
Appendix C

Traffic impact assessment

Clarence Colliery - Modification 11

Traffic Impact Assessment

Prepared for Centennial Coal Company Pty Ltd

December 2025

Clarence Colliery - Modification 11

Traffic Impact Assessment

Centennial Coal Company Pty Ltd

E250102 RP3

December 2025

Version	Date	Prepared by	Reviewed by	Comments
1	18 August 2025	Jan Muller	Abdullah Uddin	Draft
2	2 September 2025	Jan Muller	Abdullah Uddin	Final
3	17 December 2025	Jan Muller	Abdullah Uddin	Final (updated)

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17 December 2025

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Executive Summary

Clarence Colliery is an underground coal mining operation within the Western Coalfield of New South Wales (NSW) approximately 10 kilometres (km) east of Lithgow in the Lithgow local government area (LGA). Clarence Colliery extracts coal from the Katoomba Seam and has facilities on-site to wash run-of-mine (ROM) coal to maximise coal quality.

Clarence Colliery is seeking a modification (Mod 11) to Development Approval (DA) 504-00 under section 4.55(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to extend the life of mining at Clarence Colliery from 31 December 2026 for a further five years until 31 December 2031, including all truck movements currently approved to 31 December 2026.

The methodology adopted for this traffic impact assessment (TIA) includes:

- collection of baseline traffic data to allow assessment against existing conditions
- projection of 2031 baseline conditions, accounting for trips associated with the ongoing operation of Clarence Colliery through to December 2031
- evaluation of key intersections along the approved haulage routes under existing conditions and 2031 baseline scenarios.

The key findings are summarised below:

- Intersection levels of service: the following key intersections are projected to maintain very good levels of service (LOS A, B or C), indicating minimal delays under the assessed scenarios:
 - Castlereagh Highway/Boulder Road
 - Castlereagh Highway/Main Street/Wolgan Road
 - Chifley Road/Clarence Colliery Road
 - Great Western Highway/Station Street.
- Great Western Highway/Harley Avenue Intersection:
 - Most approaches are projected to operate well within capacity, generally achieving LOS A.
 - The right-turn movement from Harley Avenue onto the Great Western Highway westbound is expected to experience higher average delays, resulting in LOS C during the 2031 AM peak and LOS D during the PM peak due to the projected growth in background traffic.
 - The right turning volume at this intersection is low (one vehicle per hour), as most vehicles travel via the Station Street intersection to turn right onto the Great Western Highway westbound.
 - No additional vehicle trips associated with Clarence Colliery's ongoing transport activities are expected to make this right-turn movement.
- The modification is not expected to impact public transport services or active transport activity.
- School bus services will not be impacted, as truck operation to and from Clarence are restricted and do not take place during the AM (8:00 am to 9:30 am) and PM (2.30 pm to 4:00 pm) peak hours, during NSW school terms.

- Car parking for operational staff and visitors will continue to be provided on-site, and vehicles will not park on public roads.

Based on the assessment, it is concluded that the proposed modification will not result in any significant traffic impact on the surrounding road network.

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Abbreviations

Abbreviation	Meaning
Baseline traffic	Existing condition without any additional development traffic
Centennial	Centennial Coal Company Pty Ltd
Clarence	Clarence Colliery coal mine
DCC	Drivers Code of Conduct
DEL	Average Delay
DOS	Degree of Saturation
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
EP&A	Environmental Planning and Assessment
HV	Heavy vehicles
km	kilometre
LCC	Lithgow City Council
LOS	Level of Service
LT	Left Turn Movement
LV	Light vehicles
m	metre
MOD	Modification Application
NSW	New South Wales
Priority controlled	Unsignalised intersection, e.g. give way or stop sign
Q95	95% queue lengths
ROM	Run-of-mine coal, the coal as it is extracted from the mine, before any processing or cleaning
RT	Right turn movement
SIDRA	Signalised and unsignalised Intersection Design and Research Aid (traffic engineering software)
SISD	Safe intersection sight distance
TfNSW	Transport for NSW
TH	Through Movement
TIA	Traffic impact assessment
TMP	Traffic management plan
tpa	Tonnes per annum

1 Introduction

1.1 Overview

This traffic impact assessment (TIA) report has been prepared to accompany the modification report associated with the modification request (DA 504-00 Mod 11) submitted by Centennial Coal Company Pty Ltd (Centennial) pursuant to section 4.55(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The proposed modification seeks to extend the current operational approval for the Clarence Colliery underground coal mine by five years, from 31 December 2026 to 31 December 2031, including all truck movements currently approved to 31 December 2026.

No changes to mining methods, extraction rates, processing, handling, hours of operation, workforce or haulage hours, are required and the proposed modification does not require any additional surface disturbance activities.

1.2 Background

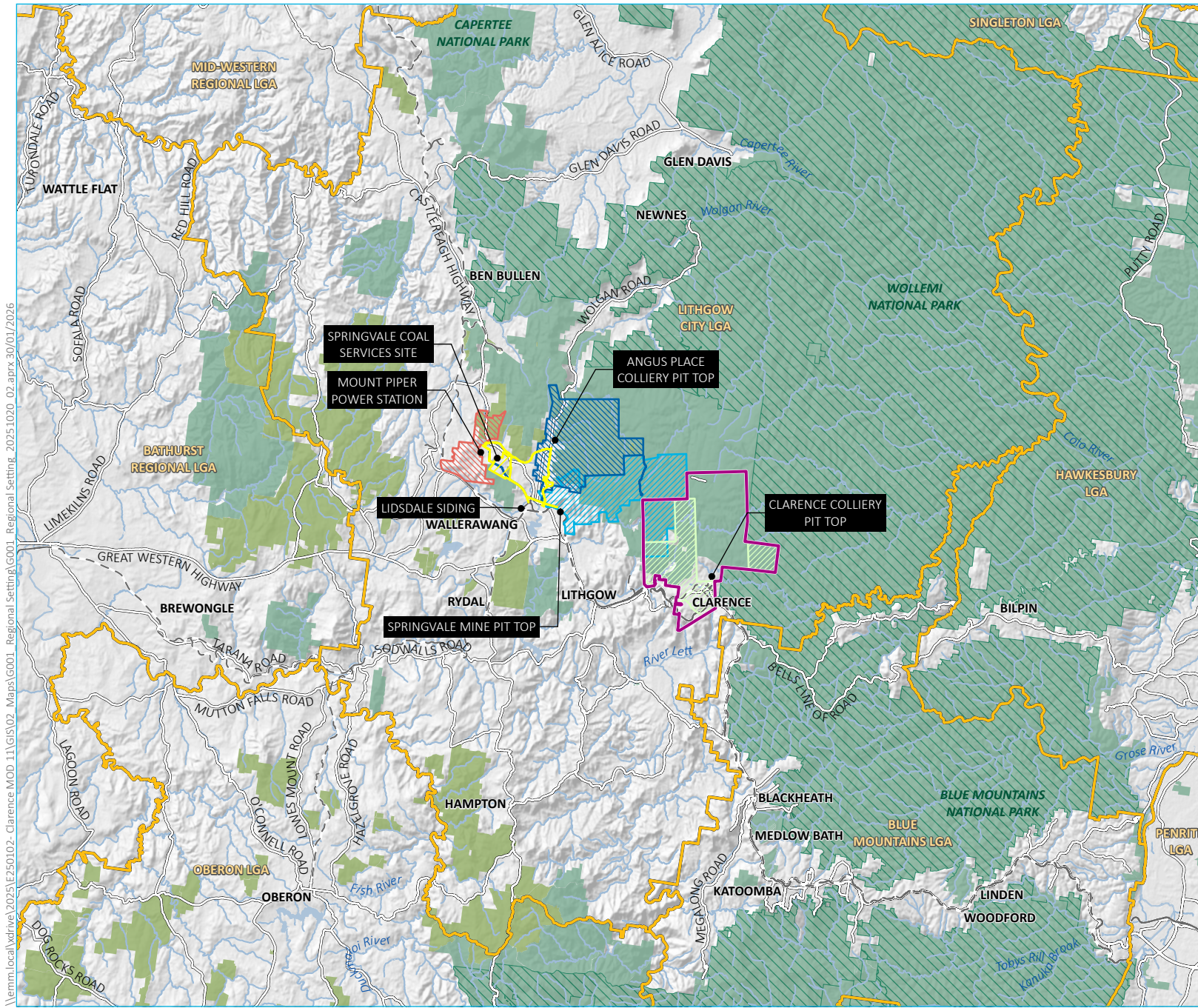
Clarence Colliery is an underground coal mine within the Western Coalfield of New South Wales (NSW), approximately 10 kilometres (km) east of Lithgow (refer to Figure 1.1 and Figure 1.2). Clarence Colliery has been in operation since the 1980s. Clarence Colliery is managed by Clarence Colliery Pty Ltd, a wholly owned subsidiary of Centennial. Clarence produces high-quality, low ash thermal coal for both domestic and export customers.

