



Transport Assessment

Shoalhaven Starches Expansion Project (Modification 31)

Ethanol Distillery Heat Recovery Project

for

Manildra Group

# Document Control

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# 1 Introduction

## 1.1 Overview

arc traffic + transport has been commissioned by Manildra Group (**Manildra**) to prepare a Transport Assessment (**TA**) to examine the access, traffic and parking issues associated with the installation of new and upgraded infrastructure to provide for significant energy efficiencies and emission reductions at **Shoalhaven Starches**, located in Bolong Road, Bomaderry. Modification 31 (**MOD 31**) to the current Shoalhaven Starches Expansion Project Approval MP06\_0228 (**SSEP Approval**) provides for:

- New beverage grade ethanol distillery heat recovery infrastructure, including mechanical vapour recompression;
- New and upgraded fuel grade ethanol reconfiguration and heat recovery infrastructure; and
- New and upgraded dried distillers grain heat recovery infrastructure.

As a consequence of the installation of the new infrastructure, minor changes to access and parking at Shoalhaven Starches are proposed, including:

- The relocation of approximately 78 staff parking spaces in the **Northern Car Park** to land immediately east of the existing Northern Car Park;
- The provision of new, separate, entry and exit driveways for the Northern Car Park, while retaining the existing driveway for the adjacent BOC Gases Site (the **BOC Site**).

MOD 31 will be assessed by the Department of Planning, Housing & Infrastructure (**DPHI**); further details in regard to MOD 31 are provided in the broader MOD 31 application which this TA accompanies.

## 1.2 Transport Assessment Scope

In determining the scope of the TA, arc traffic + transport has referenced Appendix E of the Transport for NSW (**TfNSW**) Guide to Transport Impact Assessment (**TfNSW Guide**), which outlines a Scoping Checklist for the assessment of traffic generating developments. As such, the TA includes an assessment of:

- The existing road network providing access to the different Shoalhaven Starches sites where MOD 31 infrastructure will be located, including future base traffic volumes in key roads, and the operation of key intersections.
- Additional trips generated to the road network by other SSEP Approval Modifications that have yet to commence construction/operation.
- An assessment of the operational traffic characteristics of MOD 31, including vehicle types, vehicle routes, and peak hour and daily traffic volumes; and the potential impact of additional trips on the operation of the road network.
- An assessment of access paths to, through and from the key Shoalhaven Starches sites by the largest vehicles accessing those sites during the operation of the MOD 31 infrastructure.

- An assessment of peak operational parking demands and provision.
- An assessment of the construction traffic characteristics of MOD 31, including vehicle types, vehicle routes, and peak hour and daily traffic volumes; and the potential impact of these construction trips on the operation of the road network.
- An assessment of access paths to, through and from the Shoalhaven Starches sites by the largest vehicles accessing those sites during the construction of the MOD 31 infrastructure.
- An assessment of peak construction parking demands and provision.
- The preparation of a Draft Construction Traffic Management Plan (**Draft CTMP**) which outlines the means by which the construction works can be undertaken with maximum safety and efficiency.

From the outset, it is important to note that once constructed, the MOD 31 works will not generate any additional trips to the broader local road network, but only occasional maintenance and service vehicle trips that would be generated between different Shoalhaven Starches sites. As such, the primary traffic analysis provided in the TA therefore relates to the construction of the MOD 31 infrastructure, which will generate a moderate number of trips over the construction period, estimated at between 12 months and 18 months.

## 1.3 Reference Documents

### 1.3.1 Shoalhaven Starches Reports

arc traffic + transport has prepared numerous reports relating to Shoalhaven Starches, which have been referenced in the preparation of the TA; these include:

- Shoalhaven Starches Modification 26 Transport Assessment 2024 (**MOD 26 TA**);
- Shoalhaven Starches Modification 28 Transport Assessment 2023 (**MOD 28 TA**); and
- Shoalhaven Starches (Supagas) Modification 20 Transport Assessment 2024 (**MOD 20 TA**).

Additional assessments relating to past Modifications or other major projects at Shoalhaven Starches referenced in the TA include:

- SSD 80824235: Proposed CO2 Facility Transport Assessment 2025, prepared by arc traffic + transport (**CO2 SSD TA**);
- Shoalhaven Starches Modification 25 Rail Line Extension Traffic Impact Assessment 2022, prepared by Bitzios Consulting (**MOD 25 TIA**); and
- Shoalhaven Starches Expansion Modification 19 Traffic Impact Assessment 2020, prepared by Bitzios Consulting (**MOD 19 TIA**).

### 1.3.2 Transport Guidelines & Controls

The TA also referenced key guidelines and controls relevant to the assessment of the access, traffic and parking characteristics of MOD 31; these include:

- TfNSW Guide;

- Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis Methods (**GTM Part 3**);
- Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossing Movements (**GTM Part 6**);
- Australian Standard 1742 Manual of Uniform Traffic Control Devices Part 3: Traffic Control for Works on Roads (**AS 1742.3**);
- Roads & Maritime Services Traffic Control at Worksites Manual 2020 (**TCW Manual**);
- Australian Standard 2890.1: Parking Facilities – Off Street Car Parking (**AS 2890.1**); and
- Australian Standard 2890.2: Parking Facilities – Off Street Commercial Vehicle Facilities (**AS 2890.1**).

## 1.4 Consultation

### 1.4.1 Secretary's Environmental Assessment Requirements

A Scoping Report detailing MOD 31 was prepared by Allen Price and submitted to DPHI in December 2024, and in turn Secretary's Environmental Assessment Requirements (**SEARs**) were received from DPHI dated 14 March 2025. A summary of the SEARs relevant to the TA – which generally mirror the Scoping Checklist detailed in Appendix E of the TfNSW Guide - is provided in **Table 1**, along with a summary response to each assessment requirement, and a reference to the section of the TA where each is addressed in further detail.

### 1.4.2 TfNSW Assessment Requirements

Specific assessment requirements relating to MOD 31 have not been received from TfNSW; however, based on past correspondence in response to the Scoping Reports for both MOD 26 and MOD 28, the TfNSW required assessment tasks are essentially identical to those identified in the SEARs, and in the Scoping Checklist in Appendix E of the TfNSW Guide. As such, the assessment tasks provided in response to the SEARs (per **Section 1.4.1** above) are anticipated to also provide a detailed and comprehensive response to TfNSW.

### 1.4.3 Shoalhaven City Council Assessment Requirements

Correspondence was received from Shoalhaven City Council (**Council**) dated 26 March 2025 providing Council's feedback in regard to the Scoping Report. A summary of the transport related issues raised by Council is provided in **Table 2**, along with a summary response to each, and a reference to the section of the TA where each is addressed in further detail.

Table 1: Summary Response to Secretary’s Environmental Assessment Requirements

SEAR	Summary Response	TA Reference
<p><b>Traffic and Transport</b> – including:</p>		
<p>A Traffic Impact Study prepared in accordance with the Transport for NSW Guide to Transport Impact Assessment (GTIA) and Austroads guidelines, that includes:</p>		
<ul style="list-style-type: none"> <li>consideration of all deliverables and actions for construction and operation of the development in Appendix E – Scoping checklist of the GTIA.</li> </ul>	<p>The TA has been prepared with specific reference to the deliverables and actions detailed in Appendix E of the TfNSW Guide. Of specific relevance to the Proposal, items from the Appendix E Scoping Checklist examined in the TA including:</p> <p><b>Proposed development</b></p> <p>Alignment with relevant transport strategies, plans and planning controls</p> <p>Relevant site characteristics, including location and proposed land use mix</p> <p>Plans showing layout of site and access arrangements for all modes</p> <p>Parking provisions and facilities by mode and vehicle type, on-street and off-street</p> <p>Freight and servicing plan</p> <p><b>Existing Conditions</b></p> <p>Area of influence and peak periods identified by mode</p> <p>Road performance analysis</p> <p>Road safety assessment</p> <p><b>Development Impacts</b></p> <p>Trips generated to/from the development by mode</p> <p>Trip distribution and network assignment at an appropriate scale</p> <p>Road performance analysis</p> <p>Road signal warrant and turn lane warrant analysis</p> <p>Road safety assessment</p> <p>On-site transport movements and parking analysis, including swept path diagrams</p> <p><b>Construction impacts on the surrounding transport network</b></p> <p>Haul routes and the type of heavy vehicles used</p> <p>Construction impact mitigations</p>	<p>Section 4</p> <p>Section 3</p> <p>Section 4.3</p> <p>Section 4.4</p> <p>Section 4.5</p> <p>Section 4.4</p> <p>Section 5</p>

Table 1: Summary Response to Secretary’s Environmental Assessment Requirements (continued)

SEAR	Summary Response	TA Reference
<ul style="list-style-type: none"> <li><i>an assessment of cumulative traffic impact on road performance and safety implications at key intersections using an appropriate modelling framework (including the consideration of the Shoalhaven Starches Facility traffic generation, existing base case, future base case and project case scenarios)</i></li> </ul>	<p>An assessment of existing and future base traffic conditions – which considers other Shoalhaven Starches approvals and Modification proposals - has been completed, so that any cumulative impacts arising from the additional trip generation of MOD 31 can be determined. It is noted that once operational, the trip generation of the MOD 31 infrastructure will be limited to occasional maintenance and service vehicle trips, and as such the traffic analysis in the TA focuses on the potential traffic impacts during the construction of the MOD 31 infrastructure.</p>	<p>Section 3 Section 4.4</p>
<ul style="list-style-type: none"> <li><i>plans demonstrating how all vehicles likely to be generated during construction and operation and awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network</i></li> </ul>	<p>Significant space is available within each of the MOD 31 infrastructure sites such that all loading/unloading, materials handling and stockpiling can be entirely contained within these sites at all times, and all vehicles would enter from and depart to Bolong Road in a forward direction..</p>	<p>Section 2.4 Section 4.3</p>
<ul style="list-style-type: none"> <li><i>details of road upgrades, traffic control measures, new roads or access points required for the development if necessary (including approval-in-principle from the relevant road authority, where relevant)</i></li> </ul>	<p>Significant upgrades have been completed in Bolong Road further to past SSEP Approval Modifications. In addition, the capacity of the Princes Highway &amp; Bolong Road intersection, as well as adjacent intersections and the Nowra Bridge, have been increased further to the completion of the recent Nowra Bridge Upgrade by TfNSW.</p> <p>It is again noted that once operational, the trip generation of the MOD 31 infrastructure will be limited to occasional maintenance and service vehicle trips, and as such the traffic analysis in the TA focuses on the potential traffic impacts during the construction of the MOD 31 infrastructure. These construction trips will be temporary, and have no impact on the operation of key intersections such would warrant/require any broader road network upgrades.</p>	<p>Section 3 Section 4.4</p>

Table 1: Summary Response to Secretary’s Environmental Assessment Requirements (continued)

SEAR	Summary Response	TA Reference
<ul style="list-style-type: none"> <li><i>details of the likely trip generation during construction, vehicle routes, access and parking arrangements and measures to mitigate any construction traffic and parking impacts, including a Draft Construction Traffic Management Plan detailing.</i></li> </ul>	<p>The traffic assessment indicates that the construction of the MOD 31 infrastructure will generate up to 30vph in the peak periods; the analysis of the operation of key intersections using SIDRA indicates that these additional trips would have no impact on the operation of the local road network, and moreover would be generated only for the duration of construction, estimated at between 12 months and 18 months.</p> <p>Parking for both operational staff and construction staff will be provided entirely within the Shoalhaven Starches sites, which provide permanent and temporary (construction) parking capacity well in excess of peak parking demand.</p> <p>A Draft CTMP has been prepared that outlines the best means of completing the construction of the MOD 31 infrastructure with minimum impacts on the efficiency and safety of the road network. The CTMP will be finalised further to consideration of any relevant Conditions of Consent to a future MOD 31 approval relating to the construction works.</p>	<p>Section 4.4</p> <p>Section 4.5</p> <p>Section 5</p>

Table 2: Summary Response to Shoalhaven City Council Correspondence

Shoalhaven City Council Issue	Summary Response	TA Reference
<p><i>There appear to be modifications to the car park entrance and exit that will affect the road. I recommend that the scope of works include resurfacing (re-asphalting) at least up to the median to account for the significant impact of Manildra's operations on the road.</i></p>	<p>To accommodate MOD 31 infrastructure in the western portion of the Northern Car Park, the Northern car Park will be expanded to the east, and new, separate entry and exit driveways provided, which would provide for left in only and left out only movements respectively. A short Auxiliary Left (AUL) lane will be provided to the entry driveway in an identical manner to the existing AUL providing access to Gate 2, which currently provides access to the BOC Site and the Northern Car Park. Gate 2 would continue to provide access to the BOC Site only.</p> <p>The northern side of Bolong Road will be resurfaced as part of the construction works for the new Northern Car Park driveways.</p>	<p>Section 4.3</p>
<p><i>Any road modifications must address existing drainage concerns.</i></p>	<p>The design of the Northern Car Park entry and exit driveways has appropriately considered drainage issues.</p>	<p>Section 4.3.2</p>
<p><i>Consideration should be given to expanding the gantry to accommodate pedestrian traffic across the road, thereby mitigating the risks associated with Manildra personnel crossing Bolong Road on foot.</i></p>	<p>While consideration was given to the potential for the gantry to provide pedestrian access over Bolong Road, the gradient of ramps/stairs and their landing footprints either within the road reserve (adjacent to existing footpaths) or with adjacent Shoalhaven Starches sites was determined not to be viable. It is noted however that as part of recent Modifications, footpaths are provided on both sides of Bolong Road, and formal pedestrian refuges located as key crossing locations between Shoalhaven Starches site on the northern and southern side of Bolong Road.</p>	<p>Section 4.6</p>
<p><i>Shoalhaven Water is requesting further information to be provided on the impact of the proposed road widening for the carpark entry and any proposed structural supports for the gantry, on Council critical 200mm and 355mm watermains (and any service connections) located on the northern side of Bolong Road.</i></p>	<p>The design of the Northern Car Park entry and exit driveways, as well as the structural supports for the proposed gantry over Bolong Road, has appropriately considered the location of watermains on the northern side of Bolong Road..</p>	<p>Section 4.6</p>

## 2 The Existing Site

### 2.1 Shoalhaven Starches

Shoalhaven Starches operations occupy a number of distinct ‘sites’ in Bomaderry; while operations are integrated across all sites, some sites have been differentiated in the TA for ease of reference. In this regard, the primary sites relevant to the assessment of MOD 31 are:

- The primary Shoalhaven Starches factory site (the **SS Site**), located south of Bolong Road;
- The former Dairy Farmers site (the **DF Site**), located south of Bolong Road east of the SS Site;
- The **Northern Car Park**, located north of Bolong Road adjacent to the **BOC Site**;
- The **Environmental Farm** (the **Farm**) located north of Bolong Road east of Hanigans Lane; and
- The former Australian Pulp and Paper Mill site (the **PM Site**), located south of Bolong Road east of Hanigans Lane.

