



**TRAFFIC AND PARKING IMPACT ASSESSMENT OF THE
PROPOSED MODIFICATION TO THE EXISTING ASPHALT BATCHING PLANT
AT 25 - 27 KENNINGTON DRIVE, TOMAGO**



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Development Type: Asphalt Batching Plant

Site Address: 25 - 27 Kennington Drive, Tomago

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1 INTRODUCTION

McLaren Traffic Engineering was commissioned by Monteath & Powys Pty Ltd on behalf of COLAS New South Wales Pty Ltd to provide a traffic and parking impact assessment of the proposed modification to the existing Asphalt Batching Plant at 25 - 27 Kennington Drive, Tomago as depicted in **Annexure A**. The CV's of the authors are presented in **Annexure B**.

1.1 *Description and Scale of Development*

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

- Increase the total annual output of the approved Asphalt Plant from 150,000 tonnes per year to up to 250,000 tonnes per year;
- No increase to the existing production rate;
- No proposed changes to parking area.

The proposed development in relation to the peak production rate of the Asphalt Batching Plant is not changing, rather, the site will run for longer and more frequently to achieve the increase in volume such that the peak traffic associated with the site will not increase. Additionally, the proposed development in relation to the amount of materials stored on the Materials Storage and Processing Yard is not changing, rather, the site will operate for longer and more frequently to increase the utilisation threshold of materials per year.

1.2 *State Environmental Planning Policy (Infrastructure) 2007*

The proposed development does not qualify as a traffic generating development with relevant size and/or capacity under *Clause 104* of the *SEPP (Infrastructure) 2007* as the site area is less than 20,000m² GFA. Accordingly, formal referral to Transport for New South Wales (TfNSW) is unnecessary and the application can be assessed by Department of Planning, Industry and Environment officers accordingly.

1.3 *Site Description*

The subject site is zoned *IN1: General Industry* under the Port Stephens LEP 2013 and is currently owned and operated by COLAS New South Wales Pty Ltd. The site has a single frontage to Kennington Drive to the North and is generally surrounded by industrial and rural developments.

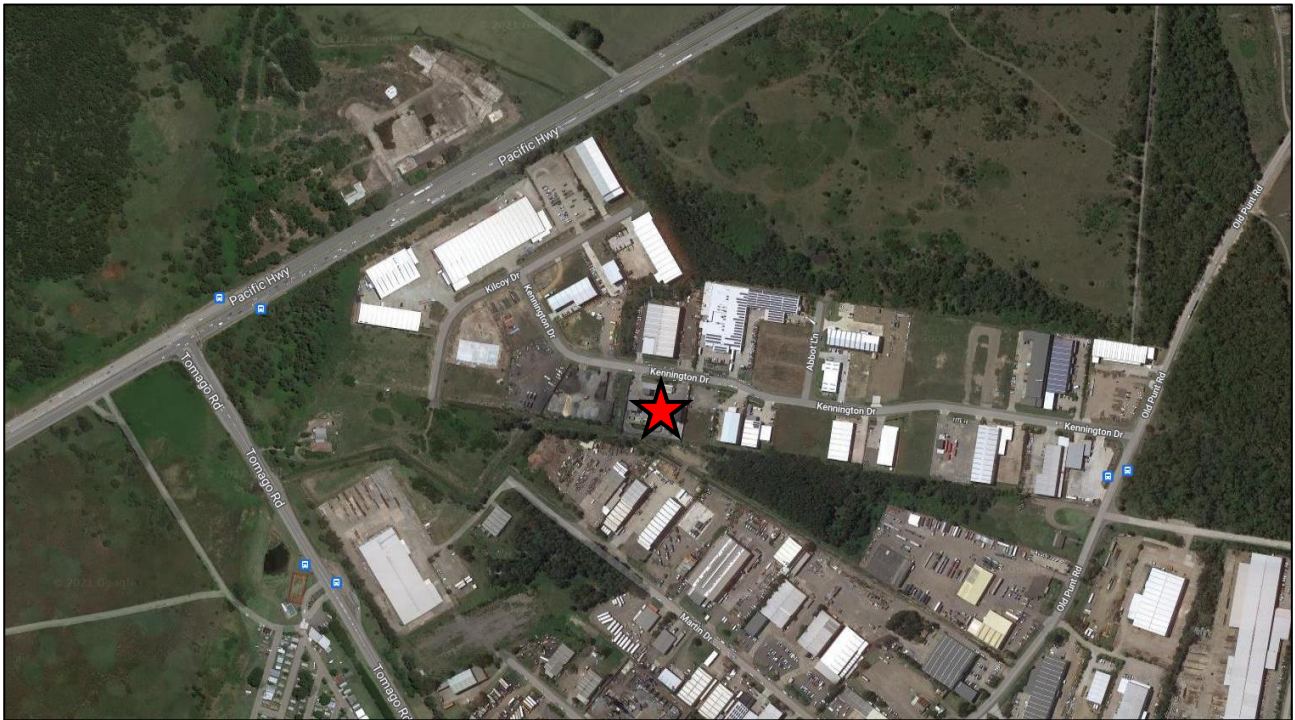
1.4 *Reference Materials*

This traffic and parking impact assessment has been undertaken with due consideration to the following documents:

1. *RTA Guide to Traffic Generating Developments 2002*
2. *RMS Traffic Modelling Guidelines 2013*
3. *Austroads Guide to Traffic Management Part 6 – Intersections, Interchanges and Crossings Management 2020*
4. *Austroads Guide to Traffic Management Part 12 – Integrated Transport Assessments for Developments 2020*

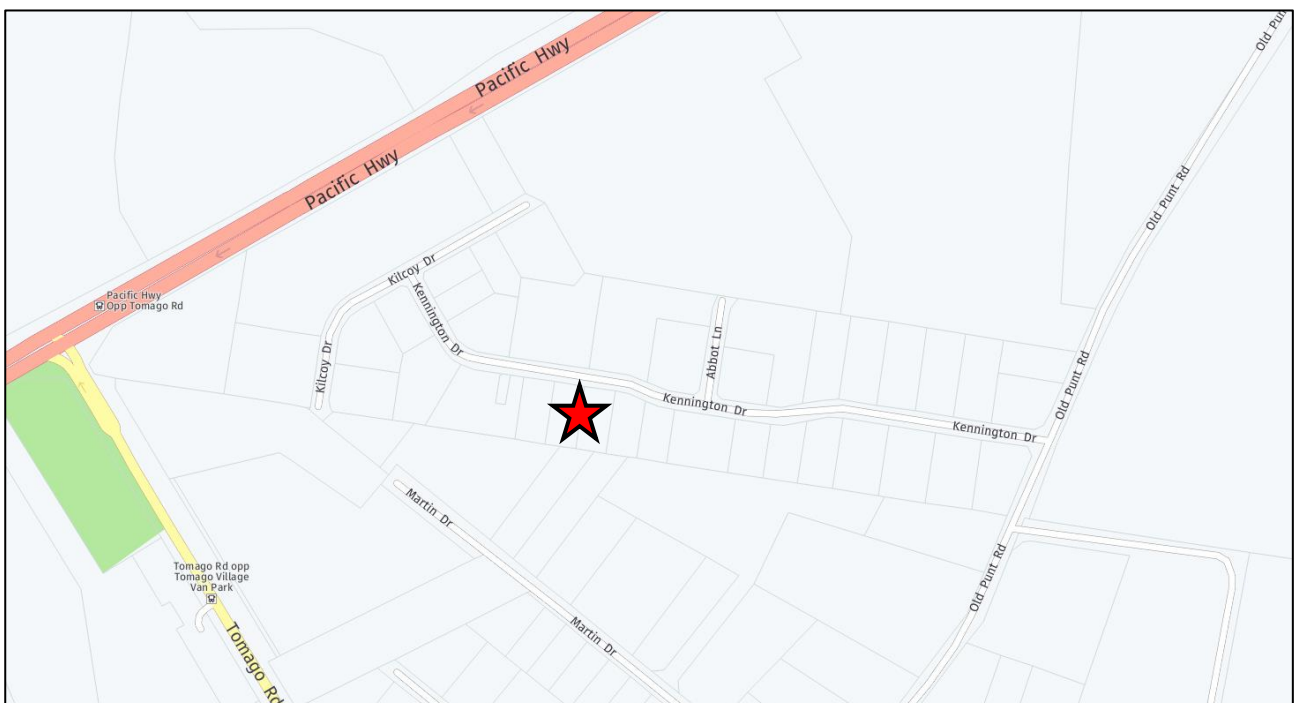
1.5 Site Context

The location of the site is shown on an aerial photo and a street map in **Figure 1** and **Figure 2** respectively.



Site Location

FIGURE 1: SITE CONTEXT – AERIAL PHOTO



Site Location

FIGURE 2: SITE CONTEXT – STREET MAP

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 Kennington Drive

- Unclassified LOCAL Road;
- Approximately 11m wide carriageway facilitating one (1) traffic flow lane in both directions and kerbside parking along both sides of the road;
- No speed limit signposted, 50km/h applies;
- Unrestricted kerbside parking permitted along both sides of the road.

2.1.2 Old Punt Road

- Unclassified LOCAL Road;
- Approximately 12m wide carriageway facilitating one (1) traffic flow lane in both directions and kerbside parking along both sides of the road;
- Signposted 60km/h speed limit;
- Unrestricted kerbside parking permitted along both sides of the road.

2.1.3 Tomago Road

- TfNSW Classified STATE Road (No. 302);
- Approximately 12m wide carriageway facilitating one (1) traffic flow lane in both directions and shoulders on both sides of the road;
- Signposted 80km/h speed limit to the east of Old Punt Road and 60km/h to the west of Old Punt Road.

2.1.4 Pacific Highway

- TfNSW Classified STATE Road (No. 10);
- Approximately 27m wide carriageway (including median) facilitating two (2) traffic flow lanes in both directions and shoulders on both sides of the road;
- Signposted 80km/h speed limit.

2.2 *Existing Traffic Management*

- GIVE-WAY controlled intersection of Kennington Drive / Old Punt Road.
- Signal controlled intersection of Old Punt Road / Pacific Highway.
- Roundabout controlled intersection of Old Punt Road / Tomago Road.
- Signal controlled intersection of Pacific Highway / Tomago Road.

2.3 Existing Traffic Environment

Turning movement traffic surveys were conducted at the intersections of Kennington Drive / Old Punt Road, Pacific Highway / Old Punt Road, Pacific Highway / Tomago Road and Old Punt Road / Tomago Road from 7:00am to 9:00am and 3:00pm to 6:00pm on Tuesday the 16th February 2021 representing a typical operating weekday. The full survey results are shown in **Annexure C** 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 9.0, **Table 1** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure D**.

TABLE 1: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation ⁽¹⁾	Average Delay ⁽²⁾ (sec/veh)	Level of Service ⁽³⁾⁽⁴⁾	Control Type	Worst Movement	95th Percentile Queue
EXISTING PERFORMANCE							
Old Punt Rd /Kennington Dr	AM	0.07	3.6 (Worst: 6.2)	NA (Worst: A)	Give Way	RT from Old Punt Rd	0.2 veh (1.6m) Old Punt Rd
	PM	0.17	3.4 (Worst: 6.4)	NA (Worst: A)		RT from Old Punt Rd	0.6 veh (4.7m) Kennington Dr
Old Punt Rd /Tomago Rd	AM	0.30	5.1 (Worst: 16.6)	A (Worst: C)	Roundabout	UT from Old Punt Rd	2 veh (15.4m) Tomago Rd
	PM	0.46	7.9 (Worst: 17.3)	A (Worst: C)		UT from Old Punt Rd	3 veh (22.3m) Tomago Rd
Pacific Hwy /Tomago Rd	AM	0.70	16	B	Signals	RT from Pacific Hwy	21.3 veh (166.9m) Pacific Hwy
	PM	0.87	23.1	B		LT from Tomago Rd	32.9 veh (245.1m) Pacific Hwy
Old Punt Rd /Pacific Hwy	AM	0.54	7.4	A	Signals	RT from Old Punt Rd	19.5 veh (151.3m) Pacific Hwy
	PM	0.69	11.2	A		RT from Old Punt Rd	26.4 veh (196.7m) Pacific Hwy

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.

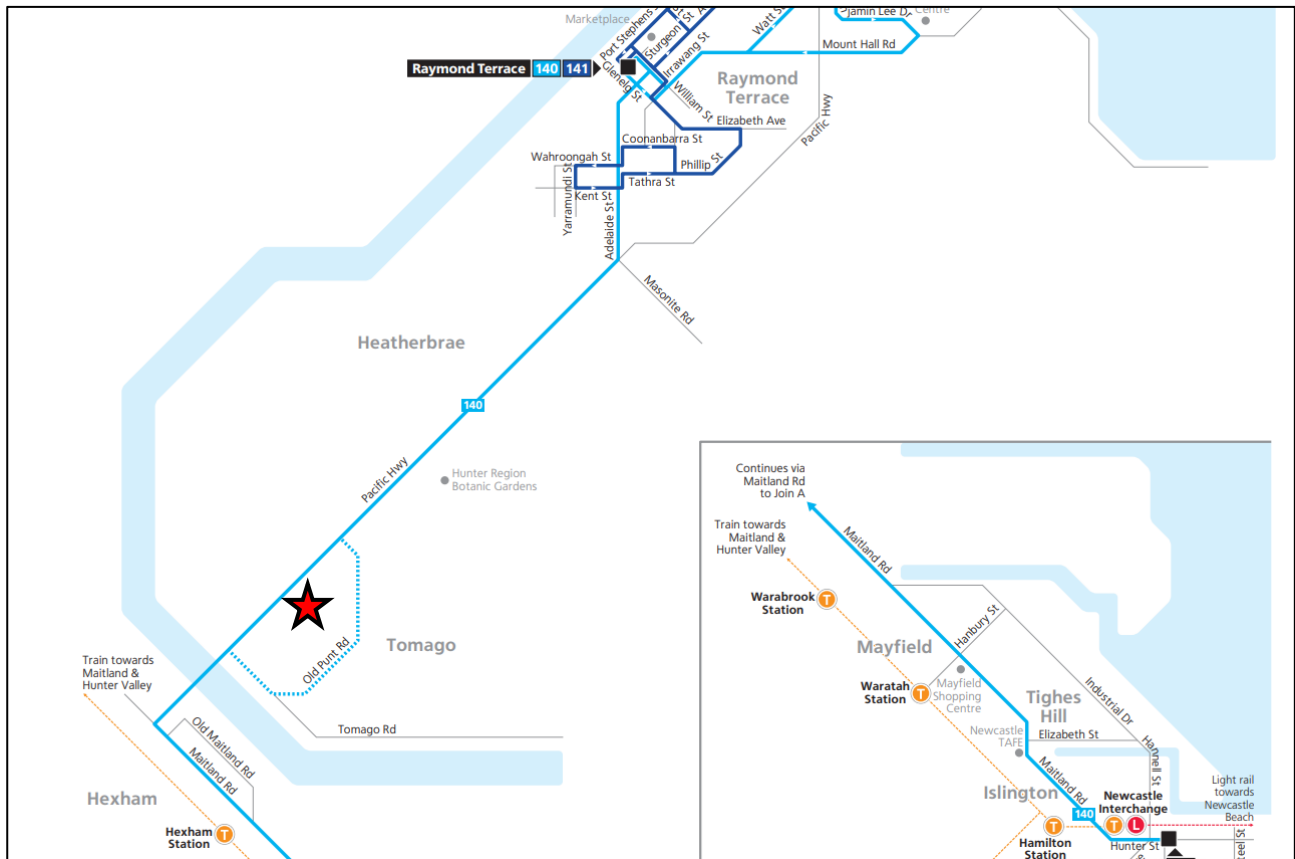
(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse 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 a level of service “A” or “B” conditions in both the AM & PM peak hour periods. The level of service “A” and “B” performance is characterised by low approach delays and spare capacity.

2.4 Public Transport

The subject site has access to existing bus stop (ID: 2322112) located approximately 500m walking distance to the east of site on Old Punt Road. The bus stop services existing bus Route 140 (Newcastle Interchange to Raymond Terrace) provided by *Hunter Valley Buses*.