Clarence Colliery operates under three separate development consents:

- IRM.GE.76 – an interim development consent issued in 1976 by Blaxland Shire Council (now Lithgow City Council (LCC)) for the construction of surface facilities
- DA 174/93 – a development consent issued in 1994 by LCC for the extension of underground coal mining, surface reject emplacement areas (REAs) and water management and ancillary structures
- DA 054-00 – development consent issued in 2005 by the NSW Department of Infrastructure, Planning and Natural Resources (now the NSW Department of Planning, Housing and Infrastructure (DPHI)) to expand into Mining Lease (ML) 1583.

Clarence Colliery is approved to extract up to three million tonnes per annum (Mtpa) of coal through underground partial extraction mining, until 31 December 2026.

Centennial is seeking a modification (Mod 11) to DA 504-00 under section 4.55(2) of the EP&A Act to extend the life of mining operation at Clarence Colliery from 31 December 2026 for an additional five years until 31 December 2031.



- KEY**
- Clarence Colliery Holdings Area
 - DA504-00 consent boundary
 - Angus Place
 - Ivanhoe
 - Springvale
 - Western Coal Services
 - Existing environment
 - Rail line
 - Major road
 - Named watercourse
 - Named waterbody
 - Greater Blue Mountains World Heritage Area
 - NPWS reserve
 - State forest
 - Local government area

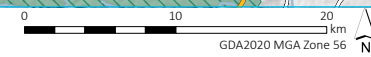
Regional context

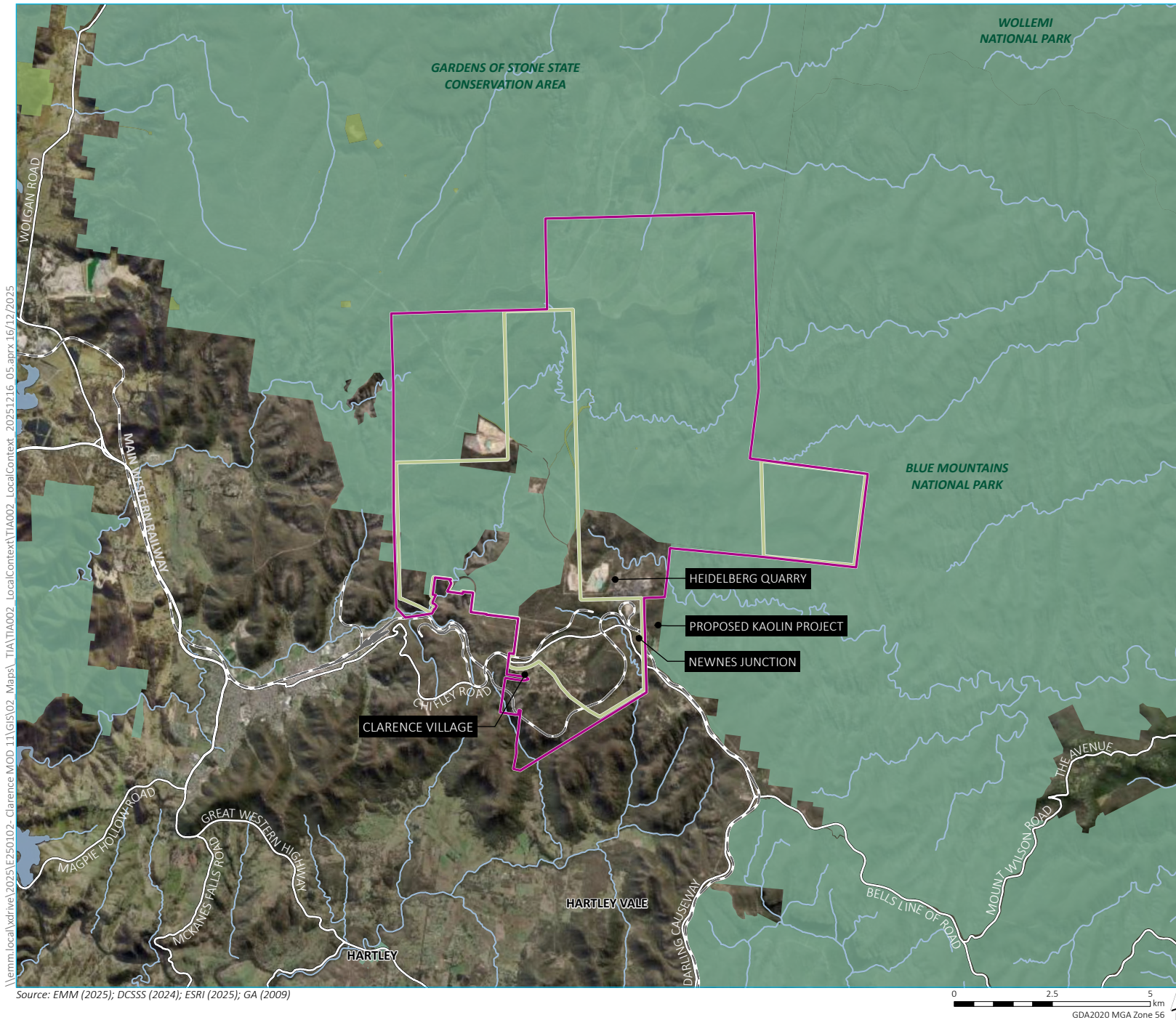
Clarence Colliery- Modification 11
Traffic Impact Assessment Report
Figure 1.1



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Source: Centennial (2025); EMM (2025); ABS (2021); DCSSS (2024); GA (2009)





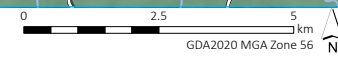
- KEY**
- Clarence Colliery Holdings Area
 - DA504-00 consent boundary
 - Existing environment
 - - Rail line
 - Major road
 - Named watercourse
 - Named waterbody
 - NPWS reserve
 - State forest

Local context

Clarence Colliery- MOD 11
Traffic Impact Assessment Report
Figure 1.2



Source: EMM (2025); DCSSS (2024); ESRI (2025); GA (2009)



