ACT MATERIALS RECOVERY FACILITY

ADDENDUM TO APPENDIX F TRAFFIC AND TRANSPORT IMPACT ASSESSMENT

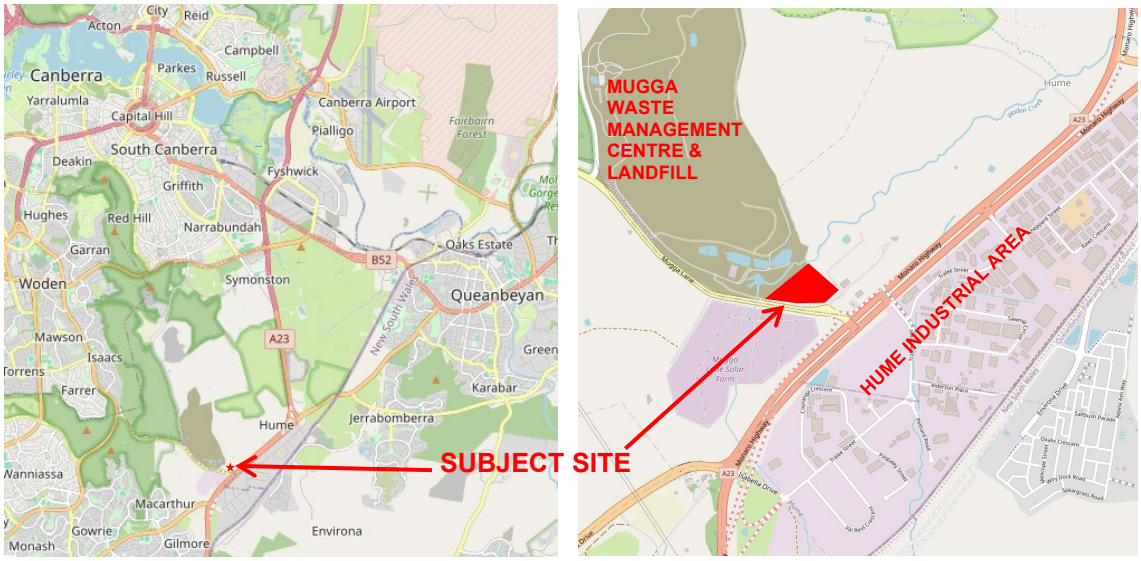
Prepared for Veolia Environmental Services (Australia) Pty Ltd | 2 April 2025

Introduction

This report is prepared as an Addendum to *Appendix F – Traffic and Transport Impact Assessment* prepared by GHD for ACT NoWaste in 2023 and submitted with a draft EIS for a new Materials Recovery Facility (MRF) on Block 12 Section 25 Hume, refer Figure 1.

Since that time ACT NoWaste has passed the responsibility to finalise the EIS to Veolia. GHD are not in a position to complete the EIS and as such, Veolia has engaged Element Environment to undertake this work.

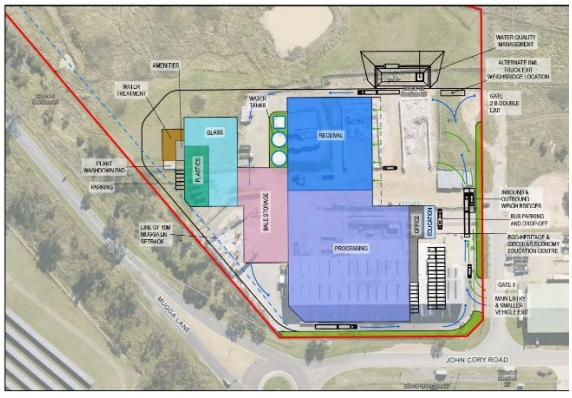
Figure 1: Site Location



Veolia has made changes to the proposed site layout and design of the MRF to achieve operational efficiencies (refer Figure 2 & 3).

Figure 2: Veolia Revised Site Plan

Figure 3: GHD Concept Plan



The GHD *Appendix F Traffic and Transport Impact Assessment Report* considered the impacts of traffic in relation to construction of a building with a gross floor area (GFA) of 13,591m^2. The Veolia design proposes a building with a GFA of 11,747m^2. The revised building has been designed to process up to 115,000 tonnes per year, consistent with the volumes considered in the GHD report.

As such, the traffic generated during construction and operation of the facility is effectively the same as that considered in the GHD Report.

Assessment

The key outcomes of the Traffic and Transport Impact Assessment are summarised as follows:

- The roundabout at Mugga Lane and John Cory Road operates at level of service (LoS) B with minimal delays and queueing for both AM and PM peak periods. With construction activities, the roundabout joining Mugga Lane and John Cory Road (site access) is expected to continue operating at LoS B with minimal delays.
- The LoS for the key intersections are generally expected to remain the same with or without the construction activities associated with the MRF, except for the Monaro Highway at Mugga Lane (southbound) which would experience a reduction in LoS from D to F during the PM peak.
- During the AM peak, the signalised intersection at Mugga Lane and the northbound carriageway of the Monaro Highway operates over capacity at LoS F. Better operations are observed during the PM peak, with a LoS of C.
- The Monaro Highway at Mugga Lane is already operating over capacity during the AM and PM peak periods. However, the proposed upgrades to the Monaro Highway at Mugga Lane would support a good LoS in the 2031 and 2041 horizon years.

The hours of operation proposed by Veolia are 10 hours per day for 6 days per week, with some delivery vehicle arriving prior to the 7am starting time of the plant. The draft EIS considered traffic over an 18 hour operating day. The reduced hours result in a higher number of heavy vehicles per hour than that assessed in the draft EIS. However, the increase equates to six additional inbound and outbound heavy vehicle movements per hour (i.e. one truck every 10 minutes). It is not considered that this increase will affect the level of service of adjacent intersections.

Conclusions

It is concluded that the revised proposal is unlikely to have an additional adverse traffic or transport impact to that assessed in *Appendix F Traffic and Transport Impact Assessment Report* prepared by GHD for ACT NoWaste in 2023 and submitted with a draft EIS for a new Materials Recovery Facility (MRF) on Block 12 Section 25 Hume.

Hume Materials Recovery Facility

Traffic and Transport Assessment

Transport Canberra and City Services

15 August 2023

→ **The Power of Commitment**

Project name		Materials Recovery Facility Hume ACT PMCA					
Document title		Hume Materials Recovery Facility | Traffic and Transport Assessment					
Project number		12540460					
File name		12540460-REP-Hume MRF Traffic and Transport Assessment Rev 0.docx					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
S4	0	M Aranas/M Lucas	O Peel	Record on file	A Montgomery	Record on file	1/5/2023

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Abbreviations and meaning

Abbreviations	Meaning
ACT	Australian Capital Territory
AFP	Australian Federal Police
AGTM	Austroads Guide to Traffic Management
AIMSUN	Advanced Interactive Microscopic Simulator for Urban and Non-Urban Networks
AMC	Alexander Maconochie Centre
CDS	Container deposit scheme
CEMP	Construction Environmental Management Plan
CSTM	Canberra Strategic Traffic Model
CTMP	Construction Traffic Management Plan
DCP	Development Control Plan
DoS	Degree of Saturation
EIS	Environmental Impact Statement
EPSDD	Environment, Planning and Sustainable Development Directorate
FOGO	Food Organics and Garden Organics
GHD	GHD Pty Ltd
HRRE	Hume Resource Recovery Estate
HV	Heavy Vehicles
km	Kilometre
LoS	Level of service
LV	Light Vehicles
m	Metre
MRF	Materials Recovery Facility
NSW	New South Wales
PBS	Performance Based Standards
PCE	Passenger Car Equivalent
Pcu	Passenger car units
SCATS	Sydney Coordinated Adaptive Traffic System
TCCS	Transport Canberra and City Services
TMP	Traffic Management Plan
tpa	tonnes per annum
TTIA	Traffic and Transport Impact Assessment
VCR	Volume to Capacity Ratio
vph	Vehicles per hour

1. Introduction

1.1 Overview

The ACT Government is proposing to replace and upgrade the existing Material Recovery Facility (MRF) on Block 12, Section 25 Hume, ACT (the proposal site). The proposal site is located to the north of the Monaro Highway in an industrial and rural area located approximately 12.5 km south of Canberra City. The existing MRF was extensively damaged due to fire on 26 December 2022 and the facility is non-operational. The main shed remains standing and is currently being used as a waste transfer station to accept recyclables, sort, and store materials before being shipped to other processing facilities.

The proposal would replace the existing MRF and provide technological improvements to facilitate greater resource recovery by both increasing the quality of recycled materials and by reducing the amount of nonrecyclable residual waste generated that is currently sent to landfill. The new Hume MRF would be one of the first advanced facilities in Australia to enable separation mixed plastics. Upgraded technology would also improve the quality and therefore marketability of paper and mixed cardboard, mixed plastics and glass that would be received from the ACT and five regional NSW councils.

The proposal would be designed to process up to 115,000 tonnes per year of mixed recyclables. The proposed capacity would provide for population growth and changing consumer behaviours which are expected to contribute to increases in recoverable materials over time.

Key features of the proposal include:

– Replacement of the existing MRF.
– Additional warehouse style facilities.
– Civil works and piling to support the dynamic loads imposed by rotating and high frequency vibrating equipment.
– Expansion of hardstand space towards the west of the proposal site.
– A trade waste system to capture contaminated stormwater runoff.

1.1.1Approval and assessment requirements

This report has been prepared by GHD Pty Ltd (GHD) as part of the environmental impact assessment (EIS) for the proposal. The EIS supports the application for approval of the proposal and to address the requirements provided by the ACT Department of Environment, Planning and Sustainable Development Directorate dated 21 July 2022.

The proposal is subject to approval by the planning and land authority within the Environment, Planning and Sustainability Development Directorate.

1.2 The proposal location

The MRF proposal site is located within the current bounds of the Hume Resource Recovery Estate (HRRE) in Hume Block 12 Section 25, which is a recent amalgamation of Hume Block 6 (southern block) and 10 (northern block), as shown in Figure 1.1. The proposal site has frontage to Mugga Lane, John Cory Road, and Recycling Road.

ACT Skip Hire is on the adjacent block to the north of the proposal site. Further north on John Cory Road, the Soft Landing Mattress Recycling facility is located adjacent to the proposal site on John Cory Road. The Mugga Lane Landfill is located approximately 200 m northwest of the proposal site.

The Hume Industrial Estate is located to the southeast of the Monaro Highway and is accessed via Tralee Street and Sheppard Street.

The location of the proposal site the in the context of the adjoining suburbs is displayed in Figure 1.2.

Legend

- Proposal Site
- Cadastre
- Watercourses

Paper Size ISO A4

0 25 50

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

GHD

Transport Canberra and City Services
Hume Materials Recovery Facility
Traffic and Transport Impact Assessment

Project No. **12540460**
Revision No. **0**
Date **15/08/2023**

Proposal Location

FIGURE 1.1

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Print date: 15 Aug 2023 - 16:37

Paper Size ISO A4

0 0.5 1

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Transport Canberra and City Services
Hume Materials Recovery Facility
Traffic and Transport Impact Assessment

Project No. **12540464**
Revision No. **0**
Date **15/08/2023**

MRF Regional Context

FIGURE 1.2

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Light Grey Base, Light Grey Reference - Vicmap, Esri, HERE, Garmin, FAO, NOAA, USGS, 2022; Imagery - Metromap Tile Service extracted 26/04/2022; Suburbs - ACTmapi; State boundary - ABS, 2021, Roads, Waterways Waterbodies - NSWSS, 2022. Vicmap, Esri, HERE, Garmin, FAO, NOAA, USGS Created by: akildea

1.3 Other developments

As shown in Figure 1.3, the proposal site is located adjacent to the southwest of the proposed Food Organics and Garden Organic (FOGO) facility on John Cory Drive.

There is currently no processing facility within the Territory that can accept and process FOGO material. ACT NOWaste is therefore proposing to develop a new FOGO facility in Hume to strengthen the Territory's circular economy and help meet Territory and Federal Government landfill diversion and resource recovery targets.

Kerbside collection trucks and articulated waste transfer vehicles would deliver FOGO waste into the receival hall through automated fast acting roller/shutter doors into the receival hall and unload in the designated delivery area. FOGO deliveries are expected to be weekly. Provision would also be made in design for acceptance of organic waste deliveries via articulated transfer vehicles up to the size of a 19.0 m long semi-trailer vehicles.

The timeline of the development of the new FOGO facility is expected to occur simultaneously with the MRF facility.

To identify the cumulative impacts of the land uses in proximity to the MRF, the vehicle activity associated with the FOGO have been accounted for in this report.

Legend

- Proposal Site
- FOGO facility
- Current MRF facility
- Cadastre
- Watercourses

Paper Size ISO A4

0 25 50

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Transport Canberra and City Services
Hume Materials Recovery Facility
Traffic and Transport Impact Assessment

Project No. **12540460**
Revision No. **0**
Date **15/08/2023**

MRF and FOGO local context

FIGURE 1.3

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1.4 Purpose of this report

GHD Pty Ltd (GHD) has been commissioned by TCCS to prepare a Traffic and Transport Impact Assessment (TTIA), which would support the EIS required to obtain approval for the construction and operation of the proposal.

This report documents the results of the TTIA and covers the following scope of work that addresses the ACT Government Environment, Planning and Sustainable Development Directorate's (EPSDD) scoping document requirements, including:

– A description of the existing traffic and transport environment in the study area.
– A review of the existing road and transport conditions, traffic volumes, access arrangements, parking, and crash data.
– An assessment of the potential impacts of the proposal and the performance of key intersections during construction and operation. Specifically, the traffic impacts of the construction and operation of the facility:
    - On Mugga Lane and the Monaro Highway.
    - On the safe and efficient flow of vehicles within the study area (e.g., existing road users accessing the Mugga Landfill or the FOGO adjacent to the proposal site).
– Recommendations on suitable mitigation measures to minimise the impacts of the proposed MRF on the adjoining road network.

The TTIA responds to scoping requirements, as detailed in Table 1.1.

Table 1.1 Scoping requirements

Requirement	Section address in
Investigate the traffic impacts of the construction and operation of the MRF facility on Mugga Lane and the Monaro Highway including consideration of whether continued safe and efficient movement of vehicles accessing the facility, relating to other activities such as the Mugga Landfill or the materials recycling facility, is not impeded by road network arrangements.	Section 4
Undertake a Transport Impact Assessment (TIA) in accordance with Transport Canberra and City Services (TCCS) Transport Impact Assessment Guidelines which is available at: https://www.cityservices.act.gov.au/__data/assets/pdf_file/0009/991989/TCCSTransport-Impact-Assessment-Guidelines.pdf.	Section 1 to 6
The TIA must include intersection analysis of the nearby roads.	Section 4.4
Describe how hazardous materials will be transported to and from the proposal site.	Appendix C

1.5 Assumptions and limitations

The preparation of this assessment has relied on the following data sources:

– Peak hour intersection traffic counts commissioned by GHD on 09 November 2022 (Wednesday). Intersection counts at the following locations were used for this study:
    - Mugga Lane / John Cory Road (Roundabout)
    - Mugga Lane / Monaro Highway (Intersection)
– SCATS data (traffic counts and signal phasing) provided by TCCS for the intersection of Mugga Lane and Monaro Highway (TCCS 147).
– The conditions of the surrounding network are based on information obtained from desktop checks using ACTmapi, Google Maps and Google Street View. No site inspection was undertaken for this study.