These sites are shown in their local context in **Figure 1**, and the figures following show a more detailed image of each of the Shoalhaven Starches sites referenced in the TA, including the Manildra designated gate reference for the access points to each of these sites.

Figure 1: Shoalhaven Starches



Source: Nearmap

Figure 2: Shoalhaven Starches, Dairy Farmers and Northern Car Park



Source: Nearmap

Figure 3: Paper Mill and Environmental Farm



Source: Nearmap

With reference to the figures above, the MOD 31 infrastructure will be provided within the Northern Car Park and SS Site; however, these other Shoalhaven Sites have been identified as they have the potential to be generating trips to/from Bolong Road (further to current approved or proposed Modifications/Major Projects) during the construction of the MOD 31 infrastructure. However, the construction of the MOD 31 infrastructure would not actually generate trips to these other Shoalhaven Starches access intersections.

## 2.2 Previous Site Approvals

### 2.2.1 Shoalhaven Starches Expansion Project Approval MP06-0228

The SSEP Approval was granted by the Minister for Planning on the 28 January 2009; this approval also encapsulated previous approvals for the Site into one overall approval (at that time).

The SSEP sought to increase ethanol production at the Site in a staged manner, from 126 million litres per annum (**ML/annum**) to 300 ML/annum. To accomplish the increase in ethanol production, the project required a series of plant upgrades and increase in throughput of raw materials, principally flour and grain.

The SSEP sought to increase ethanol production to meet the then expected increase in demand for ethanol arising from the NSW Government's mandate to increase the blending of ethanol in the total of volume of petrol sold in NSW towards an ethanol content of 10% by 2011. Unfortunately, the expected increase in demand for ethanol to meet the demand arising from this mandate has not occurred, primarily due to the mandate not being imposed on petroleum suppliers.

As a result, Manildra have been investigating alternative markets for the ethanol that is and will be produced at the Site in accordance with the SSEP Approval; one such market is the "beverage" market where ethanol is further treated and purified to enable it to meet stringent beverage grade specifications and pass organoleptic testing requirements to enable it to be utilised in the production of alcoholic drinks.

### 2.2.2 Modification Approvals

Manildra subsequently obtained approval for Modification 12 (**Mod 12**) on 12 September 2017, which provided for modifications to the ethanol distillation plant to enable an increase in production of up to 110 ML/annum of beverage grade ethanol. Mod 12 did not involve an increase in overall ethanol production above the currently approved 300 ML/annum, but rather enabled greater flexibility in the type of ethanol that is produced from the plant. Mod 12 also provided for the relocation and expansion of staff parking areas adjacent to the BOC Gas facility opposite the SS Site north of Bolong Road.

Manildra purchased the former Australia Paper Mill site at 340 Bolong Road, and Modification 14 (**MOD 14**) subsequently provided for the PM Site to be used for the storage of finished products and engineering plant and the use of existing storage tanks, buildings and workshops for purposes ancillary to the primary Shoalhaven Starches operations.

In 2020, Manildra received an approval for Modification 18 (**Mod 18**), which provides for the production of 120 ML/annum of hand sanitizer grade alcohol out of the overall 300 ML/annum approved production limit under the SSEP Approval. Mod 18 followed a request by the Federal Government's Department of Industry, Sciences and Energy to produce more hand sanitizer alcohol in response to the current Coronavirus COVID 19 conditions, noting that Mod 18 similarly does not involve production increasing above the 300 ML/annum limit conditioned under the SSEP Approval.

In 2021, Manildra received an approval for Modification 19 (**Mod 19**) which provides for an increase in capacity of Shoalhaven Starches to produce an additional 100 ML/year of beverage grade ethanol, noting that this does not exceed the maximum production of up to 300 ML/annum conditioned under the SSEP Approval.

Other recently approved or currently proposed Modifications specifically relevant to the TA include:

- Approved Modification 25 (**MOD 25**) which provides for an extension of the on-site rail line to allow additional on-site standing area so that trains longer than 900m can be entirely accommodated on-site, as well as additions to approved product dryers.
- Approved Modification 28 (**MOD 28**), which provides for the construction and operation of a temporary grain storage bunker at the Shoalhaven Starches Environmental Farm located in Hanigans Lane.
- Proposed Modification 30 (**MOD 30**), which provides for an increase in the processing capacity of the existing Supagas facility adjacent to the DF Site.
- Proposed Modification 33 (**MOD 33**), which provides for a new warehouse at the PM Site to provide greater efficiencies in the movement of products to/from Shoalhaven Starches by third parties.

In addition, the CO<sub>2</sub> SSD would provide for CO<sub>2</sub> produced as a byproduct of the broader Shoalhaven Starches operations to be piped from the SS Site to a new CO<sub>2</sub> Facility within the PM Site, where it would be purified into food and beverage grade LiCO<sub>2</sub>, and then transported from the CO<sub>2</sub> Facility by tanker truck.

## 2.3 Staff

Current Manildra operations require up to 280 permanent staff on-site at any one time (weekdays). In addition, up to 300 contract staff can be on-site at any one time during peak operating periods, or a total of 580 staff at any one time.

However, it is rarely (if ever) the case that this number of staff attend the Shoalhaven Starches sites on the same day or at the same time further to consideration the shift structures and the like.

## 2.4 Parking

Car parking is currently provided at all of the key Shoalhaven Starches sites; with reference to past parking surveys, on-site observations and Nearmap images, the total parking supply and average weekday demand across the Shoalhaven Starches sites is summarised in **Table 3**.

**Table 3: Shoalhaven Starches Parking Provision and Average Peak Demand**

Parking Area	Capacity	Average Peak Demand <sup>2</sup>
Western Car Park	15	13
Northern Car Park <sup>1</sup>	438	260
DF Site Car Park	70	64
Paper Mill	30	24
<b>Total</b>	<b>553</b>	<b>361</b>

**Note 1:** The total spaces in the Northern Car Park include the 10 spaces provided immediately adjacent to the BOC Site which are used by Shoalhaven Starches staff.

**Note 2:** Average peak demand represents the average week day demand based on permanent staff and a moderate number of contractors; however, contractor numbers can at times increase based on production spikes and construction projects such as would be the case for the construction of the MOD 31 infrastructure.

With reference to **Table 3**, it is important to note that at the time of the parking surveys (early 2024), the total number of staff (permanent and contractors) on-site was approximately 479, including almost all permanent staff and approximately 200 contractors; this in turn indicates an average car occupancy of approximately 1.5 staff per vehicle.

Based on our past assessments, contractors tend to have much higher vehicle occupancies, including in some instances the use of small shuttle buses. As such, it anticipated that permanent staff vehicles would have an occupancy closer to 1.2 staff per vehicle, and contractors an occupancy closer to 1.5 staff per vehicle, and indeed likely higher vehicle occupancies for specialist contract/construction staff.

Most importantly, the Shoalhaven Starches operations do not generate any off-site (i.e. on-street) parking demand, with on-site parking areas capable of accommodating even super-peak parking demands (see also **Section 4.5**).

## 3 Transport Networks

### 3.1 Key Roads

#### 3.1.1 Bolong Road

Bolong Road is a Regional Road which runs east-west from Gerroa Road at Coolangatta and the Princes Highway at Bomaderry. In the vicinity of Shoalhaven Starches, it provides 1 traffic lane in each direction, and has a posted speed limit of 50km/h west of Hanigans Lane, and 100km/h east of Hanigans Lane.

#### 3.1.2 Princes Highway

Princes Highway is a National Highway that generally runs north-south from Sydney to Adelaide along the eastern coast.

West of Shoalhaven Starches, Princes Highway provides 2 – 3 lanes in each direction, while north of Bomaderry it has been significantly upgraded in recent years to provide bypasses of Berry, Foxground and Gerringong. TfNSW has recently completed construction works associated with the Nowra Bridge Upgrade project, which include a new bridge over the Shoalhaven River, and upgrades to the intersections of Princes Highway & Bolong Road and Princes Highway & Illaroo Road. These upgrades have significantly increased capacity in Princes Highway through Bomaderry and Nowra, as well as the capacity of these intersections.

#### 3.1.3 Railway Street – Cambewarra Road - Meroo Road

Railway Street, Cambewarra Road and Meroo Road form a local truck route between Bolong Road and the Princes Highway interchange at Pestells Lane. Each of these roads provide 1 traffic lane in each direction, and a 50km/h posted speed limit other than the northern section of Meroo Road on the approach to the Princes Highway Interchange, where the speed limit increases to 80km/h (see also **Section 3.3**).

### 3.2 Key Intersections

#### 3.2.1 Bolong Road & Gate 1

The intersection of Bolong Road & Gate 1 (DF Site) has been extensively upgraded over the past 10 years, and includes the following:

- A Channelised Right (**CHR**) lane from Bolong Road to Gate 1;
- An Auxiliary Left (**AUL**) lane from Bolong Road to Gate 1;
- A large internal apron area within the DF Site to provide for U-Turns from other SS Site driveways and the Northern Car Park where access to/from Bolong Road is restricted to left in/left out (**LILO**) only;

- A channelised acceleration lane from Gate 1 to Bolong Road; and
- Geometry providing for the movement of the largest vehicle accessing the DF Site (a 36m A-Double – see also **Section 3.3**).

Sight distances at the intersection are in excess of the requirements of GRD Part 3.

### 3.2.2 Bolong Road & Gate 2

This intersection provides access to both the Northern Car Park and the adjacent BOC Site for LILO movements only due to a central median in Bolong Road adjacent to the Northern Car Park. The majority of trips by staff parking in the Northern Car Park (and indeed staff across Shoalhaven Starches) are to/from the west, and that as such departure trips from Gate 2 use the Bolong Road & Gate 1 intersection (and the internal DF Site driveway apron) to turn around so as to depart to the west. Sight distances at the intersection are in excess of the requirements of GRD Part 3.

As discussed, MOD 31 provides for the construction of new entry and exit lanes for the Northern Car Park, but only LILO movements would continue to be provided (see also **Section 4.3.2**).

### Bolong Road & Gate 13

The intersection of Bolong Road & Gate 13 provides Basic Left (**BAL**) treatments for the left turn movements to and from Gate 13, and a de facto Basic Right (**BAR**) treatment for the right turn movement from Bolong Road to Gate 13 given that on-street parking is not available opposite Gate 13 (due to the driveways to industrial sites on the northern side of Bolong Road). Sight distances at the intersection are in excess of the requirements of GRD Part 3.

### 3.2.3 Additional Bolong Road Intersections

A number of other local roads and Shoalhaven Starches driveways intersect with Bolong Road between the PM Site and Princes Highway; however, once operational, the MOD 31 infrastructure would not generate any additional trips to/from any of these roads or driveways.

With reference to **Section 4.4**, construction trips would have little if any potential to impact the operation of these intersections based on the relatively minor and temporary number of construction trips past these driveways in Bolong Road (i.e. through trips in Bolong Road only); the generation of most construction trips outside of commuter peak hours; and the distribution of construction staff trips to numerous available routes.

## 3.3 Truck Routes

Bolong Road (between the PM Site and Princes Highway) and Princes Highway are NHVR approved Restricted Access Vehicle (**RAV**) routes providing for vehicles up to and including 26m B-Doubles, as shown in **Figure 4**.

Figure 4: Restricted Access Vehicle Routes



Source: NHVR

Importantly, in March 2024 the NHVR also provided an approval for the use of 36m A-Doubles in Bolong Road between Princes Highway (north of Bolong Road only) and the PM Site. This approved 36m A-Double route is not currently shown in the NHVR interactive maps, but a copy of the approval is provided in **Appendix A**.

All RAV routes are assessed by the NHVR and/or TfNSW to ensure that these routes are appropriately designed to provide for the movement of the largest vehicles permitted to use them. This means that the geometry of these roads and intersections has been determined by the NHVR and/or the TfNSW to be appropriate to the movement of large vehicles both along Bolong Road and to the numerous Shoalhaven Starches access driveways.

The largest trucks that will access Shoalhaven Starches sites during the construction of the MOD 31 infrastructure will continue to be no larger than the approved 36m A-Double, and indeed are anticipated to be no larger than a standard articulated vehicle (see also **Section 4.3**).

With reference to **Figure 4**, while parts of Railway Street and Meroo Road are also approved RAV routes, a complete RAV approved route is not available for the entire trip between Bolong Road and Princes Highway. As such, this route is only available for General Access Vehicles (**GAVs**), generally being articulated vehicles up to 20m in length.