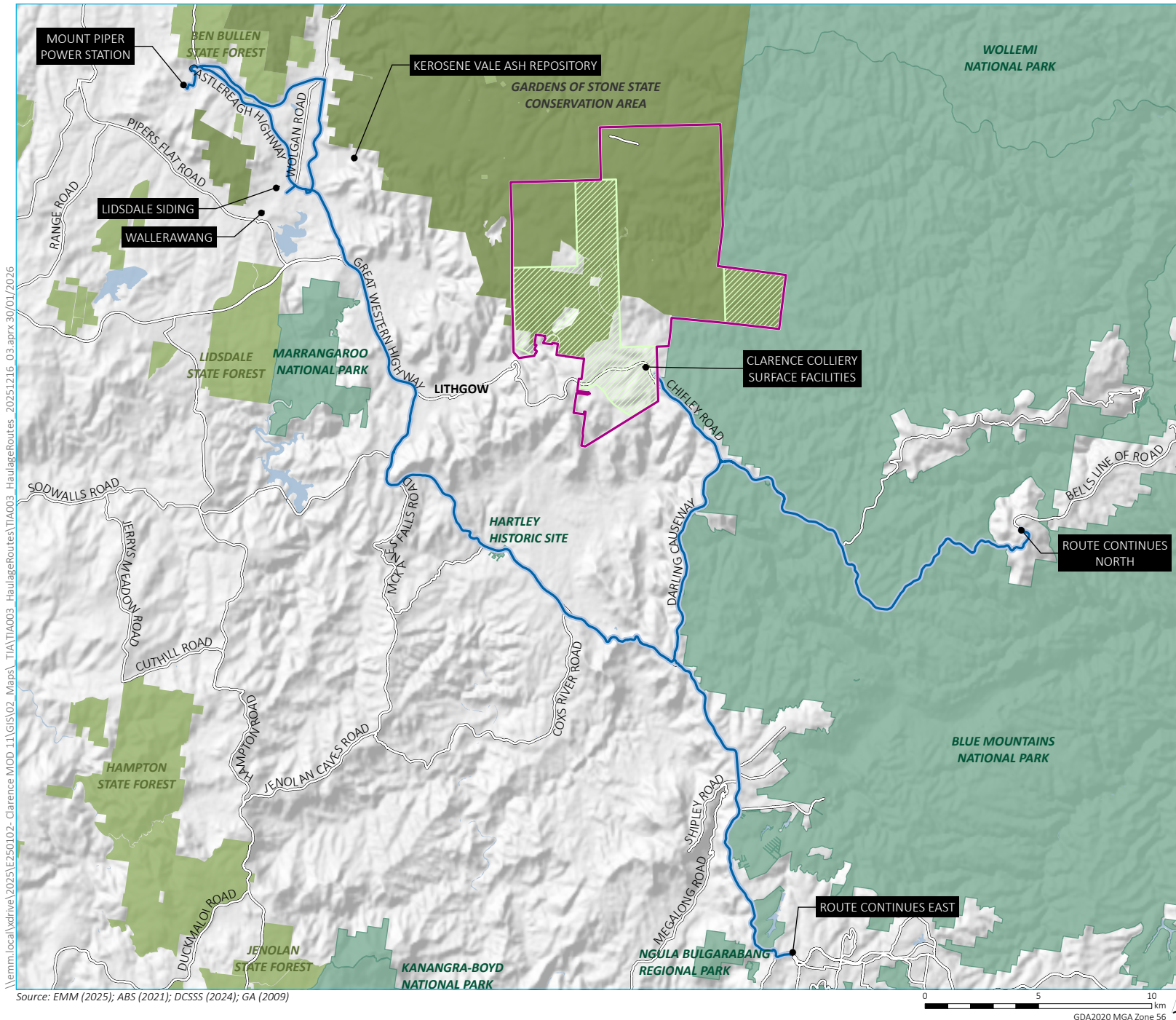
1.3 Relevant approval conditions

The development consent DA 540-00 for Clarence Colliery has been modified seven times, with the most recent approval (Mod 10) granted on 17 May 2024, under DA 540-00-Mod-10. This approval is set to lapse on 31 December 2026.

The relevant conditions for the current approval are:

5. This consent shall lapse on 31 December 2026.
7. Except for the period referred to in condition 7AA, the Applicant may transport up to 200,000 tonnes of coal by road per calendar year in total, with a maximum of 100,000 tonnes per calendar year transported to the west, via the Darling Causeway and Great Western Highway haulage route shown in Appendix 5.
- 7AA. Until 31st December 2026, the Applicant may transport up to 300,000 tonnes of coal by road per calendar year in total, including up to 200,000 tonnes of coal by road per calendar year to the Mount Piper Power Station or to the Lidsdale Siding, and up to 200,000 tonnes of coal by road per calendar year to locations north of Sydney or Eastern NSW, using the haulage routes shown in Figure 1 of Appendix 5. *Note: This figure has been reproduced and is shown in Figure 1.3*
- 7A. Other than via the haulage route shown in Appendix 5, the Applicant must not cause any coal truck movements through the City of Lithgow without the prior approval of the Council.
- 7B. Haulage of coal to the west must only take place between the hours of 7 am to 10 pm Monday to Saturday and between 8 am to 6 pm on Sunday and public holidays.

This modification application seeks approval for the extension of Clarence Colliery's operations until 31 December 2031 and to extend the lapse date of Condition 7AA to 31 December 2031.



- KEY**
- Clarence Colliery Holdings Area
 - DA504-00 consent boundary
 - Approved haul route
 - Existing environment
 - Major road
 - Minor road
 - Named waterbody
 - NPWS reserve
 - State conservation area
 - State forest

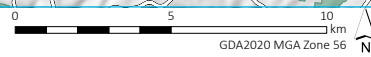
Approved haulage routes

Clarence Colliery- Modification 11
Traffic Impact Assessment Report
Figure 1.3



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Source: EMM (2025); ABS (2021); DCSSS (2024); GA (2009)



1.4 Assessment guidelines and requirements

This TIA has been prepared to accompany the modification report and assess traffic impact associated to the proposed modification. This TIA has been completed in accordance with the following guidelines:

- *Transport for NSW's Guide to Transport Impact Assessment (TfNSW 2024)*
- *Austrroads Guide to Road Design Part 4a: Unsignalised & Signalised Intersections (Austrroads 2023)*
- *Austrroads Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments, April 2020 (Austrroads 2020).*

This report comprises the following sections:

- a description of the Clarence Colliery site, local setting and surrounds
- consideration of existing traffic volumes and results of traffic surveys
- description of Clarence Colliery's operational activities
- identification and consideration of nearby developments and cumulative traffic impact
- consideration of future intersection and road upgrade requirements.

1.5 Methodology

The methodology adopted for this TIA included:

- collection of baseline traffic data to allow assessment against existing conditions
- projections of 2031 baseline conditions, accounting for trips associated with the ongoing operation of Clarence Colliery through to December 2031
- evaluation of key intersections under existing conditions, future scenarios.

1.6 Site inspection

The key intersections were inspected by EMM on Tuesday 22 July 2025. The inspection included road condition and sight distance assessments.

2 Existing environment

2.1 Site locations and accesses

Clarence Colliery is accessed directly via Clarence Colliery Road. This chapter provides a description of the road network along the approved haulage routes.

2.2 Road network

The NSW administrative road hierarchy comprises the following road classifications, which align with the generic road hierarchy as follows:

- State roads – freeways and primary arterials (TfNSW managed).
- Regional roads – secondary or sub arterials (council managed and part funded by the State).
- Local roads – collector and local access roads (council managed).

The key roads near the Clarence Colliery site are shown in Table 2.1 to Table 2.6, and Photograph 2.1 to Photograph 2.6.

2.2.1 Clarence Colliery Road

Table 2.1 Clarence Colliery Road

Aspect	Description
Road classification and connectivity	A local road providing access to Clarence Colliery from Chifley Road
Alignment	Generally north–south
Number of lanes	One lane each way, excluding near the intersections
Carriageway type	Sealed road
Carriageway width	Approximately 7 to 8 metres (m) (measured on Google Maps)
Posted speed limit	50 kilometres per hour (km/h)
Heavy vehicle access	Carries heavy vehicles to Clarence Colliery
Traffic function	Provides vehicular access to Clarence Colliery and quarry



Photograph 2.1 Clarence Colliery Road, view from Chifley Road

2.2.2 Chifley Road

Table 2.2 Chifley Road

Aspect	Description
Road classification and connectivity	State road between Darling Causeway, Bell in the east and Mort Street, Lithgow in the west, passing through local towns such as Dargan
Alignment	Generally east–west
Number of lanes	One lane in each direction, excluding near intersections and mid-block overtaking lanes
Carriageway type	Sealed road
Carriageway width	Approximately 6.0 to 7.0 m, up to 12 m near Colliery Road intersection (including shoulders)
Posted speed limit	80 km/h general speed, 60 km/h at nearby intersection with Darling Causeway
Heavy vehicle access	Approved route for up to 19 m B-doubles (over 50 tonnes (t)) Restricted oversize overmass (OSOM) vehicle route
Traffic function	Provides connection between townships, acts as an urban local road within towns



Source: Google Street View

Photograph 2.2 Chifley Road, eastbound view of the rail crossing bridge near Clarence access

2.2.3 Darling Causeway

Table 2.3 Darling Causeway

Aspect	Description
Road classification and connectivity	State road between Chifley Road, Hartley Vale in the west and Station Street, passing through local towns such as Bell and Mount Victoria
Alignment	Generally north–south
Number of lanes	One lane in each direction, excluding near intersections and mid-block overtaking lanes
Carriageway type	Sealed road
Carriageway width	Approximately 6.0 to 7.5 m (measured on MetroMap)
Posted speed limit	Truck and bus speed limit is 70 km/h and all other vehicle speed limit is 80 km/h general speed
Heavy vehicle access	Approved route for up to 19 m B-doubles (over 50 t) Restricted OSOM vehicle route
Traffic function	Provides connection between Bell (north) and Mount Victoria (south)



