Traffic Assessment

37 – 41 Bengal Street (Pacific Highway), Coolongolook

Proposed Highway Service Centre

Galen Property Pty Ltd

Revision Record

No.	Author	Reviewed/Approved	Description	Date
1.	Paul Cai	Calum Hutcheson	Rev 00	30/08/2018
2.	Calum Hutcheson	Paul Cai	Rev 01	22/10/2018
3.	Paul Cai	Calum Hutcheson	Rev 02	15/11/2018
4.	Paul Cai	Baqir Husain	Rev 03	31/10/2019
5.	Paul Cai	Baqir Husain	Rev 04	05/11/2019

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1 Introduction

1.1 Background

TTM Consulting was engaged by Galen Property Pty Ltd to prepare a traffic engineering report investigating a proposed highway service centre at 37-41 Bengal Street (Pacific Highway), Coolongolook NSW.

Section 7.5.5 of the Great Lakes Council, Great Lakes Highway Service Centre Study and Strategy Report (2004) identifies the site as a potential highway service centre. It states that existing service centre opposite has the "Potential to operate in tandem with a new facility on the opposite of the highway to serve both directions of traffic without raising any driver safety issues."

The highway service centre includes light vehicle canopy, heavy vehicle canopy and one commercial store with food offer. The site will be accessed through a proposed deceleration lane off Bengal Street, which is part of Pacific Highway. One entry driveway and one exit driveway are proposed for both light and heavy vehicles.

It is understood that a Development Application will be lodged with Mid Coast Council.

1.2 Scope

This report investigates the transport aspects associated with the proposed development. The scope of the transport aspects investigated includes:

- An intersection traffic survey
- Assessment of parking supply required to cater for development demand
- Assessment of parking layout to provide efficient and safe internal manoeuvring
- Identification of likely traffic generation and traffic distribution from the future development
- Identification of likely traffic impact of development on the public road network
- Assessment of pedestrian, service vehicle and public transport provisions

The development plans have been assessed against the following guidelines and planning documents:

- Great Lakes Development Control Plan (DCP) 2014
- Australian Standard AS 2890
- RTA (RMS) Guide to Traffic Generating Developments

1.3 Site location

The site is located at 37-41 Bengal Street (Pacific Highway), Coolongolook NSW (see Figure 1.1). The site has road frontages to Bengal Street. The proposed site includes three property lots, Lot 7, 8 and 9.

Figure 1.1: Site location

Figure 1.2: Aerial image of site

1.4 Development profile

The proposed development involves construction of a highway service centre off northbound of Pacific Highway. The service centre will include:

- One Canopy for light vehicle
- One Canopy for heavy vehicle
- One sales building with up to 7 seats (320m^2 GFA)
- 13 light vehicle parking spaces
- Two B-double parking spaces
- One Caravan parking space

The proposed site is provided with one entry driveway and one exit driveway off Pacific Highway. The entry and exit driveways are separated by a median island.

The proposed development will provide a 120 metre long left-turn deceleration lane off Pacific Highway to the site entrance. Detail design of the deceleration lane is presented in Appendix B.

2 Existing Transport Infrastructure

2.1 The road network

The site has road frontages to Bengal Street, which is part of Pacific Highway. Bengal Street is administered by the NSW Roads and Maritime Services (RMS). The characteristics of the surrounding roads are shown below in Table 2.1.

Table 2.1: Local Road Characteristics

Road	Speed Limit	Lanes	Road Authority
Bengal Street (Pacific Highway)	80kph	4 (divided)	RMS
Midge Street	50kph	2 (undivided)	Council
Lombard Street	50kph	2 (undivided)	Council

Currently there is a reserved land located adjacent to the northern boundary of the site. This land is reserved for a potential construction of Nelson Street. Nevertheless, there is no proposal or concept design for the construction of Nelson Street to this date.

2.2 Buses

Route 154 provides a loop service from Bulahdelah to Taree. Bus stops are located on Bengal Street near the site (see Figure 2.1).

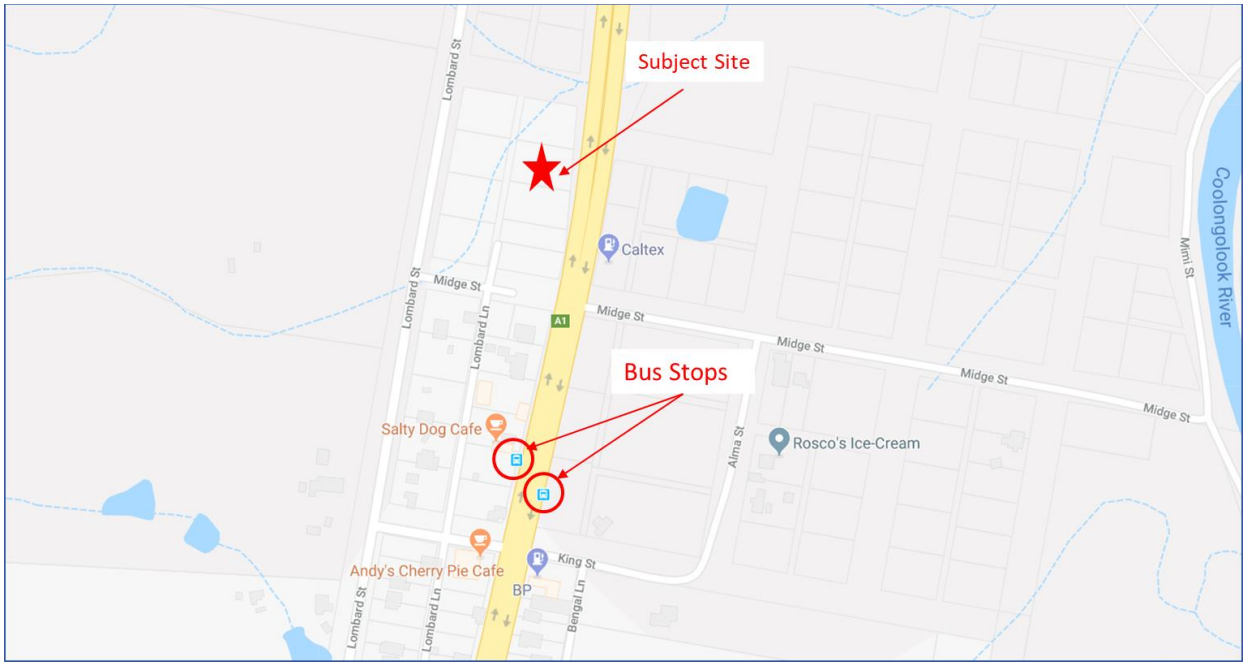


Figure 2.1: Bus stops near the site

2.3 Walking infrastructure

Formal pedestrian footpath is provided along the frontage of Lot 7 of the site, as shown in Figure 2.2. New pedestrian footpath will be constructed along the site frontage.

Figure 2.2: Existing pedestrian footpath along the frontage of Lot 7 [1] (south view)

[1] Source: Google Street View

3 Car Parking Arrangements

3.1 Council requirements

Council's Development Control Plan (DCP) does not specify a typical car parking rate for the proposed highway service centre. Parking rates recommended in the "RMS (RTA) Guide to Traffic Generating Developments" are presented in Table 3.1. The RMS rate applied for the proposed development is for service stations and convenience stores.