The following study limitations and key assumptions are applicable to this study:

– Estimates of the expected construction and operational traffic volumes of the MRF have been provided by the Client.
– Traffic distribution estimates have been based on high level assumptions on existing travel patterns and information provided by the ACT Government.

– The construction activity of the MRF and FOGO would overlap and would be completed by 2027.
– A traffic growth rate of 1.4 per cent per annum has been adopted for Mugga Lane and Monaro Highway in accordance with the ACT Government population projections.
– Upgrades to the Monaro Highway would occur subsequent to 2027.
– The volumes of construction and operational vehicles (cars and trucks) associated with the FOGO have been provided by the ACT Government.
– Peak worker vehicle activity coincides with the adjoining road network peak periods.
– All construction workers and operation staff would drive, with a car occupancy of one, i.e., no carpooling.

1.6 Relevant legislation, policies and guidelines

The assessment was undertaken with reference to the following:

– ACT Government Guidelines for Transport Impact Assessment (2020)
– ACT Government Guidelines for SIDRA Analysis Draft V1.0 (2016)
– ACT Territory Plan's Parking and Vehicular Access General Code
– Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development (Austroads, 2016)
– Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (Austroads, 2021).

1.7 Report structure

This Traffic and Transport Assessment report is structured as summarised in Table 1.2.

Table 1.2 Report structure

Section No.	Title	Content
1	Introduction	Provides background to, and an overview of, the proposal. This section also establishes the purpose of the document, the assumptions and the limitations used in the assessment, and the structure in which information is presented.
2	Existing environment	Provides a description of the existing road network, traffic, and transport conditions within the study area.
3	MRF project description	Provides a detailed description of the proposal.
4	Impact assessment	Provides details on the additional traffic associated with the construction and operation of the proposal, and an assessment of the associated traffic and transport impacts that would potentially result from the proposed development.
5	Mitigation and management measures	Provides recommendations of proposed mitigation options for the construction and operational impacts of the proposal.
6	Summary and conclusions	Presents a summary of the traffic and transport assessment findings and sets out the principal conclusions for the study.

1.8 Disclaimer

This report: has been prepared by GHD for Transport Canberra and City Services and may only be used and relied on by Transport Canberra and City Services for the purpose agreed between GHD and Transport Canberra and City Services as set out in Section 1.4 of this report.

GHD otherwise disclaims responsibility to any person other than Transport Canberra and City Services arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer to Section 1.5 and Section 4 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

2. Existing environment

2.1 Existing road network

2.1.1 Road hierarchy

Roads in the ACT, based on the Trunk Road Infrastructure Standard, are classified based on their predominant function and the extent to which they serve the following two basic purposes of the road network:

– Movement of traffic
– Access to property.

The road classifications used in the ACT are as follows:

– **Arterial Roads** – predominantly serve longer distance travel within a district and through traffic from one district to another and form the principal avenues of communication for metropolitan scale traffic movements. Design traffic volumes are typically greater than 6,000 vehicles per day.
– **Major Collector Roads** – collect and distribute traffic within residential, industrial, and commercial areas and form the link between the primary network and the roads within local areas. These roads should carry only traffic originating or terminating in the area. Design traffic volumes are typically between 3,001 and 6,000 vehicles per day.
– **Minor Collector Roads** – collect and distribute traffic from access streets, linking to the major collector roads within the neighbourhood, and provide secondary connections direct to the external arterial road network. Design traffic volumes are typically between 1,001 and 3,000 vehicles per day.
– **Local Access Streets** – provide access but do not accommodate traffic generated by sites in other streets, excluding rear lanes. Design traffic volumes are typically less than 1,000 vehicles per day.

A map of the road classifications in proximity to the proposal site is shown in Figure 2.1. Primary access to the proposal site would be provided via John Cory Road, Mugga Lane, and Monaro Highway. To the southeast of Monaro Highway, Tralee Street and Sheppard Street provide access to the Hume Industrial Estate.

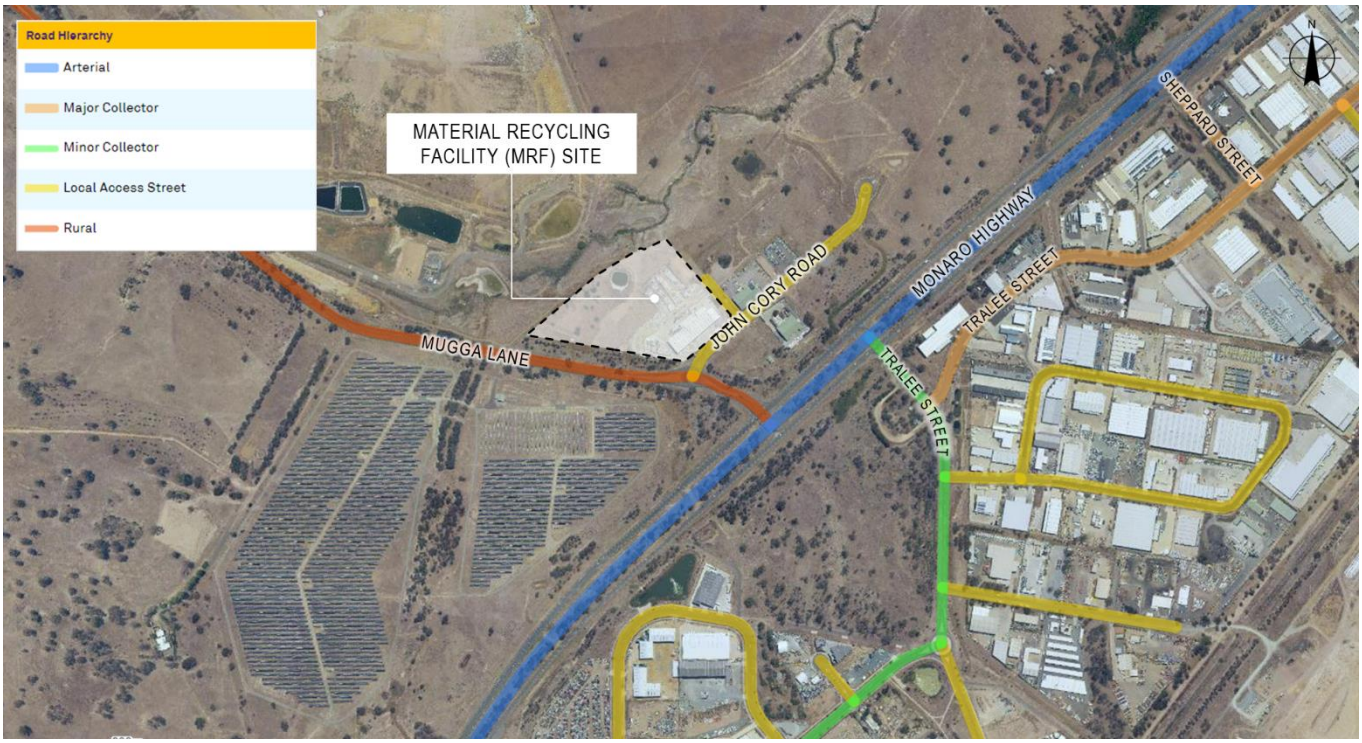


Figure 2.1 Road classification of key roads in proximity to the proposal site

Source: Active Travel Infrastructure Practitioner's Tool; modified by GHD

2.1.2 Road characteristics

2.1.2.1 Monaro Highway

The Monaro Highway (pictured in Figure 2.2) is an arterial road that traverses Victoria, New South Wales (NSW), and the ACT. It runs at a north-south alignment and has a length of approximately 285 kilometres, with its northern terminus at Pialligo in ACT, west of the Canberra Airport, and its southern terminus at the intersection with Princes Highway in Cann River, Victoria.

In proximity to the proposal site, the Monaro Highway serves as the primary connection between Canberra Central and the ACT's eastern suburbs and provides access to various light industrial areas surrounding the proposal site via Tralee Street and Sheppard Street. The section of Monaro Highway located in Hume also forms part of ACT's Tourist Drive 5, an 83 kilometre tourist loop around the northern ACT, and is the primary road used to access several national parks in southern ACT.

The key features of Monaro Highway in proximity to the proposal site are summarised in Table 2.1.

Table 2.1 Monaro Highway key features

Feature	Description	Key Map
Carriageway	Sealed, divided carriageway with two lanes in each direction. Carriageway width per direction is approximately 7 metres (3.5 metres per lane), with a wide 45 metre median. Travel lanes are delineated by road markings. Shoulders are provided on the outermost lane, which also doubles as on-road cycling lanes.	
	Slip lanes and turning lanes provide additional travel widths near the intersection of the Monaro Highway and Mugga Lane. Provides a 170 metre long left turn lane and 270 metre right turn lane into Mugga Lane.	
Parking	On-street parking is not permitted.	
Speed limit	80 km/h	
Pedestrian Facilities	No pedestrian facilities such as sidewalks or crossings.	
Bicycle Facilities	On-road cycling lanes on road shoulders, delineated by lane markings.	
Public Transport	Bus Route 182 plies along Monaro Highway, but no public transport stops are located along the highway within 800 metres of the proposal site.	

Figure 2.2 Monaro Highway looking towards Mugga Lane

Image Source: Google Street View (2022 imagery)

2.1.2.2 Mugga Lane

Mugga Lane (pictured in Figure 2.3) is a rural road that provides an alternate link from the Central ACT to the districts of Jerrabomberra and Tuggeranong. Mugga Lane runs approximately 7.4 kilometres across Jerrabomberra, beginning at the intersection with Hindmarsh Drive in the north and terminating at the intersection with the Monaro Highway in the south. Mugga Lane also connects the southern suburbs of Jerrabomberra to Woden Valley via Long Gully Road.

The section of Mugga Lane in proximity to the proposal site serves as the southern boundary of Jerrabomberra and the suburb of Hume. The key features of Mugga Lane in proximity to the proposal site are summarised in Table 2.2.

Table 2.2 Mugga Lane key features

Feature	Description	Key Map
Carriageway	Typically provides a sealed, divided carriageway with one lane in each direction. Carriageway widths of approximately 7 metres (3.5 metres per lane). Additional turning lanes are provided in proximity to the Monaro Highway.	
Parking	On-street parking is not permitted.	
Speed limit	80 km/h	
Pedestrian Facilities	No pedestrian facilities such as sidewalks or crossings.	
Bicycle Facilities	No cycling facilities.	
Public Transport	No access to public transport.	

Figure 2.3 (Left) Mugga Lane viewed west towards John Cory Road and (Right) viewed east towards the Monaro Highway

Image Source: Google Street View (2022 imagery)

2.1.2.3 John Cory Road

John Cory Road (pictured in Figure 2.4) is a local access (cul-de-sac) street to the northwest of the Monaro Highway. It has a length of approximately 500 metres, with its southern end intersecting Mugga Lane at a roundabout. John Cory Road provides access to the light industrial area northwest of the Monaro Highway, including the existing MRF (prior to its damage by fire).

The key features of John Cory Road in proximity to the proposal site are summarised in Table 2.3.

Table 2.3 John Cory Road key features

Feature	Description	Key Map
Carriageway	Sealed carriageway with travel widths of approximately 8 metres (4 metres per lane). No lane markings and shoulders.	
Parking	On-street parking is not permitted.	
Pedestrian Facilities	No pedestrian facilities such as sidewalks or crossings.	
Bicycle Facilities	No cycling facilities.	
Public Transport	No access to public transport.	

Figure 2.4 John Cory Road looking northeast of Mugga Lane

Image Source: Google Street View (2019 imagery)

2.2 Public and active transport

A map of the public transport services around the proposal is shown in Figure 2.5. At the time of writing, the following bus routes service the Monaro Highway in proximity to the proposal site. However, these routes do not have any stops within 800 metres of the proposal site and hence cannot be considered accessible for the MRF.

– **Route 182 Peak Service.** One of the peak bus services that travels to and from the City and Parliamentary Triangle during weekday peak periods. Route 182 serves the following areas: City West, City Interchange, Reid, Russell, Barton, Kingston, Chisholm, Calwell, Conder, and Lanyon Market Place.
– **Route 902 AMC Shuttle** serving Woden Interchange, Canberra Hospital, Narrabundah College, Narrabundah Shops, AMC, Hume Industrial Area. Route 902 operates Monday to Sunday between Woden and AMC via Narrabundah. The route only extends to the Hume Industrial Area (shown in Figure 2.5) on weekdays.

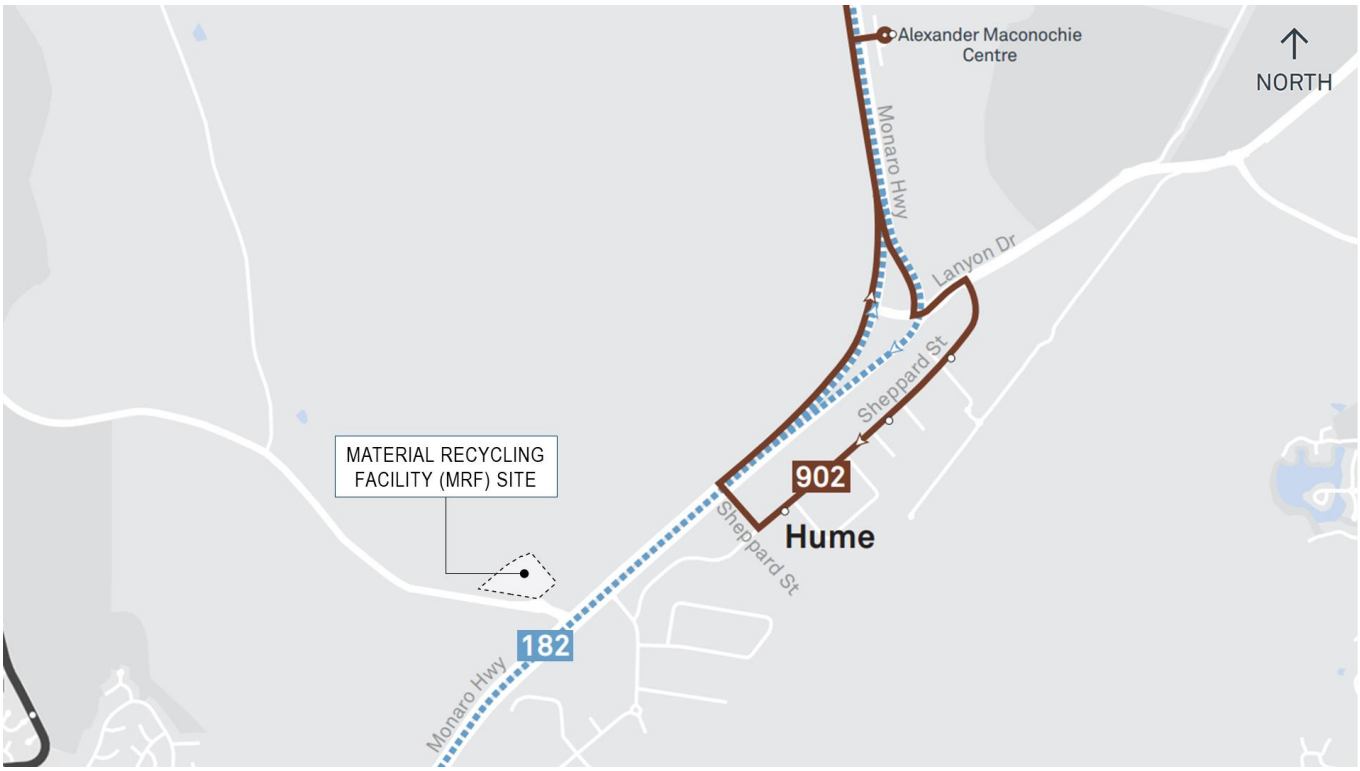


Figure 2.5 Bus network map

Source: Transport Canberra Network Map (effective 31st January 2022), modified by GHD

There are no dedicated footpaths and cycling lanes that provide access within, to or from the proposal site.