Photograph 2.3 Darling Causeway, southbound view from Bells Line of Road intersection

2.2.4 Harley Avenue

Table 2.4 Harley Avenue

Aspect	Description
Road classification and connectivity	Regional Road, connecting the Great Western Highway to Station Street through the Mount Victoria township
Alignment	Generally north-west–south-west
Number of lanes	One lane in each direction
Carriageway type	Sealed road
Carriageway width	Approximately 6.0 to 7.5 m (measured on MetroMap)
Posted speed limit	50 km/h
Heavy vehicle access	Approved route for up to 19 m B-doubles (over 50 t) Restricted OSOM vehicle route
Traffic function	Provides local connectivity and areas and alternate connectivity between Station Street and Great Western Highway



Photograph 2.4 Harley Avenue, westward view towards Station Street

2.2.5 Great Western Highway

Table 2.5 Great Western Highway

Aspect	Description
Road classification and connectivity	State road between Mitchell Highway and Broadway, Central, passing through local and regional towns such as Mount Victoria, Little Hartley and Lithgow
Alignment	Generally east–west
Number of lanes	<p>Between Station Street and Mid Hartley Road, and between Mckanes Falls Road and Magpie Hollow Road:</p> <ul style="list-style-type: none"> one lane each way, excluding near the intersections and mid-block overtaking lanes. <p>Between Mid Hartley Road and Old Great Western Highway:</p> <ul style="list-style-type: none"> two lanes in the southbound direction one lane in the northbound direction. <p>Between Blackmans Creek Road and Mckanes Falls Road, and between Magpie Hollow Road and Castlereagh Highway:</p> <ul style="list-style-type: none"> two lanes each way, excluding near intersections and mid-block overtaking lanes.
Carriageway type	Sealed road
Carriageway width	<p>Between Station Street and Mid Hartley Road, and between Mckanes Falls Road and Magpie Hollow Road:</p> <ul style="list-style-type: none"> approximately 6.8 to 7.5 m (measured on MetroMap). <p>Between Mid Hartley Road and Old Great Western Highway:</p> <ul style="list-style-type: none"> approximately 13.5 to 14 m (measured on MetroMap). <p>Between Blackmans Creek Road and Mckanes Falls Road, and between Magpie Hollow Road and Castlereagh Highway:</p> <ul style="list-style-type: none"> varies, approximately 13 to 17 m (measured on MetroMap).
Posted speed limit	<p>Between Station Street and Seldon Street</p> <ul style="list-style-type: none"> 60 km/h general speed (40 km/h during school zone times). <p>Between Selsdon Street and Main Street</p> <ul style="list-style-type: none"> 60 to 80 km/h general speed. <p>Between Main Street and Castlereagh Highway</p> <ul style="list-style-type: none"> 100 km/h general speed.
Heavy vehicle access	<p>Approved route for up to 19 m B-doubles</p> <p>Approved OSOM vehicle route with conditions</p>
Traffic function	Predominantly carries regional traffic



Photograph 2.5 Great Western Highway, view in south-east direction near Station Street

2.2.6 Castlereagh Highway

Table 2.6 Castlereagh Highway

Aspect	Description
Road classification and connectivity	State road, connecting Great Western Highway (Lithgow) to Boulder Road and extends north towards Mudgee and Gulgong. Part of the major regional freight and tourist route linking the Central Tablelands and Central West
Alignment	Generally north–south between Great Western Highway and Boulder Road. Curving in places through hilly terrain
Number of lanes	One lane per direction over most of the section, with occasional overtaking lanes at intersections
Carriageway type	Sealed road
Carriageway width	Typically, 9 to 11 m (including shoulders) depending on location. Narrower through constrained or urban sections closer to Lithgow
Posted speed limit	100 km/h general speed, 80 km/h near Lidsdale
Heavy vehicle access	Approved for 25/26 m B-doubles (GML and CML) under NHVR. Used for freight, including mining and agricultural transport Approved OSOM vehicle route
Traffic function	Major freight and regional traffic route. Connects towns, carries regional and long-distance traffic, and serves as an alternative corridor for Central West access



Source: Google Street View

Photograph 2.6 Castlereagh Highway, eastward view near Boulder Road

2.3 Key intersections

The following intersections are of relevance due to the traffic generated from the proposed modifications (from north to south):

1. Castlereagh Highway/Boulder Road
2. Castlereagh Highway/Main Street/Wolgan Road
3. Chifley Road/Clarence Colliery Road
4. Great Western Highway/Station Street
5. Great Western Highway/Harley Avenue.

A description and layout of each intersection is provided in the following tables and its associated figures.

The Bells Line of Road/Darling Causeway intersection is discussed at Section 3.7.

2.3.1 Castlereagh Highway/Boulder Road

Table 2.7 Castlereagh Highway/Boulder Road intersection

Aspect	Description
Location	Approximately 10.5 km north of the Great Western Highway intersection
Intersection control	Priority controlled T-intersection (give way)
Major road	Castlereagh Highway
West arm (Boulder Road)	Two approach lanes: one through lane and one continuous left-turn slip lane One departure lane
South arm	Two approach lanes: one through lane and one short left-turn slip lane One departure lane
North arm	Two approach lanes: one through lane and one short right-turn slip lane Two departure lanes
Pedestrian connectivity	No pedestrian facilities
Traffic function	Predominantly carries regional traffic Provides vehicular access to the Mount Piper power station
Speed limit	100 km/h on Castlereagh Highway 60 km/h on Boulder Road



Source: MetroMap

Figure 2.1 Castlereagh Highway/Boulder Road intersection

2.3.2 Castlereagh Highway/Main Street/Wolgan Road

Table 2.8 Castlereagh Highway/Main Street/Wolgan Road

Aspect	Description
Location	Approximately 3.8 km north of the Great Western Highway intersection
Intersection control	Priority controlled (give way) intersection with slight staggered offset between the northern and southern arms
Major road	Castlereagh Highway
West arm	Three approach lanes: one through lane, one dedicated short left-turn lane, one dedicated short right-turn lane One departure lane
East arm	Three approach lanes: one through lane, one dedicated short left-turn lane, one dedicated short right-turn lane One departure lane
South arm (Main Street)	One approach lane, one departure lane
North arm (Wolgan Road)	Two approach lanes: one short right-turn lane and one left-turn slip lane One departure lane
Pedestrian connectivity	No pedestrian facilities
Traffic function	Predominantly carries regional traffic Provides access from Castlereagh Highway to Wallerawang and Lidsdale townships
Speed limit	80 km/h on Castlereagh Highway 50 km/h on Main Street and on Wolgan Road



Source: MetroMap

Figure 2.2 Castlereagh Highway/Main Street/Wolgan Road

2.3.3 Chifley Road/Clarence Colliery Road

Table 2.9 Chifley Road/Clarence Colliery Road intersection

Aspect	Description
Location from the site	Approximately 2 km south of Clarence Colliery
Intersection control	Priority controlled T-intersection (give way)
Major road	Chifley Road
North arm (Clarence Colliery access)	One approach lane and one departure lane
East arm	Two approach lanes: one through lane and one short right-turn lane One departure lanes
West arm	Two approach lanes: one through lane and one short left-turn slip lane One departure lane
Pedestrian connectivity	No pedestrian facilities
Traffic function	Predominantly, carries regional traffic and provides access to the Colliery
Speed limit	50 km/h on Clarence Colliery Road 80 km/h on Chifley Road
Additional comments	Dedicated left and right turn bays are provided onto Clarence Colliery Road Left turning vehicles from Chifley Road need to give way to right turning vehicles from Chifley Road



Source: Google Earth

Figure 2.3 Chifley Road/Clarence Colliery Road intersection

2.3.4 Great Western Highway/Station Street

Table 2.10 Great Western Highway/Station Street intersection

Aspect	Description
Location from the site	Approximately 18.4 km south of Clarence Colliery
Intersection control	Signalised intersection
Major road	Great Western Highway
North-east arm (Station Street)	Two approach lanes: one right-turn lane and one short left-turn lane One departure lane
South-east arm	Two approach lanes: one through lane and one short right-turn lane One departure lane
North-west arm	One approach lane and one departure lane
Pedestrian connectivity	Pedestrian crossings are provided at north-west and north-east approaches
Traffic function	Predominantly carries regional and local traffic
Speed limit	60 km/h on Station Street (40 km/h during school zone times) 60 km/h on Great Western Highway (40 km/h during school zone times)
Additional comments	A dedicated cycling lane is provided on the northern side of Station Street