Table 3.1: RMS parking rates

Land Use	RMS Parking Rates
Service centre and convenience stores	• 6 spaces per work bay • 5 spaces per 100m^2 GFA of convenience store Plus if a restaurant is present, the greater of: • 15 spaces per 100m^2 GFA, or • 1 space per 3 seats

No restaurant is proposed at the service centre. Table 3.2 presents the parking requirements based on the above rates for the proposed use.

Table 3.2: Car parking requirement (RMS Rates)

	Car parking rate	Proposed area/bays/seats	Car parking requirements
Car parking spaces per 100 sqm of convenience store	5	320	16.0
Car parking spaces per work bay	6	0	0.0
Total			16.0
Provision			16

RMS recommends a total of 16 car parking spaces for this development. 16 car parking spaces (including one accessible space, two B-Double Spaces and one Caravan parking space) are provided on site. These spaces will be utilised by employees and customers.

The provision of parking spaces satisfies the minimum parking requirements recommended by the RMS.

3.2 Motorcycles

Council's DCP or RMS does not specify a motorcycle parking rate for this type of development. Staff or customers riding motorcycles will be able to park on the standard car parking spaces.

3.3 Bicycle parking spaces

Council's DCP or RMS do not specify the requirement of bicycle parking for this type of development. Bicycle parking spaces are not required for highway service centre.

3.4 Carpark layout

Table 3.3 identifies the characteristics of the proposed parking area with respect to the Australian Standards AS 2890. The last column identifies the compliance of each design aspect.

Table 3.3: Parking Design Requirement

Design Aspect	Council / AS 2890 Requirements	Proposed Provision	Compliance
Parking space length: – Standard space – B-Double space – Accessible bay	 5.4m (min) 25.0m (min) 5.4m (min)	 4.9m (min) + 0.6m overhang 27.0m 4.9m + + 0.6m overhang	 Refer to 3.4.1 Compliant Refer to 3.4.1
Parking space width: – Standard space – B-Double space – Accessible bay	 2.6m (min) 3.8m (min) 4.8m (min)	 2.6m 4.0m 4.8m	 Compliant Compliant Compliant
Aisle Width: Parking aisle	 5.8m (min)	 9m (min)	 Compliant

Swept path analysis has been conducted to demonstrate B-double truck and caravan will be able to access the site, park at the designated parking spaces and exit the site through the proposed exit driveway. Swept path analysis has been presented in Appendix C.

3.4.1 Light vehicle parking space

Eight light vehicle parking spaces are provided along the frontage of the sales building to a low kerb where a vehicle could overhang. Length of these parking spaces is 4.9 metres plus a 600 millimetres overhang to the low kerb along the building frontage. Australian Standard AS2890.1:2004 requires a minimum of 4.8 metre for the length of a 90 degree angle parking space where parking is to a low kerb which allows 600 millimetre overhang. The proposed parking spaces comply with the AS2890.1. Wheel stops shall be provided at the ends of the bays.

3.5 Deceleration lane

RMS have specified the following requirement for a deceleration lane:

"Any design for a deceleration lane should accommodate the design speed (i.e. 80kph +10), design vehicle and comply with the relevant warrants within Austroads Guide to Road Design 2010 and associated supplements and Australian Standards."

AUSTROADS Guide to Road Design (2010) Part4A: Unsignalised and Signalised Intersections Table 5.2 recommends a 120 metres deceleration distance based on the 90kph design speed and 20kph exit speed (see Figure 3.1)

Table 5.2: Deceleration distances required for cars on a level grade

Design speed of approach	Length of deceleration D – including diverge taper T										Diverge length Ld3 for lane widths	
	Stop condition1		Design speed of exit curve (km/h)2									
Road (km/h)	0	0	20	30	40	50	60	70	80	90	3.5 m[4]	3.0 m[4]
	Comf. 2.5 m/s²	Max. 3.5 m/s²	Comfortable average rate of deceleration 2.5m/s²									
50	40	30	30	25	15						33	27
60	55	40	50	40	30	15					40	33
70	75	55	70	60	50	40	20				47	40
80	100	70	95	85	75	60	45	25			54	44
90	125	90	120	110	100	85	70	50	25		60	50
100	155	110	150	140	130	115	100	80	55	30	67	57
110	185	135	180	175	160	150	130	110	90	60	74	62

1. Rates of deceleration are: 2.5 m/s² for comfortable deceleration; 3.5 m/s² is the maximum for design purposes.
2. Speed of exit curve depends on radius and crossfall (Figure 5.2).
3. Distance L_d assumes a lateral rate of movement of 1.5 m/s.
4. Example lane widths – use actual lateral shift distance of vehicle.

Notes:

The pink shading indicates that the deceleration lengths given are greater than the diverge length. The length of the deceleration lane should be based on these values.

The grey shading indicates that the diverge length is greater than the deceleration length. In these cases, the length of the deceleration lane should be based on the diverge length (the values shown in yellow shading).

Adjust for grade using Table 5.3.

All lengths are in metres.

Source: Based on Austroads (2005).

Figure 3.1: AUSTROADS requirements of deceleration distances (Austroads Guide to Road Design (2010) - Part 4A: Unsignalised and Signalised Intersections - Table 5.2)

The proposed development will involve a 120 metres long left turn deceleration lane off Bengal Street for the site access. The deceleration lane design plan is presented in Appendix B. The proposed left turn deceleration lane includes a 50 metre taper and a 70 metre parallel lane. This design combination is based on the AUSTROADS recommendation, RMS requirements and the existing conditions along the site frontage. The width of the deceleration lane will be 3.5 metres with a minimum 2.5 metre wide new concrete footpath along the site frontage. The new concrete footpath will be shared by pedestrians and cyclists as requested by NSW RMS.

An entry driveway will be provided at the end of the left turn lane. A separate exit only driveway will be provided at the north end of the site. The sight distance at the accesses exceeds the requirement of

Australian Standard AS2890 for 80kph being in excess of 111 metres. Signage would be required to guide customers to use the deceleration lane to enter onto the site and warning the drivers to give way to pedestrians and cyclists.

It is our advice that the proposed access arrangements to the site are acceptable and comply with Australian Standard, NSW RMS and Mid Coast Council requirements.

3.6 Service & Waste vehicles

The waste bins are located at the rear of the convenience store. One loading bay is located adjacent to the service yard. This arrangement allows forward entry and exit from the site.

3.7 Potential impacts of unconstructed Nelson Street

Council has raised a concern at the Pre-DA meeting on 3rd September 2019 that the proposed egress point would be impacted if Nelson Street is ever to be open. TTM understands that Nelson Street is an unconstructed road to be developed on vacant land adjacent to the subject site. There has been no proposal raised for the construction of Nelson Street to this date.

It is our advice that the egress point of the site would be relocated to Nelson Street if Nelson Street is ever to be open. The potential egress point to Nelson Street is indicated on Figure 3.2. The proposed exit driveway to Bengal Street would be closed if Nelson Street is ever to be open. The modification of the access points and at the north end of the site would be subject to the proposed design of Nelson Street.