The location of the site subject to the surrounding public transport network is shown in **Figure 3**.



Site Location

FIGURE 3: PUBLIC TRANSPORT NETWORK MAP

2.5 Future Road and Infrastructure Upgrades

From Port Stephens Council Development Application tracker and website, it appears that there are no future planned road or public transport changes that will affect traffic conditions within the immediate vicinity of the subject site.

From the TfNSW Projects and Initiatives Map, an upgrade to the M1 Pacific Motorway is currently in the planning stage as part of the *M1 Pacific Motorway extension to Raymond Terrace* project. A concept interchange design was provided within the October 2020 project update which is reproduced in **Figure 4**. The proposed interchange will significantly improve the connectivity between the subject site and the M1 motorway.

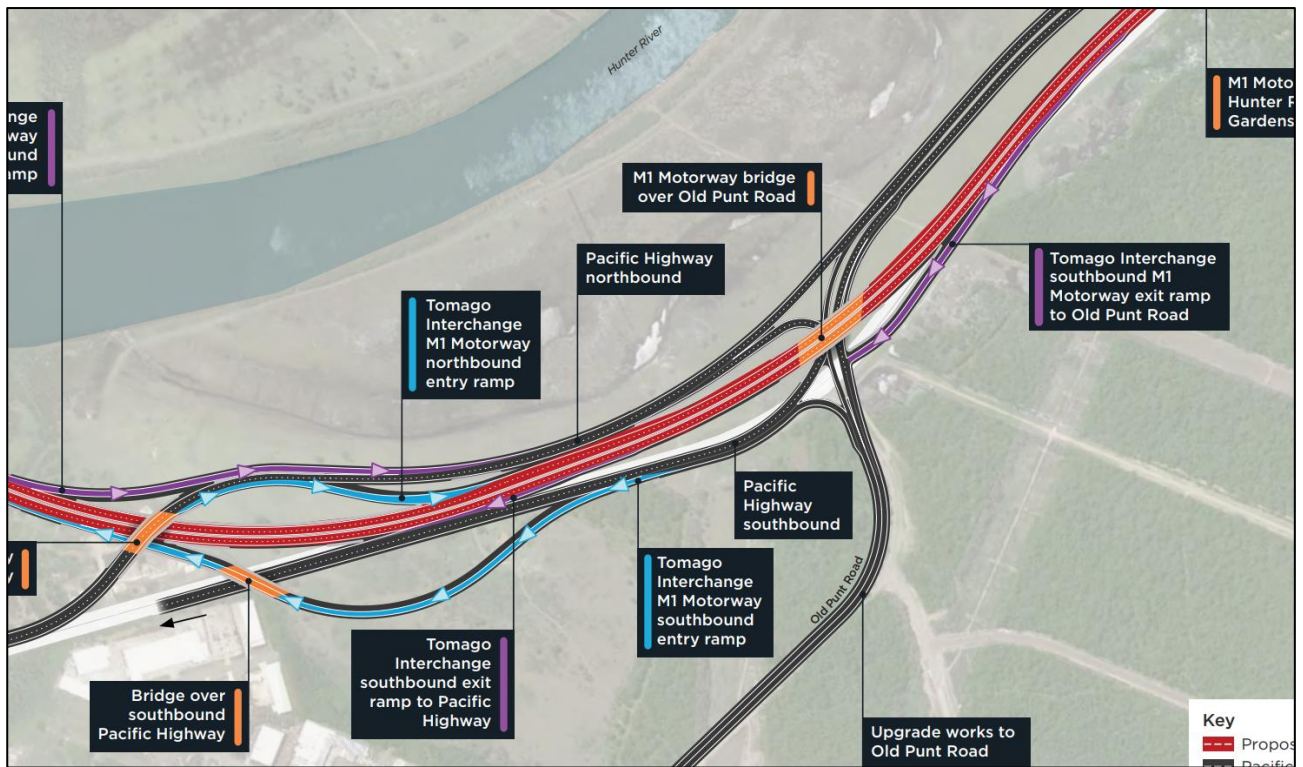


FIGURE 4: M1 PACIFIC MOTORWAY EXTENSION TO RAYOND TERRACE CONCEPT

3 PARKING ASSESSMENT

3.1 Council Parking Requirement

Reference is made to the *Port Stephens Council Development Control Plan 2014 B8.B - Road Network and Parking* which designates the following parking rates applicable to the proposed development:

20.2 Car Parking Provision and Service Facilities by Land Use

Heavy industrial storage establishments, heavy industry and general industry

1 car space per 100m² floor area or 4 space per work bay

1 bike space per 20 employees

1 accessible car space per 30 car spaces

While Council's DCP provides the above parking rates, the existing operations are known and as such a first principles assessment can be undertaken of the development.

For work health and safety reasons, Colas does not currently utilise the existing approved parking provisions within the Asphalt Batching Plant site (25-27 Kennington Drive). The parking of light vehicles on the site is restricted to ensure safety around the heavy vehicles and heavy equipment which operate on the site.

Colas operates over multiple lots between 21 Kennington Drive and 33 Kennington Drive. A total of 12 staff work across the multiple sites when the site is operating and as such would require 12 car parking spaces, assuming each staff member drives to site. In addition, the Colas operation requires storage of trucks and plant.

The staff car parking spaces for the Colas operation are located at 21 Kennington Drive which provides for 12 car parking spaces (including 1 disabled parking space) accommodating the existing staff requirement of the site. Truck and plant storage occurs at 23 Kennington Drive under internal management.

It is reiterated that no changes to the existing parking demand is proposed as part of this development application and therefore the proposed development is supportable in terms of parking impact.

3.2 Disabled Parking

Port Stephens Council DCP states the following regarding disabled parking provision relevant to the proposed development:

Table: B8.B Accessible Car Parking Provision

Heavy Industry

Minimum Number of Accessible Spaces

1 car space per 30 car spaces

No changes to the existing parking layout are proposed as part of this development application. Nevertheless, one (1) disabled car parking space is provided for at 21 Kennington Drive, satisfying Council's DCP requirement.

3.3 Bicycle & Motorcycle Parking Requirements

The Port Stephens Council DCP 2014 requires that bicycle parking be provided at a rate of one (1) bicycle space per 20 employees or part thereof. This requirement results in a required provision of 1 bicycle space. Bicycle parking can easily be accommodated on-site informally if required.

Council's DCP does not provide a motorcycle parking rate and as such the site does not require motorcycle parking.

3.4 Servicing & Loading

No changes to the existing loading and servicing operation or layout of the site are proposed as part of this application. Currently, the largest sized vehicle required to access the site is a 26m long B-double with the site typically requiring access for 20m long truck and dogs. The site has been operating satisfactorily for many years and no changes are proposed to the ongoing operations apart from an increase in total annual output. It is reiterated that the peak production rate of the site is not changing, rather, the site will run for longer to achieve the increase in volume such that no additional queues will result from the proposal.

3.5 Car Park Design & Compliance

The existing car parking layout as depicted in **Annexure A**, has not been assessed against the relevant clauses and objectives of AS2890.1:2004, AS2890.2:2002 or AS2890.6:2009 as no changes are proposed to the existing parking layout. The existing layout has been approved as part of previous development approvals and does not require reassessing.

4 TRAFFIC ASSESSMENT

The impact of the expected traffic generation levels associated with the subject proposal is discussed in the following sub-sections. The subject asphalt batching plant operates in conjunction with the materials storage and processing yard located to the west of the site. Therefore, the traffic generation of both the batching plant and the storage yard has been assessed in together.

For the purpose of this traffic assessment, it has been assumed that no truck movements to or from the site occurred during the survey period. It is likely that some truck movements to and from the site were captured by the surveys and this assessment therefore outlines a worst case.

4.1 *Traffic Generation*

The traffic generation of the existing Colas operation along Kennington Drive has been determined using the ticketing system of the inbound materials between 1st March 2020 and 28th February 2021 and the export of asphalt between 1st September 2020 and 17th February 2021. The detailed ticketing results for the import and export are presented in **Annexure E** & **Annexure F**, respectively.

4.1.1 Inbound Materials

The ticketing system for the import of material provided the daily heavy vehicle deliveries as shown in **Figure 5**. Over the 12-month period the peak daily trucks associated with the import of materials was 50 trucks. Removing the weekends and the days with no imported materials, the 85th percentile daily import of material was 25 trucks. To estimate a peak hour volume from the daily inbound traffic volumes, it has been assumed that 20% of the daily vehicle trips occur within the peak hour.

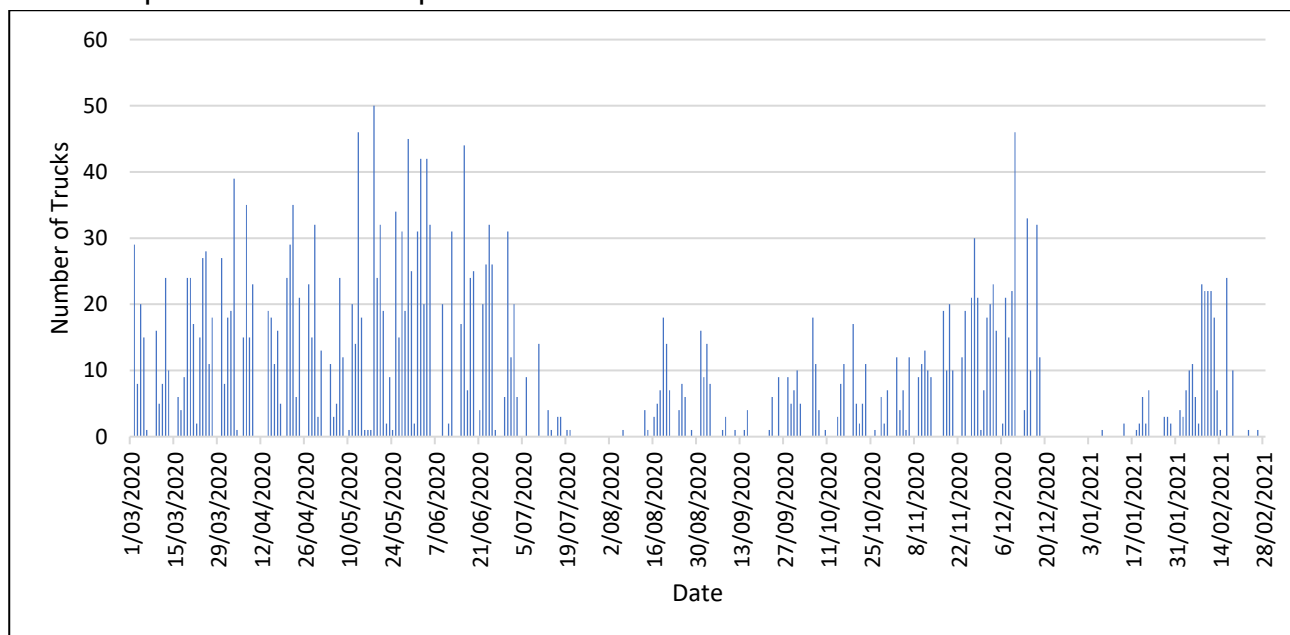


FIGURE 5: DAILY IMPORT TRUCKS

4.1.2 Exported Materials

The ticketing system for the export of asphalt provided more detailed timing of truck movements such that peak hour volumes could be derived directly. Over the available 6-month period, the 85th percentile peak hour truck generation associated with export of asphalt was 6 trucks. A box and whisker plot for the AM and PM peak hour of each day that material was exported is presented in **Figure 6**. In addition, a heatmap diagram showing the daily variation hour-to-hour is presented in **Annexure F**. The heat map shows the variation in hourly traffic generation over each day and extends for the full duration of the survey period (6-months). It should be noted that the heatmap only shows days when asphalt was exported (i.e. days with no traffic generation have been removed). The heatmap shows that the site does not consistently generate truck traffic each day, rather the traffic generation is dependent on demand and production rate of the plant.

The peak daily trucks associated with the export of asphalt was 37 trucks as shown in **Figure 7**. The 85th percentile number of daily trucks associated with the export of asphalt was 28 trucks.

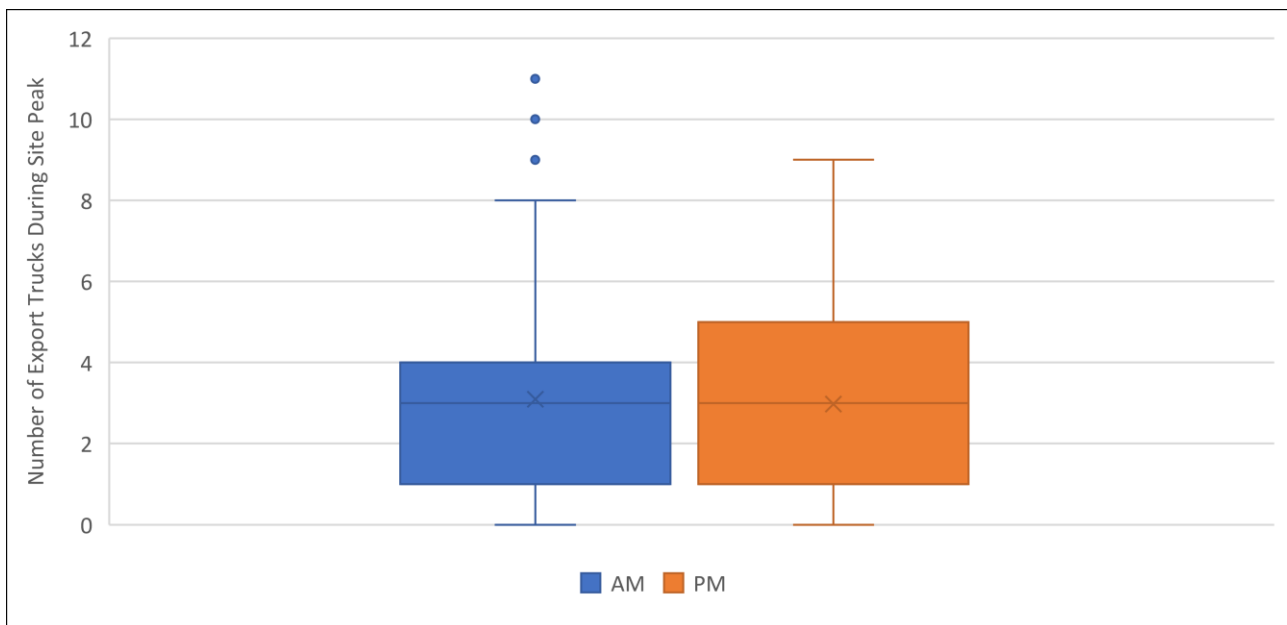


FIGURE 6: AM AND PM PEAK HOUR TRUCK EXPORT VARIATION

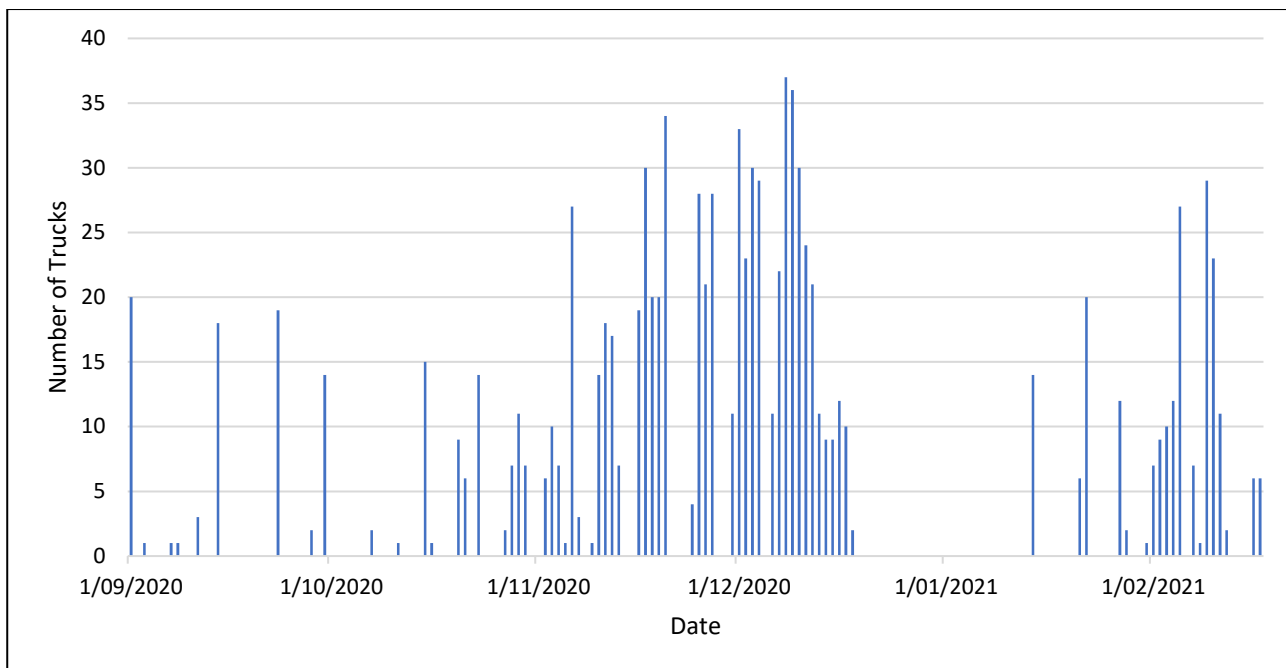


FIGURE 7: DAILY ASPHALT EXPORT TRUCKS

4.1.3 Staff Trips

The number of staff that work at the materials storage yard and the asphalt plant while the plant is processing material is 12. For a conservative assessment it is assumed that each staff member arrives in their own vehicle in the AM peak hour and departs in the PM peak hour.