Source: Metro Map

Figure 2.4 Great Western Highway/Station Street intersection

2.3.5 Great Western Highway/Harley Avenue

Table 2.11 Great Western Highway/Harley Avenue intersection

Aspect	Description
Location from the site	Approximately 18.6 km south of the Clarence Colliery
Intersection control	Priority controlled T-intersection (give way)
Major road	Great Western Highway
North arm	One approach lane and one departure lane
West arm	Two approach lanes: one through lane and one short left-turn lane One departure lane
East arm	Two approach lanes: one through lane and one short left-turn lane One departure lane
Pedestrian connectivity	No pedestrian facilities
Traffic function	Predominantly carries regional traffic
Speed limit	50 km/h on Harley Avenue 60 km/h on Great Western Highway



Source: Metro Map

Figure 2.5 Great Western Highway/Harley Avenue intersection

2.4 Surveyed traffic volumes

Traffic surveys were conducted at the key intersections identified in Section 2.3 on 30 July 2024 and 3 April 2025, from 6.00 am to 9.00 am and 3.00 pm to 6.00 pm during a regular (non-school holiday) period. The Boulder Road intersection was surveyed on 30 July 2024 as part of a separate scope of work and the remaining intersections were surveyed on 3 April 2025. While the Boulder Road intersection count is approximately one year old, it remains valid given there is no major development in the area that may have influenced the traffic data. The traffic count data are attached in Annexure A.

Table 2.12 summarises the observed peak hours for the surveyed intersections.

Table 2.12 Intersection peak hours

Intersection	AM peak hour	PM peak hour
Castlereagh Highway/Boulder Road	6.00 am to 7.00 am	3.00 pm to 4.00 pm
Castlereagh Highway/Main Street/Wolgan Road	6.00 am to 7.00 am	4.45 pm to 5.45 pm
Chifley Road/Clarence Colliery Road	8.00 am to 9.00 am	3.30 pm to 4.30 pm
Great Western Highway/Station Street	8.00 am to 9.00 am	3.45 pm to 4.45 pm
Great Western Highway/Harley Avenue	8.00 am to 9.00 am	3.45 pm to 4.45 pm

The intersection analysis has been based on the highest observed peak hour traffic volumes at each location, resulting in a conservative assessment.

2.5 Traffic volumes

2.5.1 Growth of background traffic

TfNSW has recommended a linear growth rate of 1.5% for the Great Western Highway and 1.6% for Castlereagh Highway to be applied per annum. As a conservative approach, a uniform growth rate of 1.6% per annum has been adopted.

2.5.2 Baseline and projected traffic volumes

The adopted growth rate has been applied to the surveyed traffic volumes to forecast traffic conditions for the year 2025 and 2031.

The 2025 baseline and 2031 projected volumes, as illustrated in Figure 2.6 and Figure 2.7, account for trips associated with the ongoing operation of Clarence Colliery until 2031.

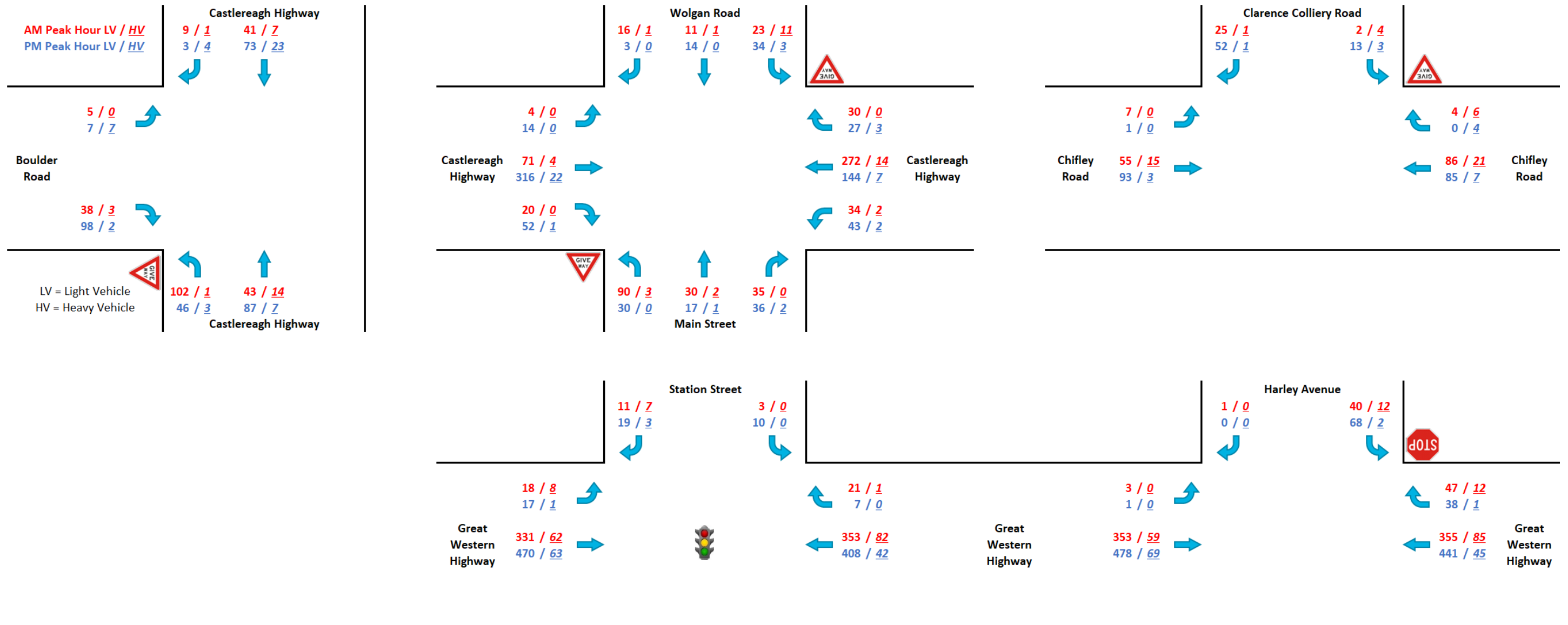


Figure 2.6 2025 baseline peak hour intersection volumes (including trips associated with the current operation of Clarence Colliery)