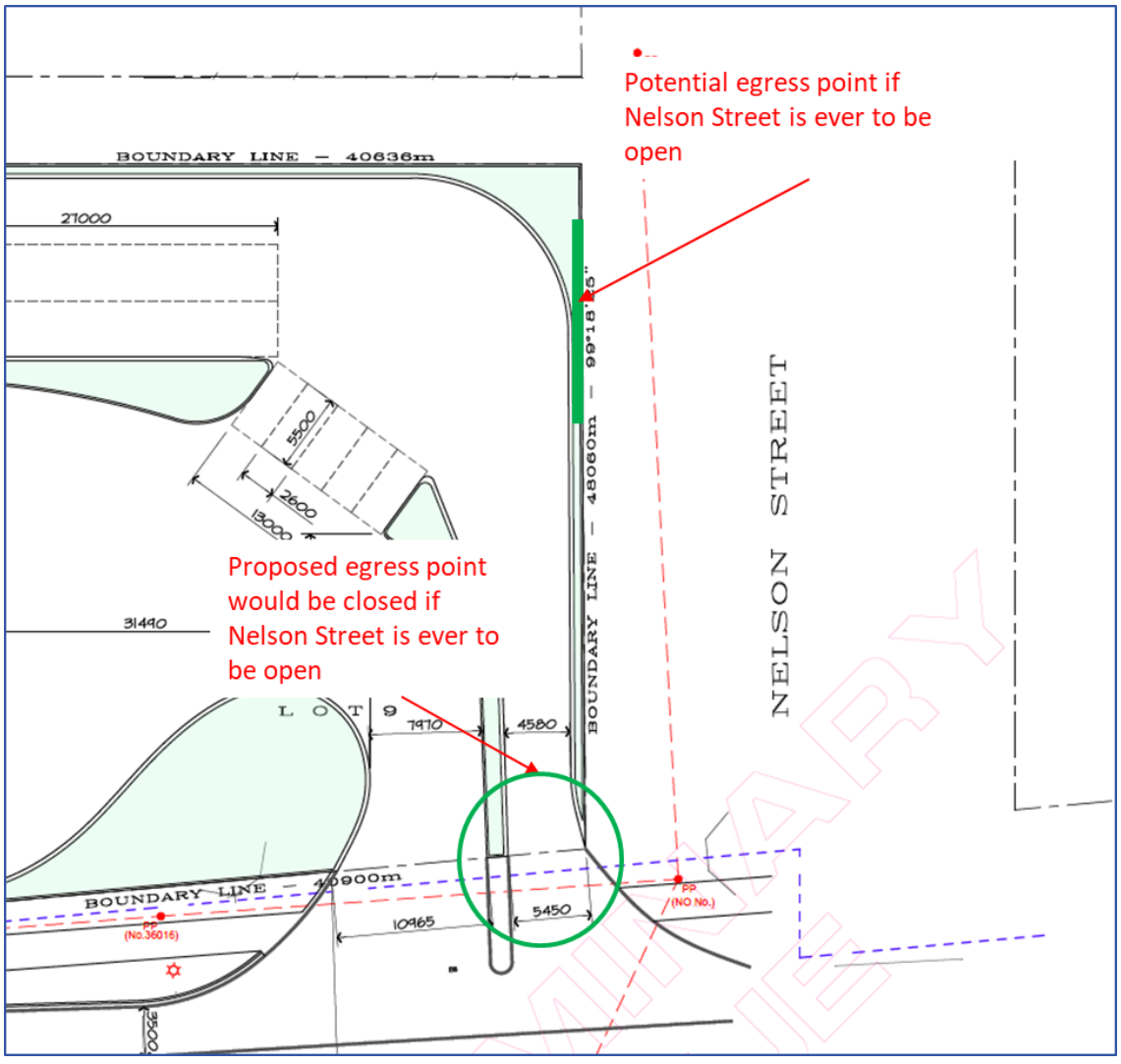


Figure 3.2: Potential modification of egress point if Nelson Street ever to be open

4 Traffic Survey

TTM Data conducted traffic surveys at the intersection of Bengal Street (Pacific Highway) and Midge Street from 6:00 to 9:00 am and 4:00 to 7:00 pm on Tuesday 7th August 2018.

The morning and evening peak hours were found to be from 8:00 to 9:00 am and 4:00 to 5:00 pm for the Bengal Street (Pacific Highway) / Midge Street intersection.

The results for the Bengal Street (Pacific Highway) / Midge Street intersection are presented in Figure 4-1 and Figure 4-2.