4.1.4 Local Transfer of Materials

In addition to the above, to transport material between the storage yard and the plant at a production rate of 150 tonnes per hour a Heavy Rigid Vehicle transports material at 12.5 tonnes per load. This corresponds to traffic generation of 12 loads per hour during peak operation of the site. It should be noted that the transport of material between the storage yard and the plant does not increase the demand on any of the surrounding intersections.

4.1.5 Summary of Traffic Generation for the Proposal

The proposed development in relation to the peak production rate of the Asphalt Batching Plant is not changing, rather, the site will run for longer and more frequently to achieve the increase in volume such that the peak traffic associated with the site will not increase. Additionally, the proposed development in relation to the amount of materials stored on the Materials Storage and Processing Yard is not changing, rather, the site will operate for longer and more frequently to increase the utilisation threshold of materials per year.

It is understood that the existing asphalt batching plant is approved for a maximum production of 150 tonnes of asphalt per hour. There are no proposed changes to the equipment and hence, no changes to the maximum production rate of the site. Further, the traffic generation detailed above was related to a total annual production of 109,000 tonnes of asphalt in the 2020 calendar year. While this total production is less than the proposed production of 250,000 tonnes per year it is not expected to change the 85th percentile traffic generation of the site as the production rate is not changing.

Considering the above, the resulting traffic generation is summarised in **Table 2**.

TABLE 2: EXISTING AND PROPOSED COLAS TRAFFIC GENERATION

Use	Peak Hour ⁽¹⁾	85 th Percentile Day ⁽¹⁾
Import (Storage Yard - Heavy Vehicles)	AM: 10 ⁽²⁾ (5 in, 5 out) PM: 10 ⁽²⁾ (5 in, 5 out)	50 (25 in, 25 out)
Export (Asphalt Plant - Heavy Vehicles)	AM: 12 (6 in, 6 out) PM: 12 (6 in, 6 out)	56 (28 in, 28 out)
Staff (Light Vehicles)	AM: 12 (12 in, 0 out) PM: 12 (0 in, 12 out)	-
Total⁽³⁾	AM: 34 (23 in, 11 out) PM: 34 (11 in, 23 out)	106 (53 in, 53 out) Heavy vehicles

- Note: (1) Assumes 50/50 split of inbound and outbound traffic.
 (2) Assumes 20% of daily traffic occurs during the peak hour.
 (3) Assumes import peak and export peak occurs concurrently.

As shown, the expected traffic generation for the existing and proposed development is in the order of **34** vehicle trips in the peak hour. The existing Colas site was operational during the recorded traffic surveys and therefore, it is assumed that the 12 staff trips were recorded within the traffic surveys and as such have not be assessed further. The number of import or export trips that occurred to / from the site during the survey period is unknown and therefore, for a conservative assessment, it has been assumed that the peak hourly traffic generation of the import and export trucks occurs at the same time and that this generation occurs during both the AM and PM network peaks. While this is unlikely to occur it provides for a worst case traffic assessment of the proposed development.

4.1.6 Heavy Vehicle Classification

A number of different sized heavy vehicles utilise the site. The different sized vehicles were recorded within the imported materials ticketing system and are presented in **Table 3** below.

TABLE 3: VEHICLE CLASSIFICATION

Month	Imported Materials Truck Size Count				
	Rigid	Flocon (Rigid)	Truck & Dog	Semi	B-double
March 2020	4	50	275	16	11
April 2020	9	48	338	14	13
May 2020	11	74	351	19	23
June 2020	9	55	385	8	26
July 2020	0	5	61	8	0
August 2020	2	5	81	3	4
September 2020	2	11	60	4	1
October 2020	3	14	102	6	2
November 2020	3	38	192	15	10
December 2020	8	63	179	14	10
January 2021	4	16	30	6	0
February 2021	5	13	160	10	6
Total trucks	60 (2%)	392 (14%)	2214 (76%)	123 (4%)	106 (4%)

As shown above, the majority of vehicles entering the storage yard are Truck & Dog and Heavy Rigid Vehicles with the occasional requirement for semi-trailer trucks and B-doubles. It is also assumed that a similar truck classification is required for the export of material at for the asphalt plant.

4.2 Traffic Assignment

The assumed traffic assignment of import, export and staff trips is discussed in the following subsections.

4.2.1 Import of Material

A number of different materials are imported for the operation of the subject site and the storage yard. The current haul routes for imported material are presented in **Table 4**.

TABLE 4: IMPORT HAUL ROUTES

Material	Supplier	Source Location	Direction from Site
Bitumen	Sami	12 Grand Avenue, Camellia Or Port of Botany	South
Hydrated Lime	Graymont	Garthowen Road, Attunga	North
Manufactured Sand & Coarse Aggregates	Hunter Quarries	Blue Rock Close, Karuah	North
SFS Slag	Australian Steel Mill Services	21 Area Springhill Road, Port Kembla	South
Natural Sand	Holcim	799 Pacific Highway, Chatswood. (Holcim office)	South (assumed)
Recycled Asphaltic product	-	Various Construction Sites	-

As shown above, material is typically imported from the north or from the Sydney region. Therefore, the import of material is assumed to have the following traffic distribution:

- 50% of traffic will travel to/from the north via the Pacific Highway;
- 50% of traffic will travel to/from the south via the Pacific Highway.

4.2.2 Export of Material

The site produces hot mix asphalt used for asphalt paving projects in local council's and roadways within the Hunter region. Therefore, the export of material is assumed to have the following traffic distribution:

- 50% to the south via the Pacific Highway;
- 25% to the west via the Pacific Highway;
- 25% to the north via the Pacific Highway.

4.2.3 Staff Trips

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 staff traffic to and from the site:

- 10% to / from the east via Tomago Road;
- 40% to / from the north via Pacific Highway;
- 40% to / from the south via Pacific Highway
- 10% to / from the west via Pacific Highway.

It is reiterated that existing staff trips would have been observed within the recorded traffic surveys and as such have not been added as additional trips to the traffic modelling. The staff trip distribution has been provided for completeness only.

4.2.4 Traffic Distribution Summary

The traffic distributions discussed in the above subsections are presented in **Figure 8** below.

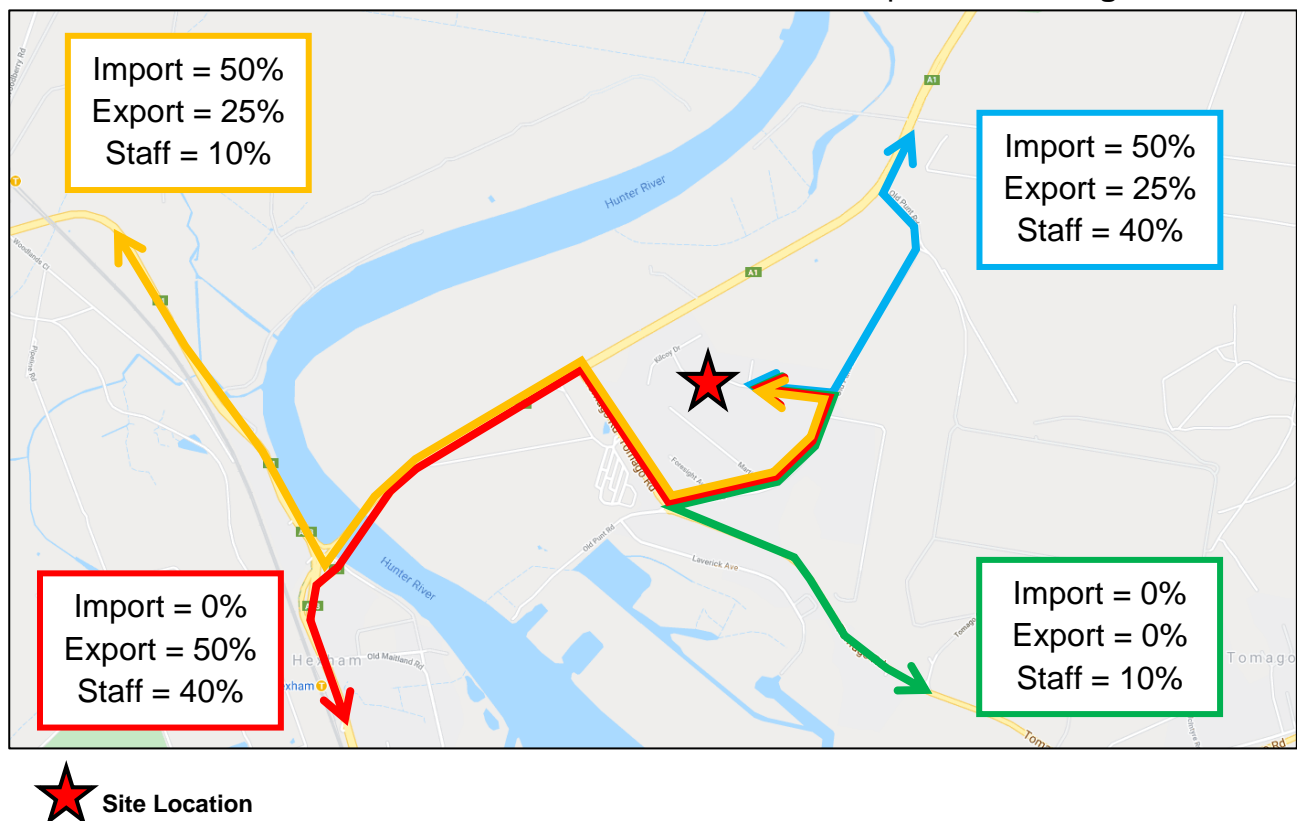


FIGURE 8: TRAFFIC DISTRIBUTION DIAGRAM

4.3 Traffic Impact

The traffic generation outlined in **Section 4.1 & 4.2** above has been added to the existing traffic volumes recorded. SIDRA INTERSECTION 9.0 was used to assess the intersections performance. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the 85th percentile operational day traffic load. The results of this assessment are shown in **Table 5**.

TABLE 5: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation ⁽¹⁾	Average Delay ⁽²⁾ (sec/veh)	Level of Service ⁽³⁾⁽⁴⁾	Control Type	Worst Movement	95th Percentile Queue
EXISTING PERFORMANCE							
Old Punt Rd /Kennington Dr	AM	0.07	3.6 (Worst: 6.2)	NA (Worst: A)	Give Way	RT from Old Punt Rd	0.2 veh (1.6m) Old Punt Rd
	PM	0.17	3.4 (Worst: 6.4)	NA (Worst: A)		RT from Old Punt Rd	0.6 veh (4.7m) Kennington Dr
Old Punt Rd /Tomago Rd	AM	0.30	5.1 (Worst: 16.6)	A (Worst: C)	Roundabout	UT from Old Punt Rd	2 veh (15.4m) Tomago Rd
	PM	0.46	7.9 (Worst: 17.3)	A (Worst: C)		UT from Old Punt Rd	3 veh (22.3m) Tomago Rd
Pacific Hwy /Tomago Rd	AM	0.70	16	B	Signals	RT from Pacific Hwy	21.3 veh (166.9m) Pacific Hwy
	PM	0.87	23.1	B		LT from Tomago Rd	32.9 veh (245.1m) Pacific Hwy
Old Punt Rd /Pacific Hwy	AM	0.54	7.4	A	Signals	RT from Old Punt Rd	19.5 veh (151.3m) Pacific Hwy
	PM	0.69	11.2	A		RT from Old Punt Rd	26.4 veh (196.7m) Pacific Hwy
FUTURE PERFORMANCE							
Old Punt Rd /Kennington Dr	AM	0.08	3.9 (Worst: 6.4)	NA (Worst: A)	Give Way	RT from Old Punt Rd	0.2 veh (2.3m) Old Punt Rd
	PM	0.19	3.7 (Worst: 6.8)	NA (Worst: A)		RT from Old Punt Rd	0.7 veh (5.5m) Kennington Dr
Old Punt Rd /Tomago Rd	AM	0.30	5.2 (Worst: 16.7)	A (Worst: C)	Roundabout	UT from Old Punt Rd	2 veh (15.4m) Tomago Rd
	PM	0.48	8 (Worst: 17.4)	A (Worst: C)		UT from Old Punt Rd	3.1 veh (23.4m) Tomago Rd
Pacific Hwy /Tomago Rd	AM	0.70	16.1	B	Signals	RT from Pacific Hwy	21.3 veh (166.9m) Pacific Hwy
	PM	0.87	23.6	B		LT from Tomago Rd	34.8 veh (259.7m) Pacific Hwy
Old Punt Rd /Pacific Hwy	AM	0.54	7.5	A	Signals	RT from Old Punt Rd	19.5 veh (151.4m) Pacific Hwy
	PM	0.67	11.4	A		RT from Old Punt Rd	27.5 veh (205m) Pacific Hwy

Notes: Refer to **Table 1**

As shown, the surrounding intersections all retain the same overall level of service under future conditions with minimal delays and additional capacity, indicating that there will be negligible impact on the existing road network as a result of the proposed development.