## 3.4 Future Base Traffic Volumes

### 3.4.1 Overview

Sections below provide details of the determination of **Base 2030** traffic volumes in Bolong Road, and at the key intersections; 2030 represents the estimated maximum timeframe for the approval and then construction of the MOD 31 infrastructure. As discussed, once operational the MOD 31 infrastructure would not generate any additional trips.

### 3.4.2 Traffic Surveys

In 2023, arc traffic + transport commissioned peak hour traffic surveys at key intersections in Bolong Road to inform the MOD 26 TA and MOD 28 TA traffic analysis. These surveyed volumes remain appropriate base volumes for the traffic analysis, and are provided in **Appendix B**.

### 3.4.3 Background Traffic Growth

The 2023 traffic volumes in Bolong Road have been factored with reference to the average annual growth rates in Bolong Road identified by TfNSW in the traffic reports prepared for the Nowra Bridge Upgrade, being 1.7% per annum (linear); this growth rate has been applied to the 2023 surveyed volumes in Bolong Road over 7 years to provide the underlying Base 2030 traffic volumes.

### 3.4.4 Super-Peak Shoalhaven Starches Staff Trips

At the time the traffic surveys were undertaken, there were approximately 100 fewer staff on-site across Shoalhaven Starches than could be on-site (across Shoalhaven Starches) further to all current SSEP Approval Modifications being under construction or in operation. Importantly, this super-peak would include construction staff working to complete other approved infrastructure across Shoalhaven Starches.

To calculate the additional trips that could be generated under these conditions, the traffic analysis has considered the following:

- With reference to the traffic survey data set in **Appendix B**, peak staff arrival periods occur prior to the AM commuter peak hour, but are generally steady across the broader PM peak period. To provide a conservative assessment, 40% of additional staff trips have been assigned in the AM peak hour, and 50% assigned in the PM peak hour.

- Contract and construction staff have a higher vehicle occupancy than permanent staff; however, for the traffic analysis a conservative occupancy of 1.2 staff per vehicle has been adopted.
- The distribution of trips is based on the existing distribution characteristics across the numerous Shoalhaven Starches driveway intersections to Bolong Road, including both arrival and departure patterns and directional distribution.
- All additional staff trips have been assigned to the Northern Car Park.
- Finally, the assignment of additional trips considers the LIFO restrictions at the intersection of Bolong Road & Gate 2, which in turn results in the majority of departure trips using the intersection of Bolong Road & Gate 1, and the internal driveway apron within the DF Site, to turn back to the west.

### 3.4.5 Current Projects

To provide an appropriate assessment of worst case conditions, the Base 2030 traffic volumes have also considered to following projects:

- **Modification 28:** MOD 28 provides for temporary grain storage capacity during periods when rail services to the broader SS Site are disrupted, as has been the case in recent years during periods of bad weather. Grain bunkers are located at the Farm, and large delivery trucks bring grain to be stored until such time as a rail disruption occurs; when a disruption occurs, smaller transfer trucks then transfer the grain from the Farm to the SS Site via Gate 13.

However, these operations are anticipated to cease by the end of 2025 further to the additional grain storage capacity being provided across Shoalhaven Starches under other Modifications, as well as the improved rail access provided further to the MOD 25 approval.

- **Modification 26:** MOD 26 proposes new grain storage and handling facilities across a number of Shoalhaven Starches sites, and would also result in the relocation of staff parking from the DF Site to the Northern Car Park. While the construction of the MOD 26 infrastructure (further to an approval of MOD 26) would occur after construction of the MOD 31 infrastructure, the relocation of staff parking is anticipated to occur prior to the MOD 31 construction period, and as such the redistribution of staff trips from the DF Site to the Northern Car Park has been included in the Base 2030 traffic volumes.

- **Modification 30:** MOD 30 provides for an increase in the processing capacity of the existing Supagas Facility adjacent to the DF Site, and is currently being assessed by the DPHI.

The MOD 30 infrastructure is anticipated to be constructed prior to the MOD 31 construction period, but the additional operational trips generated under MOD 30 would be generated under Base 2030 conditions.

- **CO2 SSD:** The CO2 SSD provides for a new CO2 Facility within the PM Site.

The CO2 SSD infrastructure is anticipated to be constructed prior to the MOD 31 construction period, but the additional operational trips generated under the CO2 SSD would be generated under Base 2030 conditions.

With reference to the above, the Base 2030 traffic volumes therefore include:

- MOD 26 staff parking redistribution;
- MOD 30 operational trips; and
- CO2 SSD operational trips.

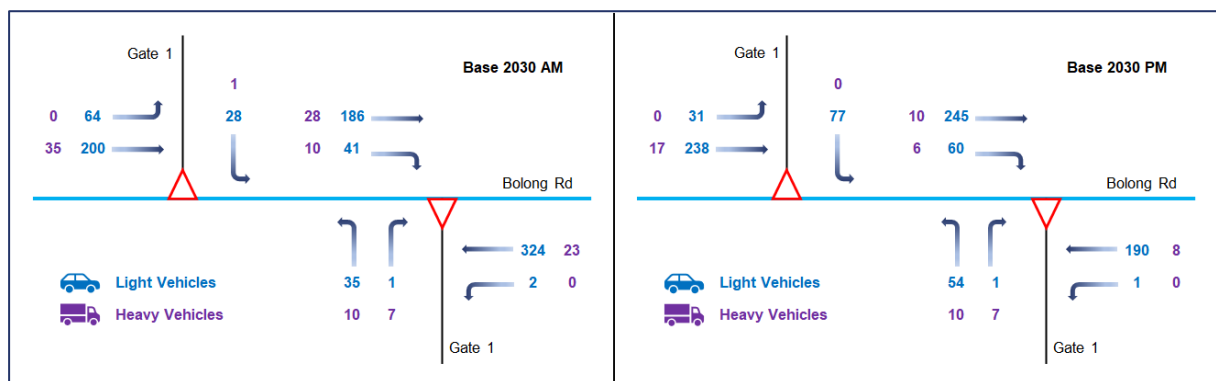
Details of these additional operational and construction trips are provided in the MOD 26 TA; MOD 30 TA; and CO2 SSD TA.

### 3.4.6 Trip Assignment

The only intersections with the potential for be impacted during the construction of the MOD 31 infrastructure are Bolong Road & Gate 1 and Bolong Road & Gate 2; simply, the MOD 31 construction period will generate few if any trips to other Shoalhaven Starches intersections, and in and of themselves be very moderate and temporary.

The peak hour traffic volumes at these intersections under super-peak Base 2030 conditions are shown in **Figure 5**

Figure 5: Base 2030 Peak Hour Traffic Volumes



## 3.5 Base 2030 Intersection Operations

### 3.5.1 SIDRA

The operation of the key intersections under Base 2030 conditions has been assessed using the SIDRA intersection model. SIDRA provides a number of key outputs by which to measure the performance of an intersection, including:

- **Average Vehicle Delay (AVD):** AVD (or average delay per vehicle in seconds) for intersections is used to determine an intersection's Level of Service (see below).

- **Level of Service (LOS):** LOS is a comparative measure that provides an indication of the operating performance, based on AVD. For unsignalised intersections, LOS is based on the worst average delay to any approach at the intersection.
- **Degree of Saturation (DOS):** DOS is defined as the ratio of demand (arrival) flow to capacity. DOS above 1.0 represent over-saturated conditions (demand flows exceed capacity) and degrees of saturation below 1.0 represent under-saturated conditions (demand flows are below capacity)
- **95%ile Queue Length (95QL):** 95QL is the length below which 95% of all modelled queue lengths fall, or 5% of modelled queues exceed.

With regard to LOS, **Table 4** provides a summary of the SIDRA recommended criteria for the assessment of unsignalised intersections.

**Table 4: SIDRA Level of Service Criteria**

Level of Service	Average Delay (seconds per vehicle)	Unsignalised Intersections
A	less than 14	Good operation
B	15 to 28	Good with acceptable delays & spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode
F	More than 70	Unsatisfactory and requires additional capacity.

Source: SIDRA Systems

### 3.5.2 Future Base Intersection Operations

Further to the SIDRA analysis, **Table 5** provides a summary of the operation of the key intersections under Base 2030 conditions; SIDRA Movement Summaries are provided in **Appendix C**.

Table 5: Base 2030 Intersection Operations

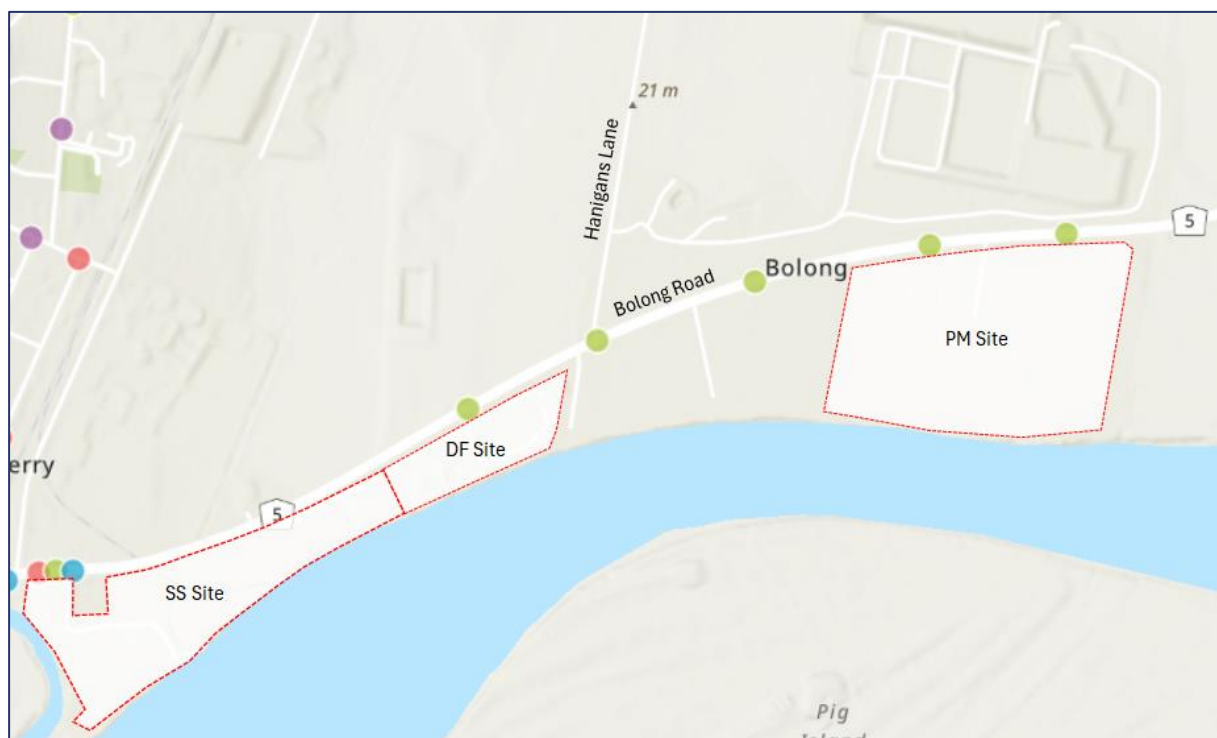
Base 2030 Intersection Operations	Level of Service		Average Delay (s)		95QL (m)		Degree of Saturation	
	AM	PM	AM	PM	AM	PM	AM	PM
Bolong Rd & Gate 1	B	A	17	11.7	2.0	1.9	0.195	0.142
Bolong Rd & Gate 2	A	A	5.5	5.5	0.7	1.8	0.139	0.144

With reference to **Table 5**, the key intersections will operate at a good LOS under Base 2030 conditions, with minimal AVD and 95QL, while retaining significant spare capacity.

### 3.6 Crash Data

TfNSW’s Centre for Road Safety provides crash data for all roads across NSW for the period 2019 – 2023 inclusive. A review of this data indicates that there were 6 serious crashes (shown as green dots) in Bolong Road in the vicinity of Shoalhaven Starches during this period, as shown in **Figure 6**.

Figure 6: 2019 – 2023 Crash Locations



Source: TfNSW

Importantly, speed and/or fatigue were identified as contributing factors in all but one of these serious crashes, and none of the crashes occurred at Shoalhaven Starches access driveways. As importantly, no crashes were reported to have involved heavy trucks.

Based on the crash data, there is no information to suggest that the geometry of Bolong Road or intersections along Bolong Road are unsafe, a point inherently agreed by the NHVR given that road safety is a key consideration when assessing RAV routes. Notwithstanding, TfNSW examined the speed limit in different sections of Bolong Road in mid-2024, and in September 2024 the speed limit in Bolong Road between Hanigans Lane and Princes Highway was reduced from 60km/h to 50km/h.

More broadly, it can only be concluded that the reported crashes in Bolong Road were simply a result of human error.

## 3.7 Public & Active Transport

### 3.7.1 Public Transport

The central part of the SS Site is located approximately 800m east of Bomaderry Station, and from bus stops in Meroo Street through which local Bomaderry and Nowra bus services operate; all other Shoalhaven Starches sites are located more than 1.5km from the Bomaderry Station, and no bus services are available in Bolong Road. As such, it is acknowledged that there is little potential for construction (or operational) staff to use public transport for all or part of the journey to any of the Shoalhaven Starches sites relevant to MOD 31.

### 3.7.2 Active Transport

As part of past Modifications, significant pedestrian infrastructure has been provided in Bolong Road adjacent to the key Shoalhaven Starches sites, including pedestrian refuges and footpaths providing access primarily between the Northern Car Park and the SS Site and DF Site; no active transport infrastructure is provided east of the DF Site.

As with public transport, it is acknowledged that there would only be a small number of staff – and likely no MOD 31 construction staff – travelling to any of the Shoalhaven Starches sites by walking or cycling.