2.3 Freight routes

The ACT Government identifies the Monaro Highway and Mugga Lane as being part of key freight routes (PBS Level 1) and B-double networks, as displayed in Figure 2.6.

A PBS L1 heavy vehicle is designated as a truck and dog trailer combination that is not longer than 20 metres and is not a B-double or road train.

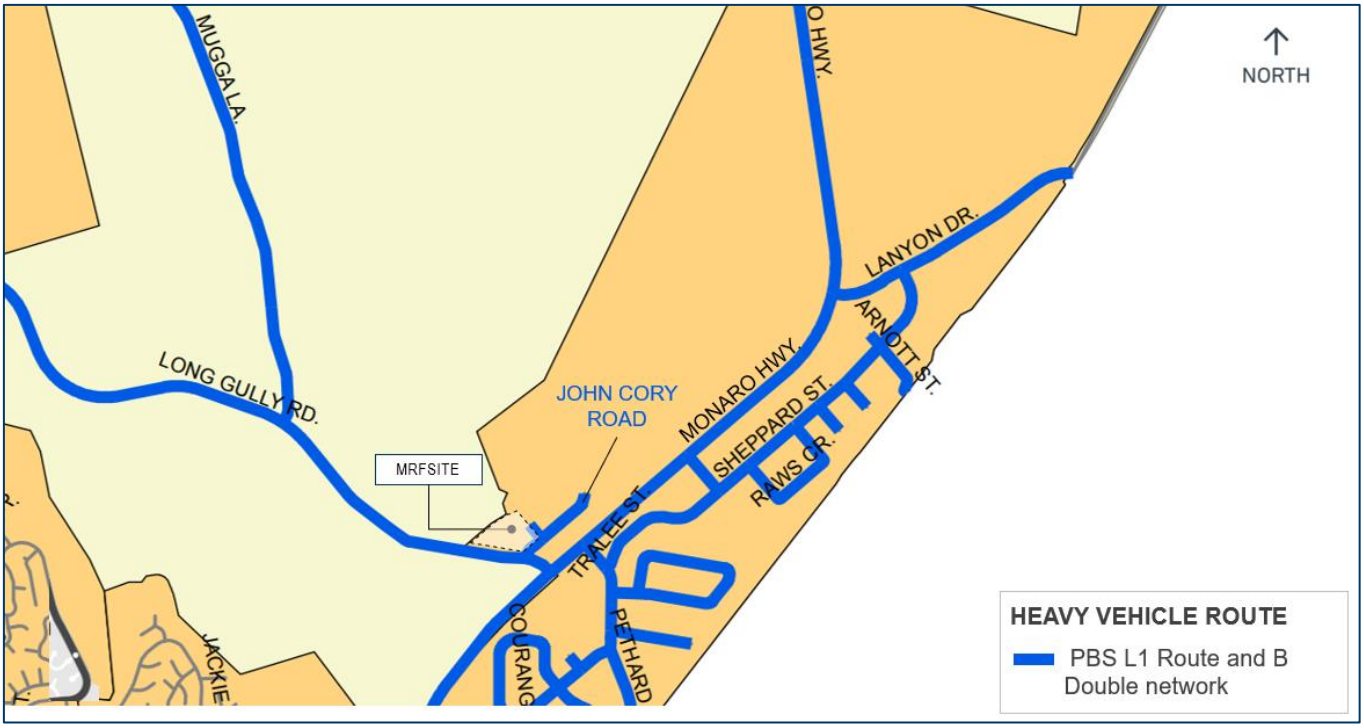


Figure 2.6 Local freight routes

Source: Approved ACT Routes for Performance Based Standards (PBS) Level 1 Vehicles, ACT Territory and Municipal Services

2.4 Crash review

Road crashes and their locations within ACT are recorded based on the reports of the police and the public through the Australian Federal Police (AFP) Crash Report Form. Since January 2016, 445 crashes have been reported within a two-kilometre radius of the proposal site, as summarised in Table 2.4. The five-year data indicates that approximately nine per cent of the reported crashes resulted in injuries or fatalities.

Table 2.4 Reported road crashes within 2-km radius

Year [a]	Total number of crashes reported	of which resulted in **Fatality**	of which resulted in **Injury**	of which resulted in **Property Damage Only**
2016	77	-	4	73
2017	92	-	8	84
2018	87	1	10	76
2019	79	-	9	70
2020	72	-	6	66
2021 [b]	38	1	2	35
Total	**445**	**2**	**39**	**404**

[a] *From 01st January to 31st December of each year, except for 2021*
[b] *As of end of July 2021*

The data indicates that the crashes were predominantly:

– *Rear end collisions* (200 incidents, 45 per cent of the total number of incidents).
– *Same direction side swipe* (65 incidents, 15 per cent).
– *Right-angle collisions* (56 incidents, 13 per cent).

A heatmap of these reported crashes (refer to Figure 2.7) shows clusters of high-incident areas at intersections along the Monaro Highway (represented by orange).

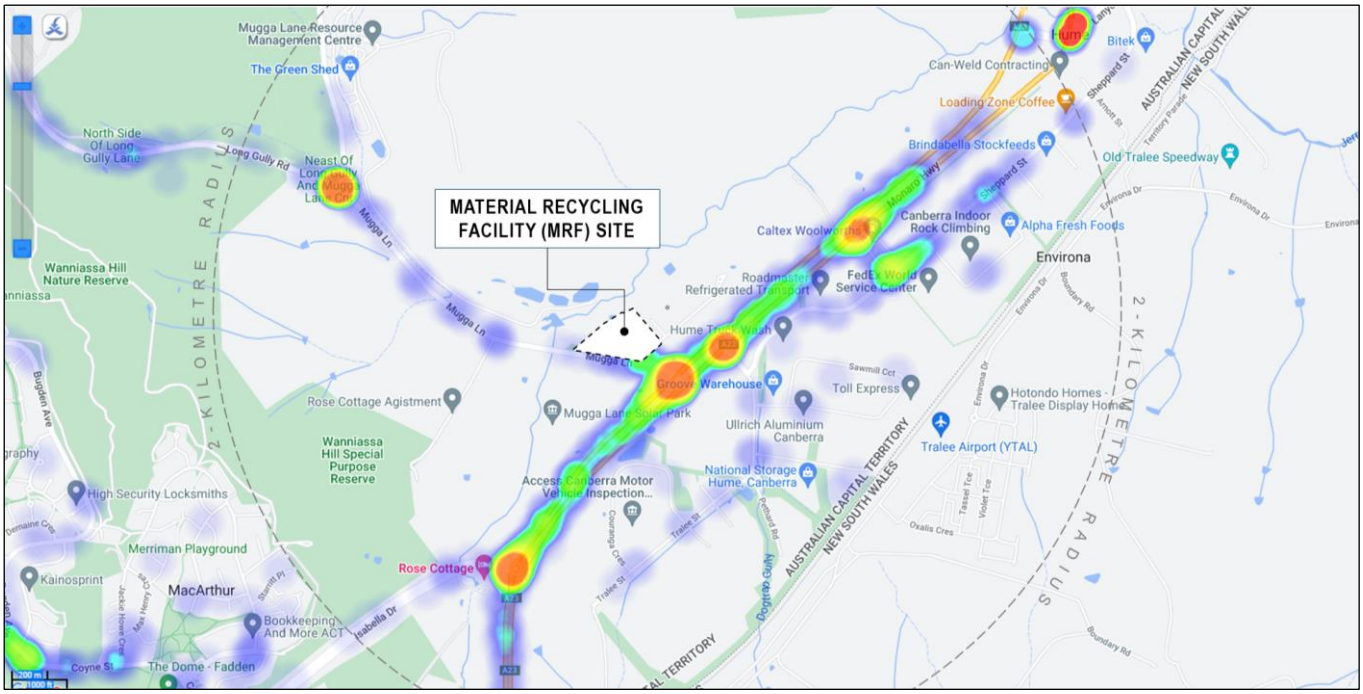


Figure 2.7 Road crash incidents within 2-km radius of the proposal site

Source: ACT Government Open Data Portal; modified by GHD

A closer look at crash data at the intersections near the proposal site (refer to Figure 2.8) shows that the majority of the recorded crashes along Mugga Lane and Monaro Highway are property damage crashes, a further four crashes resulted in injuries or fatalities.

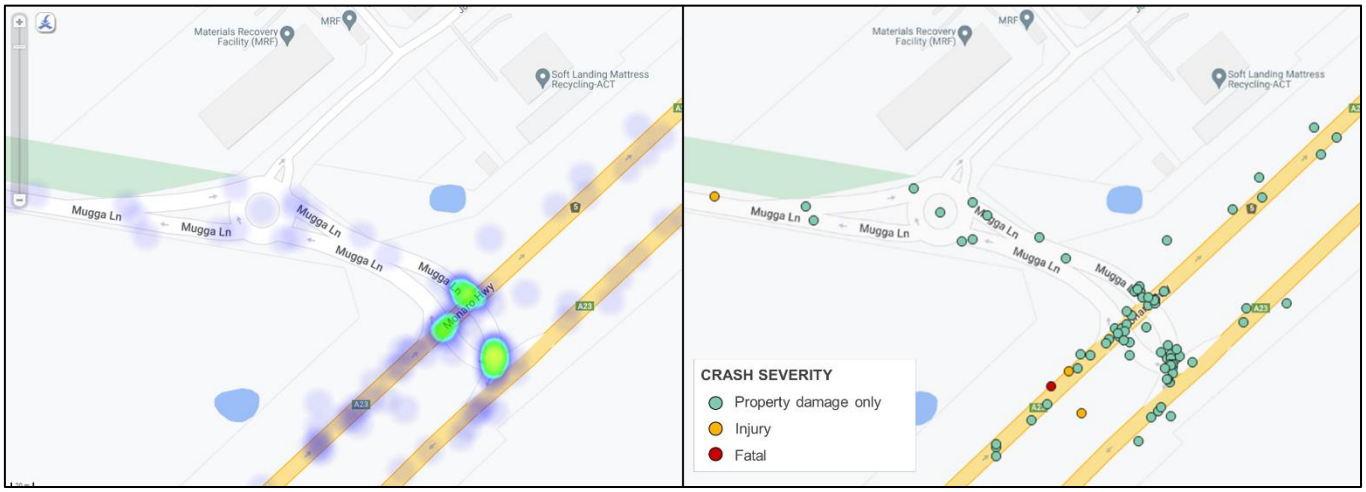


Figure 2.8 Road crash incidents near proposal access

Source (heatmap and data): ACT Government Open Data Portal; modified by GHD

Details of these crashes are summarised in Table 2.5.

Table 2.5 Reported road crashes near proposal access (injuries and fatalities)

Crash ID	Date of Crash	Time of Crash	Crash Direction	Crash Severity	Lighting Condition	Road Condition	Weather Condition
1224732	05-Mar-20	00:30	Westbound	Injury	Dark - poor street lighting	Wet surface	Light rain
1208606	15-May-19	09:00	Northbound	Injury	Daylight	Good dry surface	Fine
1193198	29-Aug-18	18:20	Southbound	Injury	Dark - good street lighting	Good dry surface	Fine
1191325	28-Jul-18	09:26	Northbound	Fatal	Daylight	Good dry surface	Fine

Source: ACT Road Crash Data, ACT Government Open Data Portal

2.5 Traffic performance

2.5.1 Traffic volumes

Existing traffic volumes were determined based on peak hour intersection traffic counts conducted on 09 November 2022 (Wednesday) at the following locations:

– Mugga Lane / John Cory Road (roundabout)

– Mugga Lane / Monaro Highway (signalised intersection)

The traffic surveys were undertaken for three-hour periods between 06:30 am – 09:30 am and 4:00 pm – 7:00 pm.

The data indicates that:

– The morning traffic peak hour occurs between 08:00 am to 09:00 am.

– The afternoon traffic peak hour occurs between 04:15 pm to 05:15 pm.

It is noted that the MRF was operational during the traffic surveys prior to its damage in a fire in December 2022.

A summary of the weekday AM and PM peak hour traffic movements is shown in Figure 2.9, while a summary of the midblock traffic volume counts is provided in Table 2.6. The traffic count data is provided in Appendix A.

Figure 2.9 Peak hour traffic count data (2022)

Table 2.6 Midblock traffic volume count summary (2022)

Road Name	Direction	AM Peak (vph)			PM Peak (vph)		
		LV	HV	Total	LV	HV	Total
Monaro Highway *(north of intersection with Mugga Lane)*	Northbound	3,257	97	3,354	1,362	101	1,463
	Southbound	1,345	136	1,481	3,303	74	3,377
Monaro Highway *(south of intersection with Mugga Lane)*	Northbound	2,980	71	3,051	1,042	55	1,097
	Southbound	1,103	100	1,203	2,884	60	2,944
Mugga Lane *(west of roundabout)*	Eastbound	582	50	632	532	51	583
	Westbound	544	60	604	638	18	656
Mugga Lane *(east of roundabout)*	Eastbound	584	48	632	540	54	594
	Westbound	549	58	607	639	22	661

Note: LV = light vehicles HV = heavy vehicles vph = vehicles per hour

2.5.2 Mid-block analysis

A midblock assessment is an approach for assessing the road network operations between intersections based on hourly traffic volumes along a road and lane capacity limits.

The capacity of the road network to accommodate additional traffic generated by the construction and operation of the proposal was determined based on mid-block volume to capacity ratio (VCR) of the impacted roads *before* (i.e., existing / baseline conditions) and *after* the construction and operation of the proposed modifications.

Volume to capacity ratio (VCR)

VCR is the ratio of the volume of vehicles (demand) and the capacity of the road. The ratio gives an indication of the road's degree of saturation and its ability to accommodate additional traffic. A lower VCR signifies low traffic volumes and typically translates to a better quality of service for road users. A ratio greater than one (1) suggests that the road is oversaturated and cannot handle the influx of volume, leading to delays and queue build-up.

The *Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis Methods (AGTM Part 3)* indicates a practical degree of saturation of 0.90. For a conservative assessment of the traffic impacts associated with the Proposal, a desirable outcome for the volume to capacity ratio of 0.85 or lower has been adopted.

Demand

Demand has been estimated to be equivalent to the traffic volumes plying along the assessed corridors. To account for the different impacts of light and heavy vehicles in the traffic mix, traffic volumes are converted from 'vehicle units' to 'passenger car units' (pcu) using multipliers called passenger car equivalent (PCE) factors. This allows for the assessment of traffic volume using one homogenised unit for all vehicles. A PCE factor of 2.0 has been adopted for heavy vehicles to obtain a highly conservative assessment of the impacts of the proposal.