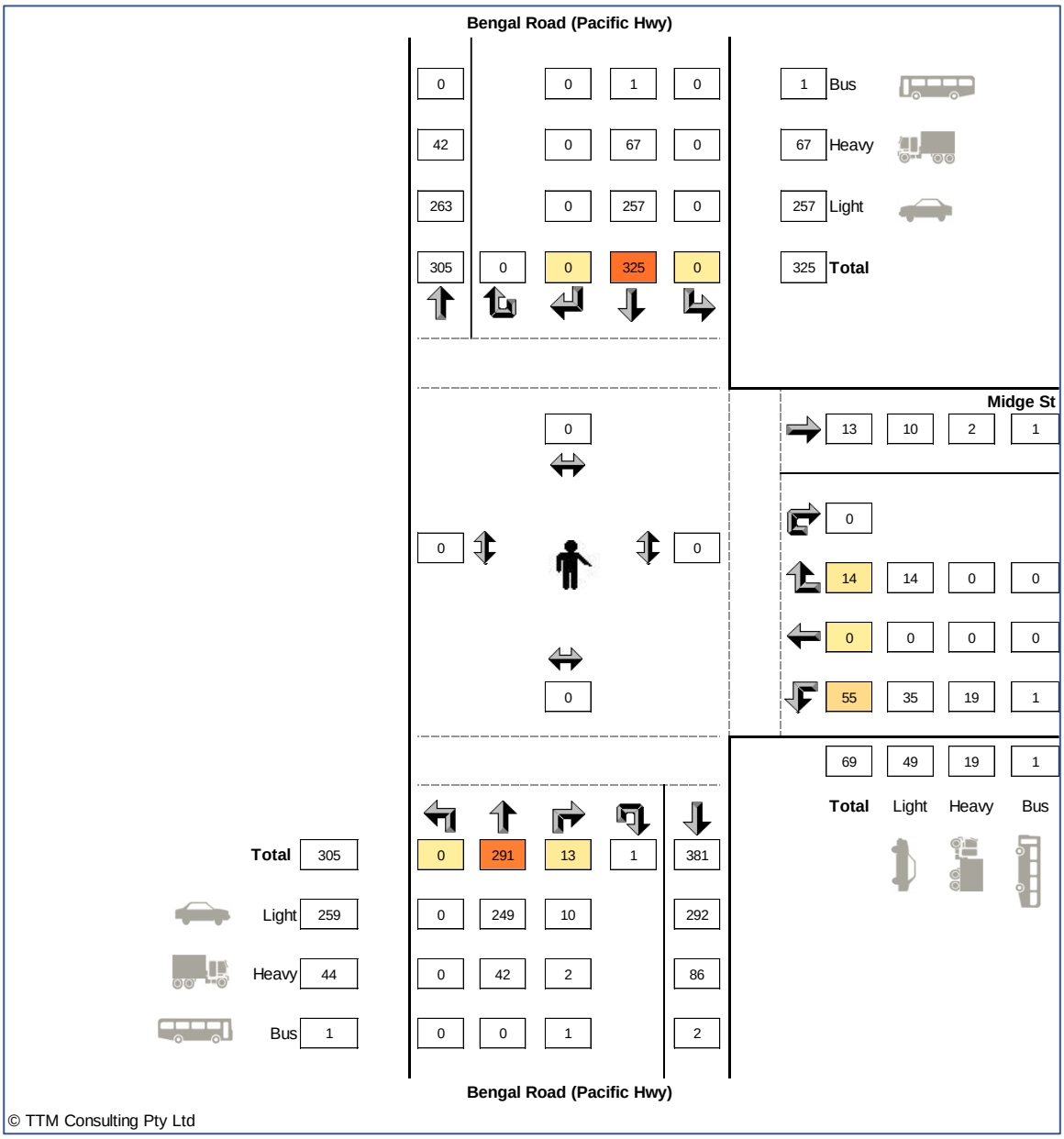


Figure 4-1: Morning Peak – Bengal Street and Midge Street Intersection (8.00 to 9.00 am)

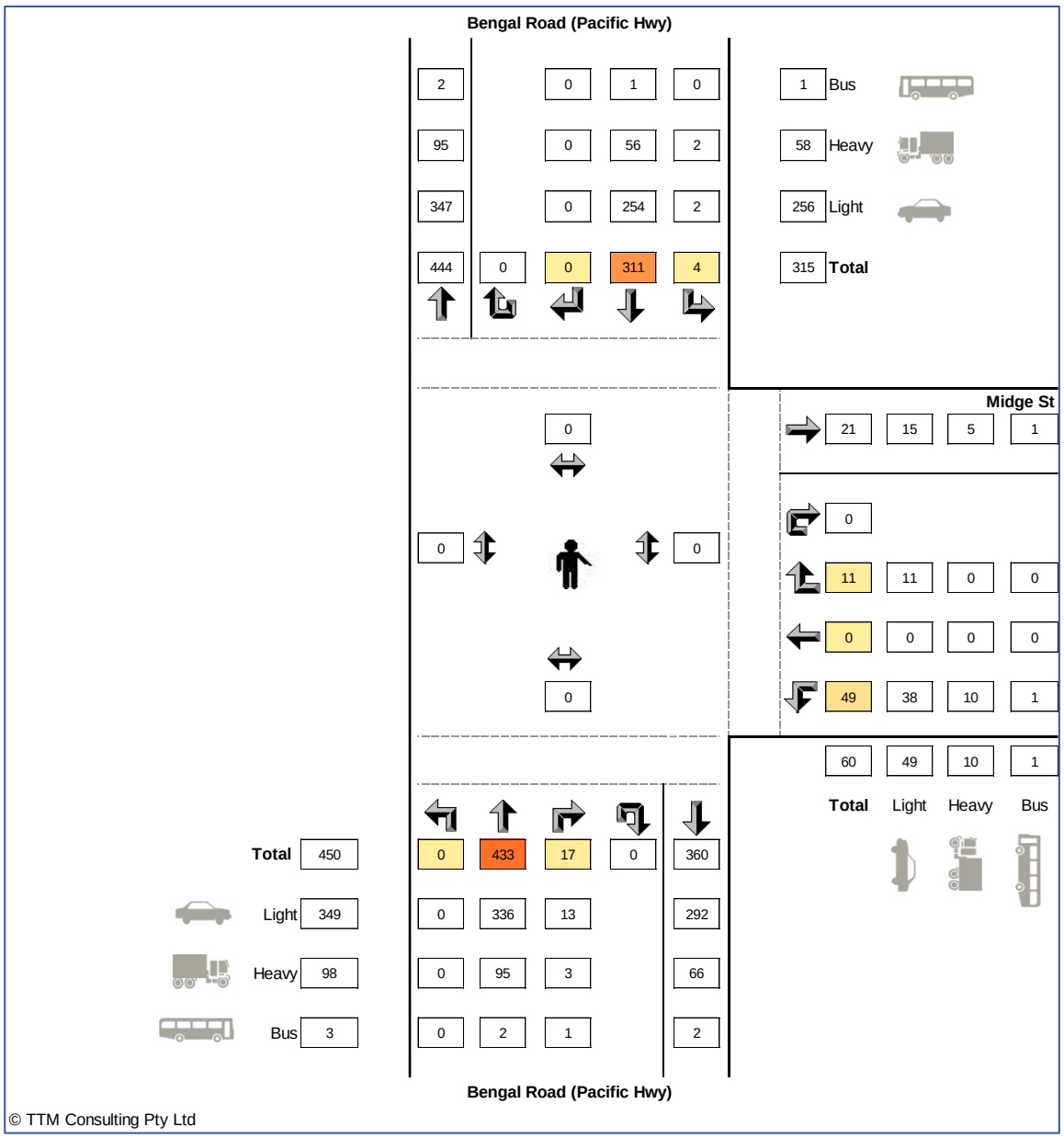


Figure 4-2: Evening Peak – Bengal Street and Midge Street Intersection (4:00 to 5:00 pm)

4.1 Assessment of existing traffic conditions

The intersection of Bengal Street and Midge Street has been assessed using the SIDRA Intersection Analysis Software (V7). Performance criteria for intersections are based on the RTA (RMS) Guide to Traffic Generating Developments. A qualitative rating and its corresponding Level of Service (LoS) are applied to the average delay per vehicle as shown in Table 4-1.

Table 4-1: Level of Service Criteria for Intersections

Level of Service (LoS)	Average Delay per Vehicle (seconds)	Traffic Signals, Roundabouts
A	Less than 15	Good operation
B	15 to 28	Acceptable delays & spare capacity
C	29 to 42	Satisfactory, but accident study required
D	43 to 56	Near capacity & accident study required
E	57 to 70	At capacity, requires other control mode

For signals, average delays per vehicle are for the intersection as a whole. If the average delay for the worst movement is greater than the cycle time, a Level of Service F is assigned, regardless of the average delay for the intersection as a whole. For Roundabouts / Give Way / Stop Signs, average delay per vehicle is for the worst movement.

Table 4-2 gives a summary of the SIDRA results for the current volumes applied to the existing intersection configuration.

Table 4-2: Summary of SIDRA Outputs for Bengal Street and Midge Street Intersection

Case	Degree of Saturation	Average Delay (Second)	Level of Service
Morning Peak	0.123	19.1	C
Evening Peak	0.114	24.5	C

The vehicle movement on Pacific Highway at the intersection is currently operating at a Level of Service A for the morning and evening peak.

The worst movement for the current intersection configuration is the right turn lane from Midge Street to Bengal Street. SIDRA Outputs for Midge Street show a satisfactory Level of Service C for the right-turn vehicle movements. It is noted that the right-turn traffic flow was significantly small (average 13 vehicles per hour). The proposed development will have no association with Midge Street traffic.

5 Traffic Impact of Proposed Development

5.1 Traffic generation and traffic flows

The RTA (RMS) Guide to Traffic Generating Developments (version 2.2, 2002) recommends the traffic generation rates for service station, as per below:

"Evening peak hour vehicle trips = 0.04 A(S) + 0.3 A(F)"

A(S) is the area of site (m^2) and A(F) is the gross floor area of convenience store (m^2).