## 4 Modification 31

### 4.1 Modification 31

As stated in the **Introduction**, MOD 31 will provide for the following:

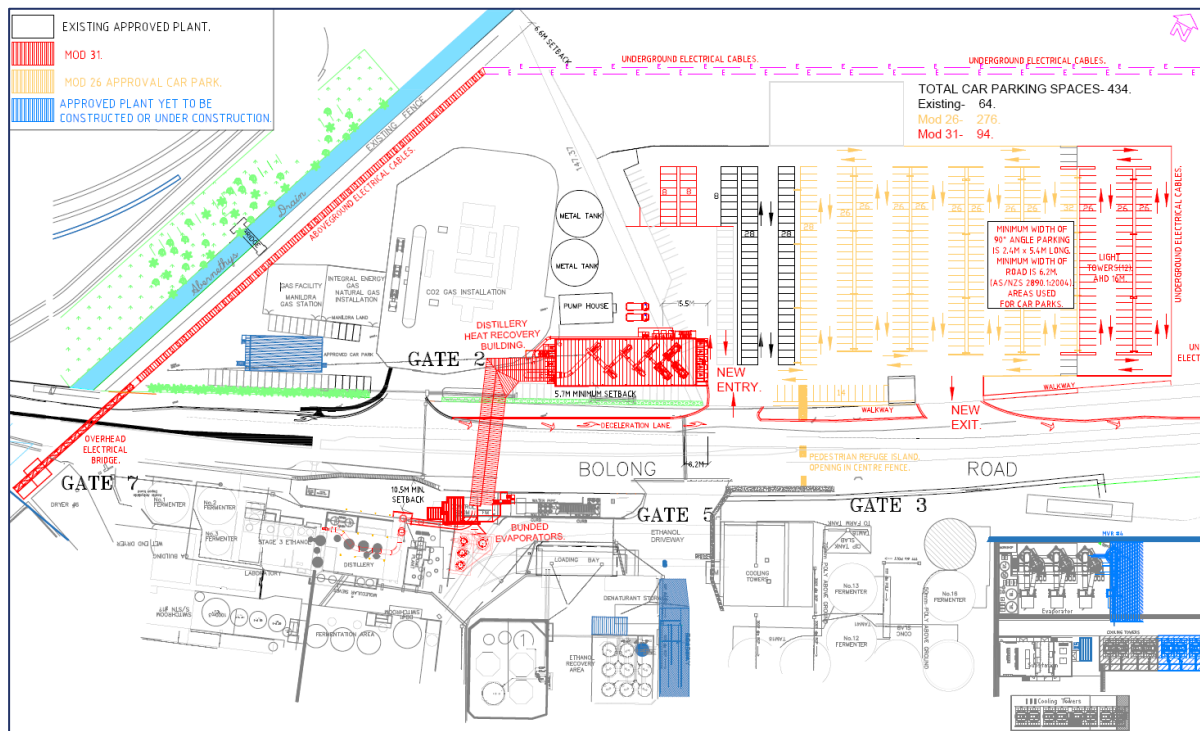
- New beverage grade ethanol distillery heat recovery infrastructure, including mechanical vapour recompression.
- New and upgraded fuel grade ethanol reconfiguration and heat recovery infrastructure.
- New and upgraded dried distillers grain heat recovery infrastructure.

As a consequence of the installation of the new infrastructure, changes to access and parking in the Northern Car Park are proposed, including:

- The relocation of staff parking spaces in the Northern Car Park to land immediately east of the existing Northern Car Park; and
- The provision of a new, separate, entry and exit driveways for the Northern Car Park, while retaining the existing driveway for access to the BOC Site.

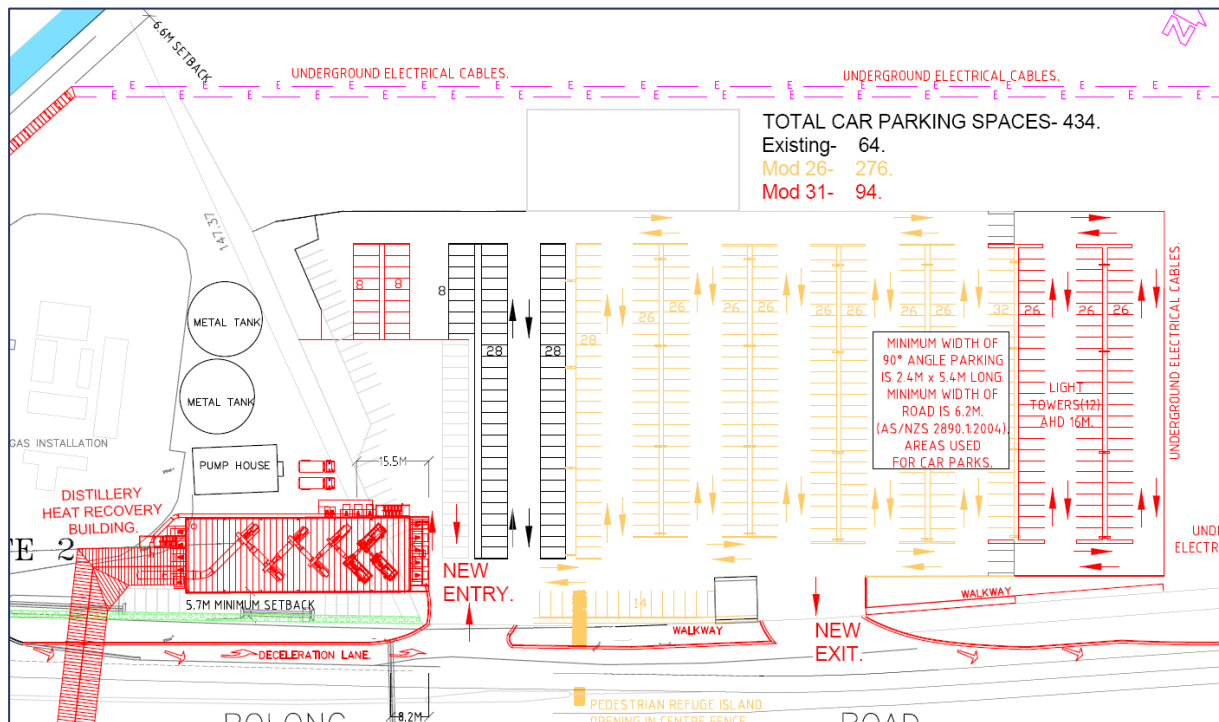
Full details of each of the components of MOD 31 are provided within the broader Modification submission that this TA accompanies; an overview of the MOD 31 infrastructure is provided in **Figure 7**, and a more detailed plan showing works within and adjacent to the Northern Car Park is provided in **Figure 8**.

Figure 7: Modification 31 Overview



Source: Manildra

Figure 8: Modification 31 Northern Car Park



Source: Manildra

As discussed previously, once operational the MOD 31 infrastructure will not result in any increases in Shoalhaven Starches staff (permanent or contract) nor generate any additional truck trips. As such, the assessment of the access, traffic and parking characteristics of MOD 31 provided in sections below specifically considers the construction of the MOD 31 infrastructure.

## 4.2 Construction Characteristics

### 4.2.1 Construction Schedule

Based on information provided by Manildra, the MOD 31 construction works are estimated to take 12 months to 18 months to complete.

### 4.2.2 Construction Staff

Up to 60 construction staff would be on-site at any one time during the MOD 31 construction works.

### 4.2.3 Construction Trucks

While somewhat labour (construction staff) intensive, the construction of the MOD 31 infrastructure will generate only a very minor number of truck trips; based on information provided by Manildra, the MOD 31 construction works would generate an average of no more than 1 truck (2 truck trips) per day.

In addition, the overwhelming majority of these trucks would be smaller trucks, with only 12 larger trucks (up to and including articulated vehicles) expected to be generated during the entire construction period (see also **Section 5.3**).

At this time, there is no expectation that Oversize/Overmass (**OSOM**) vehicles will be required during the construction period. Notwithstanding, depending on the choice of Principal Contractor for the works, the potential exists that some larger prefabricated/built components of the new infrastructure may need to be brought to the Site using OSOM vehicles. Protocols for the use of OSOM vehicles are discussed further in **Section 5.3**).

### 4.3 Access

#### 4.3.1 Bolong Road & Gate 1

While none of the MOD 31 infrastructure will be provided within the DF Site, the intersection of Bolong Road & Gate 1 will continue to provide for staff trips generated by sites on the northern side of Bolong Road with left out only access to turn back to the west using the internal apron within the DF Site. These trips will include departure trips by MOD 31 construction staff from the Northern Car Park.

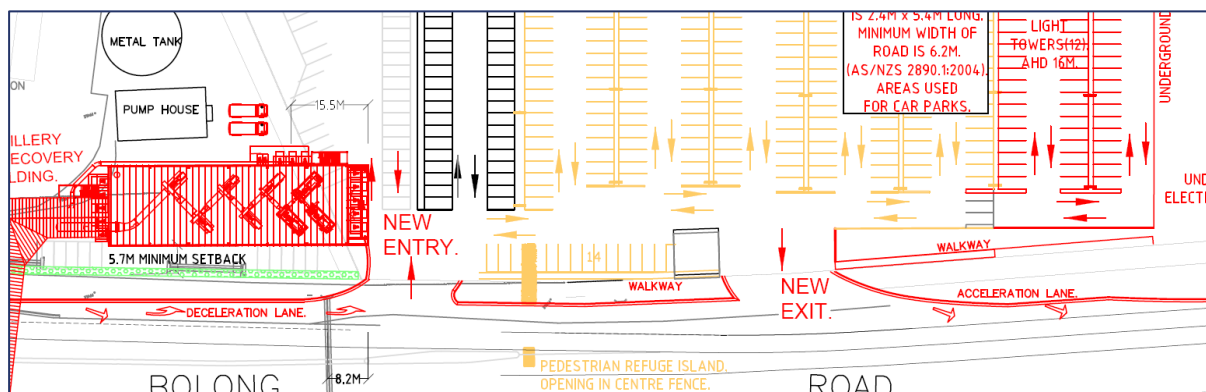
The intersection will also continue to provide for arrival trips from the west to Shoalhaven Starches driveways on the southern side of Bolong Road providing left turn entry only.

#### 4.3.2 Bolong Road & Northern Car Park

With reference to **Figure 8**, much of the MOD 31 infrastructure will be located in the western portion of the Northern Car Park. This will necessitate not only the relocation of existing parking to land east of the existing Northern Car Park (see **Section 4.5**), but also the provision of new access driveways to/from the Northern Car Park.

The proposed design of these new driveways is shown in **Figure 9**, noting that the existing Gate 2 access to the BOC Site will remain unchanged.

**Figure 9: Proposed Northern Car Park Access Driveways**



Source: Manindra

With reference to **Figure 9**, separate entry and exit driveways are proposed, with an AUL of approximately 75m from Bolong Road to the entry driveway, which is the same length as the AUL currently provided from Bolong Road to Gate 2. The entry driveway will provide for left turn entry movements only, while the exit driveway will provide for left turn departure movements only. As

discussed previously, staff wishing to travel to the west would depart the Northern Car Park to the east and then turn around at the DF Site.

Detailed design plans for the new driveways are provided in the broader MOD 31 submission, but as requested in the correspondence received from Council in regard to MOD 31, the plans:

- Provide for the resurfacing of the northern carriageway in Bolong Road adjacent to the new driveways;
- Appropriately address drainage concerns; and
- Appropriately consider the location of watermains on the northern side of Bolong Road.

The final design of the new driveways will necessarily need to be approved by Council prior to any construction works commencing.

#### 4.3.3 Additional Bolong Road Access Intersections

The intersection of Bolong Road & Gate 13, and Bolong Road & Gate 5, will be used by a small number of construction vehicles accessing MOD 31 infrastructure work sites in the western and central portion of the SS Site; however, no more than a handful of trips are anticipated to be generated via these gates each day during the construction period, and no trucks larger than existing approved trucks would use these gates.

### 4.4 Traffic

#### 4.4.1 Trip generation

As discussed in **Section 4.2**, it is estimated that up to 60 construction staff could be on-site at any one time, and with reference to **Section 2.4**, construction staff – and particularly specialist construction staff as will be required – generally travel in groups, i.e. the vehicle occupancy of construction vehicles is much higher than that of permanent staff, and will likely include the use of shuttle buses for some specialist staff from local accommodation centres (such as Bomaderry and Nowra).

As a worst case, a vehicle occupancy of 2 has been assigned to construction staff, resulting in a total of 30 arrival trips and 30 departure trips per day. While the majority of these trips would be outside of the commuter peak hours (based on construction hours of 7:00am to 6:00pm), as a worst case all arrival trips have been assigned in the AM peak, and all departure trips have been assigned in the PM peak.

As discussed in **Section 4.2**, the MOD 31 construction works will not generate any significant number of truck trips, with an average of no more than 2 truck trips per day. It is unlikely that any truck trips would occur during the commuter peak periods, but 2 truck trips have nonetheless been assigned in both the AM and PM peaks.

#### 4.4.2 Trip Distribution

The majority of construction staff trips will be generated to/from the Northern Car Park via the new access driveways, while a small number of trips would on occasion be generated to parking available

in proximity to the SS Site works areas via Gate 13 and Gate 5. As a worst case, all trips have been assigned to the Northern Car Park (which in turn results in all departure trips using the intersection of Bolong Road & Gate 1, the busiest Shoalhaven Starches intersection). Trips have then been distributed to the east and west of Shoalhaven Starches with reference to the surveyed distribution of trips at the key intersections, noting that the majority of trips will be generated to/from the west in both peaks.