Lane capacity

A road in which fixed elements influence traffic flow conditions (e.g., traffic signals, stop signs, give-way signs, roundabouts, or other controls) that cause traffic to stop periodically is referred to as an interrupted flow facility. The capacity of an urban road with interrupted flow varies depending on the type of lane (Section 6.2.1 of AGTM Part 3). The typical mid-block capacity, as stipulated in AGTM Part 3, is replicated in Table 2.7.

Table 2.7 Typical mid-block capacity for urban roads with interrupted flow

Type of lane	One-way mid-block capacity (pc/h)
Median or inner lane	
Divided road	1,000
Undivided road	900
Middle lane (of a 3-lane carriageway)	
Divided road	900
Undivided road	1,000
Kerb lane	
Adjacent to parking lane	900
Occasional parked vehicles	600
Clearway conditions	900

Source: Austroads Guide to Traffic Management Part 3 – Traffic Studies and Analysis Methods - Table 6.1

Note: AGTM Part 3 further states that "peak period mid-block traffic volumes may increase to 1,200 to 1,400 pc/h/lane on any approach road when the following conditions exist or can be implemented:

- *adequate flaring at major upstream intersections.*
- *uninterrupted flow from a wider carriageway upstream of an intersection approach and flowing at capacity.*
- *control or absence of crossing or entering traffic at minor intersections by major road priority controls.*
- *control or absence of parking.*
- *control or absence of right turns by banning turning at difficult intersections high volume flows of traffic from upstream intersections during more than one phase of a signal cycle.*
- *good co-ordination of traffic signals along the route.*

For the purposes of this assessment, a conservative approach has been adopted, and the following lane capacities were used to calculate the VCR:

- Undivided roads: 900 pc/h/lane
- Divided roads: 1,200 pc/h/lane

Table 2.8 presents the VCR of the key roads in the study area.

Table 2.8 Existing mid-block VCR – key roads (2022)

Road Name	Direction	Number of lanes	Capacity per lane	Existing traffic (2022) (pcu)		VCR (2022)	
				AM Peak	PM Peak	AM Peak	PM Peak
Monaro Highway *(north of intersection with Mugga Lane)*	Northbound	3	1,200	3,451	1,564	0.959	0.434
	Southbound	3	1,200	1,617	3,451	0.449	0.959
Monaro Highway *(south of intersection with Mugga Lane)*	Northbound	2	1,200	3,122	1,152	1.301	0.480
	Southbound	2	1,200	1,303	3,004	0.543	1.252
Mugga Lane *(west of roundabout)*	Eastbound	1	900	682	634	0.758	0.704
	Westbound	1	900	664	674	0.738	0.749
Mugga Lane *(east of roundabout)*	Eastbound	1	900	680	648	0.756	0.720
	Westbound	1	900	665	683	0.739	0.759

Note: pcu = passenger car units (1 LV = 1 pcu , 1 HV = 2 pcu)
VCR = volume to capacity ratio

This analysis indicates that presently:

- Mugga Lane is operating within its mid-block capacity during peak periods of road network activity.
- The Monaro Highway is operating at volumes that exceed its capacity during peak periods of road network activity.

2.5.3 Intersection assessment

The performance of the existing road network is largely dependent on the operating performance of key intersections, which are critical capacity control points on the road network. SIDRA 9 Intersection modelling software was used to assess the proposed peak hour operating performance of intersections on the surrounding road network. Intersection performance is represented through the following key parameters:

– Average delay (given in seconds per vehicle)
– Level of service (LoS, conversion of the average delay)
– Queue length (95th percentile in metres)
– Degree of saturation (DoS, ratio of traffic demand to capacity).

The criteria for evaluating the operational performance of intersections based on the qualitative measure are provided in Table 2.9 and Table 2.10. The TCCS Draft Guidelines for SIDRA Analysis indicate that any LoS higher than "E" represents an acceptable level of service.

Table 2.9 LoS criteria for intersections

LoS	Average Delay per Vehicle (seconds/veh)	Traffic Signals, Roundabouts
A	<14	Good operation
B	15 to 28	Good with acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At capacity, at signals, incidents would cause excessive delays, roundabouts require other control modes
F	>70	Over capacity, unstable operation

Source: Roads and Maritime Services Traffic Modelling Guidelines

Table 2.10 Maximum practical degree of saturation by intersection control

Intersection Control	Maximum Practical Degree of Saturation
Traffic Signals	0.90
Roundabouts	0.85
Priority-Controlled	0.80

Source: Roads and Maritime Traffic Modelling Guidelines

The base 2022 traffic models were developed using the weekday AM and PM peak hour SCATS data. Existing traffic flows at key intersections were analysed using SIDRA 9 to obtain the current operation of the key intersections.

The SIDRA intersection layout adopted for this assessment, shown in Figure 2.10, was developed using desktop measurements of satellite imagery on ACTmapi and SIX Maps.

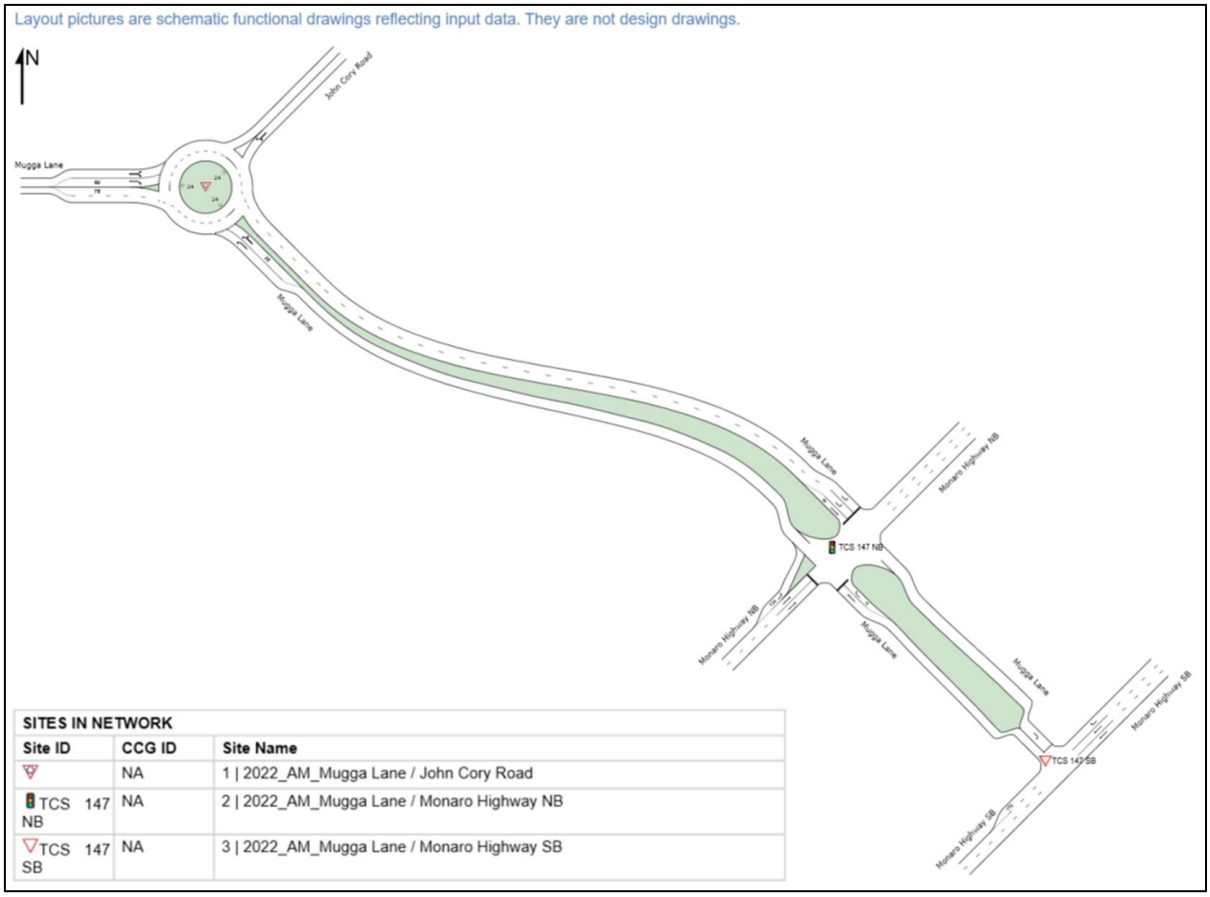


Figure 2.10 Network layout – Base Case (2022)

The signal phasing for the intersection of Mugga Lane and Monaro Highway was determined using SCATS data provided by the ACT Government (refer to Figure 2.11).

Figure 2.11 SCATS signal data – Monaro Highway and Mugga Lane

Source: ACT Government

As displayed in Figure 2.11, the intersection operates with three phases, with the majority of green time allocated to the northbound movement on the Monaro Highway.

The SIDRA model outputs for the intersections, based on their current road geometry, traffic volumes and signal phasing, are presented in Table 2.11.

Table 2.11 Existing operating conditions – Base Case (2022)

ID	Intersection Name	AM Peak Hour (08:00 - 09:00)				PM Peak Hour (16:15 – 17:15)			
		DoS	Ave Delay (s)	LoS	95th % Queue (m)	DoS	Ave Delay (s)	LoS	95th % Queue (m)
1	Mugga Lane / John Cory Road	0.125	11	B	2	0.201	11	B	3
2	Mugga Lane / Monaro Highway NB	1.109	125	F	832	0.787	21	C	73
3	Mugga Lane / Monaro Highway SB	0.195	7	A	95	0.392	26	D	5

Notes:

- *The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.*
- *The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.*
- *The degree of saturation (DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.*
- *Average delay is given in seconds per vehicle.*

Table 2.11 indicates that:

- The roundabout of Mugga Lane and John Cory Road, which is the primary access to the proposal site, is operating at LoS B with minimal delays and queueing for both AM and PM peak periods.
- During the AM peak, the signalised intersection of Mugga Lane and the northbound carriageway of the Monaro Highway is operating over capacity at LoS F, with delays of up to two minutes and queue lengths greater than 800 metres. These outputs are aligned with findings of previous traffic studies in the area, particularly the Canberra Travel Modelling Report *(Veitch Lister Consulting Pty Ltd, 2014),* which showed that as early as 2011, this section of the corridor had been operating near-capacity in the AM peak. The area is one of the pinch points along the Monaro Highway and is one of the intersections subject to upgrade in the Monaro Highway upgrade project jointly funded by the ACT and Australian Governments (refer to Section 4.1).
- During the PM peak, the signalised intersection operates at LoS C with delays of up to 21 seconds and queues up to 73 metres.
- The intersection of Mugga Lane and the southbound carriageway of the Monaro Highway operates at acceptable levels of service, with the proposal site operating at LoS A during the AM peak and LoS D in the PM Peak.

SIDRA outputs for the existing situation are presented in Appendix B.

3. MRF description

3.1 Layout and operation

The Hume MRF requires technological improvements to facilitate greater resources recovery by increasing the quality of recycled materials and reducing the amount of non-recyclable residual waste generated that is currently sent to landfill.

The upgraded facility is intended to have 115,000 tonnes of annual capacity to improve the quality and marketability of 23,000 tonnes of paper and mixed cardboard, 1,800 tonnes of mixed plastics and 14,000 tonnes of glass from the ACT and five regional NSW councils. The upgraded facility's capacity would aim to meet the population growth and changing consumer behaviour which may contribute to an increase in recoverable materials.

The proposal aim is to improve MRF operations and provide:

– Technical improvements to optically separate, identify, sort and segregate or bale specific marketable product streams.
– Technical improvements to separate, crush, screen, and wash glass sand, to nominally less than 5 millimetres.
– Improved optical sorting to identify, separate, decontaminate, quality control and bale paper and cardboard products.
– Improved and expanded baling processes in the container deposit scheme (CDS) separated materials.
– Technologies for optical sorting capability using material identification through processes like Near Infra-Red, colour, and metal sensing.
– An improved plant layout and manual sorting/quality control station ergonomics.
– An upgrade to data collection, management, and analysis systems.

Key features of the proposal include:

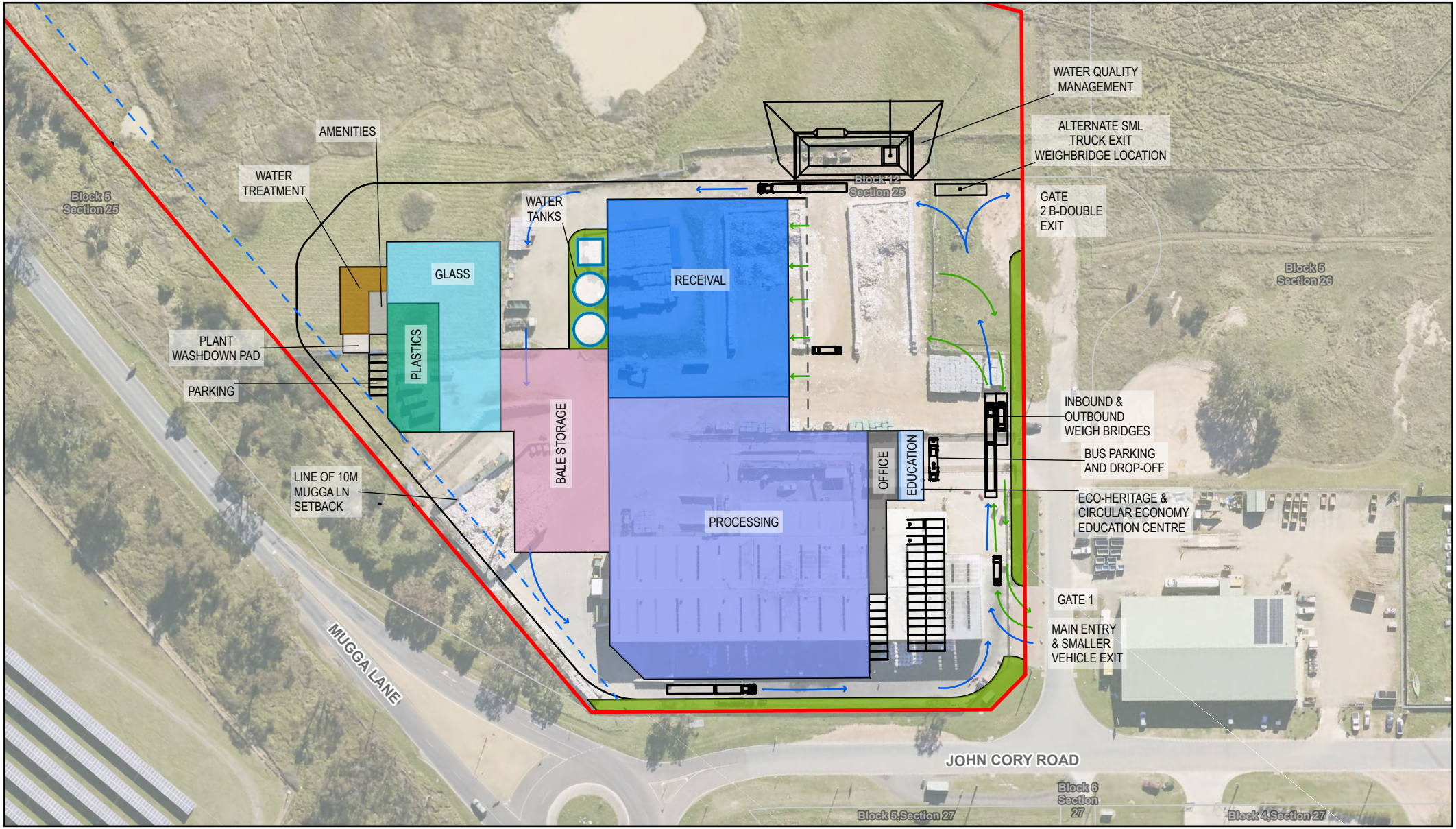
– Additional warehouse-style facilities with a floorspace of approximately 25,000 m^2 and ten metre or higher clear spans.
– Civil works and piling to support the dynamic loads imposed by rotating and high frequency vibrating equipment.
– Expansion of hardstand space towards the west of the proposal site.
– The proposal site would require a trade waste system to capture contaminated stormwater runoff.