5 CONCLUSION

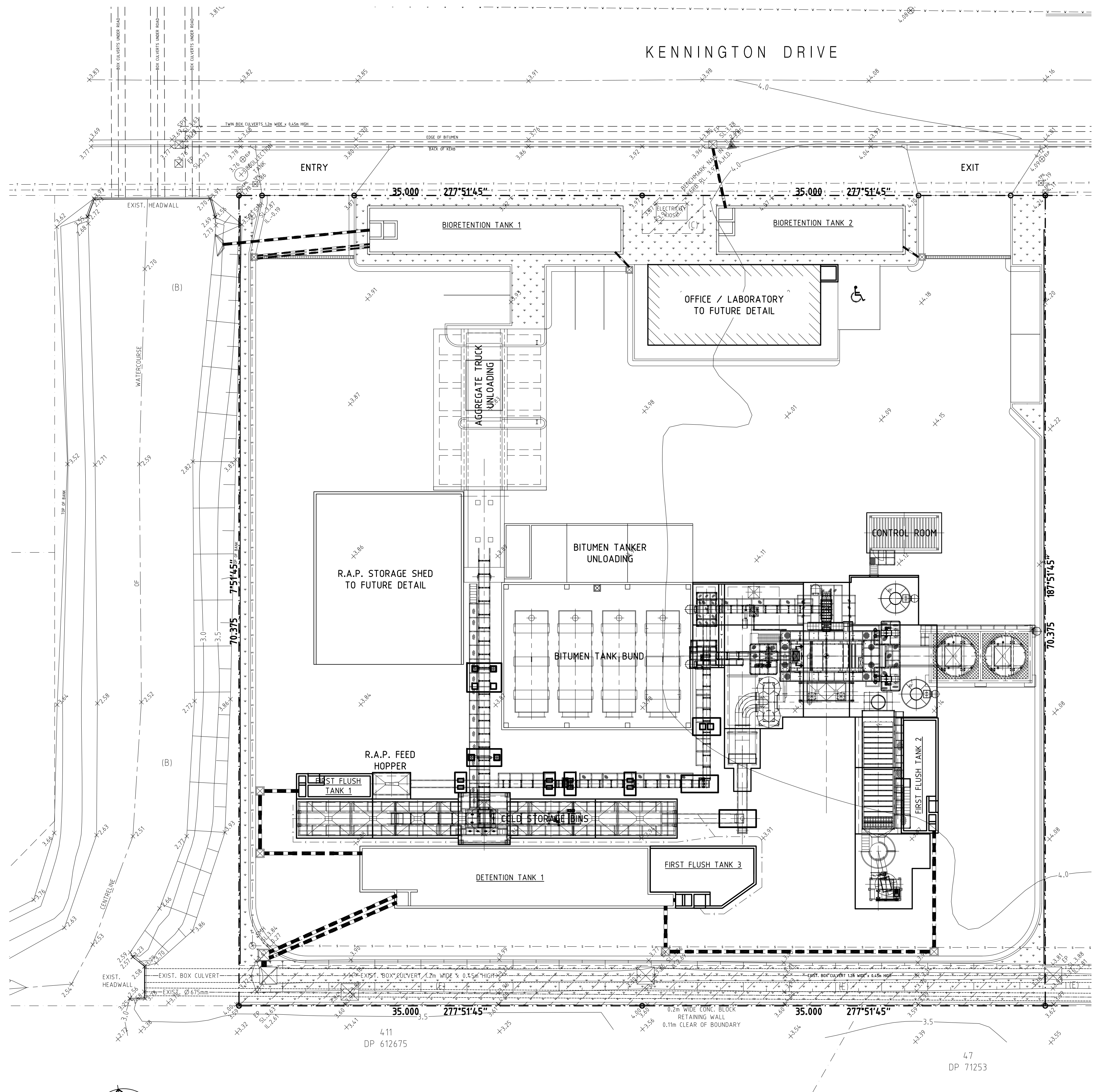
In view of the foregoing, the subject Asphalt Batching Plant proposal at 25 - 27 Kennington Drive, Tomago (as depicted in **Annexure A**) is fully supportable in terms of its traffic and parking impacts. The following outcomes of this traffic impact assessment are relevant to note:

- No changes to the existing parking demand of the site will result of the proposed modifications, with adequate parking provided for staff based on a first principles assessment and consider the Colas operation holistically.
- Bicycle parking can easily be accommodated informally on-site if required.
- Council's DCP does not require the provision of motorcycle parking facilities.
- The parking areas of the site have not been assessed against the relevant sections of AS2890.1:2004, AS2890.2:2018 and AS2890.6:2009 as no changes are proposed to the existing layout.
- The traffic generation of the proposed development in conjunction with the associated material storage and processing yard has been estimated to be some **34** trips in the AM peak period (23 in, 11 out) and **34** trips in the PM peak period (11 in, 23 out). The impacts of the traffic generation have been modelled using SIDRA INTERSECTION 9.0, indicating that cumulative traffic generation of the subject site and the materials storage and processing yard will result in no detrimental impact to the performance of the intersections as a result of the generated traffic.
- It is noted that the traffic assessment was completed on the basis that no trucks entered or exited the site during the traffic survey period. It is likely that some trucks travelling to and from the site were captured by the traffic surveys and that the results of the assessment represent a worst case.



**ANNEXURE A: SITE LAYOUT
(1 SHEET)**

DO NOT SCALE - THIS DRAWING MAY BE A REDUCED COPY



SITE PLAN

LEGEND	
	DENOTES DRAINAGE EXISTING PIT
	DENOTES EXISTING DRAINAGE PIPE
	DENOTES EXISTING CONTOUR
	DENOTES EXISTING SPOTLEVEL
	DENOTES EXISTING BENCH MARK
	DENOTES EXISTING TELSTRA LINE
	DENOTES EXISTING TELSTRA PILLAR
	DENOTES EXISTING U/G ELECTRICITY LINE
	DENOTES EXISTING ELECTRICITY PILLAR
	DENOTES EXISTING LIGHT POST
	DENOTES EXISTING SEWER LINE
	DENOTES EXISTING SEWER MANHOLE

CONTRACTOR NOTE	
1. THE POSITION OF ALL SERVICES SHOWN SHOULD BE REGARDED AS APPROXIMATE ONLY. 2. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE EXACT LOCATIONS AND INFORM ALL RELEVANT AUTHORITIES PRIOR TO ANY EXCAVATION. 3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE EXISTING FOOTINGS ARE NOT UNDERMINED. 4. DESIGN & INSTALLATION OF ANY TEMPORARY SHORING THAT MAY BE REQUIRED IS THE RESPONSIBILITY OF THE CONTRACTOR. 5. DRAWINGS SHOULD BE READ IN CONJUNCTION WITH ALL OTHER SERVICE ENGINEERS DRAWINGS	

REVISIONS			
No.	DATE	APP.	AMENDMENTS
A	19.12.07	N.I.	ISSUED FOR INFORMATION

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	MEMBER OF THE ASSOCIATION OF CONSULTING ENGINEERS OF AUSTRALIA

LINDSAY & DYNAN PTY LIMITED Newcastle 5 Newton Street Broadmeadow NSW 2292 Phone - 02 49577377 Facsimile - 02 49577507 Sydney Suite 28 / 33 Waterloo Road, North Ryde NSW 2113 Phone - : 02 98885216 Facsimile - 02 98871888 Web - lindsaydynan.com.au Email - mail@lindsaydynan.com.au	

CLIENT	TROPIC ASPHALT
TITLE	SITE PLAN

PROJECT	PROPOSED ASPHALT PLANT LOTS 14 & 15 KENNINGTON DRIVE TOMAGO N.S.W.
---------	--

NOT FOR CONSTRUCTION			
DRAWN N.I.	DESIGNED M.L.	CHECKED	SHEET SIZE
SCALE A1 - 1:200	DATE MARCH 2007	APPROVED	A1
PROJECT No. 6511		DRAWING No. S01	REVISION A



**ANNEXURE B: CIRRICULUM VITAE
(3 SHEETS)**



Craig McLaren (Director)

RPEQ 19457

Craig is an acknowledged traffic consultant since the company inception in 1995. The company's primary function has been to serve both the public and private sectors focusing on traffic impact assessments, transport planning, special event transport planning, local area traffic management, road safety and expert evidence at Land and Environment Court, Supreme Court and the Commission of Inquiry.

Qualifications

Bachelor of Civil Engineering, UNSW, 1985

Graduate Diploma in Traffic Engineering, University of New South Wales, 1991

Accredited Level 3 Road Safety Auditor, 1998

Risk Management Workshop, September 2014

Professional Engineers Australia. RPEng 2017

Registered Professional Engineer Queensland 2017
RPEQ 19457

RMS Accredited Traffic Management Plan Designer
[2018]

Affiliations:

Member, Australian Institute of Traffic Planning and Management - AITPM

Member, Institute of Transportation Engineers USA
(Australian Branch) – ITE

Papers at Conferences

"Safe & Liveable Communities, Can You Have Both?" Georgia Institute of Transportation Engineers, St Simons Island, Georgia USA July 1999.

Experience:

McLAREN TRAFFIC ENGINEERING

1995 to date:

Director and experienced traffic engineer responsible for the conduct of all facets of traffic impact assessment ranging from report preparation, design advice and giving evidence at the Land and Environment Court.

SINCLAIR KNIGHT MERZ

1994 to 1995:

Executive Traffic Engineer. Responsible for the conduct of all facets of traffic impact assessment ranging from report preparation, design advice and giving evidence at the Land and Environment Court.

TRANSPORTATION PLANNING WORKSHOP

1989 to 1994:

Senior Associate. Responsible for the conduct of a vast number of traffic impact assessment report and gained invaluable experience in giving expert evidence before the Land and Environment Court.

ROADS AND TRAFFIC AUTHORITY, NSW

1988 to 1989:

Technical Secretary to the Regional Traffic Committee, Traffic Engineer, Traffic Engineering Section, involved in traffic/transport research, policy development and assisting councils in the application of the Authority's guidelines.

OVE ARUP TRANSPORTATION PLANNING

1985 to 1988:

Traffic Engineer. Involved in the preparation of traffic impact reports for a wide range of projects.

GUTTERIDGE HASKINS & DAVEY

1980 to 1982:

Trainee Civil Engineer. Involved in assisting with road and subdivision design and field surveying.



Thomas Steal (Senior Traffic Engineer)

Thomas is a consulting traffic engineer with extensive experience in consulting with the public and private sectors on matters of transport planning, construction traffic management, traffic impact assessment, road & car park design and road safety auditing.

Thomas appears regularly as an expert witness in the Land and Environment Court to provide evidence on matters related to the traffic, parking and road safety impacts of development.

Thomas is an expert in the development and application of data, technical methods and the findings of contemporary research to provide for an evidence-based assessment of traffic, parking and road safety impacts.

Qualification and Affiliations

Bachelor of Civil Engineering, University of Sydney, 2015

Accredited Level 2 Road Safety Auditor

Engineers Australia - Member

Australian Institute of Planning and Management – Member

Professional Engineers Australia - Member

Experience:

MCLAREN TRAFFIC ENGINEERING

2015 to date, roles including:

- | | | |
|---|---|--|
| - Road Safety Auditing | - Concept Road and Parking Design | - Development of Traffic Engineering Methodology |
| - Construction Traffic Management Plans | - Expert Witness | - Transport Planning |
| - Traffic Impact Assessment | - SIDRA and Aimsun Modelling | - Expert Advice at Public Meetings |
| - Staff Training | - Reviewing and Approval of Documents and Plans | - Operational Management Plans |
-

Daniel Walker (Traffic Engineer)

Experienced traffic Engineer for the preparation and review of traffic and parking impact assessments for a wide range of land uses and scales. Skilled in traffic modelling and analysis, provision of detailed design advice for small and large scale developments.

Qualifications

Bachelor of Engineering (Honours) (Scholar), Class I, Civil Engineering, University of Wollongong, 2018

Accredited Level 1 Road Safety Auditor, 2020

Experience:

McLAREN TRAFFIC ENGINEERING

2016 to date:

- Preparation & Review of Traffic and Parking Impact Assessments
- Construction Traffic Management Plans
- Concept Road and Parking Designs
- SIDRA Traffic Modelling
- Transport and Traffic Planning and Management
- Detailed Design Advice for a variety of Land Uses
- Invarian Rapid Plan



**ANNEXURE C: TRAFFIC SURVEY DATA
(4 SHEETS)**

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au



Intersection of Kennington Dr and Old Punt Rd, Tom

GPS -32.81754, 151.70839

Date:	Tue 16/02/21
Weather:	Overcast
Suburban:	Tomago
Customer:	McLaren

North:	Old Punt Rd
East:	N/A
South:	Old Punt Rd
West:	Kennington Dr

Survey	AM:	7:00 AM-9:00 AM
Period	PM:	3:00 PM-6:00 PM
Traffic	AM:	7:15 AM-8:15 AM
Peak	PM:	3:00 PM-4:00 PM

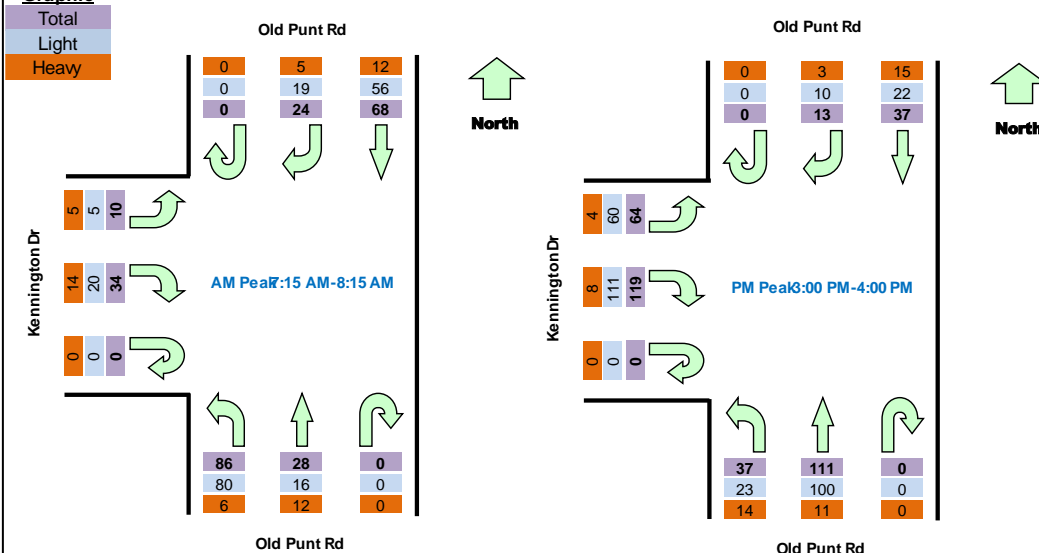
All Vehicles

Time		North Approach Old Punt Rd			South Approach Old Punt Rd			West Approach Kennington			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
7:00	7:15	0	5	17	0	11	17	0	7	1	247	
7:15	7:30	0	7	17	0	7	31	0	11	2	250	Peak
7:30	7:45	0	4	14	0	5	20	0	7	5	218	
7:45	8:00	0	9	18	0	5	17	0	7	3	211	
8:00	8:15	0	4	19	0	11	18	0	9	0	212	
8:15	8:30	0	3	12	0	10	12	0	4	2		
8:30	8:45	0	8	13	0	13	8	0	3	3		
8:45	9:00	0	3	14	0	14	20	0	4	5		
15:00	15:15	0	3	13	0	33	12	0	36	12	381	Peak
15:15	15:30	0	5	9	0	28	9	0	29	21	377	
15:30	15:45	0	1	8	0	34	11	0	32	23	334	
15:45	16:00	0	4	7	0	16	5	0	22	8	296	
16:00	16:15	1	2	10	0	36	4	0	33	19	271	
16:15	16:30	0	1	6	0	20	3	0	24	4	214	
16:30	16:45	0	0	9	0	27	6	0	21	8	192	
16:45	17:00	0	2	10	0	12	1	0	10	2	152	
17:00	17:15	0	4	4	0	10	5	0	16	9	143	
17:15	17:30	0	3	9	0	10	4	0	6	4		
17:30	17:45	1	0	5	0	10	1	0	10	4		
17:45	18:00	0	0	7	0	10	2	0	2	7		

Peak Time		North Approach Old Punt Rd			South Approach Old Punt Rd			West Approach Kennington			Peak total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	
7:15	8:15	0	24	68	0	28	86	0	34	10	250
15:00	16:00	0	13	37	0	111	37	0	119	64	381

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

Graphic



TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY



trafficsurvey.com.au



Intersection of Pacific Hwy and Old Punt Rd, Tomago

GPS -32.80927, 151.71054

Date:	Tue 16/02/21
Weather:	Overcast
Suburban:	Tomago
Customer:	McLaren

North:	N/A
East:	Pacific Hwy
South:	Old Punt Rd
West:	Pacific Hwy

Survey	AM:	7:00 AM-9:00 AM
Period	PM:	3:00 PM-6:00 PM
Traffic	AM:	7:30 AM-8:30 AM
Peak	PM:	3:30 PM-4:30 PM

