for in the Strategic Corridor Assessment.

4.0 CUMULATIVE TRAFFIC IMPACTS OF REZONING PROPOSAL

4.1 Traffic Impacts of Boral's Current Development Proposal

As noted in Section 2, the maximum hourly truck generation of the proposed blending plant is 13 loads per hour. To adopt a worst case, it is assumed that there will be 13 inbound and 13 outbound truck movements per hour and these will be new or additional truck trips.

All of these trucks will arrive and depart from/to the east along Picton Road except for a small proportion of local sales (estimated as 5%) which may depart to the west.

However, for the purpose of the assessment it is assumed that 100% of the trucks will arrive and depart from/to the east along Picton Road.

Figure 5 shows the additional trucks assigned to the road network.

To assess the impact of the additional trucks from the Boral's development proposal on the operation of the Picton Road/Maldon Bridge Road roundabout intersection, SIDRA traffic modelling has been undertaken, with the additional truck movements overlaid on to existing AM and PM peak hour traffic volumes.

The results of the modelling are shown in Table 4.1.

Reference to Table 4.1 shows that the intersection will retain a Level of Service A operation and relatively low vehicle delays. This is a very good operation and demonstrates that the current development application will have satisfactory traffic impacts.

Extracts of the SIDRA modelling outputs are contained in Appendix 1.

TABLE 4.1

**SIDRA TRAFFIC MODELLING FOR ROUNDABOUT AT
PICTON ROAD/MALDON BRIDGE ROAD INTERSECTION WITH ADDITIONAL
VEHICLES FROM CURRENT DEVELOPMENT APPLICATION IN AM AND PM
PEAK HOURS ON A WEEKDAY**

	LS	DS	AVD (Seconds)	95 th % Queue Length (metres)	Worst Movement for Vehicle Delay
AM Peak Hour	A	0.414	10.8 (4.2)	14.0	Right turn from Maldon Bridge Road
PM Peak Hour	A	0.419	12.6 (4.3)	16.8	Right turn from Maldon Bridge Road

Where:

LS –

DS –

AVD –

95th% Queue Length –

Worst Movement for vehicle delay –

Level of Service of Intersection

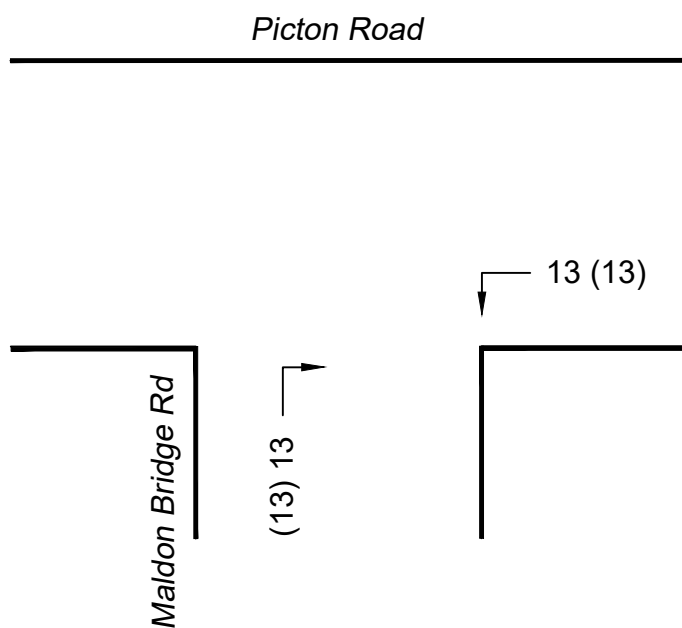
Degree of Saturation

Average Vehicle Delay in seconds. Value in brackets is for all vehicles. Value not bracketed is for Movement with Highest Delay

Longest 95th% Queue Length for any movement in metres

Movement with highest Average Vehicle Delay

On the wider road network, east of Maldon including Picton Road, Hume Motorway and or the Princes Highway, 13 additional truck movements per hour, travelling in each direction will be dispersed over these roads and will have a very small impact on these roads.