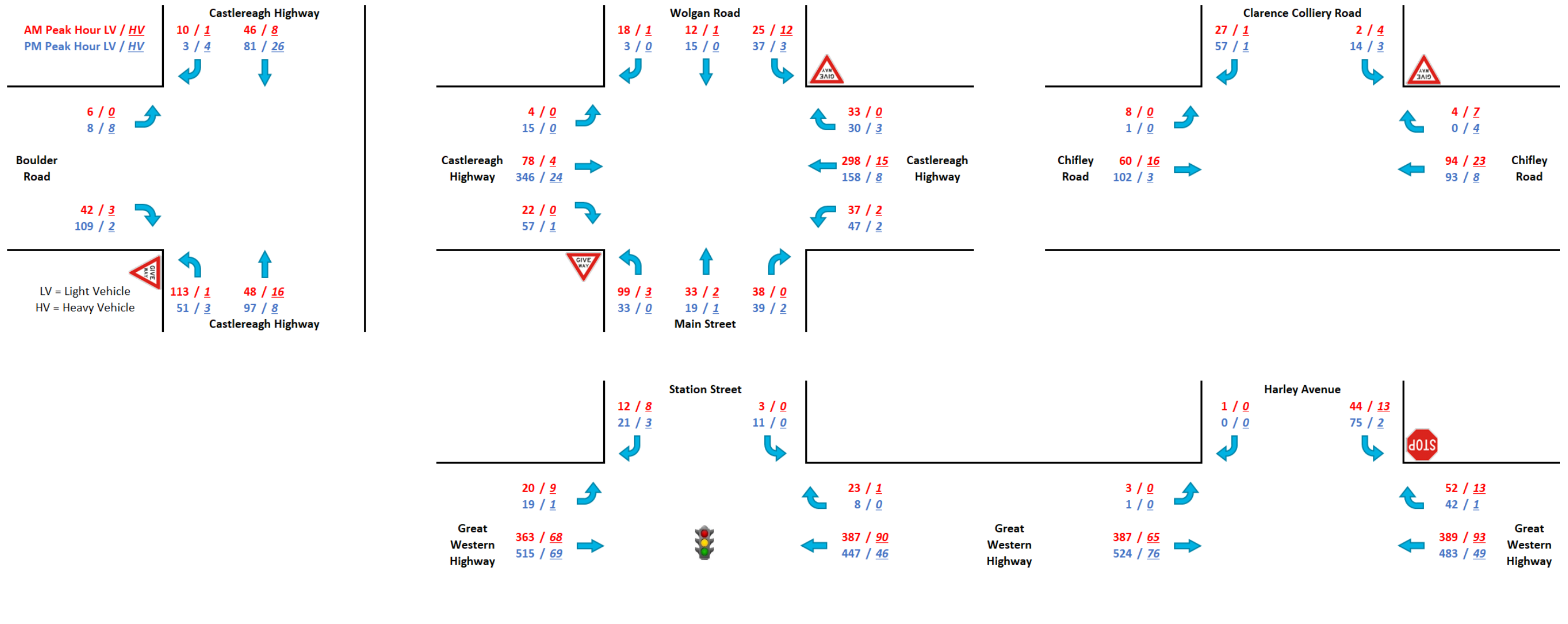


Figure 2.7 2031 peak hour intersection volumes (including trips associated with the ongoing operation of Clarence Colliery)

2.6 Crash data analysis

Crash data was obtained from the TfNSW Centre for Road Safety's interactive crash history database and reviewed for the five-year period from 2019 to 2024. The analysis focused on the local road network near the Clarence Colliery access and Mount Piper Power Station (Boulder Road).

Crashes are categorised based on severity:

- fatal
- serious injury
- moderate injury
- minor/other injury
- non-casualty (e.g. towaway).

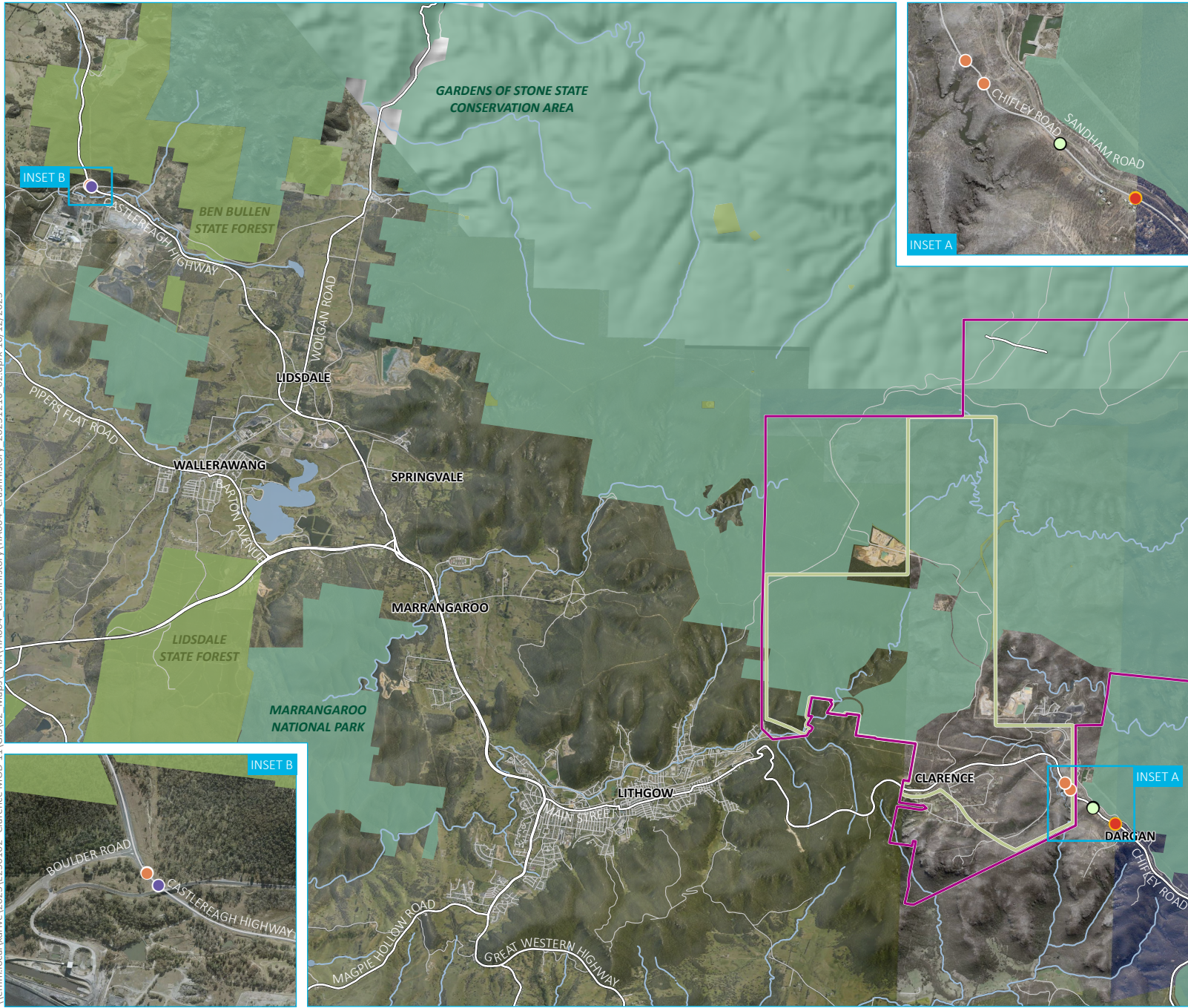
The review found no recorded crashes near the Boulder Road or Clarence Colliery access intersections. There were four crashes recorded nearby on Chifley Road and two crashes on Castlereagh Highway, as presented in Figure 2.8.

The total of six crashes involved:

- one fatality (head-on, not overtaking)
- three serious injuries (off carriageway, left-hand, on right-hand and left-hand bends into object, and head-on)
- one moderate injury (off carriageway to right on right bend)
- one minor/other injury.

Overall, the total number of crashes over the five-year periods is minor and therefore, any immediate road safety measures are not required.

\\emm.local\drive\2025\E250102 - Clarence MOD 11\GIS\02 - Maps\TIA\TIA004 - CrashHistory\TIA004 - CrashHistory_20251216_02.aprx 16/12/2025



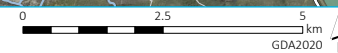
- KEY**
- Clarence Colliery Holdings Area
 - DA504-00 consent boundary
- Degree of crash**
- Fatal
 - Serious Injury
 - Moderate Injury
 - Minor/Other Injury
- Existing environment**
- Major road
 - Minor road
 - Named watercourse
 - Named waterbody
 - NPWS reserve
 - State forest

Crash history data near project site

Clarence MOD 11
Traffic Impact Assessment Report
Figure 2.8



Source: EMM (2025); DCSSS (2024); ESRI (2025); GA (2009); MetroMap (2025)



2.7 Public transport

2.7.1 Train

There is no train station near Clarence Colliery and no level crossing along the haulage routes.

2.7.2 Buses

There are no bus stops near Clarence Colliery. Regional coach services operate along the Great Western Highway and Castlereagh Highway. Private vehicle use will continue to be the dominant mode of transport for staff and visitors to Clarence Colliery.

2.7.3 School buses

School bus services are operated by Lithgow Buslines at Bell and Lithgow. School bus stops along the route include the towns of Clarence, Zig Zag and Doctors Gap. Bus Route S365¹ travels along Chifley Road between Bell and Lithgow via Clarence. The school bus operating times are from 7.20 am to 8.55 am in the morning and 3.00 pm to 4.00 pm in the afternoon.

Heavy vehicles associated with Clarence Colliery do not operate during the AM and PM peak school zone hours during school terms. This is included in the Traffic Management Plan (Annexure C).

2.8 Active transport

Signalised pedestrian crossings are provided at the Great Western Highway/Station Street intersection. However, the traffic survey observed minimal pedestrian activity at this location.