#### 4.4.3 Trip Assignment

With reference to sections above, **Figure 10** provides a summary of the additional MOD 31 construction trips at the key intersections, and **Figure 11** provides a summary of the total volumes at these intersections under Base 2030 + MOD 31 Construction conditions.

Figure 10: MOD 31 Construction Peak Hour Traffic Volumes

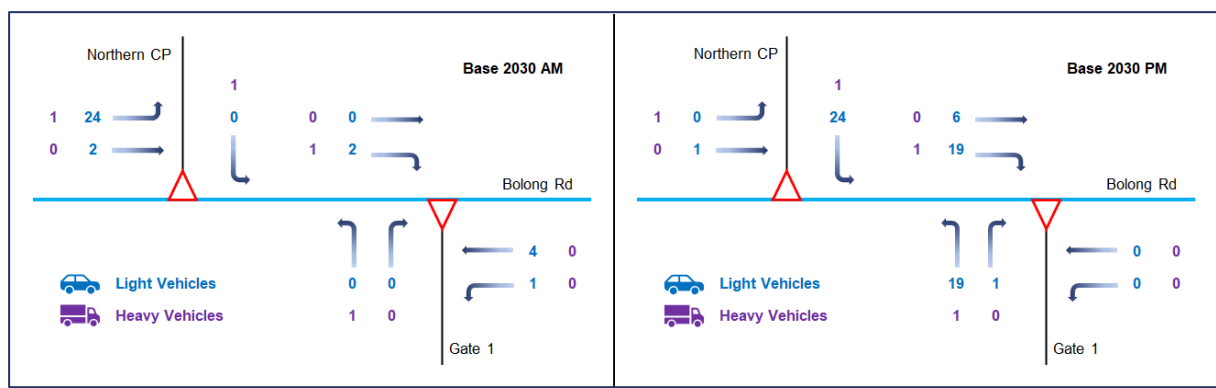
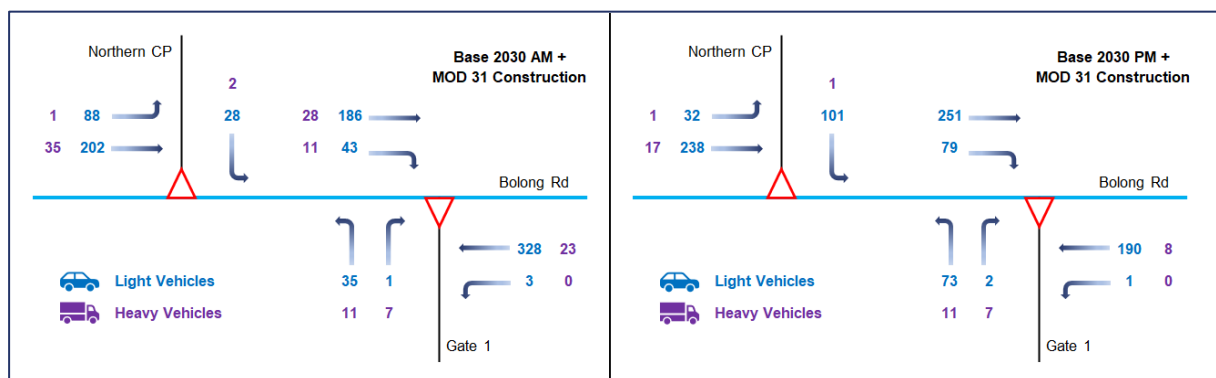


Figure 11: Base 2030 + MOD 31 Construction Peak Hour Traffic Volumes



#### 4.4.4 Intersection Operations

The operation of the key intersections under Base 2030 + MOD 31 Construction conditions has been assessed using SIDRA; the results of the SIDRA analysis are summarised in **Table 6**, and SIDRA Movement Summary reports are provided in **Appendix C**.

Table 6: Base 2030 + MOD 31 Construction Intersection Operations

Base 2030 Intersection Operations	Level of Service	Average Delay (s)	95QL (m)	Degree of Saturation

	AM	PM	AM	PM	AM	PM	AM	PM
Bolong Rd & Gate 1	B	A	17.4	11.6	2.1	2.4	0.198	0.146
Bolong Rd & Gate 2	A	A	5.6	5.6	0.7	2.4	0.140	0.144

With reference to **Table 6**, the key intersections will continue to operation at a good LOS under 2030 + MOD 31 Construction conditions, with no changes to LOS from that reported under Base 2030 conditions, and virtually no increases in AVD or 95QL. Each intersection also retains significant spare capacity.

Finally, it is noted that the Base 2030 traffic volumes already consider – essentially – the maximum number of staff that would be on-site (across the Shoalhaven Starches sites) at any one time, i.e. the super-peak conditions reflect in the Base 2030 traffic volumes would already include an allowance for construction staff (i.e. for the MOD 31 construction) being on-site.

As such, arc traffic + transport has concluded that MOD 31 is supportable further to consideration of the operation of the local road network during the construction of the MOD 31 infrastructure.

## 4.5 Parking

### 4.5.1 Parking Capacity

As discussed in **Section 2.4**, the Site currently provides a total of some 583 parking spaces, which is significantly in excess of the general day-to-day parking requirements of Shoalhaven Starches, and moreover in excess of even super-peak parking demand, noting that the additional parking currently provided/proposed in the Northern Car Park has been constructed with the knowledge that the DF Site car park (78 spaces) will be removed as part of MOD 26.

As part of MOD 31, parking spaces in the western portion of the Northern Car Park will also be removed to provide for the new MOD 31 infrastructure, to be replaced by new parking spaces in the eastern part of the Northern Car Park. Further to the Northern Car Park changes and the removal of the DF Site parking spaces (per MOD 26), the total parking that will be provided across Shoalhaven Starches is 508 spaces, as summarised in **Table 7**.

Table 7: Shoalhaven Starches Parking Capacity (Post MOD 31 and MOD 26)

Parking Area	Capacity
Western Car Park	15
Northern Car Park	434
Dairy Farmers Site	25
Paper Mill Site	30
<b>Total</b>	<b>504</b>

#### 4.5.2 Peak Parking Demand

With reference to the vehicle occupancies for permanent and contract staff detailed in **Section 2.4**, the 504 parking spaces available across Shoalhaven Starches further to approvals of both MOD 31 and MOD 26 will continue to provide a level of parking in excess of that required under super-peak conditions (580 staff on-site), being a demand for approximately 435 parking spaces (when construction works are occurring).

Notwithstanding the fact that the level of parking provided across Shoalhaven Starches specifically considers additional construction staff demand for on-site projects (such as the construction of the MOD 31 infrastructure as proposed), even if the MOD 31 construction staff parking was additional to the super-peak demand, this additional parking (30 parking spaces based on a vehicle occupancy of 2 construction staff per vehicle) could still be entirely provided on-site.

As such, parking is provided across Shoalhaven Starches that would meet both the super-peak parking demand, and even a scenario where the MOD 31 construction staff parking demand was considered to be additional to this super-peak demand.

As such, arc traffic + transport can support the construction of the MOD 31 infrastructure further to parking considerations.

#### 4.5.3 Car Park Design

All new parking spaces will be designed to provide fully compliance with the requirements of AS 2890.1, including:

- Parking space dimensions of 5.4m by 2.4m for User Class 1 vehicles; and
- Parking aisles with a minimum width of 6.2m, which is in excess of the width requirements for User Class 1 vehicles.

## 4.6 Bolong Road Gantry

The correspondence from Council suggests that the gantry over Bolong Road proposed as part of the MOD 31 works might be designed so as to provide for pedestrian access over Bolong Road. However, such access is not possible further to consideration of the grades of stairs/ramps leading to/from the gantry from landing sites on either side of Bolong Road, either within the road reserve and/or within the adjacent Shoalhaven Starches sites.

While outside of our area of expertise, the provision of additional infrastructure to allow pedestrians access to the gantry, and then the additional infrastructure required for a widened and heightened gantry itself, may also increase visual impacts.

Notwithstanding, and as detailed further in the broader Modification applications, the design of the gantry supports has specifically considered the watermains located within the road reserve on the northern side of Bolong Road.

## 4.7 Truck Access

Finally, it is again noted that the maximum size truck required during the construction of the MOD 31 infrastructure is anticipated to be a 20m articulated vehicle. However, even if larger vehicles were required (not including OSOM vehicles – see Section 5.3.4) all of the driveways providing access to the MOD 31 infrastructure work sites have been designed (using swept path analysis) and approved to provide for these larger trucks, and moreover designed so as to allow these trucks to enter and depart each Shoalhaven Starches site from/to Bolong Road in a forward direction at all times.

## 5 Draft Construction Traffic Management

### 5.1 Overview

Sections below provide details of a Construction Traffic Management Plan (**CTMP**), which would be implemented throughout the construction of the MOD 31 infrastructure. The CTMP has been prepared in draft form at this time (**Draft CTMP**) with reference to the SEARs and the Scoping Checklist in Appendix E of the TfNSW Guide.

It is noted that the Draft CTMP may be revised further to consideration of any future Conditions of Consent associated with a future MOD 31 approval relating to the construction period, and finalised prior to any construction works commencing.

### 5.2 On-Site Management

#### 5.2.1 Construction Hours

As discussed in **Section 4.2**, reference to past Conditions of Consent for construction works at Shoalhaven Starches suggest that construction hours will be as follows:

- 7:00am to 6:00pm Monday to Friday;
- 8:00am to 1:00pm on Saturdays; and
- No construction works permitted on Sundays or public holidays.

Notwithstanding, the Conditions of Consent to a future approval of MOD 31 may also include provisions for slightly extended construction work hours noise levels do not significantly exceed the existing background noise levels. Similarly, construction activities outside of the standard work hours may be permitted under some circumstances, including:

- Where required by the Police or a public authority for the delivery of vehicles, plant or materials;
- In an emergency to avoid the loss of life, damage to property or to prevent environmental harm;
- Where the works are inaudible at the nearest sensitive receivers;
- For the delivery, set-up and removal of construction cranes, where notice of the crane-related works is provided to the Planning Secretary and affected residents at least seven days prior to the works; and/or
- Where a variation is approved in advance in writing by the Planning Secretary or their nominee if appropriate justification is provided for the works.

Finally, and while not anticipated at this time, where it is necessary for any significant construction works to occur outside of the conditioned work hours, an application for an Outside of Hours Work Permit (**OHW Permit**) will be submitted to Council, and adjacent residents will also be notified of the proposed works. Any out of hours works would only commence further to an approval of the OHW Permit.

## 5.2.2 Staff Parking

All construction staff parking will be provided off-street at all times. The primary location for construction staff parking will be the Northern Car Park, though a smaller number of construction staff may at times park in closer proximity to some of the MOD 31 work sites. Importantly, all Shoalhaven Starches sites accommodating the new MOD 31 infrastructure have more than enough areas to accommodate any temporary construction staff parking.

As discussed, no off-site (on-street) parking will be permitted, a restriction to be strongly enforced by the Principal Contractor.

## 5.2.3 Deliveries & Materials Handling

All deliveries, materials handling and stockpiling will occur within the individual Shoalhaven Starches sites at all times, and all construction vehicles will enter and depart Bolong Road in a forward direction at all times.

## 5.3 Off-Site Traffic and Pedestrian Management

### 5.3.1 Designated Truck Routes

As discussed, the construction of the MOD 31 infrastructure is not anticipated to require the use of trucks larger than those already approved to access the Shoalhaven Starches sites, and in most instances trucks no larger than a 20m articulated vehicles, even though the majority of Shoalhaven Starches driveways provide for 26m B-Doubles and 36m A-Doubles.

As discussed, approved RAV routes are provided in Bolong Road and Princes Highway, while GAVs (such as standard articulated vehicles) are also able to use the local route via Railway Street, Cambewarra Road and Meroo Road between Bolong Road and Princes Highway.

While the TCW Manual does not require the preparation of a Vehicle Movement Plan (**VMP**) as part of a CTMP where truck trips do not exceed 10 truck trips per day, Figure 12 nonetheless shows the designated construction truck routes, which will be strictly enforced by the Principal Contractor.

Figure 12: Modification 31 Construction Vehicle Movement Plan



### 5.3.2 Work Zones

A separate application to Council would be required in the event that any construction work activities require the occupancy of any part of Bolong Road or any other local road. This would require a Road Occupancy Licence (**ROL**) application and approval prior to commencing any such works, and the likely preparation of a Traffic Guidance Scheme (**TGS**) to ensure that those works can be carried out in a safe manner without impact traffic movements.

At this time, it is anticipated that a ROL will be required for the construction of the new Northern Car Park driveways, and potential for the installation of the gantry over Bolong Road; in both instances, the need for a ROL, and the details of any required work zones, will be determined further to the appointment of the Principal Contractor.

### 5.3.3 Traffic Guidance Schemes

As discussed, any requirement for the occupancy of Bolong Road or other works with the potential to impact the use of Bolong Road (or other local roads or footpaths) would need to be detailed in a TGS, formerly referred to as a Traffic Control Plan.

Any TGS would necessarily be prepared by persons accredited to *Prepare a Work Zone Traffic Management Plan* in accordance with the TCW Manual and AS1742.3. Any TGS involving signage, traffic control or other impacts will require Council approval prior to the construction works to which they relate.

Where relevant, TGS would be updated to respond to any changes to prevailing traffic conditions throughout the course of the construction works, and documented in revisions to the CTMP.

### 5.3.4 Oversize/Overmass Vehicle Permits

As discussed in **Section 4.7**, while no vehicles larger than an approved RAV are anticipated to be required during the construction period, if there is a requirement for such vehicles then an application for an **OSOM Permit** will be prepared and submitted to the NHVR. OSOM Permits may be issued with conditional restrictions that limit the time and days that these vehicles are allowed to access the Site; or with other requirements such as the use of specific routes or escort vehicles.