Additionally, an educational facility would be a part of the main MRF building, adjacent to the administration office, ideally on the ground floor. The education facility would be approximately 100m^2 and include:

– Reception
– Amenities
– Display area
– Audio-visual fit out
– Two workstations
– 25 m^2 conference room
– Furniture, fixtures, and equipment
– Parking for one standard bus and four staff parking spaces

It is anticipated that the educational facility would typically cater to school groups, who would access/egress the proposal site via bus.

The detailed layout of the MRF is displayed in Figure 3.1.



Legend

- Proposal site
- Cadastre
- Water Tanks
- Amenities
- Bale Storage
- Education
- Glass
- Office
- Plant Washdown
- Plastics
- Processing
- Receival
- Water Treatment
- Grass

Paper Size ISO A4

0 20 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Transport Canberra and City Services
Hume Materials Recovery Facility
Traffic and Transport Impact Assessment

Project No. **12540460**
Revision No. **0**
Date **15/08/2023**

MRF detailed layout

FIGURE 3.1

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Print date: 15 Aug 2023 - 16:39

Data source: Metromap Tile Service: extracted 15/08/2023; Watercourses, Roads, Suburbs, Cadastre; Land zones - ACTmapi, 2022. Created by: akildea

The MRF would accept comingled recyclable materials delivered to the facility via recyclable material collection vehicles, as well as beverage containers collected via the ACT's CDS, and recyclable paper/cardboard collected from businesses in the region for baling at the MRF.

Subject to detailed design, it is expected that the facility would receive deliveries of recyclable materials from municipal kerbside collections Monday to Friday (during the day) and some loads of commercial recyclables and CDS materials on weekdays and Saturdays.

Staffing would generally be on a single shift operating basis in initial years of operation, with maintenance activities carried out after production during the day and on weekends. Staffing of the facility would include administration staff including weighbridge/gate attendant, supervisor, plant, and machinery operators, including wheel loader and forklift drivers, baler attendants, quality controllers and maintenance fitters. The number of staff required would be subject to detailed design and commensurate with the level of automation integrated within the design of the facility.

Information provided by the Client indicates that the proposed MRF would employ an additional 15 workers compared to the operation of the MRF prior to the fire.

The MRF currently operates:

– 52 weeks per year
– Six days per week (excluding Christmas and Good Friday)
– Between 4:00 am – 10:00 pm (18 hours per day)

3.1.1 Access

In terms of the proposed access arrangements (refer to Figure 3.1):

– An effort has been made separate the movement of heavy vehicles and light vehicles.
– All vehicles would enter the MRF via Gate 1 from Recycling Road.
– All vehicles would move through the proposal site in a clockwise direction.
– The majority of light vehicles (employees) would park in the designated area on the eastern side of the proposal site. A small number of vehicles would park on the western side of the proposal site in proximity to the plastic and glass recycling facility.
– All heavy vehicles would enter the proposal site and drive over the entry weighbridge in a south to north direction and manoeuvre through the site in a clockwise direction to their designated area.
– Upon dropping off/collecting their loads all heavy vehicles would drive over the exit weighbridge in a south to north direction.
– All vehicles would egress the MRF via Gate 2 onto Recycling Road.
– The MRF has been designed to accommodate vehicles up the size of a large B-double truck.

3.1.2 Parking

It is proposed that two car parking areas will be provided within the MRF facility:

– The main parking area adjacent to Gate 1, would provide 37 parking spaces, including two parking spaces for the mobility impaired.
– A secondary parking area adjacent to the glass and recycling area would provide seven parking spaces.

It is expected that the proposed car parking facilities would be able to accommodate the staff and visitor parking demands associated with the operation of the MRF.

A dedicated space would be provided within the MRF, adjacent to the educational facility for buses.

3.2 Construction

3.2.1 Methodology

Subject to the final vendor tender submission, construction activities associated with the MRF are expected to include:

- Site preparation and establishment of temporary ancillary construction infrastructure including:
  - site offices and amenities
  - fencing
  - a temporary main switchboard and electrical riser to provide power during construction.
- Bulk earthworks for site levelling.
- Detailed excavation for lift and stair raft pads.
- Pouring concrete foundation slab, footings, hardstand, and suspended slabs for the main buildings.
- Construction of pavement areas for a car park, hardstand, and access roads.
- Construction of weighbridges and weighbridge office.
- Installation of steel truss frameworks for structures.
- Erection of pre-cast concrete panels for external and internal partition walls and metal roof for site buildings.
- Installation of processing equipment.
- Installation of firewater tanks.
- Installation of fencing and signage.
- Commissioning.

The construction timing would be confirmed after the completion of the procurement process and onboarding of the contractor. At this stage the indicative contract commencement date is in 2025 and is expected to take approximately 24 months.

3.2.2 Staffing and equipment

Up to 60 workers are expected onsite during the construction of the MRF.

Typical plant and equipment required for construction of the proposal is expected to include:

- 5-tonne excavator
- 20-tonne excavator
- Dozers
- Trucks
- Compaction equipment
- Graders
- Asphalt mixers
- Paver machine
- Bobcats
- Mobile concrete pump
- Concrete vibrators
- Concrete saw
- Welders
- Boom lifts
- Mobile crane
- Elevated working platform
- Mini loader
- Forklifts

During construction of the MRF, it is expected that up to approximately fifty trucks would access/egress the proposal site per day.

3.2.3 Program and hours

Construction working hours would be undertaken during the periods specified in the *Environment Protection Regulation 2005* and abide by noise zones outlined in the *Territory Plan*. This may include hours up to:

- 7:00 am to 6:00 pm Monday to Friday.

– 8:00 am to 6:00 pm Saturdays.
– 8:00 am to 6:00 pm on Sundays or Public Holidays.

4. Impact assessment

4.1 Road upgrades

4.1.1 Background

The ACT Government has committed funding to upgrade the Monaro Highway to reduce travel times and improve safety. Under this funding, design will be progressed for works in proximity to the proposal site (referred to as the Hume Interchange) are displayed in Figure 4.1.

Figure 4.1 Proposed Monaro Highway intersection upgrade

Source: ACT Government

The available information indicates that $230 million has been allocated for the upgrade to the Monaro Highway.

In proximity to the proposal site, the proposed upgrades that would impact how vehicles access/egress the MRF and FOGO include:

– Right turns into and out of Mugga Lane from the Monaro Highway would be banned.
– A flyover would be provided on the Monaro Highway over Isabella Drive.
– A flyover would be constructed over the Monaro Highway connecting Mugga Lane and Tralee Street.
– A grade separated left turn lane would be provided on Mugga Lane that would connect to the flyover and merge onto northbound traffic lanes of the Monaro Highway.
– Tralee Street would be extended to the southeast, where it would merge onto southbound traffic lanes on the Monaro Highway.
– Sheppard Street (to the north of Tralee Street) would be left in/left out only.

Under this arrangement:

– Left turns into and out of Mugga Lane from the Monaro Highway would be maintained.
– Vehicles seeking to turn right from Mugga Lane onto Monaro Highway would:
  - Undertake a left turn on the grade separated left turn lane from Mugga Lane.

- Turn right onto the Tralee Street flyover.
- Travel southbound on the Tralee Street extension and merge onto the Monaro Highway.

– Vehicles seeking to turn right from the Monaro Highway onto Mugga Lane would:
  - Turn left onto Sheppard Street from the Monaro Highway.
  - Turn right onto Tralee Street.
  - Turn right onto the Tralee Street flyover.
  - Use the flyover to access Mugga Lane.

4.1.2 Literature review

The Monaro Highway Upgrade program has developed intersection models for the proposed road upgrades on Monaro Highway and provide recommendations on the upgrades based on the modelling results. The infrastructure upgrades that were considered on the Monaro Highway in proximity to the MRF proposal site are displayed in Figure 4.2, which includes:

– A flyover between Mugga Lane and Tralee Street.
– A northbound on-ramp between Mugga Lane and the proposed flyover.
– Removal of right turns into and out of Mugga Lane from Monaro Highway.
– Removal of the traffic signals at the intersection of Monaro Highway and Mugga Lane.

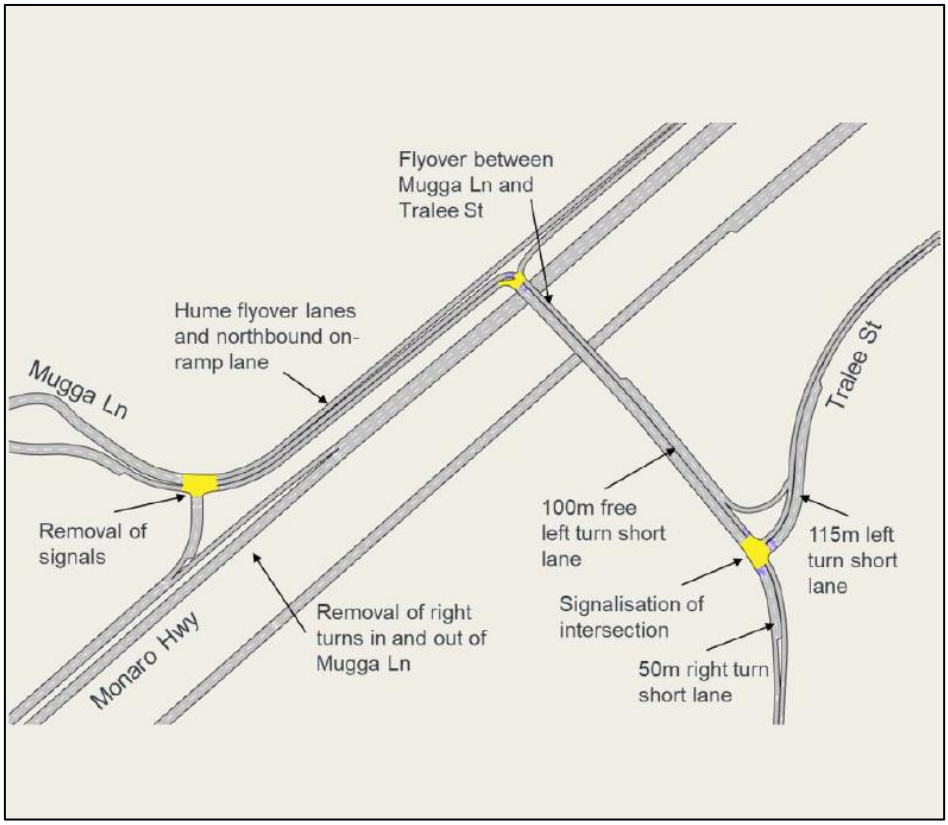

Figure 4.2 Proposed Monaro Highway upgrades

Information from the Monaro Highway Upgrade program indicates that:

– Future year traffic demands were determined from the Canberra Strategic Traffic Model (CSTM) for 2021, 2026, 2031 and 2041.
– An AIMSUN mesoscopic model was prepared for the proposed Monaro Highway upgrades.
– Existing intersection modelling indicates that the intersection of the Monaro Highway and Mugga Lane operates at LoS E in the AM peak hour and LoS B in the PM peak hour.
– A “do-nothing” scenario indicates that:

- In the 2031 horizon year, the intersection of Monaro Highway/Mugga Lane would operate at a LoS F in the AM peak hour and a LOS E in the PM peak hour.
- In the 2041 horizon year, the intersection of Monaro Highway/Mugga Lane would operate at a LoS F in the AM peak hour and PM peak hour.

– In the 2031 and 2041 horizon years, using the road geometry displayed in Figure 4.2, the intersection of interest would operate with a LoS A in the AM and PM peak hours in 2031 and 2041.

Construction of the Monaro Highway upgrade at the Hume Interchange has not commenced. For the purposes of analysis, it has been assumed that the interchange would commence operation subsequent to 2027.

4.2 Traffic generation

4.2.1 Construction

The peak hour construction vehicle activity has been undertaken on a first principles basis in accordance with the expected volumes of workers and heavy vehicles.

It is expected that up to 60 full-time equivalent people would be employed during the construction of the MRF. Most of the construction workforce is likely to be based in Canberra and Queanbeyan.

It is expected that workers would typically access the proposal site in the morning and depart the site in the afternoon. It has been assumed that peak worker vehicle activity coincides with the adjoining road network peak periods, as a conservative assumption.

Additionally, it has been assumed that all construction workers would drive, with a car occupancy of one, i.e., no carpooling.

During construction of the MRF, it is expected that up to approximately fifty trucks would access/egress the proposal site per day. Assuming a typical (weekday) workday occurs between 7:00 am and 6:00 pm, on average, this equates to approximately five trucks an hour.

To be conservative, it has been assumed that ten construction trucks would access/egress the proposal site in a single hour.

For the purposes of this assessment, the highest hourly traffic generation for the proposal under the peak construction scenario is assumed to be up to 80 vehicle trips in total for the MRF, which would consist of the following:

– AM peak hour:
  - Ten inbound heavy vehicle movements
  - Ten outbound heavy vehicle movements
  - Sixty inbound light vehicle trips.
– PM peak hour:
  - Ten inbound heavy vehicle movements
  - Ten outbound heavy vehicle movements
  - Sixty outbound light vehicle trips.

For the purposes of analysis, it has additionally been assumed that:

– The MRF and FOGO would be constructed at the same time.
– The construction of both facilities would be finalised in 2027.
– The FOGO would generate the same amount of construction vehicle activity as the MRF.

4.2.2 Operation

4.2.2.1 MRF

The operational trip generation characteristics of the MRF have been determined on a first principles assessment in accordance with the provision of a capacity of 115,000 tpa.

Based on the information provided by the Client, the following information was provided for the operation of the MRF based on weighbridge data from January 2022 – December 2022 (refer to Table 4.1).

Table 4.1 Current MRF heavy vehicle activity – 65,000 tpa (yearly and monthly)

	Per year	Per month
Cardboard	13,288	1,107
ACT CDS	2,018	168
RVM CDS	314	26
Waste	1,946	162
Product out	1,394	116
Glass out	516	43
Total	**19,476**	**1,623**

The data in Table 4.2 indicates that the MRF (prior to the December 2022 fire) generated 1,623 inbound and 1,623 outbound heavy vehicle movements per month.

Assuming an average of 22 working days per month, this equates to approximately 74 inbound and 74 outbound heavy vehicle movements per day.

It is understood that the current vehicle activity at the MRF is associated with the processing of 65,000 tpa of materials. Further, it is proposed to upgrade the MRF to have a capacity of 115,000 tpa in response to:

- The expected increase in the ACTs population.
- A policy change to increase the circular economy and generate less waste within the ACT.
- A potential increase in capacity to receive third-party materials.