KEY

13 TOTAL VEHICLES
(13) HEAVY VEHICLES

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FIGURE 5

MALDON REZONING

**TRAFFIC VOLUMES FROM BORAL'S CURRENT
DEVELOPMENT APPLICATION IN MAXIMUM HOUR**

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As the transport routes to be used by the product trucks, are approved 25/26 metre B-Double routes, no safety implications are envisaged.

4.2 Traffic Generation of Rezoning Proposal

As noted in Section 2.3, the planning proposal incorporates 12.43 hectares of land to be rezoned as IN3 (Heavy Industrial). However, as 1.0 hectare of this area is already used by Boral as a concrete batching plant, the additional traffic generation of the proposed IN3 (Heavy Industrial) area is based on 11.43 hectares.

At this time, it is not known if Boral will occupy any part of this land. For the purposes of this traffic assessment, it is assumed that the future uses will be a mix of general industrial uses which may include factories. As the future floor area and the type of uses that will occupy 11.43 hectare area is unknown, the traffic generation has been estimated based on Section 3.10 of the RTA's (now TfNSW) Guide to Traffic Generating Developments.

Adopting the indicative figure of 28 employees per developed hectare, the future employment numbers are estimated as 320 people.

The RTA (now TfNSW) Guidelines indicate that for industrial estates, some 55% of employees arrive and depart in the weekday AM and PM peak hours.

The 2016 Census data for Wollondilly LGA indicated the following mode of travel for journey to work trips for residents in Wollondilly.

• Car driver	-	70.4%
• Car passenger	-	3.6%
• Truck	-	2.6%
• Motorbike	-	0.3%
• Bus	-	0.3%
• Train	-	4.0%
• Taxi	-	0.1%
• Bicycle	-	0.1%
• Walk	-	1.4%
• Other	-	0.8%
• Worked at home	-	5.3%
• Did not go to work	-	9.9%
• Not stated	-	1.1%

The industrial subdivision at Maldon is likely to have a higher driver rate than the above 2016 statistics.

Adopting a higher driver rate of 90% of trips by motor vehicle (i.e. car, motorbike, truck) would provide a conservative (i.e. worst case) assessment.

Adopting the above assumptions then the traffic generation of the employee trips would be 158 vehicle trips in the AM and PM peak hours.

Heavy vehicle trips would be expected to be around 10% of the light vehicle trips which would add another 17 vehicle trips, with the total traffic generation in the AM and PM peak hours of 175 vehicle trips.

Based on 80:20 split between peak and non peak direction of travel the maximum traffic generation is calculated to be as follows.

- AM peak hour - 140 inbound trips and 35 outbound trips
- PM peak hour - 35 inbound trips and 140 outbound trips

4.3 Cumulative Traffic Impact of Rezoning Proposal

Figure 6 shows the additional traffic from the rezoning proposal assigned to the Maldon Bridge Road/Picton Road intersection based on a 50:50 split in Picton Road to/from the east and west. The split for heavy vehicles is 60:40 to/from east and west.

To assess the impact of the additional traffic from the rezoning proposal on the operation of the Picton Road/Maldon Bridge Road roundabout intersection, SIDRA traffic modelling has been undertaken, with the additional vehicles as shown in **Figure 6** overlaid on to existing and Boral's proposed AM and PM peak hour traffic volumes.

The results of the modelling are shown in Table 4.2.

Reference to Table 4.2 shows that the intersection will continue to operate at a Level of Service A operation with relatively low vehicle delays and spare capacity. This is a very good operation and demonstrates that the rezoning proposal will have satisfactory traffic impacts.

Extracts of the SIDRA modelling outputs are contained in Appendix 1.