In contrast, the other assessed intersections are located in rural settings with limited or no active transport activities and infrastructure.

2.9 Parking

Clarence Colliery provides on-site parking that is sufficient for light vehicles of staff and visitors.

Due to the rural nature of the area, there is no on-street parking demand. Hence, no on-street parking is available along Clarence Colliery Road or any of the adjoining public roads.

2.10 Existing operation of Clarence Colliery

Clarence Colliery is currently operational and therefore, traffic surveys have captured the ongoing operational traffic.

¹ <https://transportnsw.info/routes/details/lithgow-buslines/s365/71s36-5>

3 Proposed modification

3.1 Overview

Clarence Colliery is seeking a modification to DA 504-00 under section 4.55(2) of the EP&A Act to extend the life of mining operation at Clarence Colliery from 31 December 2026 for an additional five years until 31 December 2031 (Mod 11).

A summary of the key traffic related elements of the current approval and the proposed modification is provided in Table 3.1.

Table 3.1 Comparison of current approval (DA 504-00) and Mod 11

Element	Current approval (DA 504-00)	Mod 11
Mine life	31 December 2026	31 December 2031
Workforce	300 full-time equivalents (FTE)	No change
Maximum coal extraction	3 Mtpa of ROM coal	No change
The maximum road transport of coal	300,000 tpa coal	No change
The maximum road transport to the west via Darling Causeway and Great Western Highway	200,000 tpa coal 7:00 am to 10:00 pm Monday to Saturday and between 8:00 am to 10:00 pm on Sunday and public holidays	No change
The maximum road transport to the east, e.g. north or east of Sydney	200,000 tpa coal	No change

3.2 Road Haulage routes

The existing coal haulage route (refer to Figure 1.3) will remain unchanged as per current approval:

- Coal transport to the west: Clarence Colliery Road – Chifley Road – Darling Causeway – Station Street - Great Western Highway – Castlereagh Highway – Boulder Road.
- Coal transport to the east: Clarence Colliery Road – Chifley Road – Darling Causeway – Station Street - Harley Avenue -Great Western Highway, or Clarence Colliery Road – Chifley Road – Bells Line of Road.

3.3 Road haulage vehicle type

Coal transport to Mount Piper power station is via semi-trailer or truck and dog trailer, and these vehicle types will remain unchanged.

3.4 Traffic distribution

Traffic distribution for coal transport will not change as a result of the modification.

3.5 Traffic generation

Traffic generation of light vehicles and heavy vehicles associated with the ongoing operation of Clarence Colliery will remain unchanged as result of the modification. Clarence Colliery will continue to generate the similar vehicular traffic volumes during the five-year operational extension. The surveyed traffic volumes have captured the ongoing vehicular movements.

3.5.1 Light vehicle movements

The modification does not result in any additional light vehicle generation, as the operational workforce will remain unchanged.

3.5.2 Heavy vehicle movements

Heavy vehicle movements for coal transport will remain unchanged as a result of the modification.

3.6 Cumulative traffic impact assessment

As there is no known major development along the haulage route, no cumulative traffic impact assessment is required except for the inclusion of traffic growth, captured in the projected 2031 traffic volumes.

3.7 Bells Line of Road

The haulage route via Bells Line of Road and the Darling Causeway intersection has not been analysed. Vehicles travelling between Chifley Road and Bells Line of Road are not required to give way to other vehicles at this intersection.

The intersection has a large geometry and has recently been upgraded (refer to Figure 3.1). Furthermore, NSW government has recently announced \$100 million funding² for traffic safety improvements along the Bells Line of Road.



Source: Metromap

Figure 3.1 Chifley Road/Bells Line of Road/Darling Causeway intersection

² <https://www.transport.nsw.gov.au/news-and-events/media-releases/starting-bell-rings-on-planning-for-100-million-safety-upgrades-to>

4 Impact assessment

4.1 Intersection performance

The key intersections have been analysed using SIDRA Intersection Version 10 software, a micro-analytical traffic modelling tool designed for individual intersections and small networks. SIDRA provides the following performance indicators:

- Degree of saturation (DOS):
Represents the ratio of traffic demand to capacity, with a value of 1.0 indicating full capacity (100 per cent saturation). The thresholds are commonly referred to as practical degrees of saturation. Target DOS thresholds are generally accepted as follows:
 - 0.90 for signalised intersections
 - 0.85 for roundabouts
 - 0.80 for priority-controlled intersections.
- Average delay (DEL):
Represents the average delay (in seconds) experienced by vehicles at the intersection:
 - for signalised and roundabout intersections, DEL is averaged across all movements
 - for priority-controlled intersections (e.g. stop or give-way), DEL is typically reported for the worst-performing movement. It is important to assess individual approach delays, as high delays on minor roads can be masked by low delays on dominant through movements.
- Level of service (LOS):
A qualitative measure that categorises average delay into levels ranging from A (best) to F (worst). LOS provides an intuitive summary of intersection performance. The LOS thresholds are provided in Table 4.1.
- 95 per cent queue lengths (Q95)
Refers to the queue length (in metres) that has only a five per cent probability of being exceeded during the analysis period. This metric translates delays into a spatial measure, helping identify potential spillback risks and storage deficiencies.

Table 4.1 Intersection LOS standards

Level of service LOS	Average delay DEL (seconds per vehicle)
A	<14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	>71

Source: TfNSW Guide to Transport Impact Assessment (TfNSW 2024)

It is noted that the SIDRA analysis has adopted a higher Passenger Car Unit (PCU) value for heavy vehicles, increased from the default value of 1.65 to 2, as recommended by TfNSW. The PCU value expresses the impact of different vehicle types and sizes on traffic flow, using a passenger car as the base unit.

The SIDRA analysis has been conducted for the key intersections identified in Section 2.3 along the haulage route, under the following scenarios:

- 2025 baseline: surveyed traffic volumes which include traffic associated with the current operation of Clarence Colliery, as determined by the surveys. The Boulder Road intersection was surveyed in 2024; volumes have been projected accordingly by applying the associated traffic growth for one year (refer to Figure 2.6).
- 2031 projected: includes relevant traffic growth and traffic associated with the ongoing operation of Clarence Colliery through to December 2031 (refer to Figure 2.7).

The following abbreviations are used for the turn movements:

- TH: through
- LT: left turn
- RT: right turn.

4.2 SIDRA modelling results

This section presents the SIDRA results for the assessed intersections. Detailed SIDRA outputs are provided in Annexure B.

4.2.1 Castlereagh Highway/Boulder Road intersection

SIDRA modelling results for the Castlereagh Highway/Boulder Road intersection are presented in Table 4.2.

Table 4.2 SIDRA modelling result for Castlereagh Highway/Boulder Road intersection

Priority controlled (Giveaway)	AM Peak						PM Peak						
	Scenarios (with development traffic)	Intersection volume	DEL (s)	LOS	DOS	Q95 (m)	Q95 direction and approach	Intersection volume	DEL (s)	LOS	DOS	Q95 (m)	Q95 direction and approach
	2025 baseline	278	8.8	A	0.056	1.3	RT from west	379	10.1	A	0.118	3.4	RT from west
	2031 projected	309	8.8	A	0.062	1.5	RT from west	421	10.1	A	0.135	3.9	RT from west

Key findings:

- The intersection operates efficiently under both the 2025 and 2031 scenarios, maintaining LOS A, indicating good performance with minimal delays.

4.2.2 Castlereagh Highway/Main Street/Wolgan Road

The SIDRA modelling results for the Castlereagh Highway/Main Street/Wolgan Road intersection are presented in Table 4.3 and Table 4.4. Main Street and Wolgan Road are offset by approximately 30 metres and have therefore been modelled as two individual intersections operating as a network.