As part of the OSOM Permit application, there may be a requirement to undertake additional assessments of the capability of the proposed access routes to accommodate OSOM vehicles; for example, this may require further assessment of:

- The load bearing capacity of bridges or culverts along the route;
- The width of carriageways and intersections, and the ability to accommodate the swept paths of larger OSOM vehicles; and/or
- Height clearance under bridges or other vertical obstructions.

Should OSOM vehicles be required, the Principal Contractor will be responsible for ensuring full compliance with the requirements of the OSOM Permit, including the preparation of the OSOM Permit application.

### 5.3.5 Public Access Management

Appropriate fencing and security gates are already provided at each of the Shoalhaven Starches sites so as to prevent any unauthorised vehicle or pedestrian access.

## 5.4 Principal Contractor Responsibilities

### 5.4.1 Site Induction

All construction staff will be properly inducted prior to commencing work on-site. The induction will detail the Principal Contractor's construction safety protocols, including:

- General Site safety;
- Site access, amenities and general procedures;
- Truck movements and on-site parking;
- Neighbour consultation and notification requirements; and
- Project Management's policies and procedures.

### 5.4.2 Truck Movements

The Principal Contractor will be required to take all steps necessary to ensure all trucks, and truck movements, are as safe as possible, and will not result in truck drivers operating under conditions that are unsafe. This will be achieved by undertaking the following:

- Ensuring all trucks are well maintained and that the equipment enhances driver, operator and passenger safety to as great an extent as practicable;
- Ensuring all truck drivers have a valid Verification of Competency for the class of vehicle they are driving;
- Identifying truck driver training needs and arranging appropriate training or re-training. This is anticipated to include truck driver competency assessments as part of all inductions, and regular Toolbox Talks on safety conditions, managing fatigue, approved truck routes and truck driver responsibilities; and
- Encouraging safe driving behaviour by not covering or re-imbursing staff speeding or other infringement notices; ensuring the legal use of mobile phones only while driving; and providing training on, and circulating information about, travel planning and efficient truck driving habits.

### 5.4.3 Road Maintenance

All trucks will be required to be appropriately covered when carrying materials to/from any of the on-site work areas during the construction period. Wash down areas will also be provided on-site to minimise to the extent possible the potential for trucks to track any dirt or debris onto Bolong Road.

In addition, a road sweeper is already used by Manildra to maintain all internal roads and sealed areas across Shoalhaven Starches, as well as to maintain clean conditions in Bolong Road at the numerous Shoalhaven Starches access points to Bolong Road, and in Bolong Road itself.

This road sweeper will continue to be used to maintain clean conditions in Bolong Road adjacent to all of the construction access points so as to ensure Bolong Road is clear of dirt and debris at all times.

#### 5.4.4 Communications Strategy

A Communications Strategy will be established by the Principal Contractor and included in the CTMP.

The Communications Strategy will outline the most effective communication methods to ensure adequate information is provided to relevant authorities and the local community (where required), and will assist the Principal Contractor to deliver any construction traffic changes with minimal disruption to the on and off-site vehicle and pedestrian environment.

As a minimum, the Communications Strategy will include:

- The erection of signs providing advanced notice of works and/or any traffic control measures to be implemented (on or off-site);
- Written notices to surrounding residents who would potentially be impacted by the construction works (prior to commencement of those works); and
- A contact person for the Principal Contractor to answer enquiries from local residents and other stakeholders.

#### 5.4.5 CTMP Monitoring and Review

The development of a program to monitor the effectiveness of the CTMP will also be established by the Principal Contractor.

The CTMP will be subject to ongoing review to further enhance the safety and efficiency of the construction works; any and all reviews will be documented by the Principal Contractor, with considerations for review potentially including the following:

- Tracking deliveries and general construction vehicle movements against estimated volumes (as detailed in the TA);
- Identifying any shortfalls in the existing CTMP, and developing an updated action plan to address issues that may arise during construction (for example, parking or access issues);
- Ensuring that any TGS (where required) is updated by accredited persons to ensure they remain consistent with construction requirements and the intent of the CTMP; and/or
- Undertaking regular checks to ensure all loads are leaving the Site appropriately covered and without tracking materials onto the Bolong Road carriageway.

### 5.5 Driver Code of Conduct:

#### 5.5.1 Driver Code of Conduct Objectives

Further to the above, a Driver Code of Conduct (**Driver COC**) will be prepared and provided to all construction vehicle drivers accessing the Site. The objectives of the Driver COC include:

- Minimising the impact of construction vehicle movements on the on-site work environment and local road network;

- Minimising conflict with other on and off-site road users;
- Minimising construction vehicle traffic noise; and
- Ensuring truck drivers use the designated vehicle routes (as detailed in **Section 5.3.1**) based on the size of vehicle they are driving.

The Driver COC will also require that, while driving any truck or other vehicle for construction related purposes, drivers must:

- Demonstrate safe driving and road safety activities;
- Abide by traffic and road legislation; and
- Follow Site signage and instructions at all times.

### 5.5.2 Breach of Driver Code of Conduct

The following activities by any construction vehicle driver would be considered as a breach of the Driver COC:

- Reckless or dangerous driving causing injury or death;
- Driving whilst disqualified or not correctly licensed;
- Drinking or being under the influence of drugs while driving;
- Failing to stop after an incident;
- Loss of demerit points leading to suspension of licence;
- Any actions that warrant the suspension of a licence; and/or
- Exceeding the speed limit in place on any permanent or temporary roads.

Any drivers found to be in breach of the Driver COC would be notified of the breach, as would their immediate managers, who would in turn be required to provide additional training/guidance to the driver. Any repeat offenders would be prevented from returning to Site.

### 5.5.3 Driver Responsibilities

All construction vehicle drivers must:

- Be responsible and accountable for their actions when operating a truck or company vehicle;
- Ensure they have a current driver licence for the class of vehicle they are driving, and this licence is to be carried with them at all times;
- Immediately notify their manager if their drivers licence has been suspended, cancelled, or has had limitations applied;
- Comply with all traffic and road legislation when driving;
- Regularly check the operating condition of trucks or company vehicles;
- Not drive along routes other than the designated truck routes in accordance with the size of vehicle they are driving.

- Never drive under the influence of alcohol or drugs;
- Wear a safety seat belt at all times when in the vehicle;
- Report any near-misses, crashes or scrapes to their manager, including those that do not result in injury;
- Report infringements to a manager at the earliest opportunity;
- Report vehicle defects to a manager prior to the next use of the vehicle; and
- Keep loads covered at all times (where relevant).

#### 5.5.4 Crash or incident Procedure

In the event of a crash or other traffic incident, the construction vehicle driver is required to:

- Stop the vehicle as close to it as possible to the scene, making sure this not hindering traffic;
- Ensure one's own safety first, then help any injured people and seek assistance immediately if required;
- Ensure that key information is exchanged with the other driver, including the registration, names and insurance details of other vehicles/drivers;
- Ensure that the police are contacted should there be a disagreement over the cause of the crash, if there are injuries or if property is damaged; and
- As soon as reasonably practical, report all details gathered to Manildra and the Principal Contractor.

## 6 Conclusions

Further to a detailed assessment of MOD 31, arc traffic + transport has determined that:

- All access to the new MOD 31 infrastructure will be provided via existing intersections that provide geometry appropriate to the maximum sized vehicles entering/departing these sites, and have previously been approved by the NHVR.
- All internal access infrastructure has been designed to accommodate the movements of the largest vehicles travelling within the Shoalhaven Starches sites where MOD 31 infrastructure is located.
- The operation of the MOD 31 infrastructure is not anticipated to generate any additional vehicle trips above the currently approved trip generation of Shoalhaven Starches.
- The new Northern Car Park driveways will be designed in full accordance with the relevant Austroads guidelines, and continue to provide for LILO movements only.
- The construction of the MOD 31 infrastructure will generate up to 30 additional vehicle trips in a peak hour. This level of additional trips would have no impact on the operation of the local road network, even when considered as being additional to super-peak Base 2020 conditions.
- Significant parking is provided across Shoalhaven Starches such that even if the MOD 31 construction staff parking demand were considered separately to a super-peak staff demand, these parking areas would still provide significant spare capacity. As such, the MOD 31 construction, or indeed general Shoalhaven Starches operations, will generate no on-street parking demand.
- A Draft CTMP has been prepared which indicates that the construction of the MOD 31 infrastructure can be undertaken safely and efficiently without impacting the local road network. The Draft CTMP will be finalised further to consideration of any future Conditions of Consent in a MOD 31 approval, and implemented prior to any construction work commencing.

**In summary, arc traffic + transport has determined that MOD 31 is entirely supportable further to access, traffic and parking considerations.**

## Appendix A: National Heavy Vehicle Regulator A-Double Permit



Permit number

978442V2

## Performance Based Standards (PBS) Authorisation Permit

### Heavy Vehicle National Law

This Permit is issued under the provisions of *Section 143 of the Heavy Vehicle National Law* for the operation of a Class 2 vehicle (as defined in this Permit) subject to the conditions set out in this Permit and any attachments.

### Permit details

This Permit is issued to

MANILDRA FLOUR MILLS PTY. LTD.

Address

6 FRANK ST  
GLADESVILLE, NSW 2111

Type

Performance Based Standards (PBS)

Vehicle configuration and description

PBS vehicle  
A-Double (3-2-3)

### Permit period

Start date

21-Mar-2024

End date

07-Mar-2027

## Authorised Routes

### Turn by turn description

#### 978442r1v1 - Single Route

1) Approved to operate at HML 85.5t

Start: 160 Bolong Road, Bomaderry NSW 2541

Bolong Road, Bomaderry

Destination: PBS Level 2B HML Tier 3 Network, Princes Highway, Bomaderry NSW 2541

Return unladen via:

Bolong Road, Bomaderry

Destination: Bolong Road, Bomaderry NSW 2541 (Approx. 1.02km East of Railway Street)

Bolong Road, Bomaderry

End: 160 Bolong Road, Bomaderry NSW 2541

2) Approved to operate at HML 85.5t

Start: PBS Level 2B HML Tier 3 Network, Old Port Road, Port Kembla NSW 2505

Foreshore Road, Port Kembla

End: Port Access, Foreshore Road, Port Kembla NSW 2505

Return unladen via reversal of route

#### 978442r3v1 - Single Route

Shoalhaven City Council -

1) Approved to operate at CML 81.5t

Start: Manildra Group, Bolong Road, Bomaderry NSW 2541

Bolong Road, Bomaderry

End: PBS Level 2B GML and CML Tier 3 Network, Princes Highway, Bomaderry NSW 2541

Return via reversal of route

Port Botany -

2) Approved to operate at CML 81.5t

Start: PBS Level 2B GML and CML Tier 3 Network, Bumborah Point Road, Port Botany NSW 2019

Simblist Road, Port Botany

Friendship Road, Port Botany

Destination: Quantem, Friendship Road, Port Botany NSW 2019

Friendship Road, Port Botany

End: PBS Level 2B GML and CML Tier 3 Network, Bumborah Point Road, Port Botany NSW 2019

Sydney Airport -

3) Approved to operate at CML 81.5t

Start: PBS Level 2B GML and CML Tier 3 Network, Joyce Drive, Mascot NSW 2020

Qantas Drive, Mascot

End: PBS Level 2B GML and CML Tier 3 Network, Robey Street, Mascot NSW 202

No return trip permitted

## Appendix B: Traffic Surveys

Source: TIS Surveys

Location \_\_\_\_\_  
 \_\_\_\_\_  
 Bolong Road  
 Dairy Farmers (DF Site) Driveway  
 Bolong Road  
 Suburb BOMADERRY

Duration 7:00 - 9:00  
 16:00 - 18:00  
 \_\_\_\_\_  
 Day/Date Tuesday, 7 November 2023  
 Weather \_\_\_\_\_

All Vehicles Time Per 15 Mins	NORTH							EAST Bolong Road							TOTAL		TOTAL
	L		I		R		TOTAL	L		I		R		TOTAL	LIGHT	HEAVY	
	LIGHT	HEAVY	LIGHT	HEAVY	LIGHT	HEAVY		LIGHT	HEAVY	LIGHT	HEAVY	LIGHT	HEAVY				
7:00 - 7:15								4	0	4	27	4	31	35	73	18	91
7:15 - 7:30								3	0	3	36	8	44	47	84	18	102
7:30 - 7:45								0	0	0	67	4	71	71	115	18	133
7:45 - 8:00								3	0	3	74	9	83	86	132	22	154
8:00 - 8:15								3	0	3	69	4	73	76	127	15	142
8:15 - 8:30								5	0	5	68	4	72	77	122	16	138
8:30 - 8:45								3	0	3	72	3	75	78	139	10	149
8:45 - 9:00								2	2	4	54	6	60	64	136	16	152
Period End								23	2	25	467	42	509	534	928	133	1061
16:00 - 16:15								0	0	0	57	3	60	60	142	10	152
16:15 - 16:30								0	0	0	46	2	48	48	126	5	131
16:30 - 16:45								0	0	0	36	0	36	36	109	6	115
16:45 - 17:00								0	0	0	25	1	26	26	89	2	91
17:00 - 17:15								0	0	0	31	2	33	33	103	9	112
17:15 - 17:30								1	0	1	21	3	24	25	84	11	95
17:30 - 17:45								0	0	0	31	3	34	34	89	8	97
17:45 - 18:00								2	1	3	26	2	28	31	89	6	95
Period End								3	1	4	273	16	289	293	831	57	888