All Vehicles

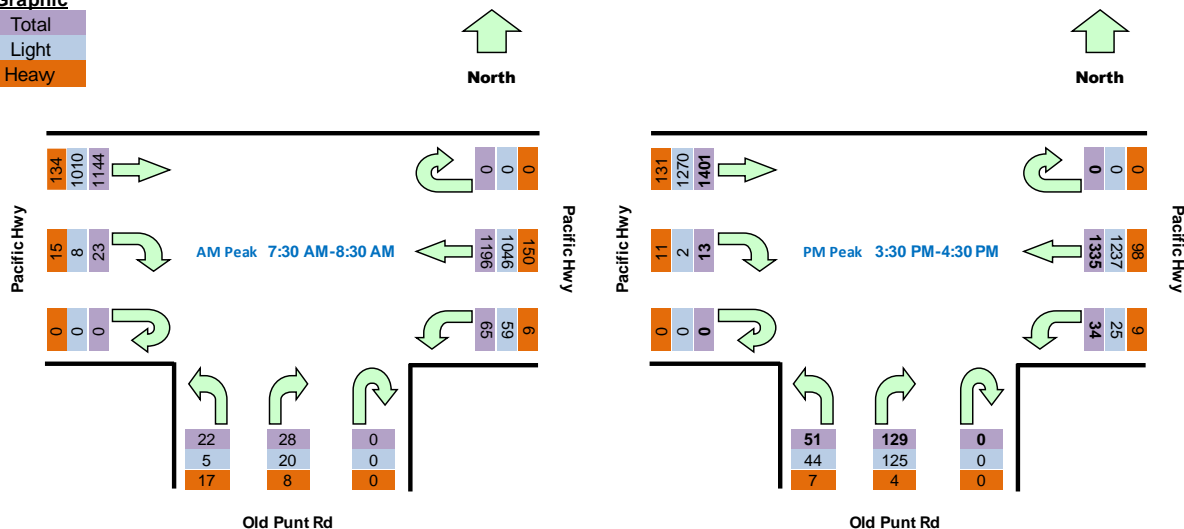
Time		East Approach Pacific Hwy			South Approach Old Punt Rd			West Approach Pacific Hwy			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
7:00	7:15	0	238	19	0	6	5	0	7	234	2357	
7:15	7:30	0	280	22	0	7	6	0	1	257	2431	
7:30	7:45	0	309	18	0	7	8	0	3	316	2478	Peak
7:45	8:00	0	331	22	0	6	4	0	6	245	2432	
8:00	8:15	0	280	10	0	8	4	0	9	272	2428	
8:15	8:30	0	276	15	0	7	6	0	5	311		
8:30	8:45	0	272	17	0	15	3	0	9	299		
8:45	9:00	0	259	14	0	16	4	0	7	310		
15:00	15:15	0	319	14	0	35	6	1	1	312	2881	
15:15	15:30	0	324	10	0	34	14	0	4	326	2944	
15:30	15:45	0	344	6	0	43	20	0	6	355	2963	Peak
15:45	16:00	0	338	10	0	22	6	0	1	330	2898	
16:00	16:15	0	314	12	0	38	16	0	2	369	2826	
16:15	16:30	0	339	6	0	26	9	0	4	347	2725	
16:30	16:45	0	323	8	0	30	8	0	4	336	2621	
16:45	17:00	0	304	8	0	19	4	0	2	298	2485	
17:00	17:15	0	303	5	0	16	11	0	6	309	2366	
17:15	17:30	0	297	11	0	16	3	0	1	299		
17:30	17:45	0	252	5	0	13	1	0	4	298		
17:45	18:00	0	208	4	0	10	7	0	6	281		

Peak Time		East Approach Pacific Hwy			South Approach Old Punt Rd			West Approach Pacific Hwy			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
7:30	8:30	0	1196	65	0	28	22	0	23	1144	2478
15:30	16:30	0	1335	34	0	129	51	0	13	1401	2963

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

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au



Intersection of Pacific Hwy and Tomago Rd, Tomago

GPS -32.81653, 151.69636

Date:	Tue 16/02/21
Weather:	Overcast
Suburban:	Tomago
Customer:	McLaren

North:	N/A
East:	Pacific Hwy
South:	Tomago Rd
West:	Pacific Hwy

Survey	AM:	7:00 AM-9:00 AM
Period	PM:	3:00 PM-6:00 PM
Traffic	AM:	7:30 AM-8:30 AM
Peak	PM:	3:30 PM-4:30 PM

All Vehicles

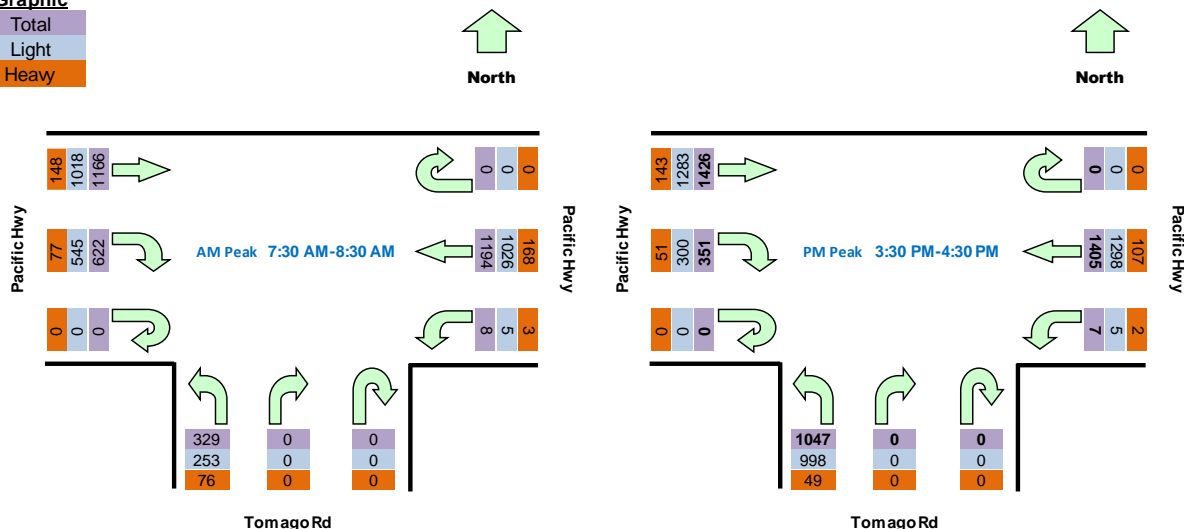
Time		East Approach Pacific Hwy			South Approach Tomago Rd			West Approach Pacific Hwy			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
7:00	7:15	0	237	2	0	0	80	0	200	240	3284	
7:15	7:30	0	293	2	0	0	76	0	188	265	3310	
7:30	7:45	0	300	3	0	0	94	0	171	313	3319	Peak
7:45	8:00	0	334	0	0	0	73	0	162	251	3238	
8:00	8:15	0	288	3	0	0	74	0	144	276	3196	
8:15	8:30	0	272	2	0	0	88	0	145	326		
8:30	8:45	0	295	4	0	0	76	0	129	296		
8:45	9:00	0	256	1	0	0	73	0	122	326		
15:00	15:15	0	329	3	0	0	219	0	74	326	4051	
15:15	15:30	0	325	2	0	0	291	1	107	318	4181	
15:30	15:45	0	329	2	0	0	260	0	96	371	4236	Peak
15:45	16:00	0	381	4	0	0	210	0	81	322	4177	
16:00	16:15	0	320	1	0	0	289	0	90	381	4105	
16:15	16:30	0	375	0	0	0	288	0	84	352	3888	
16:30	16:45	0	305	1	0	0	261	0	82	350	3608	
16:45	17:00	0	324	0	0	0	234	0	74	294	3415	
17:00	17:15	0	296	3	0	0	161	0	87	317	3128	
17:15	17:30	0	315	0	0	0	113	0	97	294		
17:30	17:45	0	257	1	0	0	159	0	78	311		
17:45	18:00	0	208	0	0	0	96	0	56	279		

Peak Time		East Approach Pacific Hwy			South Approach Tomago Rd			West Approach Pacific Hwy			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
7:30	8:30	0	1194	8	0	0	329	0	622	1166	3319
15:30	16:30	0	1405	7	0	0	1047	0	351	1426	4236

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

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY



trafficsurvey.com.au



Intersection of Old Punt Rd and Tomago Rd, Tomago

GPS -32.82191, 151.70058

Date:	Tue 16/02/21
Weather:	Overcast
Suburban:	Tomago
Customer:	McLaren

North:	Tomago Rd
East:	Old Punt Rd
South:	Tomago Rd
West:	Old Punt Rd

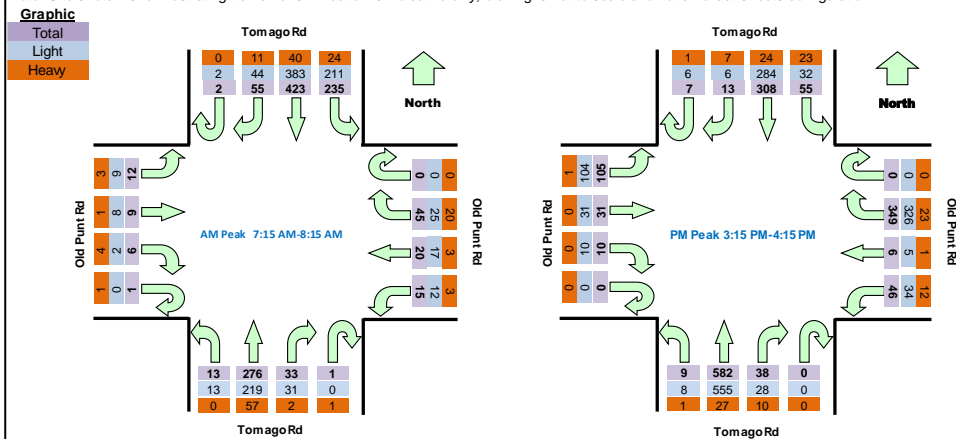
Survey	AM:	7:00 AM-9:00 AM
Period	PM:	3:00 PM-6:00 PM
Traffic	AM:	7:15 AM-8:15 AM
Peak	PM:	3:15 PM-4:15 PM

All Vehicles

Time		North Approach Tomago Rd				East Approach Old Punt Rd				South Approach Tomago Rd				West Approach Old Punt Rd				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	1	14	106	53	0	11	4	4	0	4	72	4	0	1	1	2	1135	
7:15	7:30	0	21	119	56	0	10	6	0	0	6	79	7	0	1	2	2	1146	Peak
7:30	7:45	1	7	107	62	0	12	7	6	0	8	71	0	0	0	1	2	1112	
7:45	8:00	1	12	94	60	0	9	3	7	1	8	59	3	0	3	2	3	1060	
8:00	8:15	0	15	103	57	0	14	4	2	0	11	67	3	1	2	4	5	1031	
8:15	8:30	2	12	96	44	1	20	1	6	0	11	65	2	1	3	5	6		
8:30	8:45	1	13	85	34	0	11	3	11	0	3	56	0	0	1	6	8		
8:45	9:00	2	9	90	38	0	7	6	8	0	7	53	4	0	1	6	5		
15:00	15:15	1	5	64	19	2	89	2	18	0	12	139	2	0	2	5	20	1531	
15:15	15:30	2	4	78	15	0	83	2	12	0	11	159	1	0	2	8	21	1559	Peak
15:30	15:45	1	5	90	17	0	101	2	20	0	9	149	4	0	1	7	23	1539	
15:45	16:00	4	0	68	11	0	68	1	4	0	8	133	4	0	5	7	11	1496	
16:00	16:15	0	4	72	12	0	97	1	10	0	10	141	0	0	2	9	50	1459	
16:15	16:30	1	3	74	9	0	69	0	14	0	4	193	0	0	0	1	10	1318	
16:30	16:45	2	1	73	7	0	78	0	10	0	8	194	0	0	1	4	8	1180	
16:45	17:00	0	3	73	3	0	45	0	9	0	3	136	0	0	2	4	9	1033	
17:00	17:15	1	0	77	9	0	43	1	7	0	3	113	1	0	2	1	9	924	
17:15	17:30	2	1	98	6	0	31	0	11	0	5	74	0	0	0	2	10		
17:30	17:45	2	0	73	4	0	36	0	4	0	6	88	0	0	0	2	24		
17:45	18:00	0	1	47	11	0	22	1	6	0	9	81	0	0	0	0	0		

Peak Time		North Approach Tomago Rd				East Approach Old Punt Rd				South Approach Tomago Rd				West Approach Old Punt Rd				Peak total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L		
7:15	8:15	2	55	423	235	0	45	20	15	1	33	276	13	1	6	9	12	1146	
15:15	16:15	7	13	308	55	0	349	6	46	0	38	582	9	0	10	31	105	1559	

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





**ANNEXURE D: SIDRA RESULTS
(20 SHEETS)**

MOVEMENT SUMMARY

▼ Site: 101 [Old Punt Rd / Kennington Dr - EX AM (Site Folder: Existing)]

Old Punt Road / Kennington Drive
Existing conditions
AM peak period
Site Category: (None)
Give-Way (Two-Way)

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: Old Punt Rd (S)														
1	L2	86	6	91	7.0	0.070	5.6	LOS A	0.0	0.0	0.00	0.44	0.00	54.0
2	T1	28	12	29	42.9	0.070	0.0	LOS A	0.0	0.0	0.00	0.44	0.00	55.7
Approach		114	18	120	15.8	0.070	4.3	NA	0.0	0.0	0.00	0.44	0.00	54.4
North: Old Punt Rd (N)														
8	T1	68	12	72	17.6	0.059	0.2	LOS A	0.2	1.4	0.14	0.15	0.14	58.1
9	R2	24	5	25	20.8	0.059	6.2	LOS A	0.2	1.4	0.14	0.15	0.14	51.6
Approach		92	17	97	18.5	0.059	1.8	NA	0.2	1.4	0.14	0.15	0.14	56.3
West: Kennington Dr (W)														
10	L2	10	5	11	50.0	0.049	5.2	LOS A	0.2	1.6	0.17	0.54	0.17	47.5
12	R2	34	14	36	41.2	0.049	5.9	LOS A	0.2	1.6	0.17	0.54	0.17	47.4
Approach		44	19	46	43.2	0.049	5.7	LOS A	0.2	1.6	0.17	0.54	0.17	47.4
All Vehicles		250	54	263	21.6	0.070	3.6	NA	0.2	1.6	0.08	0.35	0.08	53.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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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Project: \\192.168.1.107\mte storage\Jobs\2020\200931\MTE SIDRA\Tomago.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Old Punt Rd / Kennington Dr - EX PM (Site Folder: Existing)]

Old Punt Road / Kennington Drive
Existing conditions
PM peak period
Site Category: (None)
Give-Way (Two-Way)

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: Old Punt Rd (S)														
1	L2	37	14	39	37.8	0.090	6.0	LOS A	0.0	0.0	0.00	0.15	0.00	55.6
2	T1	111	11	117	9.9	0.090	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	59.0
Approach		148	25	156	16.9	0.090	1.5	NA	0.0	0.0	0.00	0.15	0.00	58.1
North: Old Punt Rd (N)														
8	T1	37	15	39	40.5	0.035	0.2	LOS A	0.1	0.8	0.16	0.16	0.16	57.7
9	R2	13	3	14	23.1	0.035	6.4	LOS A	0.1	0.8	0.16	0.16	0.16	51.3
Approach		50	18	53	36.0	0.035	1.8	NA	0.1	0.8	0.16	0.16	0.16	55.9
West: Kennington Dr (W)														
10	L2	64	4	67	6.3	0.168	5.1	LOS A	0.6	4.7	0.27	0.56	0.27	48.9
12	R2	119	8	125	6.7	0.168	5.5	LOS A	0.6	4.7	0.27	0.56	0.27	48.5
Approach		183	12	193	6.6	0.168	5.4	LOS A	0.6	4.7	0.27	0.56	0.27	48.7
All Vehicles		381	55	401	14.4	0.168	3.4	NA	0.6	4.7	0.15	0.35	0.15	52.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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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MOVEMENT SUMMARY