If the capacity of the MRF increases from 65,000 tpa to 115,000 tpa, it is assumed that there would be a 77 percent increase in heavy vehicle activity. This rate has been applied to the data in Table 4.1 to determine the future heavy vehicle activity at the MRF, as displayed in Table 4.2.

Table 4.2 Future MRF heavy vehicle activity – 115,000 tpa

	Per year	Per month	Per day
Cardboard	23,510	1,959	89
ACT CDS	3,570	298	14
RVM CDS	556	46	2
Waste	3,443	287	13
Product out	2,466	206	9
Glass out	913	76	3
Total	**34,458**	**2,871**	**131**

The data in Table 4.2 indicates that based on an annual capacity of 115,000 tpa, the MRF would generate 131 inbound and 131 outbound heavy vehicle movement per day, approximately 60 more (in either direction), compared to the current situation.

Assuming the MRF operates 18 hours per day, on average, this equates to three additional inbound and three outbound heavy vehicle movement per hour.

To be conservative, it has been assumed that eight trucks would access/egress the proposal site in a single hour.

Additionally, it is assumed that:

– Vehicle activity associated with operational staff at the MRF (prior to the fire) was captured in the traffic surveys commissioned by GHD on the 09 November 2022.
– The MRF would employ up to 15 additional staff (subject to detailed design), who would typically access the MRF in the morning and depart the proposal site in the afternoon.

For the purposes of this assessment, it would be assumed that the MRF would generate up to 31 vehicle trips in peak periods of activity, as follows:

– AM peak hour:
  - Eight inbound heavy vehicle movements.
  - Eight outbound heavy vehicle movements.
  - 15 inbound light vehicle trips.
– PM peak hour:
  - Eight inbound heavy vehicle movements.
  - Eight outbound heavy vehicle movements.
  - 15 outbound workers.

4.2.2.2 FOGO

Trip generation for the FOGO has been determined on a first principles basis in accordance with information provided by the Client.

The facility would process 70,000 tonnes per annum of raw FOGO materials. Assuming each truck has a capacity of 10 tonnes, this equates to:

– 7,000 heavy vehicle movements per year – inbound and outbound
– 583 heavy vehicles movements per month – inbound and outbound
– 27 heavy vehicle movements per day (assuming 22 working days per month) – inbound and outbound

To support a robust assessment, it has been assumed that rigid vehicles would be used to transport the organics materials.

In summary, the FOGO would generate up to 96 heavy vehicle movements per day as follows:

– 18 inbound and 18 outbound heavy vehicle movements per day (compost material)
– Three inbound and three out dog and truck trailer movements per day (residual materials)
– 27 inbound and 27 outbound heavy vehicle movements per day (FOGO material)

Assuming the FOGO operates 12 hours per day, on average, this equates to approximately four inbound and four outbound heavy vehicle movement per hour. To be conservative, it would be assumed that ten trucks would access/egress the FOGO site in a single hour.

The FOGO would employ up to 20 staff (subject to detail design), who would typically access the FOGO in the morning and depart the FOGO in the afternoon.

For the purposes of this assessment, it has been assumed that the FOGO would generate up to 40 vehicle trips in peak periods of activity, as follows:

– AM peak hour:
  - Ten inbound heavy vehicle movements
  - Ten outbound heavy vehicle movements
  - Twenty inbound light vehicle trips.
– PM peak hour:
  - Ten inbound heavy vehicle movements

- Ten outbound heavy vehicle movements
- Twenty outbound workers.

4.3 Trip distribution

The trip distribution has been undertaken in accordance with the information provided by the ACT Government.

4.3.1 Heavy vehicles

For construction heavy vehicles, in the AM and PM peak hours:

– 70 percent of heavy would access/egress the proposal site to and from the north via the Monaro Highway.
– 30 percent of heavy would access/egress the site to and from the south via the Monaro Highway.

For operational heavy vehicles:

– AM peak hour:
  - 60 percent of heavy vehicles would access the proposal site from the west via Mugga Lane.
  - 40 percent of heavy vehicles would access the site from the east via Mugga Lane.
  - Of the heavy vehicles accessing the proposal site from the east:
    – 50 percent would access the site from the south via the Monaro Highway.
    – 50 percent would access the site from the north via the Monaro Highway.
  - All heavy vehicles would exit the proposal site from the direction they arrived.
– PM peak hour:
  - 60 percent of heavy vehicles would access the proposal site from the west via Mugga Lane.
  - 40 percent of heavy vehicles would access the site from the east via Mugga Lane.
  - Of the heavy vehicles accessing the proposal site from the east:
    – 50 percent would access the site from the south via the Monaro Highway.
    – 50 percent would access the site from the north via the Monaro Highway.
  - All heavy vehicles would exit the proposal site towards the depot that is accessed from Tralee Street and would:
    – Egress the site westbound towards Monaro Highway.
    – Undertake a left turn onto the Monaro Highway towards Tralee Street.

4.3.2 Light vehicles

The residential location of construction workforce and the operational staff of the MRF and FOGO is not currently known. However, it is expected that they would be predominantly drawn from Canberra and Queanbeyan. In accordance with the patterns of activity identified in the peak hour traffic surveys (for construction and operation):

– AM peak hour:
  - 50 percent of light vehicles would access the proposal site from the west via Mugga Lane.
  - 50 percent of light vehicles would access the site from the east via Mugga Lane.
  - Of the light vehicles accessing the proposal site from the east:
    – 50 percent would access the site from the south via the Monaro Highway.
    – 50 percent would access the site from the north via the Monaro Highway.
– PM peak hour:
  - 55 percent of light vehicles would egress the proposal site to the west via Mugga Lane.
  - 45 percent of light vehicles would egress the site to the east via Mugga Lane.
  - Of the light vehicles egressing the site to the east.
    – 70 percent would travel northbound on the Monaro Highway.

– 30 percent would travel southbound on the Monaro Highway.

Based on the trip generation data detailed in Section 4.2 and the trip generation assumptions for light vehicles and heavy vehicles described above:

– The AM and PM peak hour construction trips associated with the MRF, and the FOGO are displayed in Figure 4.3.
– The AM and PM peak hour operational trips associated with the MRF, and the FOGO are displayed in Figure 4.4.

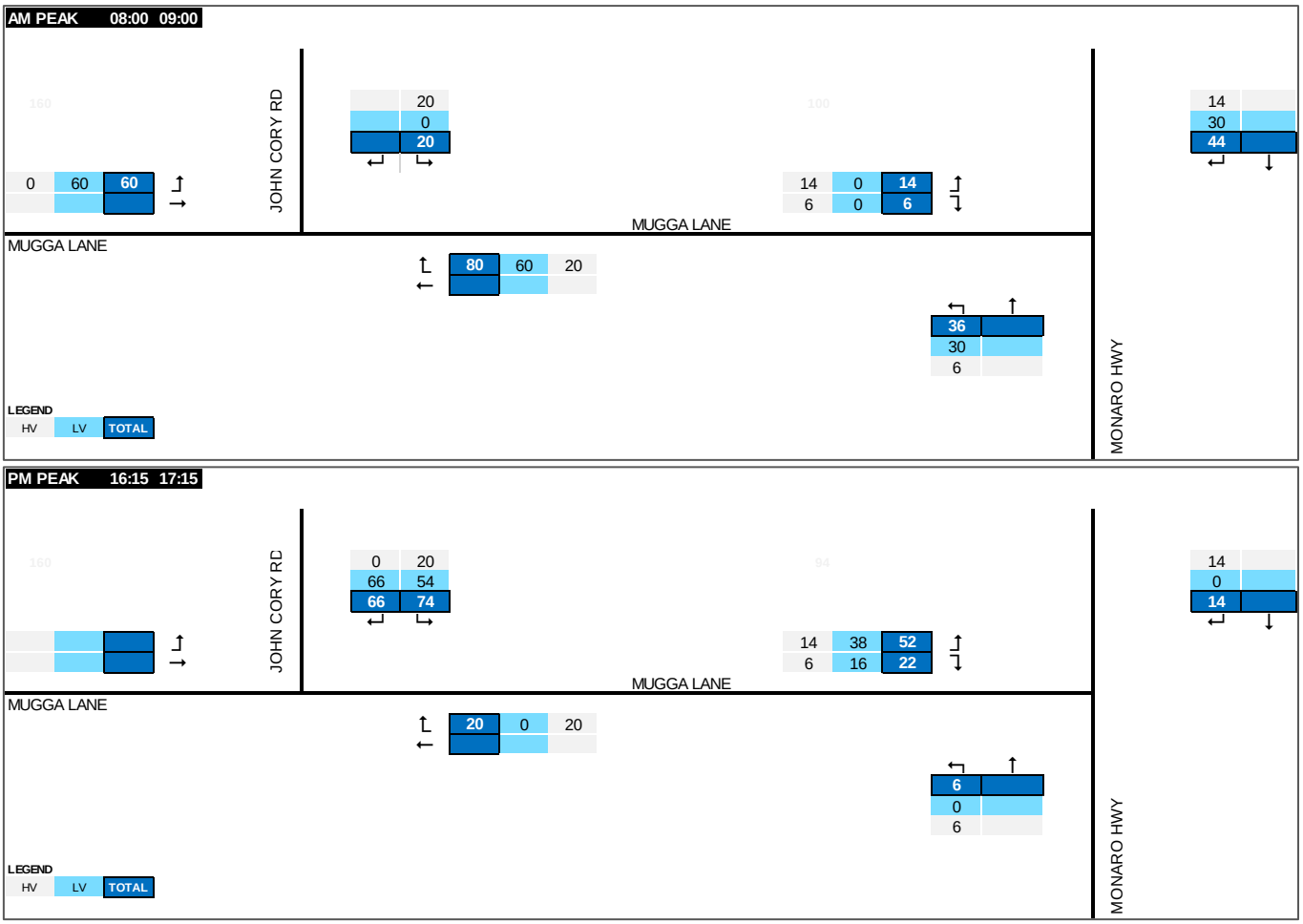

Figure 4.3 MRF and FOGO construction trips (2027)

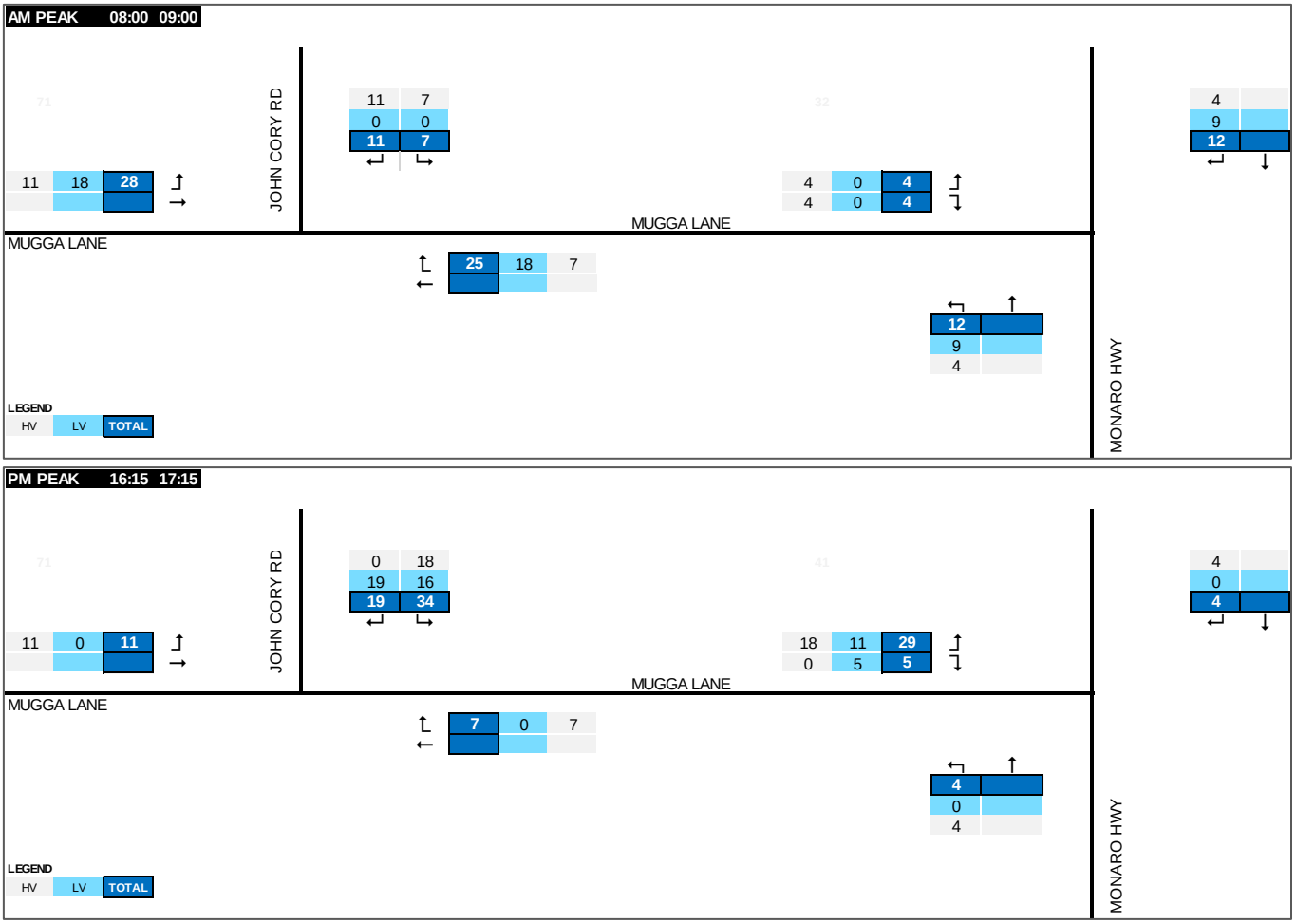

Figure 4.4 MRF and FOGO operational trips (2033)

4.4 Impacts to roads

SIDRA analysis has been undertaken for 2027 to account for construction traffic and 2033 (ten-year horizon) to account for operational traffic.

The ACT Population Projections 2022 to 2060 projects an annual population growth of 1.4 percent. This annual rate has been applied to the current volumes on the Mugga Lane and Monaro Highway to determine the 2027 (refer to Figure 4.5) and 2033 background traffic volumes (refer to Figure 4.6).