All Vehicles Time Per 15 Mins	SOUTH Dairy Farmers (DF Site) Driveway							WEST Bolong Road							TOTAL		TOTAL			
	L		I		R		TOTAL	L		I		R		TOTAL	LIGHT	HEAVY				
	LIGHT	HEAVY	LIGHT	HEAVY	LIGHT	HEAVY		LIGHT	HEAVY	LIGHT	HEAVY	LIGHT	HEAVY							
7:00 - 7:15	3	1	4				7				32	8	40	4	5	9	49	73	18	91
7:15 - 7:30	10	3	13				14				27	5	32	7	2	9	41	84	18	102
7:30 - 7:45	9	2	11				12				31	11	42	7	1	8	50	115	18	133
7:45 - 8:00	6	1	7				8				41	10	51	7	2	9	60	132	22	154
8:00 - 8:15	5	3	8				9				38	5	43	11	3	14	57	127	15	142
8:15 - 8:30	9	4	13				15				31	5	36	7	3	10	46	122	16	138
8:30 - 8:45	5	1	6				9				52	4	56	5	1	6	62	139	10	149
8:45 - 9:00	16	2	18				20				49	4	53	14	1	15	68	136	16	152
Period End	63	17	80				94				301	52	353	62	18	80	433	928	133	1061
16:00 - 16:15	20	0	20				20				55	6	61	10	1	11	72	142	10	152
16:15 - 16:30	10	1	11				12				56	1	57	13	1	14	71	126	5	131
16:30 - 16:45	9	3	12				13				57	1	58	6	2	8	66	109	6	115
16:45 - 17:00	11	0	11				12				43	0	43	9	1	10	53	89	2	91
17:00 - 17:15	15	2	17				19				47	3	50	8	2	10	60	103	9	112
17:15 - 17:30	4	3	7				8				53	2	55	4	3	7	62	84	11	95
17:30 - 17:45	7	1	8				9				44	2	46	6	2	8	54	89	8	97
17:45 - 18:00	14	1	15				15				34	1	35	13	1	14	49	89	6	95
Period End	90	11	101				108				389	16	405	69	13	82	487	831	57	888

Location \_\_\_\_\_ Duration 7:00 - 9:00  
 \_\_\_\_\_ 16:00 - 18:00  
 Dairy Farmers (DF Site) Driveway \_\_\_\_\_  
 Bolong Road \_\_\_\_\_ Day/Date Tuesday, 7 November 2023  
 Suburb BOMADERRY \_\_\_\_\_ Weather \_\_\_\_\_

All Vehicles Time Per Hour	NORTH								EAST								TOTAL		TOTAL		
	-								Bolong Road								TOTAL				
	L		I		R		TOTAL		L		I		R		TOTAL						
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY				
7:00 - 8:00										10	0	10	204	25	229			239	404	76	480
7:15 - 8:15										9	0	9	246	25	271			280	458	73	531
7:30 - 8:30										11	0	11	278	21	299			310	496	71	567
7:45 - 8:45										14	0	14	283	20	303			317	520	63	583
8:00 - 9:00										13	2	15	263	17	280			295	524	57	581
Period End																					
16:00 - 17:00										0	0	0	164	6	170			170	466	23	489
16:15 - 17:15										0	0	0	138	5	143			143	427	22	449
16:30 - 17:30										1	0	1	113	6	119			120	385	28	413
16:45 - 17:45										1	0	1	108	9	117			118	365	30	395
17:00 - 18:00										3	1	4	109	10	119			123	365	34	399
Period End																					

All Vehicles Time Per Hour	SOUTH								WEST								TOTAL		TOTAL			
	Dairy Farmers (DF Site) Driveway								Bolong Road								TOTAL					
	L		I		R		TOTAL		L		I		R		TOTAL							
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY					
7:00 - 8:00	28	7	35				6	0	6	41			131	34	165	25	10	35	200	404	76	480
7:15 - 8:15	30	9	39				4	0	4	43			137	31	168	32	8	40	208	458	73	531
7:30 - 8:30	29	10	39				5	0	5	44			141	31	172	32	9	41	213	496	71	567
7:45 - 8:45	25	9	34				6	1	7	41			162	24	186	30	9	39	225	520	63	583
8:00 - 9:00	35	10	45				6	2	8	53			170	18	188	37	8	45	233	524	57	581
Period End																						
16:00 - 17:00	50	4	54				3	0	3	57			211	8	219	38	5	43	262	466	23	489
16:15 - 17:15	45	6	51				5	0	5	56			203	5	208	36	6	42	250	427	22	449
16:30 - 17:30	39	8	47				5	0	5	52			200	6	206	27	8	35	241	385	28	413
16:45 - 17:45	37	6	43				5	0	5	48			187	7	194	27	8	35	229	365	30	395
17:00 - 18:00	40	7	47				4	0	4	51			178	8	186	31	8	39	225	365	34	399
Period End																						

Location BOC and Car Park Driveway  
Bolong Road  
-  
Bolong Road  
Suburb BOMADERRY

Duration 7:00 - 9:00  
16:00 - 18:00  
-  
Day/Date Tuesday, 7 November 2023  
Weather -

All Vehicles Time Per 15 Mins	NORTH BOC and Car Park Driveway						EAST Bolong Road						TOTAL		TOTAL		
	L		I		R		TOTAL	L		I		R		TOTAL		TOTAL	
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ		LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ			LIGHT	HEAVY
7:00 - 7:15	1	0	1				1			29	4	33	33	79	18	97	
7:15 - 7:30	2	0	2				2			45	8	53	53	83	16	99	
7:30 - 7:45	3	0	3				3			73	6	79	79	120	18	138	
7:45 - 8:00	0	1	1				1			85	11	96	96	152	24	176	
8:00 - 8:15	2	0	2				2			76	6	82	82	131	13	144	
8:15 - 8:30	2	0	2				2			77	7	84	84	119	16	135	
8:30 - 8:45	11	0	11				11			79	4	83	83	140	9	149	
8:45 - 9:00	5	0	5				5			70	7	77	77	134	15	149	
Period End	26	1	27				27			534	53	587	587	958	129	1087	
16:00 - 16:15	9	0	9				9			71	4	75	75	139	11	150	
16:15 - 16:30	13	0	13				13			63	5	68	68	133	8	141	
16:30 - 16:45	6	0	6				6			46	3	49	49	115	6	121	
16:45 - 17:00	12	0	12				12			39	2	41	41	99	4	103	
17:00 - 17:15	9	0	9				9			46	5	51	51	110	9	119	
17:15 - 17:30	6	0	6				6			32	2	34	34	97	7	104	
17:30 - 17:45	6	0	6				6			40	2	42	42	93	6	99	
17:45 - 18:00	18	0	18				18			43	2	45	45	102	5	107	
Period End	79	0	79				79			380	25	405	405	888	56	944	

All Vehicles Time Per 15 Mins	SOUTH -						WEST Bolong Road						TOTAL		TOTAL		
	L		I		R		TOTAL	L		I		R		TOTAL		TOTAL	
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ		LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ			LIGHT	HEAVY
7:00 - 7:15								15	0	15	34	14	48	63	79	18	97
7:15 - 7:30								6	0	6	30	8	38	44	83	16	99
7:30 - 7:45								7	1	8	37	11	48	56	120	18	138
7:45 - 8:00								21	0	21	46	12	58	79	152	24	176
8:00 - 8:15								7	0	7	46	7	53	60	131	13	144
8:15 - 8:30								3	0	3	37	9	46	49	119	16	135
8:30 - 8:45								4	0	4	46	5	51	55	140	9	149
8:45 - 9:00								2	1	3	57	7	64	67	134	15	149
Period End								65	2	67	333	73	406	473	958	129	1087
16:00 - 16:15								4	0	4	55	7	62	66	139	11	150
16:15 - 16:30								1	0	1	56	3	59	60	133	8	141
16:30 - 16:45								6	0	6	57	3	60	66	115	6	121
16:45 - 17:00								5	0	5	43	2	45	50	99	4	103
17:00 - 17:15								6	1	7	49	3	52	59	110	9	119
17:15 - 17:30								7	0	7	52	5	57	64	97	7	104
17:30 - 17:45								3	0	3	44	4	48	51	93	6	99
17:45 - 18:00								5	1	6	36	2	38	44	102	5	107
Period End								37	2	39	392	29	421	460	888	56	944

Location BOC and Car Park Driveway Duration 7:00 - 9:00  
Bolong Road 16:00 - 18:00  
-  
Bolong Road Day/Date Tuesday, 7 November 2023  
Suburb BOMADERRY Weather -

All Vehicles Time Per Hour	NORTH BOC and Car Park Driveway								EAST Bolong Road								TOTAL		TOTAL
	L		I		R		TOTAL	L		I		R		TOTAL	LIGHT	HEAVY			
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ		LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ				TOTAL		
7:00 - 8:00	6	1	7				7				232	29	261	261	434	76	510		
7:15 - 8:15	7	1	8				8				279	31	310	310	486	71	557		
7:30 - 8:30	7	1	8				8				311	30	341	341	522	71	593		
7:45 - 8:45	15	1	16				16				317	28	345	345	542	62	604		
8:00 - 9:00	20	0	20				20				302	24	326	326	524	53	577		
Period End																			
16:00 - 17:00	40	0	40				40				219	14	233	233	486	29	515		
16:15 - 17:15	40	0	40				40				194	15	209	209	457	27	484		
16:30 - 17:30	33	0	33				33				163	12	175	175	421	26	447		
16:45 - 17:45	33	0	33				33				157	11	168	168	399	26	425		
17:00 - 18:00	39	0	39				39				161	11	172	172	402	27	429		
Period End																			

All Vehicles Time Per Hour	SOUTH -								WEST Bolong Road								TOTAL		TOTAL
	L		I		R		TOTAL	L		I		R		TOTAL	LIGHT	HEAVY			
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ		LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ				TOTAL		
7:00 - 8:00								49	1	50	147	45	192	242	434	76	510		
7:15 - 8:15								41	1	42	159	38	197	239	486	71	557		
7:30 - 8:30								38	1	39	166	39	205	244	522	71	593		
7:45 - 8:45								35	0	35	175	33	208	243	542	62	604		
8:00 - 9:00								16	1	17	186	28	214	231	524	53	577		
Period End																			
16:00 - 17:00								16	0	16	211	15	226	242	486	29	515		
16:15 - 17:15								18	1	19	205	11	216	235	457	27	484		
16:30 - 17:30								24	1	25	201	13	214	239	421	26	447		
16:45 - 17:45								21	1	22	188	14	202	224	399	26	425		
17:00 - 18:00								21	2	23	181	14	195	218	402	27	429		
Period End																			

Location \_\_\_\_\_  
 \_\_\_\_\_  
 Bolong Road  
 Shoalhaven Starches Western Driveway  
 \_\_\_\_\_  
 Bolong Road  
 Suburb BOMADERRY

Duration 7:00 - 9:00  
 \_\_\_\_\_  
 16:00 - 18:00  
 \_\_\_\_\_  
 -  
 \_\_\_\_\_  
 Day/Date Tuesday, 7 November 2023  
 \_\_\_\_\_  
 Weather \_\_\_\_\_

All Vehicles Time Per 15 Mins	NORTH								EAST Bolong Road								TOTAL		TOTAL
	L		I		R		TOTAL	L		I		R		TOTAL	LIGHT	HEAVY			
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ		LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ						
7:00 - 7:15								3	2	5	18	10	28	33	72	27	99		
7:15 - 7:30								5	1	6	40	10	50	56	80	22	102		
7:30 - 7:45								4	1	5	56	4	60	65	111	22	133		
7:45 - 8:00								5	3	8	78	8	86	94	153	24	177		
8:00 - 8:15								4	3	7	74	3	77	84	133	13	146		
8:15 - 8:30								4	2	6	74	5	79	85	120	19	139		
8:30 - 8:45								5	0	5	67	5	72	77	124	15	139		
8:45 - 9:00								5	1	6	68	6	74	80	135	21	156		
Period End								35	13	48	475	51	526	574	928	163	1091		
16:00 - 16:15								0	1	1	81	3	84	85	144	14	158		
16:15 - 16:30								1	1	2	61	5	66	68	122	15	137		
16:30 - 16:45								0	1	1	47	1	48	49	123	8	131		
16:45 - 17:00								0	0	0	46	0	46	46	92	6	98		
17:00 - 17:15								2	3	5	45	1	46	51	103	7	110		
17:15 - 17:30								0	2	2	28	4	32	34	88	11	99		
17:30 - 17:45								0	0	0	42	3	45	45	90	9	99		
17:45 - 18:00								0	0	0	46	2	48	48	89	8	97		
Period End								3	8	11	396	19	415	426	851	78	929		

All Vehicles Time Per 15 Mins	SOUTH Shoalhaven Starches Western Driveway								WEST Bolong Road								TOTAL		TOTAL			
	L		I		R		TOTAL	L		I		R		TOTAL	LIGHT	HEAVY						
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ		LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ									
7:00 - 7:15	1	0	1				5	3	1	4			46	13	59	1	1	2	61	72	27	99
7:15 - 7:30	0	1	1				8	6	1	7			27	7	34	2	2	4	38	80	22	102
7:30 - 7:45	2	0	2				9	5	2	7			36	10	46	8	5	13	59	111	22	133
7:45 - 8:00	0	3	3				11	4	4	8			60	6	66	6	0	6	72	153	24	177
8:00 - 8:15	4	1	5				15	7	3	10			40	3	43	4	0	4	47	133	13	146
8:15 - 8:30	1	0	1				4	1	2	3			37	6	43	3	4	7	50	120	19	139
8:30 - 8:45	2	3	5				11	6	0	6			42	6	48	2	1	3	51	124	15	139
8:45 - 9:00	3	3	6				13	6	1	7			52	7	59	1	3	4	63	135	21	156
Period End	13	11	24				76	38	14	52			340	58	398	27	16	43	441	928	163	1091
16:00 - 16:15	2	1	3				10	3	4	7			56	4	60	2	1	3	63	144	14	158
16:15 - 16:30	4	3	7				11	3	1	4			53	3	56	0	2	2	58	122	15	137
16:30 - 16:45	3	2	5				9	2	2	4			68	0	68	3	2	5	73	123	8	131
16:45 - 17:00	1	1	2				3	0	1	1			44	1	45	1	3	4	49	92	6	98
17:00 - 17:15	1	0	1				5	2	2	4			53	1	54	0	0	0	54	103	7	110
17:15 - 17:30	2	0	2				4	0	2	2			57	3	60	1	0	1	61	88	11	99
17:30 - 17:45	2	2	4				6	0	2	2			44	2	46	2	0	2	48	90	9	99
17:45 - 18:00	5	1	6				7	0	1	1			38	3	41	0	1	1	42	89	8	97
Period End	20	10	30				55	10	15	25			413	17	430	9	9	18	448	851	78	929