It is our advice that the traffic generation would be associated with bypass trips. Additional traffic generation would be associated with staff plus some members of the local community. The additional traffic generation should be based on the convenience areas. This amounts to around 96 vehicle trips if fully utilised. These trips will be local trips that would have been accessing other local facilities.

Traffic flows will be generally unchanged as the service centre relies on bypass traffic. There may be some local traffic accessing the site.

It is our advice that the proposed development will not adversely impact on the efficiency of the local and state road network which has sufficient spare capacity to cater for the development.

6 Summary and Conclusions

6.1 Development access

The proposed entry to and exit off the site will be left in and left out only via Bengal Street (Pacific Highway). A left turn deceleration lane is proposed to assist vehicles accessing the site from Bengal Street. The proposed deceleration lane complies with AUSTROAD and NSW RMS requirements. Separate entry and exit points are provided at the north end of the site.

Swept path analysis has been conducted to demonstrate that a B-double truck will be able to enter and exit the site in a forward direction.

6.2 Car parking arrangements

The proposed parking supply for the site satisfies the minimum recommended by the RMS.

6.3 Impact on surrounding road network

The proposed development will not have a significant impact on the surrounding road network.

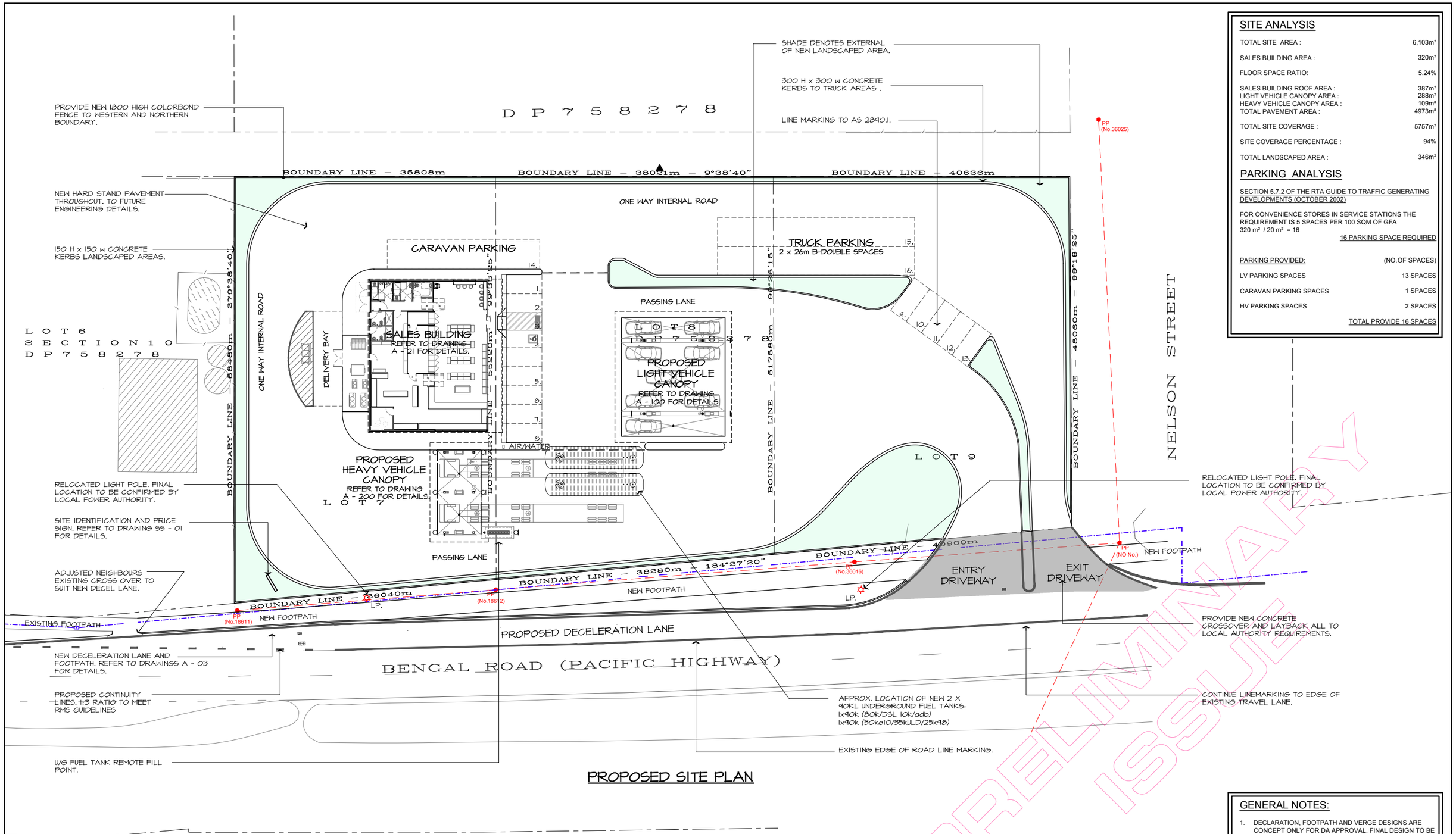
6.4 Service vehicle arrangements

Service vehicle and waste truck will be accommodated at the proposed loading bay.

6.5 Conclusion

TTM see no traffic engineering reason why the relevant approvals should not be granted.

Appendix A Site Plans



PROPOSED SITE PLAN

SITE ANALYSIS

TOTAL SITE AREA :	6,103m²
SALES BUILDING AREA :	320m²
FLOOR SPACE RATIO:	5.24%
SALES BUILDING ROOF AREA :	387m²
LIGHT VEHICLE CANOPY AREA :	288m²
HEAVY VEHICLE CANOPY AREA :	109m²
TOTAL PAVEMENT AREA :	4973m²
TOTAL SITE COVERAGE :	5757m²
SITE COVERAGE PERCENTAGE :	94%
TOTAL LANDSCAPED AREA :	346m²

PARKING ANALYSIS

SECTION 5.7.2 OF THE RTA GUIDE TO TRAFFIC GENERATING DEVELOPMENTS (OCTOBER 2002)

FOR CONVENIENCE STORES IN SERVICE STATIONS THE REQUIREMENT IS 5 SPACES PER 100 SQM OF GFA
320 m² / 20 m² = 16

16 PARKING SPACE REQUIRED

PARKING PROVIDED:	(NO.OF SPACES)
LV PARKING SPACES	13 SPACES
CARAVAN PARKING SPACES	1 SPACES
HV PARKING SPACES	2 SPACES

TOTAL PROVIDE 16 SPACES

GENERAL NOTES:

1. DECLARATION, FOOTPATH AND VERGE DESIGNS ARE CONCEPT ONLY FOR DA APPROVAL. FINAL DESIGN TO BE PREPARED SUBJECT TO DA APPROVAL AN TO IN ACCORDANCE WITH ALL LOCAL AUTHORITY REQUIREMENTS AND DESIGN STANDARDS.