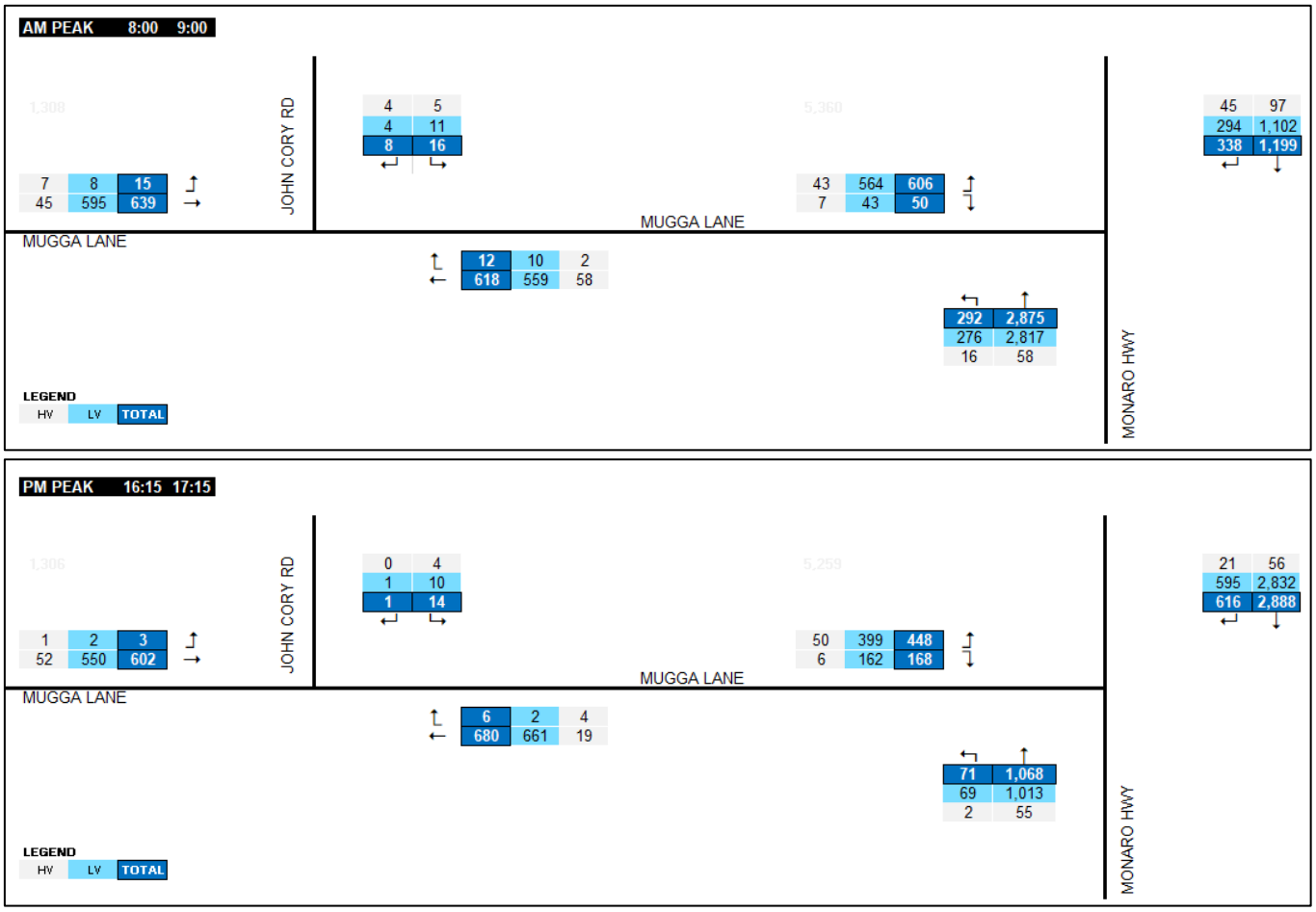

Figure 4.5 2027 background traffic volumes

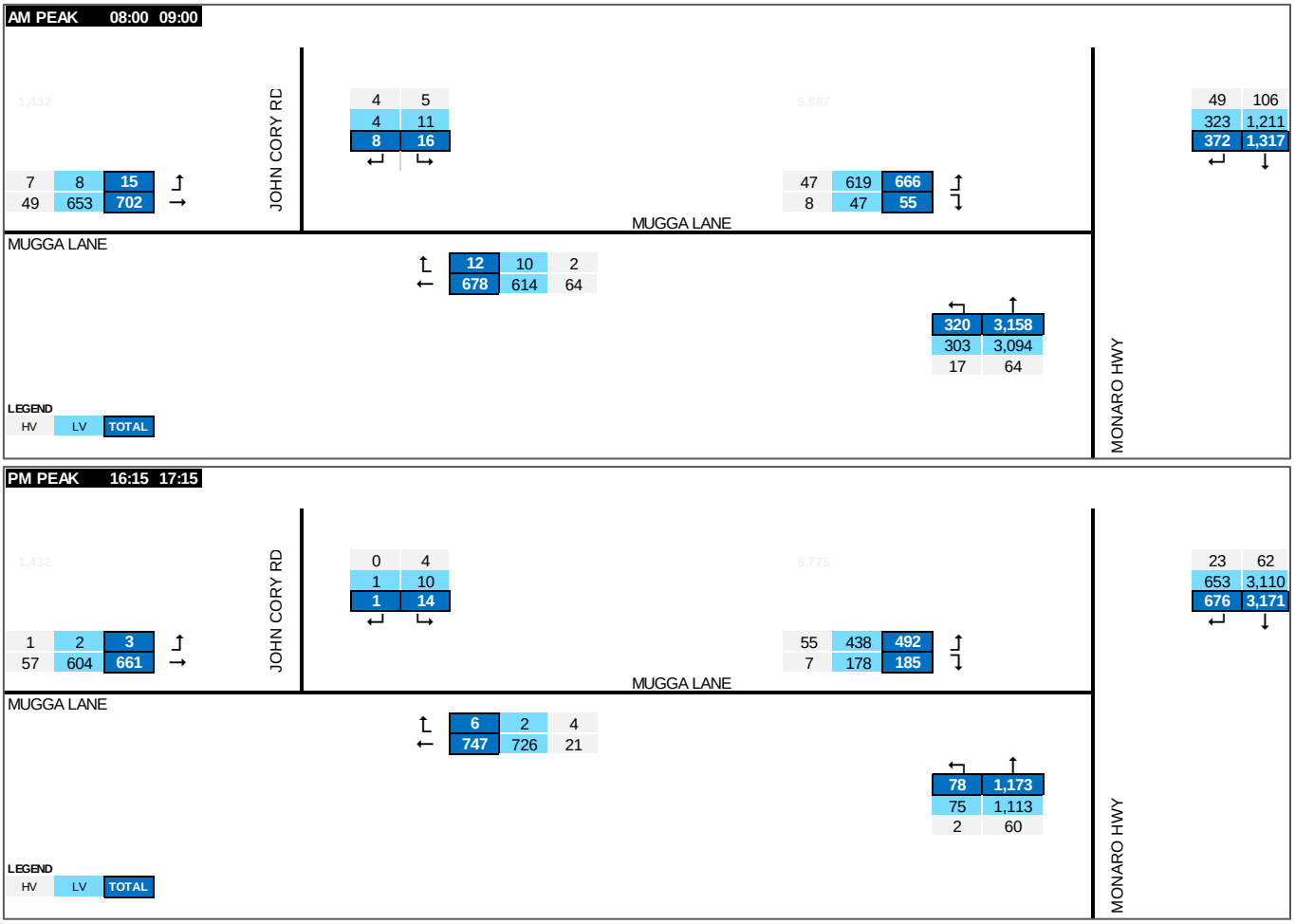

Figure 4.6 2033 background traffic volumes

4.4.1 Construction impacts (2027)

The 2027 horizon year traffic volumes accounting for the MRF and FOGO construction vehicle trips (refer to Figure 4.3) and background traffic volumes (refer to Figure 4.5) are displayed in Figure 4.7.

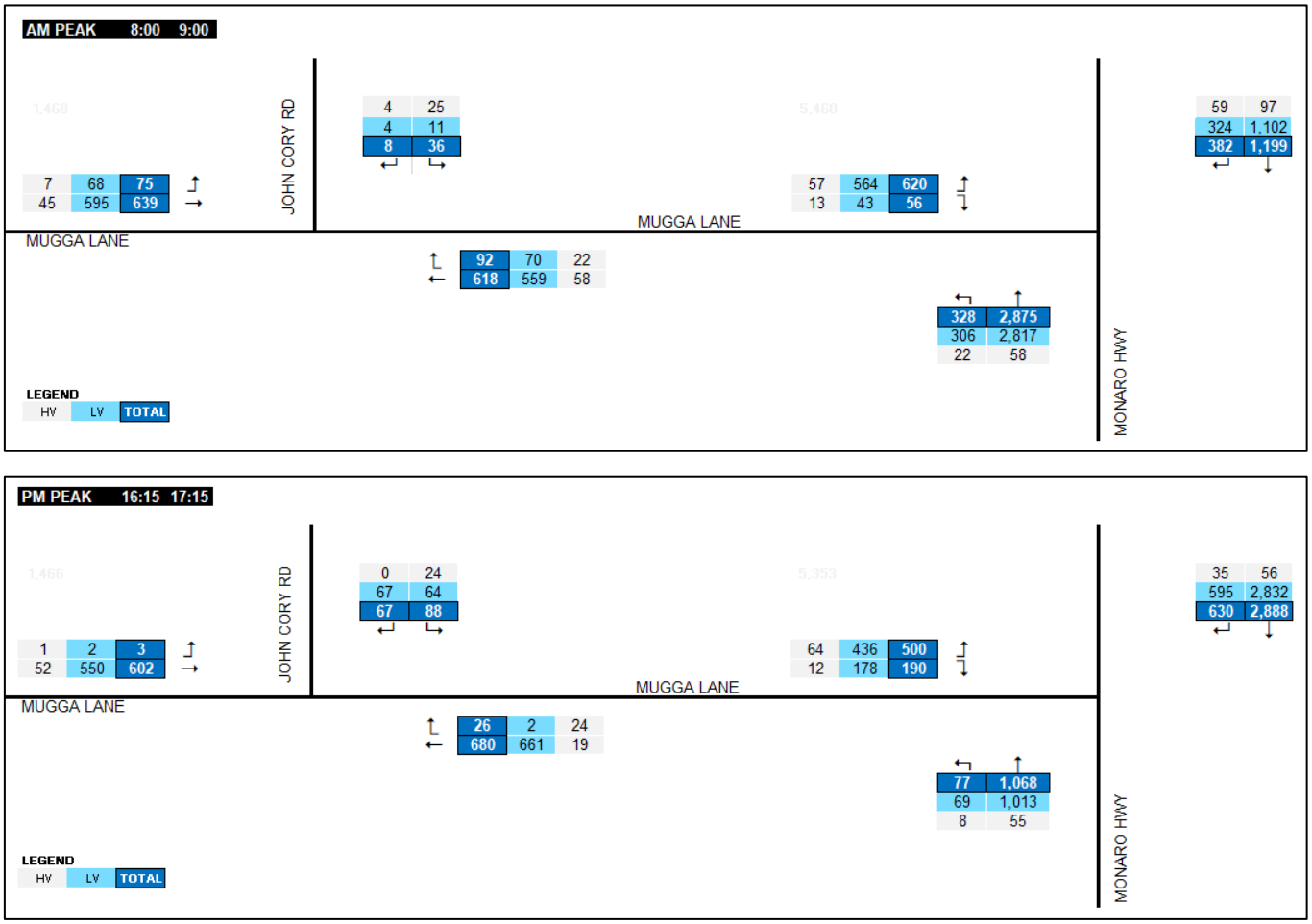

Figure 4.7 Total 2027 traffic volumes (construction scenario)

The traffic impact of the project was determined by comparing the future performance of key intersections *"with"* and *"without"* the project activities.

A summary of the SIDRA results for 2027 future scenarios are provided in Table 4.3 and Table 4.4. Detailed SIDRA results are provided in Appendix B.

Table 4.3 Future intersection performance – 2027 without construction (background growth only)

ID	Intersection Name	AM Peak Hour (08:00 - 09:00)				PM Peak Hour (16:15 – 17:15)			
		DoS	Ave Delay (s)	LoS	95th % Queue (m)	DoS	Ave Delay (s)	LoS	95th % Queue (m)
1	Mugga Lane / John Cory Road	0.128	11	B	2	0.207	11	B	3
2	Mugga Lane / Monaro Highway NB	1.145	147	F	929	0.808	22	C	76
3	Mugga Lane / Monaro Highway SB	0.200	7	A	105	0.417	31	D	5

Notes:

- *The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.*
- *The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.*
- *The degree of saturation (DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.*
- *Average delay is given in seconds per vehicle.*

Table 4.4 Future intersection performance – 2027 with construction (MRF and FOGO)

ID	Intersection Name	AM Peak Hour (08:00 - 09:00)				PM Peak Hour (16:15 – 17:15)			
		DoS	Ave Delay (s)	LoS	95th % Queue (m)	DoS	Ave Delay (s)	LoS	95th % Queue (m)
1	Mugga Lane / John Cory Road	0.142	11	B	2	0.154	11	B	2
2	Mugga Lane / Monaro Highway NB	1.180	197	F	918	0.867	26	C	74
3	Mugga Lane / Monaro Highway SB	0.337	9	A	183	0.781	75	F	52

Notes:

- *The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.*
- *The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.*
- *The degree of saturation (DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.*
- *Average delay is given in seconds per vehicle.*

Results of the SIDRA modelling in Table 4.3 and Table 4.4 indicate that by 2027:

- With construction activities, the roundabout of Mugga Lane and John Cory Road (site access) is expected to continue operating at LoS B with minimal delays.
- Intersections with the Monaro Highway are expected to experience levels of service between A to F:
  - During the AM peak, the northbound lane of Monaro Highway (Site 2) experiences poor levels of service, with delays up to 197seconds and queues approximately a kilometre long. Meanwhile, the southbound lane of Monaro Highway (Site 3) experiences virtually unimpeded flow.
  - During the PM peak, both directions experience poor levels of service from C to E, with delays between 37 to 75 seconds.
- The LoS of the key intersections are generally expected to remain the same with or without the MRF construction activities, except for Site 3 which would experience an LoS increase from D to F during the PM peak.

It is worth noting that, even without the construction, access routes to and from Monaro Highway are expected to already be operating over capacity during the AM and PM peak periods. This means that the performance of these roads could decrease significantly even with a minimal increase in traffic, as there is no longer enough capacity to accommodate demand.

Traffic generated by the construction activities are not expected to have a significant impact on the operation of the road network, which is already operating near or over capacity. Additional heavy vehicles generated by the construction activities are not expected to change the composition of the existing traffic already on the road network.

4.4.2 Operational impacts (2033)

The 2033 horizon year traffic volumes accounting for the MRF and FOGO operational vehicle trips (refer to Figure 4.4) and background traffic volumes (refer to Figure 4.6) are displayed in Figure 4.8.