Location \_\_\_\_\_  
 \_\_\_\_\_  
 Bolong Road  
 \_\_\_\_\_  
 Shoalhaven Starches Western Driveway  
 \_\_\_\_\_  
 Bolong Road  
 \_\_\_\_\_  
 Suburb BOMADERRY

Duration 7:00 - 9:00  
 \_\_\_\_\_  
 16:00 - 18:00  
 \_\_\_\_\_  
 Day/Date Tuesday, 7 November 2023  
 \_\_\_\_\_  
 Weather \_\_\_\_\_

All Vehicles Time Per Hour	NORTH								EAST								TOTAL		TOTAL		
	-								Bolong Road								TOTAL				
	L		I		R		Σ		L		I		R		Σ		TOTAL				
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	TOTAL			
7:00 - 8:00										17	7	24	192	32	224			248	416	95	511
7:15 - 8:15										18	8	26	248	25	273			299	477	81	558
7:30 - 8:30										17	9	26	282	20	302			328	517	78	595
7:45 - 8:45										18	8	26	293	21	314			340	530	71	601
8:00 - 9:00										18	6	24	283	19	302			326	512	68	580
Period End																					
16:00 - 17:00										1	3	4	235	9	244			248	481	43	524
16:15 - 17:15										3	5	8	199	7	206			214	440	36	476
16:30 - 17:30										2	6	8	166	6	172			180	406	32	438
16:45 - 17:45										2	5	7	161	8	169			176	373	33	406
17:00 - 18:00										2	5	7	161	10	171			178	370	35	405
Period End																					

All Vehicles Time Per Hour	SOUTH								WEST								TOTAL		TOTAL						
	Shoalhaven Starches Western Driveway								Bolong Road								TOTAL								
	L		I		R		Σ		L		I		R		Σ		TOTAL								
	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	Σ	LIGHT	HEAVY	TOTAL							
7:00 - 8:00	3	4	7				18	8	26	33						169	36	205	17	8	25	230	416	95	511
7:15 - 8:15	6	5	11				22	10	32	43						163	26	189	20	7	27	216	477	81	558
7:30 - 8:30	7	4	11				17	11	28	39						173	25	198	21	9	30	228	517	78	595
7:45 - 8:45	7	7	14				18	9	27	41						179	21	200	15	5	20	220	530	71	601
8:00 - 9:00	10	7	17				20	6	26	43						171	22	193	10	8	18	211	512	68	580
Period End																									
16:00 - 17:00	10	7	17				8	8	16	33						221	8	229	6	8	14	243	481	43	524
16:15 - 17:15	9	6	15				7	6	13	28						218	5	223	4	7	11	234	440	36	476
16:30 - 17:30	7	3	10				4	7	11	21						222	5	227	5	5	10	237	406	32	438
16:45 - 17:45	6	3	9				2	7	9	18						198	7	205	4	3	7	212	373	33	406
17:00 - 18:00	10	3	13				2	7	9	22						192	9	201	3	1	4	205	370	35	405
Period End																									

## Appendix C: SIDRA Movement Summary Reports

## Bolong Road & Gate 1 AM Base 2030

### MOVEMENT SUMMARY

Site: 1 [Bolong Road & Gate 1 Base 2030 AM (Site Folder: General)]

Site Category: Existing Design  
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 ] %	v/c	sec		[ Veh. ]	[ Dist ] m				km/h
South: Gate 1														
1	L2	45	10	47	22.2	0.030	2.0	LOSA	0.0	0.0	0.00	0.32	0.00	29.9
3	R2	8	7	8	87.5	0.044	17.0	LOS B	0.1	1.8	0.75	0.77	0.75	24.5
Approach		53	17	56	32.1	0.044	4.3	LOSA	0.1	1.8	0.11	0.39	0.11	28.9
East: Bolong Road														
4	L2	2	0	2	0.0	0.001	4.6	LOSA	0.0	0.0	0.00	0.53	0.00	46.6
5	T1	347	23	365	6.6	0.195	0.1	LOSA	0.0	0.0	0.00	0.00	0.00	49.9
Approach		349	23	367	6.6	0.195	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Bolong Road														
11	T1	214	28	225	13.1	0.126	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	51	10	54	19.6	0.064	6.9	LOSA	0.2	2.0	0.45	0.63	0.45	27.3
Approach		265	38	279	14.3	0.126	1.4	NA	0.2	2.0	0.09	0.12	0.09	43.1
All Vehicles		667	78	702	11.7	0.195	0.9	NA	0.2	2.0	0.04	0.08	0.04	44.5

## Bolong Road & Gate 1 PM Base 2030

### MOVEMENT SUMMARY

Site: 1 [Bolong Road & Gate 1 Base 2030 PM (Site Folder: General)]

Site Category: Existing Design  
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 ] %	v/c	sec		[ Veh. ]	[ Dist ] m				km/h
South: Gate 1														
1	L2	64	10	67	15.6	0.040	2.0	LOSA	0.0	0.0	0.00	0.32	0.00	29.9
3	R2	8	7	8	87.5	0.033	11.7	LOSA	0.1	1.4	0.67	0.65	0.67	25.4
Approach		72	17	76	23.6	0.040	3.1	LOSA	0.1	1.4	0.07	0.36	0.07	29.3
East: Bolong Road														
4	L2	1	0	1	0.0	0.001	4.6	LOSA	0.0	0.0	0.00	0.53	0.00	46.6
5	T1	198	8	208	4.0	0.110	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	50.0
Approach		199	8	209	4.0	0.110	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Bolong Road														
11	T1	255	10	268	3.9	0.142	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	66	6	69	9.1	0.063	5.6	LOSA	0.2	1.9	0.33	0.55	0.33	27.5
Approach		321	16	338	5.0	0.142	1.2	NA	0.2	1.9	0.07	0.11	0.07	42.7
All Vehicles		592	41	623	6.9	0.142	1.0	NA	0.2	1.9	0.05	0.11	0.05	42.4

## Bolong Road & Gate 2 AM Base 2030

### MOVEMENT SUMMARY

Site: [Bolong Road & Gate 2 Base 2030 AM (Site Folder: General)]

Site Category: Existing Design  
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 ] %	v/c	sec		[ Veh. veh	Dist ] m				km/h
North: Gate 2														
7	L2	29	1	31	3.4	0.024	2.8	LOSA	0.1	0.7	0.33	0.40	0.33	37.7
Approach		29	1	31	3.4	0.024	2.8	LOSA	0.1	0.7	0.33	0.40	0.33	37.7
West: Bolong Road														
10	L2	64	0	67	0.0	0.036	5.5	LOSA	0.0	0.0	0.00	0.58	0.00	53.6
11	T1	235	35	247	14.9	0.139	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	59.9
Approach		299	35	315	11.7	0.139	1.2	NA	0.0	0.0	0.00	0.12	0.00	58.4
All Vehicles		328	36	345	11.0	0.139	1.4	NA	0.1	0.7	0.03	0.15	0.03	55.7

## Bolong Road & Gate 2 PM Base 2030

### MOVEMENT SUMMARY

Site: [Bolong Road & Gate 2 Base 2030 PM (Site Folder: General)]

Site Category: Existing Design  
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 ] %	v/c	sec		[ Veh. veh	Dist ] m				km/h
North: Gate 2														
7	L2	77	0	81	0.0	0.064	2.9	LOSA	0.3	1.8	0.35	0.43	0.35	37.7
Approach		77	0	81	0.0	0.064	2.9	LOSA	0.3	1.8	0.35	0.43	0.35	37.7
West: Bolong Road														
10	L2	31	0	33	0.0	0.018	5.5	LOSA	0.0	0.0	0.00	0.58	0.00	53.6
11	T1	255	17	268	6.7	0.144	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	59.9
Approach		286	17	301	5.9	0.144	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.2
All Vehicles		363	17	382	4.7	0.144	1.1	NA	0.3	1.8	0.07	0.14	0.07	52.8

## Bolong Road & Gate 1 AM Base 2030 + MOD 31 Construction

### MOVEMENT SUMMARY

Site: 1 [Bolong Road & Northern CP Base 2030 AM + Construction (Site Folder: General)]

Site Category: Existing Design  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [ Total veh/h ]		DEMAND FLOWS [ Total veh/h ]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [ Veh. veh ]		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gate 1														
1	L2	46	11	48	23.9	0.031	2.0	LOSA	0.0	0.0	0.00	0.32	0.00	29.9
3	R2	8	7	8	87.5	0.044	17.4	LOS B	0.1	1.8	0.76	0.77	0.76	24.5
Approach		54	18	57	33.3	0.044	4.3	LOSA	0.1	1.8	0.11	0.38	0.11	28.9
East: Bolong Road														
4	L2	3	0	3	0.0	0.002	4.6	LOSA	0.0	0.0	0.00	0.53	0.00	46.6
5	T1	351	23	369	6.6	0.198	0.1	LOSA	0.0	0.0	0.00	0.00	0.00	49.9
Approach		354	23	373	6.5	0.198	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Bolong Road														
11	T1	214	28	225	13.1	0.126	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	54	11	57	20.4	0.068	7.0	LOSA	0.3	2.1	0.46	0.64	0.46	27.3
Approach		268	39	282	14.6	0.126	1.4	NA	0.3	2.1	0.09	0.13	0.09	42.8
All Vehicles		676	80	712	11.8	0.198	1.0	NA	0.3	2.1	0.05	0.08	0.05	44.4

## Bolong Road & Gate 1 PM Base 2030 + MOD 31 Construction

### MOVEMENT SUMMARY

Site: 1 [Bolong Road & Northern CP Base 2030 PM + Construction (Site Folder: General)]

Site Category: Existing Design  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [ Total veh/h ]		DEMAND FLOWS [ Total veh/h ]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [ Veh. veh ]		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gate 1														
1	L2	84	11	88	13.1	0.052	2.0	LOSA	0.0	0.0	0.00	0.32	0.00	29.9
3	R2	9	7	9	77.8	0.036	11.6	LOSA	0.1	1.5	0.68	0.66	0.68	25.5
Approach		93	18	98	19.4	0.052	2.9	LOSA	0.1	1.5	0.07	0.35	0.07	29.4
East: Bolong Road														
4	L2	1	0	1	0.0	0.001	4.6	LOSA	0.0	0.0	0.00	0.53	0.00	46.6
5	T1	198	8	208	4.0	0.110	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	50.0
Approach		199	8	209	4.0	0.110	0.1	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Bolong Road														
11	T1	261	10	275	3.8	0.146	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	86	7	91	8.1	0.081	5.6	LOSA	0.3	2.4	0.33	0.56	0.33	27.5
Approach		347	17	365	4.9	0.146	1.4	NA	0.3	2.4	0.08	0.14	0.08	41.5
All Vehicles		639	43	673	6.7	0.146	1.2	NA	0.3	2.4	0.05	0.13	0.05	41.2

## Bolong Road & Northern Car Park AM Base 2030 + MOD 31 Construction

### MOVEMENT SUMMARY

Site: [Bolong Road & Northern CP Base 2030 AM + Construction (Site Folder: General)]

Site Category: Existing Design  
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 ] %	v/c	sec		[ Veh. veh	[ Dist ] m				km/h
North: Gate 2														
7	L2	30	2	32	6.7	0.026	2.9	LOSA	0.1	0.7	0.34	0.40	0.34	37.6
Approach		30	2	32	6.7	0.026	2.9	LOSA	0.1	0.7	0.34	0.40	0.34	37.6
West: Bolong Road														
10	L2	89	1	94	1.1	0.051	5.6	LOSA	0.0	0.0	0.00	0.58	0.00	53.6
11	T1	237	35	249	14.8	0.140	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	59.9
Approach		326	36	343	11.0	0.140	1.5	NA	0.0	0.0	0.00	0.16	0.00	58.0
All Vehicles		356	38	375	10.7	0.140	1.7	NA	0.1	0.7	0.03	0.18	0.03	55.5

## Bolong Road & Northern Car Park PM Base 2030 + MOD 31 Construction

### MOVEMENT SUMMARY

Site: [Bolong Road & Northern CP Base 2030 PM + Construction (Site Folder: General)]

Site Category: Existing Design  
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 ] %	v/c	sec		[ Veh. veh	[ Dist ] m				km/h
North: Gate 2														
7	L2	102	1	107	1.0	0.085	2.9	LOSA	0.3	2.4	0.35	0.44	0.35	37.7
Approach		102	1	107	1.0	0.085	2.9	LOSA	0.3	2.4	0.35	0.44	0.35	37.7
West: Bolong Road														
10	L2	33	1	35	3.0	0.019	5.6	LOSA	0.0	0.0	0.00	0.58	0.00	53.5
11	T1	255	17	268	6.7	0.144	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	59.9
Approach		288	18	303	6.3	0.144	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.1
All Vehicles		390	19	411	4.9	0.144	1.3	NA	0.3	2.4	0.09	0.16	0.09	51.4