ISSUED FOR APPROVAL
NOT FOR CONSTRUCTION

SCALE BAR 1 : 1 On A1 Size Original

SCALE BAR 1 : 2 On A3 Size Reduction

No.	Amendment	By	Date
P1	PRELIMINARY ISSUE FOR DISCUSSION PURPOSES ONLY. NOT FOR CONSTRUCTION.	MH	15.08.2018
P2	PRELIMINARY ISSUE FOR DISCUSSION PURPOSES ONLY. NOT FOR CONSTRUCTION.	MH	20.08.2018
P3	UPDATED SITE ACCESS AND LAYOUT TO SUIT RMS REQUIREMENTS. PRELIMINARY ISSUE FOR CLIENT APPROVAL ONLY. NOT FOR CONSTRUCTION.	VP	06.08.2019
P4	UPDATED PARKING AND PARKING ACCESS TO SUIT COUNCIL REQUIREMENTS. PRELIMINARY ISSUE FOR CLIENT APPROVAL ONLY. NOT FOR CONSTRUCTION.	VP	30.09.2019
P5	CANOPY MOVED EAST AND SHOPFRONT PARKING DETAIL ADDED. PRELIMINARY ISSUE FOR CLIENT APPROVAL ONLY. NOT FOR CONSTRUCTION.	VP	22.10.2019

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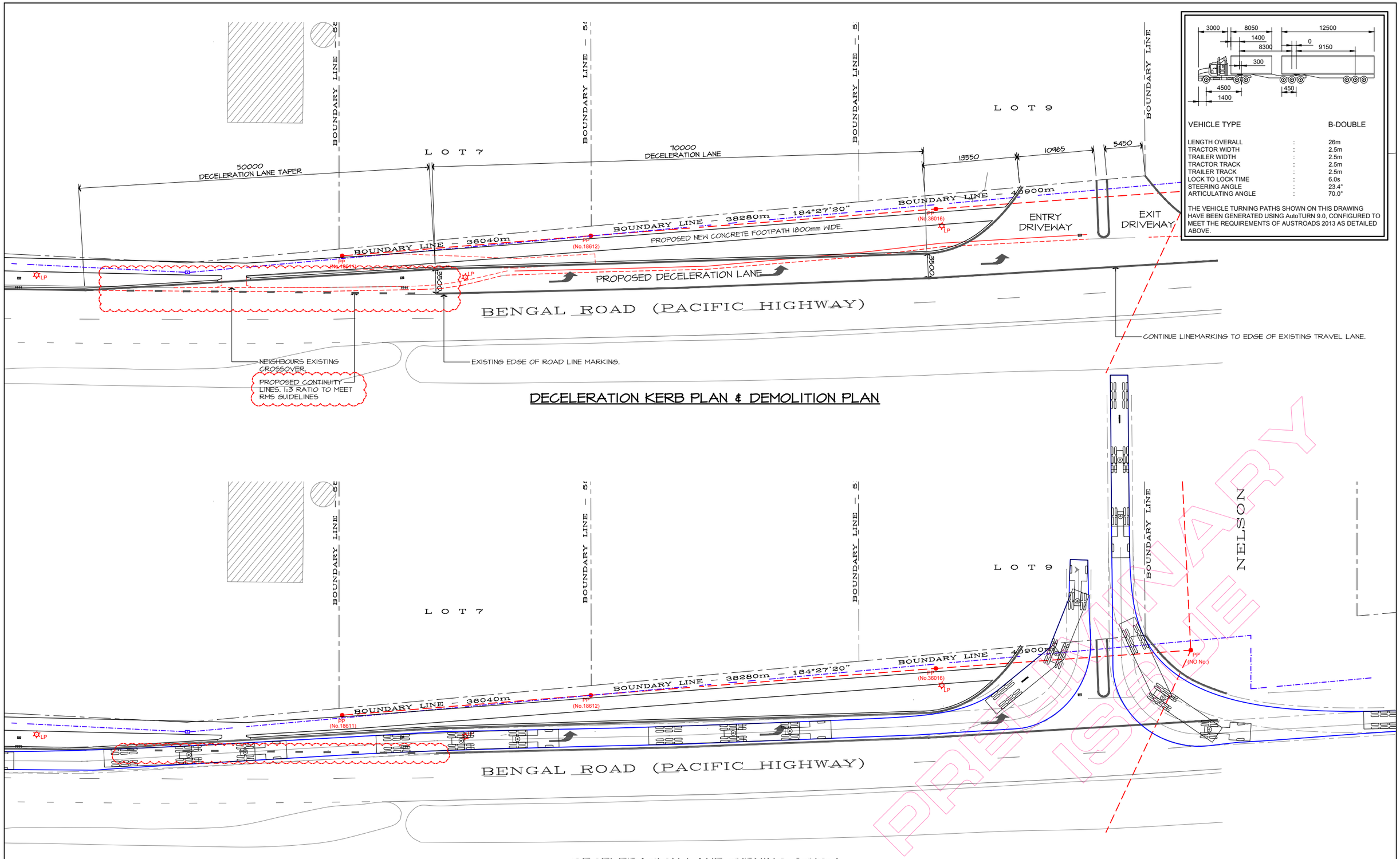
Project
PROPOSED HIGHWAY SERVICE CENTRE
37 - 41 BENGAL ROAD (PACIFIC HIGHWAY)
COOLONGOLOOK NSW
FOR
GALEN PROPERTY Pty Ltd

Drawing Title
PROPOSED SITE PLAN

Approved	Designed
Date: August 2018	Drawn: MH
Scale: 1:250 @ A1 & 1:500 @ A3	Checked
Project No.: 18 - 048	Drawing No.: A - 02
	Amdt.: P5

Appendix B Deceleration Lane Plan



VEHICLE TYPE		B-DOUBLE
LENGTH OVERALL	:	26m
TRACTOR WIDTH	:	2.5m
TRAILER WIDTH	:	2.5m
TRACTOR TRACK	:	2.5m
TRAILER TRACK	:	2.5m
LOCK TO LOCK TIME	:	6.0s
STEERING ANGLE	:	23.4°
ARTICULATING ANGLE	:	70.0°

THE VEHICLE TURNING PATHS SHOWN ON THIS DRAWING HAVE BEEN GENERATED USING AutoTURN 9.0, CONFIGURED TO MEET THE REQUIREMENTS OF AUSTROADS 2013 AS DETAILED ABOVE.