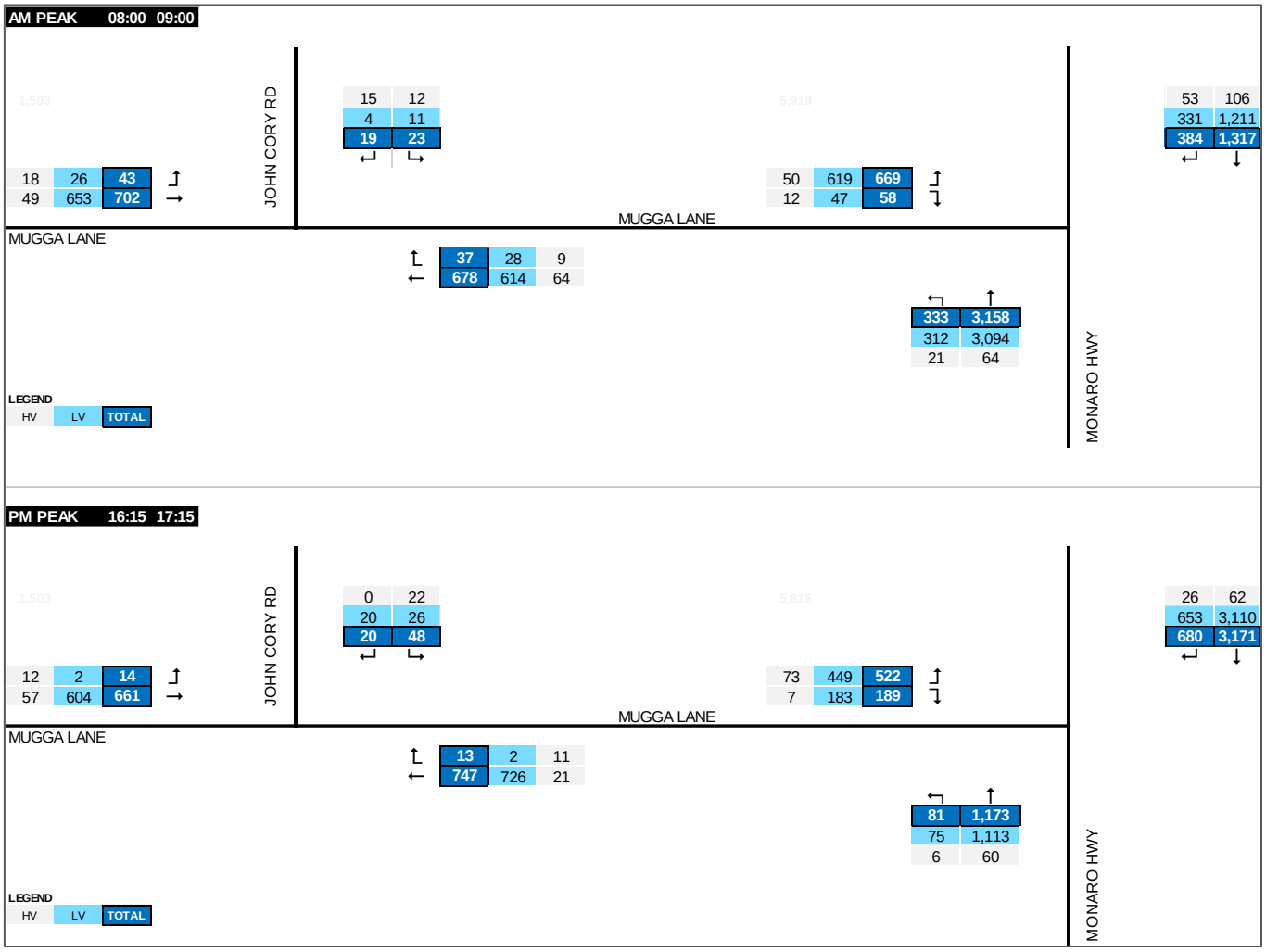

Figure 4.8 Total 2033 traffic volumes (operational scenario)

A summary of the SIDRA results for 2033 future scenarios are provided in Table 4.5 and Table 4.6. Detailed SIDRA results are provided in Appendix B.

Table 4.5 Future intersection performance – 2033 without operation (background growth only)

ID	Intersection Name	AM Peak Hour (08:00 - 09:00)				PM Peak Hour (16:15 – 17:15)			
		DoS	Ave Delay (s)	LoS	95th % Queue (m)	DoS	Ave Delay (s)	LoS	95th % Queue (m)
1	Mugga Lane / John Cory Road	0.142	11	B	2	0.229	11	B	3
2	Mugga Lane / Monaro Highway NB	1.327	295	F	1,463	0.883	28	C	98
3	Mugga Lane / Monaro Highway SB	0.223	7	A	123	0.543	480	F	7

Notes:

- *The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.*
- *The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.*
- *The degree of saturation (DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.*
- *Average delay is given in seconds per vehicle.*

Table 4.6 Future intersection performance – 2033 with operation

ID	Intersection Name	AM Peak Hour (08:00 - 09:00)				PM Peak Hour (16:15 – 17:15)			
		DoS	Ave Delay (s)	LoS	95th % Queue (m)	DoS	Ave Delay (s)	LoS	95th % Queue (m)
1	Mugga Lane / John Cory Road	0.151	11	B	2	0.246	11	B	4
2	Mugga Lane / Monaro Highway NB	1.309	285	F	1412	0.883	29	C	98
3	Mugga Lane / Monaro Highway SB	0.231	7	A	139	0.858	519	F	77

Notes:

- *The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.*
- *The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.*
- *The degree of saturation (DoS) is defined as the ratio of the arrival flow (demand) to the capacity of each approach.*
- *Average delay is given in seconds per vehicle.*

Results of the SIDRA modelling in Table 4.5 and Table 4.6 indicate that by 2033:

- With the operation of the MRF and FOGO facilities, the roundabout of Mugga Lane and John Cory Road (site access) is expected to continue operating at LoS B with minimal delays.
- Similar to conditions in 2027, the intersections of the Monaro Highway are expected to operate between LoS A to F, with the southbound lane of the Monaro Highway (Site 3) having good flow in the AM Peak. However, during the PM peak, it is expected to experience high delays and long queues, with a LoS F.
- The LoS of the key intersections are expected to remain the same with or without the operation of the MRF and FOGO facilities.
- Access to and from the Monaro Highway is already operating over capacity even without the operation of the Proposal, with LoS F for northbound traffic in the AM peak, and LoS F for southbound traffic in the PM peak. The existing road network is no longer able to accommodate background traffic growth, and capacity upgrades would be necessary to allow the intersections to operate at acceptable levels of service.
- Additional traffic generated by the operation of the proposed MRF and FOGO facilities are not expected to have a significant impact on the operation of the road network, which is already operating near or over capacity.

The analysis indicates that the road upgrades detailed in Section 4.1 would be required to support an acceptable LoS at the intersection of Monaro Highway and Mugga Lane.

The Monaro Highway Upgrade program has undertaken traffic modelling that identified that the proposed upgrades to the Monaro Highway at Mugga Lane would support a good LoS in the 2031 and 2041 horizon years.

All SIDRA outputs are included in Appendix B.

4.5 Impacts to public transport and active transport

Impacts from the construction and operation of the proposal on public transport facilities and services is expected to be minimal, as the proposal site and its access points are not located near any public transport facilities and are not expected to interfere with existing public transport routes.

There is no formal active transport infrastructure in proximity to the proposal site. Therefore, the expected vehicle activity associated with the construction and operation of the proposal is expected to have a negligible impact on the active transport.

4.6 Impacts to parking

Parking for all vehicles associated with the proposal would be contained on site within the MRF boundaries. As such, vehicle parking demand generated by the proposal would have no impact on parking spaces or roads surrounding the sites.

4.7 Impacts to road safety

The proposed construction and operation of the proposal is expected to generate a minimal increase in vehicle traffic when compared to the existing traffic already in the road network. Additional traffic generated by the proposal is not expected to significantly change the vehicle composition of the road network and is not anticipated to cause changes to road safety risks in the study area.

Notwithstanding, a Construction Traffic Management Plan (CTMP) shall be prepared to maintain road safety and mitigate any potential impacts of the traffic generated by the proposal. Details of the proposed measures are outlined in Section 5.

5. Mitigation and management measures

5.1 Traffic management measures

5.1.1 Site access and parking

– The following measures are proposed to minimise the number of traffic movements to/from the proposal site:
  - Logistics management shall be controlled by the site supervisor to ensure the efficient delivery of equipment and construction materials, and to minimise the number of trips that would need to be taken for all vehicle types.
  - Carpooling opportunities for personnel living in close proximity to one another shall be explored where feasible. Opportunities for coach services to shuttle workers from the CBD or nearby public transport stations to the proposal site shall also be explored.
– All vehicles shall comply with road traffic rules, particularly for any local traffic rules.
– All parking shall be contained within the proposal site premises. Under no circumstance are personnel, company vehicles or heavy vehicles allowed to use any public road for long-term parking, including leaving parked or unattended vehicles.

5.1.2 Safety

– All staff and subcontractors engaged on site shall be required to undergo site induction. The induction shall outline the requirements on the CTMP, including site access routes, environmental and occupational health and safety responsibilities, emergency procedures, potential carpooling/shuttle service opportunities, and vehicle height and mass restrictions, among others. Additionally, the Site Manager would discuss CTMP requirements regularly as a part of regular “toolbox talks”.
– Separation of internal haulage routes for light and heavy vehicle movements within the proposal site shall be maintained as far as practicable.
– All vehicles shall move through the proposal site in a clockwise direction to maintain the predictability of vehicle movements and to minimise conflict points.
– Separate entrances and exits for vehicles and pedestrians shall be provided. Pedestrians on site shall be directed to utilise clearly defined designated pedestrian paths.
– Access for emergency vehicles shall be maintained at the proposal site during the construction works, in accordance with emergency vehicle requirements. The emergency services, including fire, ambulance, and police, shall be advised of all planned changes to traffic arrangements prior to the commencement of works.

5.1.3 Heavy vehicle access

– Truck drivers shall be directed to follow the predetermined haulage routes. Additionally, all drivers must observe posted speed limits on adjoining road networks to comply with Australian Road Rules. Drivers are to adjust speeds to suit the road environment and weather conditions appropriately to ensure the safe movement of the vehicles based on the individual vehicle configurations.
– Any oversized or overweight loads shall be transported in accordance with the requirements of the relevant road authority.

5.2 Construction traffic management plan

In accordance with a review of the existing traffic facilities and the assessment of the impacts associated with the construction traffic, no road upgrades or other traffic controls are required to support the construction of the MRF.

Traffic and transport impact mitigation measures for the proposal are listed in Table 5.1. These measures would be included in the issue-specific environmental management sub-plans for the MRF.

Table 5.1 Mitigation measures – traffic and transport

No.	Outcome	Mitigation measure	Timing
T1	Minimise impacts to traffic and transport networks.	Develop a construction traffic management sub-plan, prior to construction. Include, at a minimum, the following management measures: – Preparation of a Traffic Guidance Scheme, detailing adequate road signage at construction work sites to inform motorists and pedestrians of the work site ahead to ensure that the risk of road accidents and disruption to surrounding land uses is minimised. – Maintain accessibility for pedestrians and cyclists. – Indicate routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses. – Implement measures to manage traffic flows around the area affected by the construction of the proposal, including, as required, regulatory and direction signposting, line marking, and variable message signs and all other traffic control devices necessary for the implementation of the construction traffic management sub-plan. – Undertake consultation with the relevant road authorities during preparation of the sub-plan. Ensure the performance of the proposal traffic arrangements is monitored during construction.	Pre-construction
T2	Minimise impacts to the operation of the current land uses on John Cory Road	Ensure trucks used for the delivery for the developments on John Cory Road are unimpeded.	Construction
T3	Minimise environmental impacts associated with the movement of vehicles.	Monitor the roads leading to and from the proposal site and take necessary steps to rectify any road deposits caused by site vehicles, to maintain the safety of road users. Where possible, offset the construction vehicle activity from peak periods of road network activity.	Construction
T4	Minimise environmental impacts associated with the movement of vehicles.	Induct employees and contractors to raise awareness and understanding of traffic and transport mitigation measures to be implemented during construction via the Construction Environmental Management Plan (CEMP).	Construction

6. Summary and conclusions

6.1 Overview

The TTIA has been prepared to support the EIS required to obtain approval for the construction and operation of the proposed MRF.

The TTIA provides an overview of the existing road network and traffic conditions, a review of proposal site access arrangements, an assessment of the potential traffic implications arising from the proposal, and recommendations on measures to minimise any adverse effects of the proposal to road users.

6.2 Key findings

The key findings of the TTIA are summarised as follows:

- Traffic surveys were undertaken on 09 November 2022 (Wednesday) to determine the existing traffic conditions in the study area. Data from the survey indicate the following peak periods:
  - AM Peak hour occurs between 08:00 am and 09:00 am.
  - PM Peak hour occurs between 04:15 pm and 05:15 pm.
- SIDRA analysis of existing intersection performance showed that:
  - The roundabout joining Mugga Lane and John Cory Road, which is the primary access to the proposal site, operates at LoS B with minimal delays and queueing for both AM and PM peak periods.
  - During the AM peak, the signalised intersection between Mugga Lane and the northbound carriageway of the Monaro Highway operates over capacity at LoS F. Better operations are observed during the PM peak, with an LoS of C.
- The proposal is expected to generate the following vehicles movements during the peak hour:
  - Construction:
    - Heavy vehicles: 20 vehicle movements (10 inbound,
    - outbound)
    - Light vehicles: 120 vehicle movements (60 inbound in the AM, 60 outbound in the PM)
  - Operation:
    - Heavy vehicles: 16 vehicle movements (8 inbound, 8 outbound)
    - Light vehicles: 30 vehicle movements (15 inbound in the AM, 15 outbound in the PM)
- The adjacent FOGO facility, which is expected to be constructed and operated during the same period as the MRF, has been assumed to generate the same amount of vehicle activities. Traffic generation of the FOGO has been included in the assessment.
- Analysis of traffic performance using SIDRA indicates the following:
  - Construction traffic performance by 2027:
    - With construction activities, the roundabout joining Mugga Lane and John Cory Road (site access) is expected to continue operating at LoS B with minimal delays.
    - Intersections with the Monaro Highway are expected to operate between LoS A and F in the AM peak, with high delays and long queues in the northbound lane. In the PM peak, both northbound and southbound lanes experience poor levels of service from LoS D to F, with delays ranging from 37 to 75 seconds.
    - The LoS for the key intersections are generally expected to remain the same with or without the construction activities associated with the MRF, except for the Monaro Highway at Mugga Lane (southbound) which would experience an LoS increase from D to F during the PM peak.
  - Operation traffic performance by 2033:
    - With the operation of the MRF and FOGO facilities, the roundabout joining Mugga Lane and John Cory Road (site access) is expected to continue operating at LoS B with minimal delays.

    - The LoS of key intersections are expected to remain the same with or without the operation of the MRF and FOGO facilities.
- Even without the construction and operation of the proposed facilities, the Monaro Highway at Mugga Lane is expected to be already operating over capacity during the AM and PM peak periods. This means that the performance of these roads could decrease significantly even with minimal increase in traffic as there is no longer enough capacity to accommodate demand. Capacity upgrades would be necessary to allow the intersections to operate at acceptable levels of service.
- The analysis indicates that the road upgrades detailed in Section 4.1 would be required to support an acceptable LoS at the intersection of the Monaro Highway and Mugga Lane.
- As detailed in the Monaro Highway Upgrade program, the proposed upgrades to the Monaro Highway at Mugga Lane would support a good LoS in the 2031 and 2041 horizon years.
- There are no public transport facilities in proximity to the proposal site. Proposal activities are not expected to impact on public transport operations.

6.3 Conclusions

Based on the assumptions and findings outlined in this report, it is considered that the proposal satisfies the planning requirements on traffic engineering grounds and is not anticipated to have adverse traffic impacts on the surrounding road network.

Appendices

Appendix A

Traffic Data

Traffic Data

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Appendix B

SIDRA Results Summary

Results

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Appendix C

Hazardous materials transport

The following is an excerpt from the Preliminary Hazard Analysis Report:

"*The expectation is that any hazardous chemical will be transported to site following the ADG code requirements. Whilst diesel is likely to be trucked in via a bulk tanker and transferred to a fixed storage vessel, the other chemicals are expected to be transported in package form, for example a 1,000 litre iso-container and used as required*."

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