TABLE 4.2

**SIDRA TRAFFIC MODELLING FOR ROUNDABOUT AT
PICTON ROAD/MALDON BRIDGE ROAD INTERSECTION WITH ADDITIONAL
VEHICLES FROM REZONING PROPOSAL IN AM AND PM PEAK
HOURS ON A WEEKDAY**

	LS	DS	AVD (Seconds)	95 th % Queue Length (metres)	Worst Movement for Vehicle Delay
AM Peak Hour	A	0.473	10.6 (4.7)	17.8	Right turn from Maldon Bridge Road
PM Peak Hour	A	0.432	12.6 (5.0)	19.0	Right turn from Maldon Bridge Road

Where:

LS –

DS –

AVD –

95th% Queue Length –

Worst Movement for vehicle delay –

Level of Service of Intersection

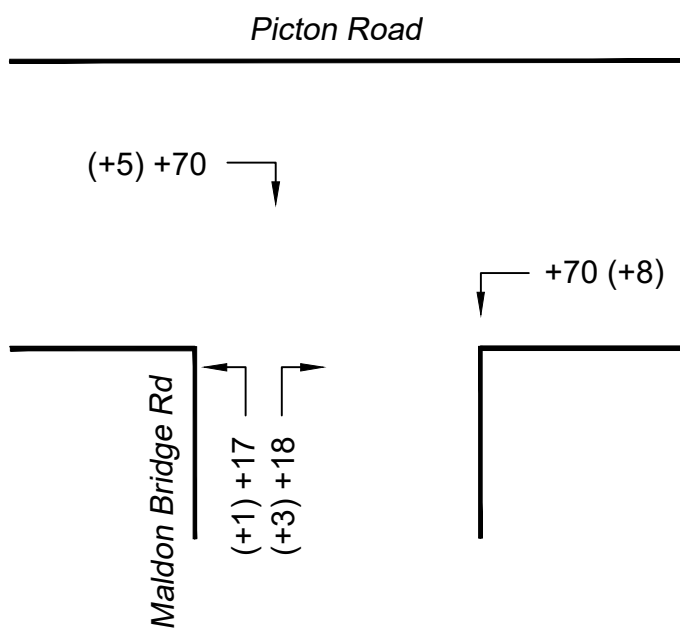
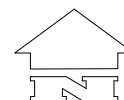
Degree of Saturation

Average Vehicle Delay in seconds. Value in brackets is for all vehicles. Value not bracketed is for Movement with Highest Delay

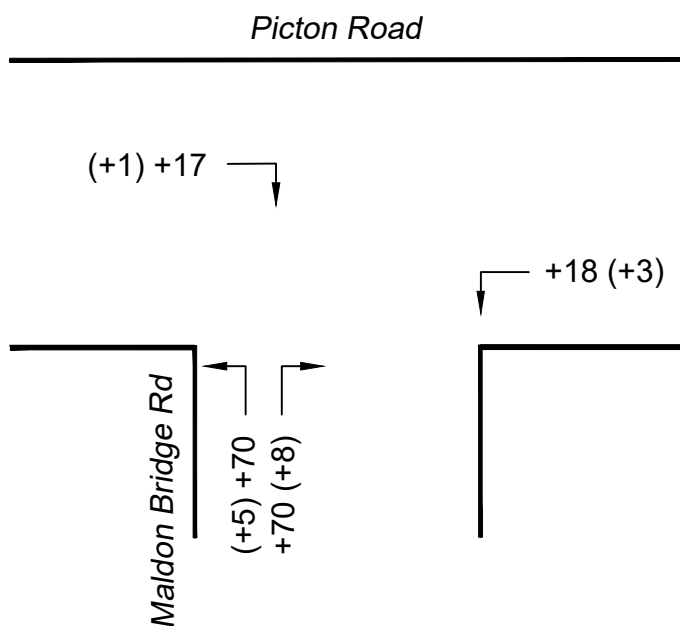
Longest 95th% Queue Length for any movement in metres

Movement with highest Average Vehicle Delay

Away from the intersection, the additional traffic from the rezoning proposal will be dispersed over a number of roads and traffic conditions on the wider road network are expected to remain satisfactory.