DECELERATION KERB PLAN & DEMOLITION PLAN

DECELERATION LANE TURNING STUDY

SCALE BAR 1 : 1 On A1 Size Original

0 10 20 30 40 50 60 70 80 90 100

0 20 40 60 80 100 120 140 160 180 200

SCALE BAR 1 : 2 On A3 Size Reduction

PRELIMINARY ISSUE FOR DISCUSSION PURPOSES ONLY NOT FOR CONSTRUCTION

No.	Amendment	By	Date
P1	PRELIMINARY ISSUE FOR DISCUSSION PURPOSES ONLY. NOT FOR CONSTRUCTION.	ALM	15.05.2019
P2	PRELIMINARY ISSUE FOR DISCUSSION PURPOSES ONLY. NOT FOR CONSTRUCTION.	ALM	11.06.2019
P3	DECEL LANE LINEMARKING AMENDED. REVISED PRELIMINARY ISSUE FOR DISCUSSION PURPOSES ONLY. NOT FOR CONSTRUCTION.	RJS	13.06.2019

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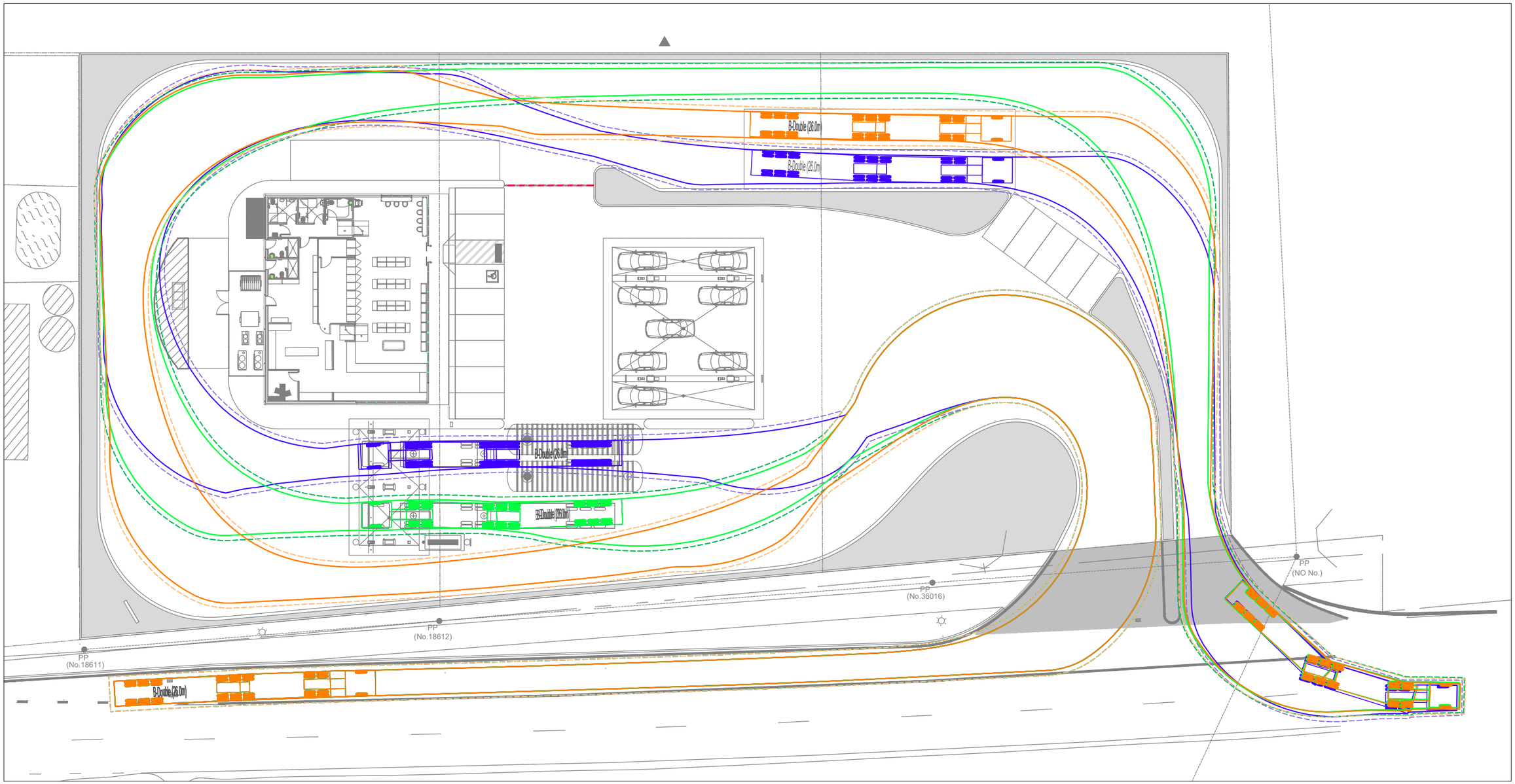
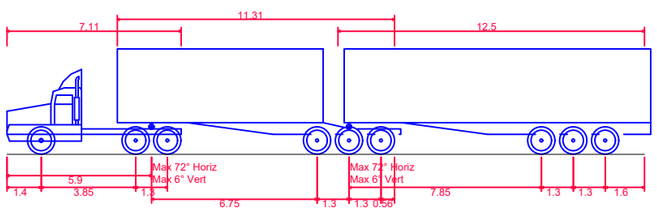
Project
PROPOSED HIGHWAY SERVICE CENTRE
37 - 41 BENGAL ROAD (PACIFIC HIGHWAY)
COOLONGOLOOK NSW
FOR
GALEN PROPERTY Pty Ltd

Drawing Title
PROPOSED DECELERATION LANE
WITH TURNING STUDIES

Approved			Designed VP
Date	February 2019		Drawn VP
Scale	1:250 @ A1 & 1:500 @ A3		Checked
Project No.	18 - 048	Drawing No. Sk - 10.1	Amdt. P3

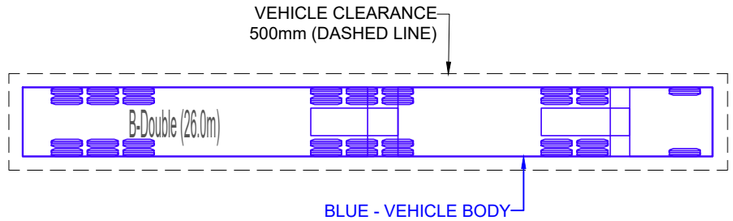
Appendix C Swept Path Analysis





B-Double (26.0m)

Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m



REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	31-10-19	ORIGINAL ISSUE	LD	PC	PC