 **Site: 101 [Old Punt Rd / Tomago Rd - EX AM (Site Folder: Existing)]**

Old Punt Road / Tomago Road
Existing conditions
AM peak period
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: Old Punt Rd (S)														
1	L2	12	3	13	25.0	0.039	6.3	LOS A	0.2	1.5	0.50	0.59	0.50	53.2
2	T1	9	1	9	11.1	0.039	5.5	LOS A	0.2	1.5	0.50	0.59	0.50	55.2
3	R2	6	4	6	66.7	0.039	13.0	LOS B	0.2	1.5	0.50	0.59	0.50	53.3
3u	U	1	1	1	100.0	0.039	16.6	LOS C	0.2	1.5	0.50	0.59	0.50	53.5
Approach		28	9	29	32.1	0.039	7.9	LOS A	0.2	1.5	0.50	0.59	0.50	53.8
East: Tomago Rd (E)														
4	L2	13	0	14	0.0	0.086	4.3	LOS A	0.5	3.8	0.35	0.42	0.35	54.8
5	T1	276	57	291	20.7	0.169	4.5	LOS A	1.0	8.4	0.34	0.44	0.34	55.8
6	R2	33	2	35	6.1	0.169	9.8	LOS A	1.0	8.4	0.34	0.44	0.34	56.1
6u	U	1	1	1	100.0	0.169	13.7	LOS B	1.0	8.4	0.34	0.44	0.34	54.2
Approach		323	60	340	18.6	0.169	5.1	LOS A	1.0	8.4	0.34	0.44	0.34	55.8
North: Old Punt Rd (N)														
7	L2	15	3	16	20.0	0.126	8.0	LOS A	0.6	5.7	0.61	0.72	0.61	51.2
8	T1	20	3	21	15.0	0.126	7.1	LOS A	0.6	5.7	0.61	0.72	0.61	52.9
9	R2	45	20	47	44.4	0.126	13.9	LOS B	0.6	5.7	0.61	0.72	0.61	52.0
9u	U	1	0	1	0.0	0.126	14.6	LOS B	0.6	5.7	0.61	0.72	0.61	54.8
Approach		81	26	85	32.1	0.126	11.1	LOS B	0.6	5.7	0.61	0.72	0.61	52.1
West: Tomago Rd (W)														
10	L2	235	24	247	10.2	0.183	4.0	LOS A	1.1	8.3	0.22	0.42	0.22	55.4
11	T1	423	40	445	9.5	0.296	3.8	LOS A	2.0	15.4	0.22	0.39	0.22	56.7
12	R2	55	11	58	20.0	0.296	9.7	LOS A	2.0	15.4	0.22	0.39	0.22	56.5
12u	U	2	0	2	0.0	0.296	11.8	LOS B	2.0	15.4	0.22	0.39	0.22	58.8
Approach		715	75	753	10.5	0.296	4.4	LOS A	2.0	15.4	0.22	0.40	0.22	56.3
All Vehicles		1147	170	1207	14.8	0.296	5.1	LOS A	2.0	15.4	0.29	0.44	0.29	55.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
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.

MOVEMENT SUMMARY

 **Site: 101 [Old Punt Rd / Tomago Rd - EX PM (Site Folder: Existing)]**

Old Punt Road / Tomago Road
Existing conditions
PM peak period
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: Old Punt Rd (S)														
1	L2	105	1	111	1.0	0.265	12.0	LOS B	1.5	10.3	0.79	0.88	0.79	51.9
2	T1	31	0	33	0.0	0.265	9.2	LOS A	1.5	10.3	0.79	0.88	0.79	53.4
3	R2	10	0	11	0.0	0.265	14.9	LOS B	1.5	10.3	0.79	0.88	0.79	53.8
3u	U	1	0	1	0.0	0.265	17.3	LOS C	1.5	10.3	0.79	0.88	0.79	55.2
Approach		147	1	155	0.7	0.265	11.7	LOS B	1.5	10.3	0.79	0.88	0.79	52.3
East: Tomago Rd (E)														
4	L2	9	1	9	11.1	0.195	6.3	LOS A	1.2	9.0	0.62	0.59	0.62	53.1
5	T1	582	27	613	4.6	0.383	6.5	LOS A	3.0	22.3	0.66	0.57	0.66	54.7
6	R2	38	10	40	26.3	0.383	11.8	LOS B	3.0	22.3	0.68	0.57	0.68	54.0
6u	U	1	0	1	0.0	0.383	13.5	LOS B	3.0	22.3	0.68	0.57	0.68	56.4
Approach		630	38	663	6.0	0.383	6.8	LOS A	3.0	22.3	0.66	0.57	0.66	54.6
North: Old Punt Rd (N)														
7	L2	46	12	48	26.1	0.463	7.3	LOS A	2.9	21.8	0.63	0.77	0.64	50.3
8	T1	6	1	6	16.7	0.463	6.6	LOS A	2.9	21.8	0.63	0.77	0.64	52.0
9	R2	349	23	367	6.6	0.463	11.9	LOS B	2.9	21.8	0.63	0.77	0.64	52.4
9u	U	1	0	1	0.0	0.463	14.1	LOS B	2.9	21.8	0.63	0.77	0.64	53.9
Approach		402	36	423	9.0	0.463	11.3	LOS B	2.9	21.8	0.63	0.77	0.64	52.1
West: Tomago Rd (W)														
10	L2	55	23	58	41.8	0.092	4.6	LOS A	0.5	4.4	0.28	0.41	0.28	54.2
11	T1	308	24	324	7.8	0.181	4.0	LOS A	1.1	8.7	0.27	0.39	0.27	56.7
12	R2	13	7	14	53.8	0.181	10.2	LOS B	1.1	8.7	0.26	0.39	0.26	55.2
12u	U	7	1	7	14.3	0.181	12.1	LOS B	1.1	8.7	0.26	0.39	0.26	58.2
Approach		383	55	403	14.4	0.181	4.4	LOS A	1.1	8.7	0.27	0.39	0.27	56.3
All Vehicles		1562	130	1644	8.3	0.463	7.9	LOS A	3.0	22.3	0.57	0.61	0.57	54.1

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

Roundabout LOS Method: Same as Sign Control.

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.

MOVEMENT SUMMARY

 **Site: 101 [Pacific Hwy / Tomago Rd - EX AM (Site Folder: Existing)]**

Pacific Highway / Tomago Road

Existing Conditions

AM peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Tomago Rd (S)														
1	L2	329	76	346	23.1	0.320	28.1	LOS B	5.5	46.3	0.76	0.76	0.76	40.5
Approach		329	76	346	23.1	0.320	28.1	LOS B	5.5	46.3	0.76	0.76	0.76	40.5
East: Pacific Hwy (E)														
4	L2	8	3	8	37.5	0.012	21.7	LOS B	0.2	1.8	0.54	0.67	0.54	47.5
5	T1	1194	168	1257	14.1	* 0.703	18.7	LOS B	21.3	166.9	0.83	0.75	0.83	56.8
Approach		1202	171	1265	14.2	0.703	18.7	LOS B	21.3	166.9	0.83	0.75	0.83	56.7
West: Pacific Hwy (W)														
11	T1	1164	148	1225	12.7	0.403	0.9	LOS A	3.7	28.5	0.25	0.18	0.25	77.8
12	R2	622	77	655	12.4	* 0.685	32.5	LOS C	15.9	122.8	0.86	0.83	0.86	41.8
Approach		1786	225	1880	12.6	0.685	11.9	LOS A	15.9	122.8	0.47	0.41	0.47	59.8
All Vehicles		3317	472	3492	14.2	0.703	16.0	LOS B	21.3	166.9	0.63	0.57	0.63	56.1

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.

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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Tomago Rd (S)												
P1	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	202.0	211.5	1.05
P1B	Slip/ Bypass	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	199.0	207.6	1.04
East: Pacific Hwy (E)												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	213.5	226.5	1.06
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	204.8	215.2	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: 101 [Pacific Hwy / Tomago Rd - EX PM (Site Folder: Existing)]**

Pacific Highway / Tomago Road

Existing Conditions

PM peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Tomago Rd (S)														
1	L2	1047	49	1102	4.7	* 0.867	42.9	LOS D	26.8	195.2	0.99	0.99	1.20	36.6
Approach		1047	49	1102	4.7	0.867	42.9	LOS D	26.8	195.2	0.99	0.99	1.20	36.6
East: Pacific Hwy (E)														
4	L2	7	2	7	28.6	0.011	22.7	LOS B	0.2	1.5	0.58	0.66	0.58	46.8
5	T1	1405	107	1479	7.6	* 0.853	29.6	LOS C	32.9	245.1	0.96	0.95	1.08	48.6
Approach		1412	109	1486	7.7	0.853	29.6	LOS C	32.9	245.1	0.95	0.95	1.08	48.6
West: Pacific Hwy (W)														
11	T1	1426	143	1501	10.0	0.485	1.0	LOS A	5.0	38.2	0.28	0.20	0.28	77.5
12	R2	351	51	369	14.5	0.360	27.3	LOS B	7.4	58.0	0.72	0.78	0.72	44.3
Approach		1777	194	1871	10.9	0.485	6.2	LOS A	7.4	58.0	0.37	0.31	0.37	67.5
All Vehicles		4236	352	4459	8.3	0.867	23.1	LOS B	32.9	245.1	0.72	0.69	0.81	50.4

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.

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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Tomago Rd (S)												
P1	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	202.0	211.5	1.05
P1B	Slip/ Bypass	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	199.0	207.6	1.04
East: Pacific Hwy (E)												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	213.5	226.5	1.06
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	204.8	215.2	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

 **Site: 101 [Pacific Hwy / Old Punt Rd - EX AM (Site Folder: Existing)]**

Pacific Highway / Old Punt Road

Existing conditions

AM Peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Old Punt Rd (S)														
1	L2	22	17	23	77.3	0.019	7.8	LOS A	0.0	0.0	0.00	0.49	0.00	52.3
3	R2	28	8	29	28.6	0.382	71.7	LOS F	1.8	15.8	1.00	0.72	1.00	27.1
Approach		50	25	53	50.0	0.382	43.6	LOS D	1.8	15.8	0.56	0.62	0.56	34.5
East: Pacific Hwy (E)														
4	L2	65	6	68	9.2	* 0.056	10.2	LOS A	0.7	5.1	0.33	0.68	0.33	55.8
5	T1	1196	150	1259	12.5	* 0.538	11.9	LOS A	19.5	151.3	0.58	0.53	0.58	63.4
Approach		1261	156	1327	12.4	0.538	11.9	LOS A	19.5	151.3	0.57	0.54	0.57	63.0
West: Pacific Hwy (W)														
11	T1	1144	134	1204	11.7	0.332	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.7
12	R2	23	15	24	65.2	* 0.191	50.6	LOS D	1.2	13.0	0.95	0.72	0.95	34.0
Approach		1167	149	1228	12.8	0.332	1.1	LOS A	1.2	13.0	0.02	0.01	0.02	77.7
All Vehicles		2478	330	2608	13.3	0.538	7.4	LOS A	19.5	151.3	0.31	0.29	0.31	67.9

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.

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.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

 **Site: 101 [Pacific Hwy / Old Punt Rd - EX PM (Site Folder: Existing)]**

Pacific Highway / Old Punt Road

Existing conditions

PM Peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Old Punt Rd (S)														
1	L2	51	7	54	13.7	0.032	7.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.4
3	R2	129	4	136	3.1	* 0.685	61.7	LOS E	7.5	53.6	1.00	0.83	1.09	31.2
Approach		180	11	189	6.1	0.685	46.4	LOS D	7.5	53.6	0.72	0.75	0.78	35.5
East: Pacific Hwy (E)														
4	L2	34	9	36	26.5	0.034	10.7	LOS A	0.3	2.9	0.35	0.67	0.35	54.9
5	T1	1335	98	1405	7.3	* 0.675	17.9	LOS B	26.4	196.7	0.76	0.69	0.76	57.4
Approach		1369	107	1441	7.8	0.675	17.7	LOS B	26.4	196.7	0.75	0.69	0.75	57.4
West: Pacific Hwy (W)														
11	T1	1401	131	1475	9.4	0.401	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.7
12	R2	13	11	14	84.6	* 0.108	41.5	LOS C	0.6	6.6	0.93	0.69	0.93	36.9
Approach		1414	142	1488	10.0	0.401	0.5	LOS A	0.6	6.6	0.01	0.01	0.01	78.8
All Vehicles		2963	260	3119	8.8	0.685	11.2	LOS A	26.4	196.7	0.39	0.37	0.40	63.2

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.

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.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

Site: 101 [Old Punt Rd / Kennington Dr - FUT AM (Site Folder: Future)]

Old Punt Road / Kennington Drive
 Future conditions
 AM peak period
 Site Category: (None)
 Give-Way (Two-Way)

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: Old Punt Rd (S)														
1	L2	93	13	98	14.0	0.077	5.7	LOS A	0.0	0.0	0.00	0.45	0.00	53.7
2	T1	28	12	29	42.9	0.077	0.0	LOS A	0.0	0.0	0.00	0.45	0.00	55.7
Approach		121	25	127	20.7	0.077	4.4	NA	0.0	0.0	0.00	0.45	0.00	54.2
North: Old Punt Rd (N)														
8	T1	68	12	72	17.6	0.065	0.3	LOS A	0.2	1.8	0.17	0.17	0.17	58.0
9	R2	28	9	29	32.1	0.065	6.4	LOS A	0.2	1.8	0.17	0.17	0.17	51.3
Approach		96	21	101	21.9	0.065	2.1	NA	0.2	1.8	0.17	0.17	0.17	55.9
West: Kennington Dr (W)														
10	L2	14	9	15	64.3	0.065	5.3	LOS A	0.2	2.3	0.17	0.55	0.17	47.0
12	R2	41	21	43	51.2	0.065	6.2	LOS A	0.2	2.3	0.17	0.55	0.17	47.0
Approach		55	30	58	54.5	0.065	6.0	LOS A	0.2	2.3	0.17	0.55	0.17	47.0
All Vehicles		272	76	286	27.9	0.077	3.9	NA	0.2	2.3	0.09	0.37	0.09	53.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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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MOVEMENT SUMMARY

Site: 101 [Old Punt Rd / Kennington Dr - FUT PM (Site Folder: Future)]

Old Punt Road / Kennington Drive
 Future conditions
 PM peak period
 Site Category: (None)
 Give-Way (Two-Way)

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: Old Punt Rd (S)														
1	L2	44	21	46	47.7	0.097	6.1	LOS A	0.0	0.0	0.00	0.16	0.00	55.1
2	T1	111	11	117	9.9	0.097	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	58.9
Approach		155	32	163	20.6	0.097	1.8	NA	0.0	0.0	0.00	0.16	0.00	57.8
North: Old Punt Rd (N)														
8	T1	37	15	39	40.5	0.040	0.4	LOS A	0.1	1.3	0.20	0.18	0.20	57.6
9	R2	17	7	18	41.2	0.040	6.8	LOS A	0.1	1.3	0.20	0.18	0.20	50.8
Approach		54	22	57	40.7	0.040	2.4	NA	0.1	1.3	0.20	0.18	0.20	55.2
West: Kennington Dr (W)														
10	L2	68	8	72	11.8	0.185	5.1	LOS A	0.7	5.5	0.28	0.57	0.28	48.7
12	R2	126	15	133	11.9	0.185	5.7	LOS A	0.7	5.5	0.28	0.57	0.28	48.3
Approach		194	23	204	11.9	0.185	5.5	LOS A	0.7	5.5	0.28	0.57	0.28	48.4
All Vehicles		403	77	424	19.1	0.185	3.7	NA	0.7	5.5	0.16	0.36	0.16	52.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 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.