AM PEAK HOUR
7:45am - 8:45am



PM PEAK HOUR
16:45pm - 17:45pm

KEY
13 TOTAL VEHICLES
(13) HEAVY VEHICLES

5.0 CONCLUSIONS

This report documents the assessment of the traffic and transport impacts of a planning proposal to rezone an indicative 12.43 hectares of land in Maldon Bridge Road to IN3 Heavy Industrial.

The land is located on the western side of Maldon Bridge Road opposite Boral's cement works and rail terminal.

The rezoning proposal could generate up to 175vph in the weekday AM and PM peak hour.

These vehicles would use the roundabout controlled intersection of Maldon Bridge Road/Picton Road as the principal intersection to access the proposed industrial land.

The assessment has found that the existing traffic conditions at this intersection are very good with a Level of Service A operation in the AM and PM peak hours.

Boral currently has a development proposal being assessed by Wollondilly Council which will generate up to 26 truck movements (13 in/13 out) in the AM and PM peak hours.

The assessment of the cumulative impacts of the current development proposal, as well as the rezoning proposal has found that the roundabout intersection will continue to operate at a very good Level of Service with a Level of Service A operation in the AM and PM peak hours and low vehicle delay.

Away from the intersection, traffic from the rezoning proposal will be dispersed over a number of roads, and traffic conditions on the wider road network are expected to remain satisfactory.

APPENDIX 1

SIDRA Outputs

MOVEMENT SUMMARY

 Site: 101 [Picton Rd & Maldon Rd - Ex AM (Site Folder: General)]

Ex AM

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Maldon Rd														
1	L2	9	5	9	55.6	0.031	5.3	LOS A	0.1	2.1	0.35	0.62	0.35	51.1
3	R2	17	12	18	70.6	0.031	10.6	LOS A	0.1	2.1	0.35	0.62	0.35	51.6
Approach		26	17	27	65.4	0.031	8.8	LOS A	0.1	2.1	0.35	0.62	0.35	51.4
East: Picton Rd														
4	L2	34	18	36	52.9	0.024	4.6	LOS A	0.0	0.0	0.00	0.48	0.00	53.9
5	T1	419	20	441	4.8	0.243	3.9	LOS A	1.1	8.5	0.04	0.37	0.04	57.3
Approach		453	38	477	8.4	0.243	4.0	LOS A	1.1	8.5	0.04	0.38	0.04	57.0
West: Picton Rd														
11	T1	618	7	651	1.1	0.399	3.9	LOS A	1.8	13.2	0.09	0.38	0.09	57.1
12	R2	7	0	7	0.0	0.399	9.0	LOS A	1.8	13.2	0.09	0.38	0.09	57.2
Approach		625	7	658	1.1	0.399	4.0	LOS A	1.8	13.2	0.09	0.38	0.09	57.1
All Vehicles		1104	62	1162	5.6	0.399	4.1	LOS A	1.8	13.2	0.08	0.39	0.08	56.9

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA Standard.

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

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

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V21005 Maldon (2020_10_27 07_28_25 UTC).sip9

MOVEMENT SUMMARY

 Site: 101 [Picton Rd & Maldon Rd - Ex PM (Site Folder: General)]

Ex PM

Site Category: (None)

Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total	HV]	[Total	HV]				[Veh.	Dist]				
		veh/h	veh/h	veh/h	%									
South: Maldon Rd														
1	L2	15	0	16	0.0	0.052	6.5	LOS A	0.2	2.6	0.53	0.69	0.53	51.5
3	R2	29	9	31	31.0	0.052	12.1	LOS A	0.2	2.6	0.53	0.69	0.53	51.9
Approach		44	9	46	20.5	0.052	10.2	LOS A	0.2	2.6	0.53	0.69	0.53	51.7
East: Picton Rd														
4	L2	20	1	21	5.0	0.011	4.1	LOS A	0.0	0.0	0.00	0.48	0.00	55.5
5	T1	746	8	785	1.1	0.419	3.9	LOS A	2.3	16.5	0.02	0.38	0.02	57.5
Approach		766	9	806	1.2	0.419	3.9	LOS A	2.3	16.5	0.02	0.38	0.02	57.4
West: Picton Rd														
11	T1	396	7	417	1.8	0.266	4.0	LOS A	1.1	8.3	0.11	0.38	0.11	57.0
12	R2	2	0	2	0.0	0.266	9.0	LOS A	1.1	8.3	0.11	0.38	0.11	57.1
Approach		398	7	419	1.8	0.266	4.0	LOS A	1.1	8.3	0.11	0.38	0.11	57.0
All Vehicles		1208	25	1272	2.1	0.419	4.2	LOS A	2.3	16.5	0.07	0.39	0.07	57.0

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA Standard.

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

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

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V21005 Maldon (2020_10_27 07_28_25 UTC).sip9

MOVEMENT SUMMARY

 **Site: 101 [Picton Rd & Maldon Rd - AM & Current DA (Site Folder: General)]**

AM with Current DA
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Maldon Rd														
1	L2	9	5	9	55.6	0.050	5.4	LOS A	0.2	3.7	0.36	0.64	0.36	51.1
3	R2	30	25	32	83.3	0.050	10.8	LOS A	0.2	3.7	0.36	0.64	0.36	51.1
Approach		39	30	41	76.9	0.050	9.5	LOS A	0.2	3.7	0.36	0.64	0.36	51.1
East: Picton Rd														
4	L2	47	31	49	66.0	0.036	4.7	LOS A	0.0	0.0	0.00	0.48	0.00	53.5
5	T1	419	20	441	4.8	0.243	3.9	LOS A	1.1	8.6	0.04	0.37	0.04	57.3
Approach		466	51	491	10.9	0.243	4.0	LOS A	1.1	8.6	0.04	0.38	0.04	56.9
West: Picton Rd														
11	T1	618	7	651	1.1	0.414	4.0	LOS A	1.9	14.0	0.14	0.38	0.14	56.8
12	R2	7	0	7	0.0	0.414	9.1	LOS A	1.9	14.0	0.14	0.38	0.14	57.0
Approach		625	7	658	1.1	0.414	4.1	LOS A	1.9	14.0	0.14	0.38	0.14	56.8
All Vehicles		1130	88	1189	7.8	0.414	4.2	LOS A	1.9	14.0	0.10	0.39	0.10	56.6

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA Standard.

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

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

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V21005 Maldon (2020_10_27 07_28_25 UTC).sip9

MOVEMENT SUMMARY

 Site: 101 [Picton Rd & Maldon Rd - PM & Current DA (Site Folder: General)]

PM with Current DA
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Maldon Rd														
1	L2	15	0	16	0.0	0.075	6.6	LOS A	0.3	4.8	0.53	0.72	0.53	51.2
3	R2	42	22	44	52.4	0.075	12.6	LOS A	0.3	4.8	0.53	0.72	0.53	50.9
Approach		57	22	60	38.6	0.075	11.0	LOS A	0.3	4.8	0.53	0.72	0.53	51.0
East: Picton Rd														
4	L2	33	14	35	42.4	0.022	4.5	LOS A	0.0	0.0	0.00	0.48	0.00	54.2
5	T1	746	8	785	1.1	0.419	3.9	LOS A	2.3	16.8	0.02	0.38	0.02	57.5
Approach		779	22	820	2.8	0.419	3.9	LOS A	2.3	16.8	0.02	0.38	0.02	57.3
West: Picton Rd														
11	T1	396	7	417	1.8	0.275	4.0	LOS A	1.2	8.6	0.14	0.39	0.14	56.8
12	R2	2	0	2	0.0	0.275	9.1	LOS A	1.2	8.6	0.14	0.39	0.14	56.9
Approach		398	7	419	1.8	0.275	4.0	LOS A	1.2	8.6	0.14	0.39	0.14	56.8
All Vehicles		1234	51	1299	4.1	0.419	4.3	LOS A	2.3	16.8	0.09	0.40	0.09	56.8

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA Standard.