SCALE 0 4 8 12 16 20m
SCALE 1:400 AT ORIGINAL SIZE

NORTH

CLIENT: TURNBULL PLANNING

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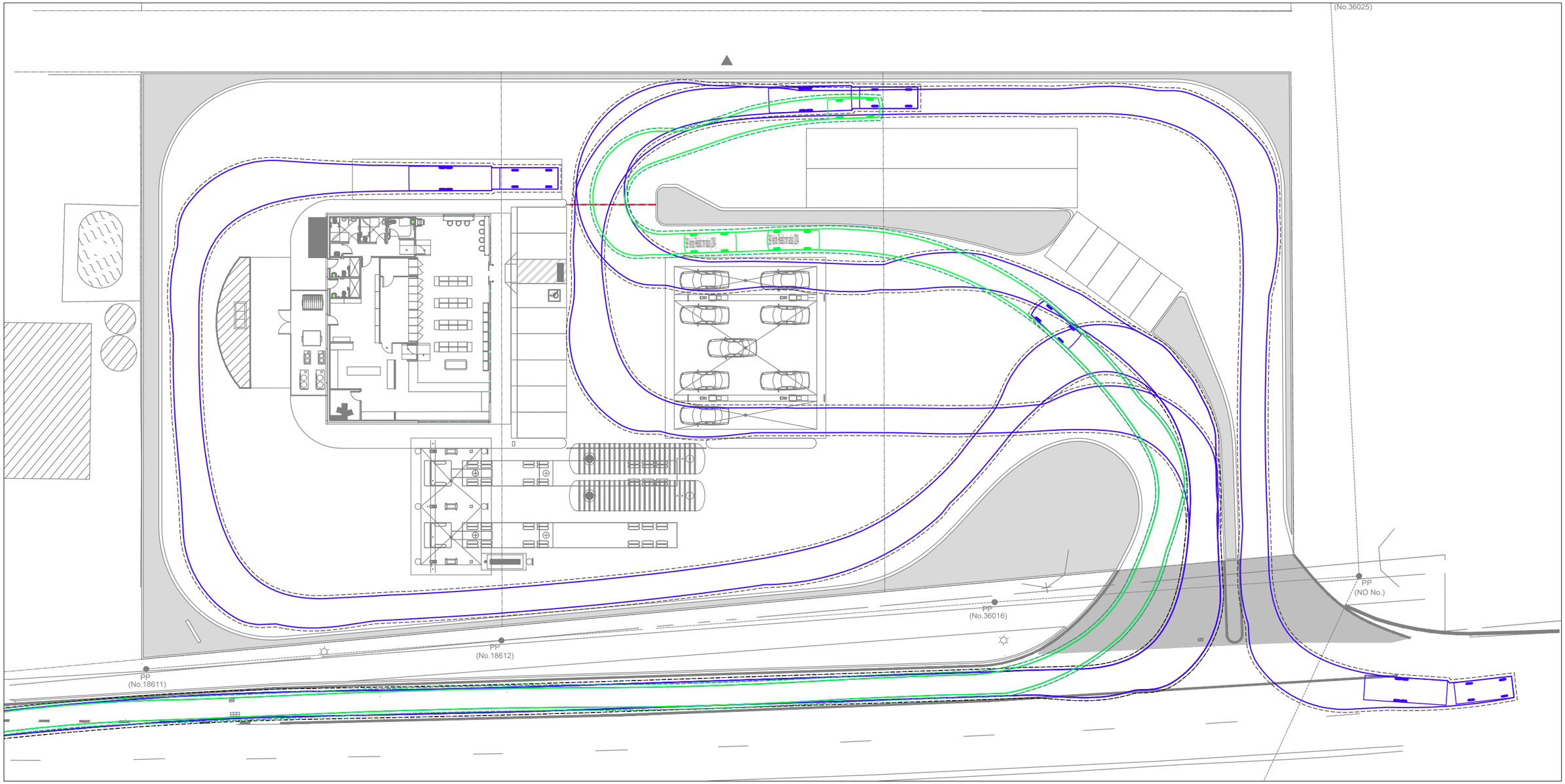
E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

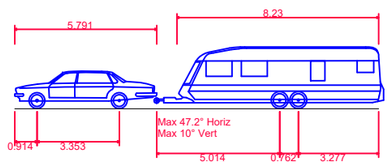
PROJECT: **37 - 41 BENGAL STREET, COOLONGOLOOK NSW**

DRAWING TITLE: **DSWEPT PATH ANALYSIS**
DESIGN VEHICLE - B DOUBLE (26m)

PROJECT NUMBER	18SYT0067
ORIGINAL SIZE	A3
DRAWING NUMBER	18SYT0067-01
REVISION	A
DATE	31 Oct 2019
SHEET	1 OF 1

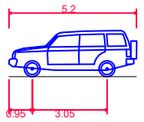
\\ttmfps01.ttm.local\synergy\sy\synergy\projects\18syt\18syt0067 37-41 bengal street, coolongolook service station - traffic assessment\3 - plans\ttm\191023 - [updated plans - canopy location]\18syt0067.dwg





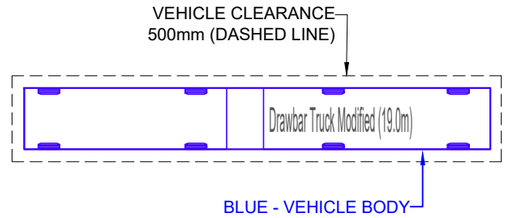
P/T - Car and Camper Trailer

Overall Length	14.844m
Overall Width	2.438m
Overall Body Height	2.515m
Min Body Ground Clearance	0.242m
Max Track Width	2.438m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.058m



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m



REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	31-10-19	ORIGINAL ISSUE	LD	PC	PC

SCALE 0 4 8 12 16 20m
SCALE 1:400 AT ORIGINAL SIZE

NORTH

CLIENT: TURNBULL PLANNING

TTM CONSULTING PTY LTD
ABN 65 010 868 621
LEVEL 5, Suite 501, 174 Pacific Highway
Greenwich NSW 2065
T: (02) 9418 3033 F: (02) 9418 3112
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PROJECT: **37 - 41 BENGAL STREET, COOLONGOLOOK NSW**

DRAWING TITLE: **DSWEPT PATH ANALYSIS**
DESIGN VEHICLE - CAVARAN/CAR & B99

PROJECT NUMBER	18SYT0067
ORIGINAL SIZE	A3
DRAWING NUMBER	18SYT0067-02
REVISION	A
DATE	31 Oct 2019
SHEET	1 OF 1

Appendix D SIDRA Modelling

MOVEMENT SUMMARY

Site: 101 [Base Case (AM peak): Bengal Road - Midge Street]

Base Case: Bengal Road - Midge Street
8-9am
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Bengal Road South												
2	T1	306	14.4	0.086	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	14	23.1	0.016	7.7	LOS A	0.1	0.5	0.44	0.61	0.44	51.0
Approach		320	14.8	0.086	0.3	NA	0.1	0.5	0.02	0.03	0.02	59.5
East: Midge Street East												
4	L2	58	34.5	0.123	10.8	LOS B	0.4	3.8	0.39	0.93	0.39	48.7
6	R2	15	0.0	0.123	19.1	LOS C	0.4	3.8	0.39	0.93	0.39	49.8
Approach		73	27.5	0.123	12.5	LOS B	0.4	3.8	0.39	0.93	0.39	48.9
North: Bengal Road North												
7	L2	1	0.0	0.099	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.3
8	T1	342	20.6	0.099	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		343	20.6	0.099	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
All Vehicles		736	18.7	0.123	1.4	NA	0.4	3.8	0.05	0.10	0.05	58.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Base Case (PM peak): Bengal Road - Midge Street]

Base Case: Bengal Road - Midge Street
4-5 pm
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Bengal Road South												
2	T1	456	22.4	0.133	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	18	23.5	0.021	7.7	LOS A	0.1	0.7	0.43	0.61	0.43	51.1
Approach		474	22.4	0.133	0.3	NA	0.1	0.7	0.02	0.02	0.02	59.6
East: Midge Street East												
4	L2	52	22.4	0.114	10.1	LOS B	0.4	3.2	0.38	0.91	0.38	48.8
6	R2	12	0.0	0.114	24.5	LOS C	0.4	3.2	0.38	0.91	0.38	49.4
Approach		63	18.3	0.114	12.7	LOS B	0.4	3.2	0.38	0.91	0.38	48.9
North: Bengal Road North												
7	L2	4	50.0	0.094	6.1	LOS A	0.0	0.0	0.00	0.01	0.00	55.8
8	T1	327	18.3	0.094	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		332	18.7	0.094	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.9
All Vehicles		868	20.7	0.133	1.1	NA	0.4	3.2	0.04	0.08	0.04	58.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.