MOVEMENT SUMMARY

 **Site: 101 [Old Punt Rd / Tomago Rd - FUT AM (Site Folder: Future)]**

Old Punt Road / Tomago Road
 Future conditions
 AM peak period
 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: Old Punt Rd (S)														
1	L2	12	3	13	25.0	0.039	6.4	LOS A	0.2	1.5	0.51	0.59	0.51	53.1
2	T1	9	1	9	11.1	0.039	5.6	LOS A	0.2	1.5	0.51	0.59	0.51	55.1
3	R2	6	4	6	66.7	0.039	13.1	LOS B	0.2	1.5	0.51	0.59	0.51	53.3
3u	U	1	1	1	100.0	0.039	16.7	LOS C	0.2	1.5	0.51	0.59	0.51	53.5
Approach		28	9	29	32.1	0.039	7.9	LOS A	0.2	1.5	0.51	0.59	0.51	53.8
East: Tomago Rd (E)														
4	L2	13	0	14	0.0	0.087	4.4	LOS A	0.5	3.9	0.37	0.42	0.37	54.7
5	T1	276	57	291	20.7	0.171	4.6	LOS A	1.0	8.5	0.36	0.44	0.36	55.7
6	R2	33	2	35	6.1	0.171	9.9	LOS A	1.0	8.5	0.36	0.45	0.36	56.1
6u	U	1	1	1	100.0	0.171	13.8	LOS B	1.0	8.5	0.36	0.45	0.36	54.1
Approach		323	60	340	18.6	0.171	5.1	LOS A	1.0	8.5	0.36	0.44	0.36	55.7
North: Old Punt Rd (N)														
7	L2	15	3	16	20.0	0.141	8.0	LOS A	0.7	6.6	0.62	0.73	0.62	51.1
8	T1	20	3	21	15.0	0.141	7.1	LOS A	0.7	6.6	0.62	0.73	0.62	52.8
9	R2	52	27	55	51.9	0.141	14.3	LOS B	0.7	6.6	0.62	0.73	0.62	51.6
9u	U	1	0	1	0.0	0.141	14.7	LOS B	0.7	6.6	0.62	0.73	0.62	54.7
Approach		88	33	93	37.5	0.141	11.6	LOS B	0.7	6.6	0.62	0.73	0.62	51.8
West: Tomago Rd (W)														
10	L2	242	31	255	12.8	0.190	4.0	LOS A	1.1	8.9	0.22	0.42	0.22	55.3
11	T1	423	40	445	9.5	0.296	3.8	LOS A	2.0	15.4	0.22	0.39	0.22	56.7
12	R2	55	11	58	20.0	0.296	9.7	LOS A	2.0	15.4	0.22	0.39	0.22	56.5
12u	U	2	0	2	0.0	0.296	11.8	LOS B	2.0	15.4	0.22	0.39	0.22	58.8
Approach		722	82	760	11.4	0.296	4.4	LOS A	2.0	15.4	0.22	0.40	0.22	56.2
All Vehicles		1161	184	1222	15.8	0.296	5.2	LOS A	2.0	15.4	0.30	0.44	0.30	55.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.
 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.

MOVEMENT SUMMARY

 **Site: 101 [Old Punt Rd / Tomago Rd - FUT PM (Site Folder: Future)]**

Old Punt Road / Tomago Road
 Future conditions
 PM peak period
 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: Old Punt Rd (S)														
1	L2	105	1	111	1.0	0.267	12.2	LOS B	1.5	10.4	0.79	0.88	0.79	51.8
2	T1	31	0	33	0.0	0.267	9.3	LOS A	1.5	10.4	0.79	0.88	0.79	53.4
3	R2	10	0	11	0.0	0.267	15.0	LOS B	1.5	10.4	0.79	0.88	0.79	53.7
3u	U	1	0	1	0.0	0.267	17.4	LOS C	1.5	10.4	0.79	0.88	0.79	55.1
Approach		147	1	155	0.7	0.267	11.8	LOS B	1.5	10.4	0.79	0.88	0.79	52.3
East: Tomago Rd (E)														
4	L2	9	1	9	11.1	0.197	6.4	LOS A	1.3	9.2	0.63	0.60	0.63	53.1
5	T1	582	27	613	4.6	0.387	6.6	LOS A	3.1	22.7	0.67	0.58	0.67	54.6
6	R2	38	10	40	26.3	0.387	11.9	LOS B	3.1	22.7	0.69	0.57	0.69	54.0
6u	U	1	0	1	0.0	0.387	13.6	LOS B	3.1	22.7	0.69	0.57	0.69	56.4
Approach		630	38	663	6.0	0.387	6.9	LOS A	3.1	22.7	0.67	0.58	0.67	54.6
North: Old Punt Rd (N)														
7	L2	46	12	48	26.1	0.476	7.5	LOS A	3.1	23.4	0.64	0.78	0.66	50.3
8	T1	6	1	6	16.7	0.476	6.7	LOS A	3.1	23.4	0.64	0.78	0.66	52.0
9	R2	356	30	375	8.4	0.476	12.1	LOS B	3.1	23.4	0.64	0.78	0.66	52.3
9u	U	1	0	1	0.0	0.476	14.2	LOS B	3.1	23.4	0.64	0.78	0.66	53.9
Approach		409	43	431	10.5	0.476	11.5	LOS B	3.1	23.4	0.64	0.78	0.66	52.1
West: Tomago Rd (W)														
10	L2	62	30	65	48.4	0.095	4.7	LOS A	0.5	4.8	0.29	0.42	0.29	54.0
11	T1	308	24	324	7.8	0.186	4.0	LOS A	1.2	9.0	0.27	0.39	0.27	56.7
12	R2	13	7	14	53.8	0.186	10.2	LOS B	1.2	9.0	0.26	0.39	0.26	55.2
12u	U	7	1	7	14.3	0.186	12.1	LOS B	1.2	9.0	0.26	0.39	0.26	58.2
Approach		390	62	411	15.9	0.186	4.5	LOS A	1.2	9.0	0.27	0.40	0.27	56.2
All Vehicles		1576	144	1659	9.1	0.476	8.0	LOS A	3.1	23.4	0.58	0.61	0.58	54.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Sign Control.
 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.

MOVEMENT SUMMARY

 **Site: 101 [Pacific Hwy / Tomago Rd - FUT AM (Site Folder: Future)]**

Pacific Highway / Tomago Road

Future Conditions

AM peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Tomago Rd (S)														
1	L2	336	83	354	24.7	0.329	28.2	LOS B	5.7	48.0	0.76	0.77	0.76	40.3
Approach		336	83	354	24.7	0.329	28.2	LOS B	5.7	48.0	0.76	0.77	0.76	40.3
East: Pacific Hwy (E)														
4	L2	8	3	8	37.5	0.012	21.7	LOS B	0.2	1.8	0.54	0.67	0.54	47.5
5	T1	1194	168	1257	14.1	* 0.703	18.7	LOS B	21.3	166.9	0.83	0.75	0.83	56.8
Approach		1202	171	1265	14.2	0.703	18.7	LOS B	21.3	166.9	0.83	0.75	0.83	56.7
West: Pacific Hwy (W)														
11	T1	1164	148	1225	12.7	0.403	0.9	LOS A	3.7	28.5	0.25	0.18	0.25	77.8
12	R2	629	84	662	13.4	* 0.697	32.8	LOS C	16.2	126.4	0.87	0.84	0.87	41.6
Approach		1793	232	1887	12.9	0.697	12.1	LOS A	16.2	126.4	0.47	0.41	0.47	59.6
All Vehicles		3331	486	3506	14.6	0.703	16.1	LOS B	21.3	166.9	0.63	0.57	0.63	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.

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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Tomago Rd (S)												
P1	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	202.0	211.5	1.05
P1B	Slip/ Bypass	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	199.0	207.6	1.04
East: Pacific Hwy (E)												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	213.5	226.5	1.06
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	204.8	215.2	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

 **Site: 101 [Pacific Hwy / Tomago Rd - FUT PM (Site Folder: Future)]**

Pacific Highway / Tomago Road

Future Conditions

PM peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Tomago Rd (S)														
1	L2	1054	56	1109	5.3	* 0.853	40.4	LOS C	26.1	191.0	0.98	0.97	1.15	37.4
Approach		1054	56	1109	5.3	0.853	40.4	LOS C	26.1	191.0	0.98	0.97	1.15	37.4
East: Pacific Hwy (E)														
4	L2	7	2	7	28.6	0.011	23.3	LOS B	0.2	1.6	0.59	0.67	0.59	46.4
5	T1	1405	107	1479	7.6	* 0.874	33.1	LOS C	34.8	259.7	0.98	0.99	1.14	46.4
Approach		1412	109	1486	7.7	0.874	33.1	LOS C	34.8	259.7	0.97	0.99	1.14	46.4
West: Pacific Hwy (W)														
11	T1	1426	143	1501	10.0	0.485	1.0	LOS A	5.0	38.1	0.28	0.20	0.28	77.5
12	R2	358	58	377	16.2	0.361	26.7	LOS B	7.4	59.0	0.71	0.78	0.71	44.6
Approach		1784	201	1878	11.3	0.485	6.2	LOS A	7.4	59.0	0.37	0.32	0.37	67.5
All Vehicles		4250	366	4474	8.6	0.874	23.6	LOS B	34.8	259.7	0.72	0.70	0.82	50.0

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.

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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Tomago Rd (S)												
P1	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	202.0	211.5	1.05
P1B	Slip/ Bypass	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	199.0	207.6	1.04
East: Pacific Hwy (E)												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	213.5	226.5	1.06
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	204.8	215.2	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: \\192.168.1.107\mte storage\Jobs\2020\200931\MTE SIDRA\Tomago.sip9

MOVEMENT SUMMARY

 **Site: 101 [Pacific Hwy / Old Punt Rd - FUT AM (Site Folder: Future)]**

Pacific Highway / Old Punt Road

Future conditions

AM Peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Old Punt Rd (S)														
1	L2	22	17	23	77.3	0.019	7.8	LOS A	0.0	0.0	0.00	0.49	0.00	52.3
3	R2	32	12	34	37.5	* 0.460	72.5	LOS F	2.1	19.4	1.00	0.73	1.00	26.4
Approach		54	29	57	53.7	0.460	46.2	LOS D	2.1	19.4	0.59	0.63	0.59	33.2
East: Pacific Hwy (E)														
4	L2	69	10	73	14.5	0.062	10.3	LOS A	0.7	5.7	0.33	0.68	0.33	55.6
5	T1	1196	150	1259	12.5	* 0.538	11.9	LOS A	19.5	151.4	0.58	0.53	0.58	63.4
Approach		1265	160	1332	12.6	0.538	11.9	LOS A	19.5	151.4	0.57	0.54	0.57	62.9
West: Pacific Hwy (W)														
11	T1	1144	134	1204	11.7	0.332	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.7
12	R2	23	15	24	65.2	* 0.191	50.6	LOS D	1.2	13.0	0.95	0.72	0.95	34.0
Approach		1167	149	1228	12.8	0.332	1.1	LOS A	1.2	13.0	0.02	0.01	0.02	77.7
All Vehicles		2486	338	2617	13.6	0.538	7.5	LOS A	19.5	151.4	0.31	0.29	0.31	67.6

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.

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.

* Critical Movement (Signal Timing)

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MOVEMENT SUMMARY

 **Site: 101 [Pacific Hwy / Old Punt Rd - FUT PM (Site Folder: Future)]**

Pacific Highway / Old Punt Road

Future conditions

PM Peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Old Punt Rd (S)														
1	L2	51	7	54	13.7	0.032	7.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.4
3	R2	133	8	140	6.0	* 0.674	65.3	LOS E	8.3	60.8	1.00	0.83	1.06	30.1
Approach		184	15	194	8.2	0.674	49.3	LOS D	8.3	60.8	0.72	0.74	0.77	34.4
East: Pacific Hwy (E)														
4	L2	38	13	40	34.2	0.038	10.6	LOS A	0.4	3.4	0.32	0.67	0.32	54.8
5	T1	1335	98	1405	7.3	* 0.653	17.7	LOS B	27.5	205.0	0.72	0.66	0.72	57.6
Approach		1373	111	1445	8.1	0.653	17.5	LOS B	27.5	205.0	0.71	0.66	0.71	57.5
West: Pacific Hwy (W)														
11	T1	1401	131	1475	9.4	0.401	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.7
12	R2	13	11	14	84.6	* 0.118	45.5	LOS D	0.6	7.4	0.94	0.69	0.94	35.5
Approach		1414	142	1488	10.0	0.401	0.5	LOS A	0.6	7.4	0.01	0.01	0.01	78.8
All Vehicles		2971	268	3127	9.0	0.674	11.4	LOS A	27.5	205.0	0.38	0.35	0.38	62.9

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.

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.

* Critical Movement (Signal Timing)

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**ANNEXURE E: COLAS IMPORT TRAFFIC GENERATION
(8 SHEETS)**

Date	Day	Daily inbound
1/03/2020	Sunday	0
2/03/2020	Monday	29
3/03/2020	Tuesday	8
4/03/2020	Wednesday	20
5/03/2020	Thursday	15
6/03/2020	Friday	1
7/03/2020	Saturday	0
8/03/2020	Sunday	0
9/03/2020	Monday	16
10/03/2020	Tuesday	5
11/03/2020	Wednesday	8
12/03/2020	Thursday	24
13/03/2020	Friday	10
14/03/2020	Saturday	0
15/03/2020	Sunday	0
16/03/2020	Monday	6
17/03/2020	Tuesday	4
18/03/2020	Wednesday	9
19/03/2020	Thursday	24
20/03/2020	Friday	24
21/03/2020	Saturday	17
22/03/2020	Sunday	2
23/03/2020	Monday	15
24/03/2020	Tuesday	27
25/03/2020	Wednesday	28
26/03/2020	Thursday	11
27/03/2020	Friday	18
28/03/2020	Saturday	0
29/03/2020	Sunday	0
30/03/2020	Monday	27
31/03/2020	Tuesday	8
1/04/2020	Wednesday	18
2/04/2020	Thursday	19
3/04/2020	Friday	39
4/04/2020	Saturday	1
5/04/2020	Sunday	0
6/04/2020	Monday	15
7/04/2020	Tuesday	35
8/04/2020	Wednesday	15
9/04/2020	Thursday	23
10/04/2020	Friday	0
11/04/2020	Saturday	0
12/04/2020	Sunday	0
13/04/2020	Monday	0
14/04/2020	Tuesday	19
15/04/2020	Wednesday	18

16/04/2020	Thursday	11
17/04/2020	Friday	16
18/04/2020	Saturday	5
19/04/2020	Sunday	0
20/04/2020	Monday	24
21/04/2020	Tuesday	29
22/04/2020	Wednesday	35
23/04/2020	Thursday	6
24/04/2020	Friday	21
25/04/2020	Saturday	0
26/04/2020	Sunday	0
27/04/2020	Monday	23
28/04/2020	Tuesday	15
29/04/2020	Wednesday	32
30/04/2020	Thursday	3
1/05/2020	Friday	13
2/05/2020	Saturday	0
3/05/2020	Sunday	0
4/05/2020	Monday	11
5/05/2020	Tuesday	3
6/05/2020	Wednesday	5
7/05/2020	Thursday	24
8/05/2020	Friday	12
9/05/2020	Saturday	0
10/05/2020	Sunday	1
11/05/2020	Monday	20
12/05/2020	Tuesday	14
13/05/2020	Wednesday	46
14/05/2020	Thursday	18
15/05/2020	Friday	1
16/05/2020	Saturday	1
17/05/2020	Sunday	1
18/05/2020	Monday	50
19/05/2020	Tuesday	24
20/05/2020	Wednesday	32
21/05/2020	Thursday	19
22/05/2020	Friday	2
23/05/2020	Saturday	9
24/05/2020	Sunday	1
25/05/2020	Monday	34
26/05/2020	Tuesday	15
27/05/2020	Wednesday	31
28/05/2020	Thursday	19
29/05/2020	Friday	45
30/05/2020	Saturday	25
31/05/2020	Sunday	2
1/06/2020	Monday	31