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

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

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V21005 Maldon (2020_10_27 07_28_25 UTC).sip9

MOVEMENT SUMMARY

 **Site: 101 [Picton Rd & Maldon Rd - Rezoning AM (Site Folder: General)]**

AM with Rezoning Proposal

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Maldon Rd														
1	L2	26	6	27	23.1	0.083	5.1	LOS A	0.3	5.0	0.38	0.64	0.38	52.1
3	R2	48	28	51	58.3	0.083	10.6	LOS A	0.3	5.0	0.38	0.64	0.38	52.1
Approach		74	34	78	45.9	0.083	8.6	LOS A	0.3	5.0	0.38	0.64	0.38	52.1
East: Picton Rd														
4	L2	117	39	123	33.3	0.075	4.5	LOS A	0.0	0.0	0.00	0.48	0.00	54.5
5	T1	419	20	441	4.8	0.268	4.1	LOS A	1.3	10.2	0.19	0.39	0.19	56.5
Approach		536	59	564	11.0	0.268	4.2	LOS A	1.3	10.2	0.15	0.41	0.15	56.0
West: Picton Rd														
11	T1	618	7	651	1.1	0.473	4.1	LOS A	2.4	17.8	0.18	0.43	0.18	56.2
12	R2	77	5	81	6.5	0.473	9.2	LOS A	2.4	17.8	0.18	0.43	0.18	56.1
Approach		695	12	732	1.7	0.473	4.6	LOS A	2.4	17.8	0.18	0.43	0.18	56.2
All Vehicles		1305	105	1374	8.0	0.473	4.7	LOS A	2.4	17.8	0.18	0.43	0.18	55.9

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA Standard.

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

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

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\21005 Maldon (2020_10_27 07_28_25 UTC).sip9

MOVEMENT SUMMARY

 Site: 101 [Picton Rd & Maldon Rd - Rezoning PM (Site Folder: General)]

PM with Rezoning Proposal
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
						v/c	sec							km/h
South: Maldon Rd														
1	L2	85	5	89	5.9	0.233	7.1	LOS A	1.1	12.5	0.60	0.78	0.60	51.2
3	R2	112	30	118	26.8	0.233	12.6	LOS A	1.1	12.5	0.60	0.78	0.60	51.9
Approach		197	35	207	17.8	0.233	10.2	LOS A	1.1	12.5	0.60	0.78	0.60	51.6
East: Picton Rd														
4	L2	51	17	54	33.3	0.033	4.4	LOS A	0.0	0.0	0.00	0.48	0.00	54.5
5	T1	746	8	785	1.1	0.432	3.9	LOS A	2.6	19.0	0.10	0.37	0.10	57.0
Approach		797	25	839	3.1	0.432	4.0	LOS A	2.6	19.0	0.09	0.38	0.09	56.9
West: Picton Rd														
11	T1	396	7	417	1.8	0.310	4.2	LOS A	1.4	10.4	0.25	0.43	0.25	56.1
12	R2	18	1	19	5.6	0.310	9.3	LOS A	1.4	10.4	0.25	0.43	0.25	56.0
Approach		414	8	436	1.9	0.310	4.4	LOS A	1.4	10.4	0.25	0.43	0.25	56.1
All Vehicles		1408	68	1482	4.8	0.432	5.0	LOS A	2.6	19.0	0.21	0.45	0.21	55.8

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA Standard.

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

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

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APPENDIX 2

Extracts of Picton Bypass Strategic Corridor Option Study

Picton Bypass

Strategic Corridor Options Report

Transport for NSW | December 2020



Figure 5-6: General alignment for Corridor 9