2/06/2020	Tuesday	42
3/06/2020	Wednesday	20
4/06/2020	Thursday	42
5/06/2020	Friday	32
6/06/2020	Saturday	0
7/06/2020	Sunday	0
8/06/2020	Monday	0
9/06/2020	Tuesday	20
10/06/2020	Wednesday	0
11/06/2020	Thursday	2
12/06/2020	Friday	31
13/06/2020	Saturday	0
14/06/2020	Sunday	0
15/06/2020	Monday	17
16/06/2020	Tuesday	44
17/06/2020	Wednesday	7
18/06/2020	Thursday	24
19/06/2020	Friday	25
20/06/2020	Saturday	0
21/06/2020	Sunday	4
22/06/2020	Monday	20
23/06/2020	Tuesday	26
24/06/2020	Wednesday	32
25/06/2020	Thursday	26
26/06/2020	Friday	1
27/06/2020	Saturday	0
28/06/2020	Sunday	0
29/06/2020	Monday	6
30/06/2020	Tuesday	31
1/07/2020	Wednesday	12
2/07/2020	Thursday	20
3/07/2020	Friday	6
4/07/2020	Saturday	0
5/07/2020	Sunday	0
6/07/2020	Monday	9
7/07/2020	Tuesday	0
8/07/2020	Wednesday	0
9/07/2020	Thursday	0
10/07/2020	Friday	14
11/07/2020	Saturday	0
12/07/2020	Sunday	0
13/07/2020	Monday	4
14/07/2020	Tuesday	1
15/07/2020	Wednesday	0
16/07/2020	Thursday	3
17/07/2020	Friday	3
18/07/2020	Saturday	0

19/07/2020	Sunday	1
20/07/2020	Monday	1
21/07/2020	Tuesday	0
22/07/2020	Wednesday	0
23/07/2020	Thursday	0
24/07/2020	Friday	0
25/07/2020	Saturday	0
26/07/2020	Sunday	0
27/07/2020	Monday	0
28/07/2020	Tuesday	0
29/07/2020	Wednesday	0
30/07/2020	Thursday	0
31/07/2020	Friday	0
1/08/2020	Saturday	0
2/08/2020	Sunday	0
3/08/2020	Monday	0
4/08/2020	Tuesday	0
5/08/2020	Wednesday	0
6/08/2020	Thursday	1
7/08/2020	Friday	0
8/08/2020	Saturday	0
9/08/2020	Sunday	0
10/08/2020	Monday	0
11/08/2020	Tuesday	0
12/08/2020	Wednesday	0
13/08/2020	Thursday	4
14/08/2020	Friday	1
15/08/2020	Saturday	0
16/08/2020	Sunday	3
17/08/2020	Monday	5
18/08/2020	Tuesday	7
19/08/2020	Wednesday	18
20/08/2020	Thursday	14
21/08/2020	Friday	7
22/08/2020	Saturday	0
23/08/2020	Sunday	0
24/08/2020	Monday	4
25/08/2020	Tuesday	8
26/08/2020	Wednesday	6
27/08/2020	Thursday	0
28/08/2020	Friday	1
29/08/2020	Saturday	0
30/08/2020	Sunday	0
31/08/2020	Monday	16
1/09/2020	Tuesday	9
2/09/2020	Wednesday	14
3/09/2020	Thursday	8

4/09/2020	Friday	0
5/09/2020	Saturday	0
6/09/2020	Sunday	0
7/09/2020	Monday	1
8/09/2020	Tuesday	3
9/09/2020	Wednesday	0
10/09/2020	Thursday	0
11/09/2020	Friday	1
12/09/2020	Saturday	0
13/09/2020	Sunday	0
14/09/2020	Monday	1
15/09/2020	Tuesday	4
16/09/2020	Wednesday	0
17/09/2020	Thursday	0
18/09/2020	Friday	0
19/09/2020	Saturday	0
20/09/2020	Sunday	0
21/09/2020	Monday	0
22/09/2020	Tuesday	1
23/09/2020	Wednesday	6
24/09/2020	Thursday	0
25/09/2020	Friday	9
26/09/2020	Saturday	0
27/09/2020	Sunday	0
28/09/2020	Monday	9
29/09/2020	Tuesday	5
30/09/2020	Wednesday	7
1/10/2020	Thursday	10
2/10/2020	Friday	5
3/10/2020	Saturday	0
4/10/2020	Sunday	0
5/10/2020	Monday	0
6/10/2020	Tuesday	18
7/10/2020	Wednesday	11
8/10/2020	Thursday	4
9/10/2020	Friday	0
10/10/2020	Saturday	1
11/10/2020	Sunday	0
12/10/2020	Monday	0
13/10/2020	Tuesday	0
14/10/2020	Wednesday	3
15/10/2020	Thursday	8
16/10/2020	Friday	11
17/10/2020	Saturday	0
18/10/2020	Sunday	0
19/10/2020	Monday	17
20/10/2020	Tuesday	5

21/10/2020	Wednesday	2
22/10/2020	Thursday	5
23/10/2020	Friday	11
24/10/2020	Saturday	0
25/10/2020	Sunday	0
26/10/2020	Monday	1
27/10/2020	Tuesday	0
28/10/2020	Wednesday	6
29/10/2020	Thursday	2
30/10/2020	Friday	7
31/10/2020	Saturday	0
1/11/2020	Sunday	0
2/11/2020	Monday	12
3/11/2020	Tuesday	4
4/11/2020	Wednesday	7
5/11/2020	Thursday	1
6/11/2020	Friday	12
7/11/2020	Saturday	0
8/11/2020	Sunday	0
9/11/2020	Monday	9
10/11/2020	Tuesday	11
11/11/2020	Wednesday	13
12/11/2020	Thursday	10
13/11/2020	Friday	9
14/11/2020	Saturday	0
15/11/2020	Sunday	0
16/11/2020	Monday	0
17/11/2020	Tuesday	19
18/11/2020	Wednesday	10
19/11/2020	Thursday	20
20/11/2020	Friday	10
21/11/2020	Saturday	0
22/11/2020	Sunday	0
23/11/2020	Monday	12
24/11/2020	Tuesday	19
25/11/2020	Wednesday	0
26/11/2020	Thursday	21
27/11/2020	Friday	30
28/11/2020	Saturday	21
29/11/2020	Sunday	1
30/11/2020	Monday	7
1/12/2020	Tuesday	18
2/12/2020	Wednesday	20
3/12/2020	Thursday	23
4/12/2020	Friday	16
5/12/2020	Saturday	0
6/12/2020	Sunday	2

7/12/2020	Monday	21
8/12/2020	Tuesday	15
9/12/2020	Wednesday	22
10/12/2020	Thursday	46
11/12/2020	Friday	0
12/12/2020	Saturday	0
13/12/2020	Sunday	4
14/12/2020	Monday	33
15/12/2020	Tuesday	10
16/12/2020	Wednesday	0
17/12/2020	Thursday	32
18/12/2020	Friday	12
19/12/2020	Saturday	0
20/12/2020	Sunday	0
21/12/2020	Monday	0
22/12/2020	Tuesday	0
23/12/2020	Wednesday	0
24/12/2020	Thursday	0
25/12/2020	Friday	0
26/12/2020	Saturday	0
27/12/2020	Sunday	0
28/12/2020	Monday	0
29/12/2020	Tuesday	0
30/12/2020	Wednesday	0
31/12/2020	Thursday	0
1/01/2021	Friday	0
2/01/2021	Saturday	0
3/01/2021	Sunday	0
4/01/2021	Monday	0
5/01/2021	Tuesday	0
6/01/2021	Wednesday	0
7/01/2021	Thursday	1
8/01/2021	Friday	0
9/01/2021	Saturday	0
10/01/2021	Sunday	0
11/01/2021	Monday	0
12/01/2021	Tuesday	0
13/01/2021	Wednesday	0
14/01/2021	Thursday	2
15/01/2021	Friday	0
16/01/2021	Saturday	0
17/01/2021	Sunday	0
18/01/2021	Monday	1
19/01/2021	Tuesday	2
20/01/2021	Wednesday	6
21/01/2021	Thursday	2
22/01/2021	Friday	7

23/01/2021	Saturday	0
24/01/2021	Sunday	0
25/01/2021	Monday	0
26/01/2021	Tuesday	0
27/01/2021	Wednesday	3
28/01/2021	Thursday	3
29/01/2021	Friday	2
30/01/2021	Saturday	0
31/01/2021	Sunday	0
1/02/2021	Monday	4
2/02/2021	Tuesday	3
3/02/2021	Wednesday	7
4/02/2021	Thursday	10
5/02/2021	Friday	11
6/02/2021	Saturday	6
7/02/2021	Sunday	2
8/02/2021	Monday	23
9/02/2021	Tuesday	22
10/02/2021	Wednesday	22
11/02/2021	Thursday	22
12/02/2021	Friday	18
13/02/2021	Saturday	7
14/02/2021	Sunday	1
15/02/2021	Monday	0
16/02/2021	Tuesday	24
17/02/2021	Wednesday	0
18/02/2021	Thursday	10
19/02/2021	Friday	0
20/02/2021	Saturday	0
21/02/2021	Sunday	0
22/02/2021	Monday	0
23/02/2021	Tuesday	1
24/02/2021	Wednesday	0
25/02/2021	Thursday	0
26/02/2021	Friday	1
27/02/2021	Saturday	0
28/02/2021	Sunday	0



**ANNEXURE F: COLAS EXPORT TRAFFIC GENERATION
(21 SHEETS)**

Date	Time	Day
1/09/2020	5:36:00 AM	Tuesday
1/09/2020	5:36:00 AM	Tuesday
1/09/2020	6:46:00 AM	Tuesday
1/09/2020	7:59:00 AM	Tuesday
1/09/2020	8:06:00 AM	Tuesday
1/09/2020	8:34:00 AM	Tuesday
1/09/2020	9:15:00 AM	Tuesday
1/09/2020	9:18:00 AM	Tuesday
1/09/2020	9:48:00 AM	Tuesday
1/09/2020	9:57:00 AM	Tuesday
1/09/2020	10:30:00 AM	Tuesday
1/09/2020	10:37:00 AM	Tuesday
1/09/2020	11:05:00 AM	Tuesday
1/09/2020	11:40:00 AM	Tuesday
1/09/2020	11:40:00 AM	Tuesday
1/09/2020	11:55:00 AM	Tuesday
1/09/2020	12:14:00 PM	Tuesday
1/09/2020	12:48:00 PM	Tuesday
1/09/2020	1:26:00 PM	Tuesday
1/09/2020	1:37:00 PM	Tuesday
3/09/2020	11:47:00 AM	Thursday
7/09/2020	11:50:00 PM	Monday
8/09/2020	10:59:00 AM	Tuesday
11/09/2020	7:04:00 AM	Friday
11/09/2020	7:33:00 AM	Friday
11/09/2020	8:11:00 AM	Friday
23/09/2020	4:51:00 AM	Wednesday
23/09/2020	4:54:00 AM	Wednesday
23/09/2020	5:02:00 AM	Wednesday
23/09/2020	5:12:00 AM	Wednesday
23/09/2020	5:41:00 AM	Wednesday
23/09/2020	6:00:00 AM	Wednesday
23/09/2020	6:16:00 AM	Wednesday
23/09/2020	6:31:00 AM	Wednesday
23/09/2020	6:41:00 AM	Wednesday
23/09/2020	6:54:00 AM	Wednesday
23/09/2020	7:06:00 AM	Wednesday
23/09/2020	7:24:00 AM	Wednesday
23/09/2020	8:10:00 AM	Wednesday
23/09/2020	8:28:00 AM	Wednesday
23/09/2020	10:07:00 AM	Wednesday
23/09/2020	11:14:00 AM	Wednesday
23/09/2020	11:23:00 AM	Wednesday
23/09/2020	12:06:00 PM	Wednesday
23/09/2020	12:21:00 PM	Wednesday
28/09/2020	7:30:00 AM	Monday
28/09/2020	8:55:00 AM	Monday
30/09/2020	6:33:00 PM	Wednesday
30/09/2020	6:39:00 PM	Wednesday

30/09/2020	8:26:00 PM	Wednesday
30/09/2020	6:24:00 PM	Wednesday
30/09/2020	6:10:00 PM	Wednesday
30/09/2020	6:52:00 PM	Wednesday
30/09/2020	6:45:00 PM	Wednesday
30/09/2020	7:23:00 PM	Wednesday
30/09/2020	7:15:00 PM	Wednesday
30/09/2020	7:01:00 PM	Wednesday
30/09/2020	6:05:00 PM	Wednesday
30/09/2020	7:39:00 PM	Wednesday
30/09/2020	7:47:00 PM	Wednesday
30/09/2020	8:00:00 PM	Wednesday
7/10/2020	10:28:00 AM	Wednesday
7/10/2020	7:15:00 AM	Wednesday
11/10/2020	8:57:00 PM	Sunday
14/09/2020	6:45:00 AM	Monday
14/09/2020	6:59:00 AM	Monday
14/09/2020	7:16:00 AM	Monday
14/09/2020	7:19:00 AM	Monday
14/09/2020	7:33:00 AM	Monday
14/09/2020	7:35:00 AM	Monday
14/09/2020	7:44:00 AM	Monday
14/09/2020	7:50:00 AM	Monday
14/09/2020	8:09:00 AM	Monday
14/09/2020	8:09:00 AM	Monday
14/09/2020	8:23:00 AM	Monday
14/09/2020	9:55:00 AM	Monday
14/09/2020	10:41:00 AM	Monday
14/09/2020	10:53:00 AM	Monday
14/09/2020	10:53:00 AM	Monday
14/09/2020	11:05:00 AM	Monday
14/09/2020	11:35:00 AM	Monday
14/09/2020	11:45:00 AM	Monday
15/10/2020	7:24:00 AM	Thursday
15/10/2020	8:14:00 AM	Thursday
15/10/2020	8:30:00 AM	Thursday
15/10/2020	9:04:00 AM	Thursday
15/10/2020	9:43:00 AM	Thursday
15/10/2020	10:31:00 AM	Thursday
15/10/2020	10:51:00 AM	Thursday
15/10/2020	11:36:00 AM	Thursday
15/10/2020	1:19:00 PM	Thursday
15/10/2020	9:52:00 AM	Thursday
15/10/2020	9:58:00 AM	Thursday
15/10/2020	10:11:00 AM	Thursday
15/10/2020	10:38:00 AM	Thursday
15/10/2020	11:29:00 AM	Thursday
15/10/2020	11:43:00 AM	Thursday
16/10/2020	7:14:00 AM	Friday
20/10/2020	6:33:00 AM	Tuesday

20/10/2020	6:40:00 AM	Tuesday
20/10/2020	7:28:00 AM	Tuesday
20/10/2020	7:45:00 AM	Tuesday
20/10/2020	8:04:00 AM	Tuesday
20/10/2020	8:14:00 AM	Tuesday
20/10/2020	8:42:00 AM	Tuesday
20/10/2020	9:58:00 AM	Tuesday
20/10/2020	10:56:00 AM	Tuesday
21/10/2020	6:40:00 AM	Wednesday
21/10/2020	6:57:00 AM	Wednesday
21/10/2020	7:13:00 AM	Wednesday
21/10/2020	7:35:00 AM	Wednesday
21/10/2020	8:10:00 AM	Wednesday
21/10/2020	8:10:00 AM	Wednesday
23/10/2020	5:15:00 AM	Friday
23/10/2020	6:51:00 AM	Friday
23/10/2020	7:08:00 AM	Friday
23/10/2020	7:24:00 AM	Friday
23/10/2020	7:37:00 AM	Friday
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8/12/2020	8:18:00 AM	Tuesday
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22/01/2021	4:10:00 PM	Friday
22/01/2021	4:38:00 PM	Friday
22/01/2021	4:53:00 PM	Friday
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27/01/2021	10:27:00 AM	Wednesday
27/01/2021	10:27:00 AM	Wednesday
27/01/2021	12:03:00 PM	Wednesday
27/01/2021	2:32:00 PM	Wednesday
27/01/2021	4:03:00 PM	Wednesday
27/01/2021	4:31:00 PM	Wednesday
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28/01/2021	10:47:00 AM	Thursday
31/01/2021	10:51:00 PM	Sunday
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7/02/2021	10:40:00 PM	Sunday
7/02/2021	10:55:00 PM	Sunday
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9/02/2021	12:46:00 PM	Tuesday
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9/02/2021	2:17:00 PM	Tuesday
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9/12/2020	11:05:00 AM	Wednesday
9/12/2020	12:05:00 PM	Wednesday

Number of export trucks hour-to-hour data.

[illegible]

Notes:

- (1) Each column represents a different day that asphalt was exported. Each row represents a 1-hour period.
- (2) The coloured values represent the number of trucks that exported asphalt within the associated 1-hour period.