Table 4.3 SIDRA modelling result for Castlereagh Highway/Main Street

Priority controlled (Giveaway)	AM Peak						PM Peak						
	Scenarios (with development traffic)	Intersection volume	DEL (s)	LOS	DOS	Q95 (m)	Q95 direction and approach	Intersection volume	DEL (s)	LOS	DOS	Q95 (m)	Q95 direction and approach
	2025 baseline	642	10.4	A	0.252	2.9	LT and RT from south	741	13.9	A	0.199	2.1	LT and RT from south
	2031 projected	702	11.6	A	0.292	3.6	LT and RT from south	811	15.9	B	0.239	2.6	LT and RT from south

Table 4.4 SIDRA modelling result for Castlereagh Highway/Wolgan Road

Priority controlled (Giveaway)	AM Peak						PM Peak						
	Scenarios (with development traffic)	Intersection volume	DEL (s)	LOS	DOS	Q95 (m)	Q95 direction and approach	Intersection volume	DEL (s)	LOS	DOS	Q95 (m)	Q95 direction and approach
	2025 baseline	591	10.7	A	0.162	0.7	RT from north	724	12.6	A	0.216	0.5	RT from north
	2031 projected	645	11.6	A	0.177	0.9	RT from north	792	14.1	A	0.236	0.6	RT from north

Key findings:

- The intersections operate efficiently under both the 2025 and 2031 scenarios, achieving LOS A–B, which indicates good performance with minimal delays.

4.2.3 Chifley Road/Clarence Colliery Road intersection

The SIDRA modelling results for the Chifley Road/Clarence Colliery Road intersection are presented in Table 4.5.

Table 4.5 SIDRA modelling result for Chifley Road/Clarence Colliery Road intersection

Priority controlled (Giveaway)	AM Peak						PM Peak					
	Scenarios (with development traffic)	Intersection volume	DEL (s)	LOS	DOS	Q95 (m)	Q95 direction and approach	Intersection volume	DEL (s)	LOS	DOS	Q95 (m)
2025 baseline	238	8.3	A	0.069	0.9	LT and RT from north	276	9.3	A	0.071	1.7	LT and RT from north
2031 projected	259	8.5	A	0.076	1.0	LT and RT from north	301	9.4	A	0.078	2.0	LT and RT from north

Key findings:

- The intersection operates efficiently under both the 2025 and 2031 scenarios, achieving LOS A, which indicates good performance with minimal delays.

4.2.4 Great Western Highway/Station Street intersection

The SIDRA modelling results for the Great Western Highway/Station Street intersection are presented in Table 4.6.

Table 4.6 SIDRA modelling result for Great Western Highway/Station Street intersection

Signalised	AM Peak						PM Peak					
	Scenarios (with development traffic)	Intersection volume	DEL (s)	LOS	DOS	Q95 (m)	Q95 direction and approach	Intersection volume	DEL (s)	LOS	DOS	Q95 (m)
2025 baseline	944	4.0	A	0.330	47.4	TH and RT from southeast	1,095	4.5	A	0.393	61.9	LT and TH from north-west
2031 projected	1,036	4.1	A	0.361	54.0	TH and RT from southeast	1,200	4.6	A	0.431	71.2	LT and TH from north-west

Key findings:

- The intersection operates efficiently under both the 2025 and 2031 scenarios, maintaining a LOS A, indicating good performance and minimal delays.

4.2.5 Great Western Highway/Harley Avenue intersection

The SIDRA modelling results for the Great Western Highway/Harley Avenue intersection are presented in Table 4.7.

Table 4.7 SIDRA modelling result for Great Western Highway/Harley Avenue intersection

Priority controlled (Giveaway)	AM Peak						PM Peak					
	Scenarios (with development traffic)	Intersection volume	DEL (s)	LOS	DOS	Q95 (m)	Q95 direction and approach	Intersection volume	DEL (s)	LOS	DOS	Q95 (m)
2025 baseline	1,018	27.7	B	0.283	2.9	LT and RT from north	1,204	37.1	C	0.333	3.6	LT and RT from north
2031 projected	1,116	33.2	C	0.310	3.5	LT and RT from north	1,320	46.7	D	0.365	4.4	LT and RT from north

Key findings:

- Most approaches operate well within capacity, achieving LOS A under both the 2025 and 2031 scenarios.
- The left-turn movement from the Harley Avenue approach onto the Great Western Highway westbound is projected to experience higher average delays, resulting in LOS B/C under the 2025 scenario and deteriorating to LOS C/D in the 2031 scenario.
- LOS D is considered acceptable, given there is only one light vehicle turning right during the AM peak hour and no right turn movement during the PM peak hour (refer to Figure 2.6). No vehicles associated with Clarence Colliery transport activities will turn right at this intersection.

4.3 Road safety assessment

The road safety assessment considers available sight distances and visibility near the analysed priority-controlled T-intersections, according to the *2023 Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (Austroads Guide). Clear visibility is required between turning vehicles from the minor road and through traffic on the major road. This allows turning vehicles to identify suitable gaps and safely enter the major road, referred to the Safe Intersection Sight Distance (SISD).

4.3.1 Chifley Road/Clarence Colliery Road intersection sight distance assessment

Chifley Road feature a relatively wide road footprint and generally flat terrain near the Clarence Colliery Road intersection with a sign posted speed limit of 80 km/h. In accordance with the Austroads Guide, the design speed is 90 km/h, 10 km/h above the posted speed limit. The minimum SISD required for a driver reaction of 2.5 second at this design speed is 226 m.

Sight distances on Chifley Road have been estimated through line-of-sight analysis and on-site observations, as shown in Photograph 4.1, Photograph 4.2, Figure 4.1, and Figure 4.2.

The available sight distance from the access road to the left is around 235 m, satisfying the minimum requirement. However, the available sight distance to the right is around 158 m, below the required minimum due to vegetation adjacent to the intersection that obstructs visibility.

Several safety measures are in place to mitigate this issue:

- An advanced "Trucks Entering" warning sign (W5-22) is installed on Chifley Road for eastbound traffic approaching the intersection (refer to Photograph 4.3).
- A dedicated eastbound left-turn merge lane from the access road enables vehicles to join Chifley Road safely at speed without disrupting through traffic.

These existing mitigation measures are considered appropriate to manage the sight distance limitation and to maintain intersection safety.



Photograph 4.1 View to the left from Clarence Colliery Road to Chifley Road



Source: Metro Map

Figure 4.1 Sight distance to the left from Clarence Colliery Road to Chifley Road (235 m)



Photograph 4.2 View to the right from Clarence Colliery Road to Chifley Road



Source: Metro Map

Figure 4.2 Sight distance to the right from Clarence Colliery Road to Chifley Road (158 m)



Source: Google Earth Pro

Photograph 4.3 Trucks crossing or entering sign (W5-22) on Chifley Road eastbound approach to Clarence Colliery Road

4.3.2 Great Western Highway/Harley Avenue intersection sight distance assessment

The Great Western Highway near Harley Avenue has a sign posted speed limit of 60 km/h. The minimum SISD required for a design speed of 70 km/h and a general driver reaction of two seconds is 151 m.

Sight distance analysis indicates an available SISD of around 170 m to the left from Harley Avenue, meeting the minimum requirement, as shown in Photograph 4.4 and Figure 4.3,.



Photograph 4.4 View to the left from Harley Avenue to Great Western Highway



Source: Metro Map

Figure 4.3 Sight distance to the left from Harley Avenue to Great Western Highway (170 m)

Photograph 4.5 and Figure 4.4 indicate an available SISD of around 160 m to the right from Harley Avenue, also meeting the minimum requirement.



Photograph 4.5 View to the right from Harley Avenue to Great Western Highway



Source: Metro Map

Figure 4.4 Sight distance to the right from Harley Avenue to Great Western Highway (160 m)

4.3.3 Castlereagh Highway/Main Street intersection

Castlereagh Highway near Main Street has a sign posted speed limit of 80 km/h. The minimum SISD required for a design speed of 90 km/h and a driver reaction of 2.5 second is 226 m.

Photograph 4.6 and Figure 4.6 indicate an available SISD from Main Street of 260 m to left and 335 m to the right, both meeting the minimum requirement.



Photograph 4.6 View to the left from Main Street to Castlereagh Highway



Source: Metro Map

Figure 4.5 Sight distance to the left from Main Street to Castlereagh Highway (260 m)



Source: Metro Map

Photograph 4.7 View to the right from Main Street to Castlereagh Highway



Figure 4.6 Sight distance to the right from Main Street to Castlereagh Highway (335 m)

4.3.4 Castlereagh Highway/Wolgan Road intersection

Castlereagh Highway near Wolgan Road has a sign posted speed limit of 80 km/h. The minimum SISD required for a design speed of 90 km/h and a driver reaction of 2.5 second is 226 m.

Figure 4.7 and Figure 4.8 indicate an available sight distance from Wolgan Road of 235 m to left and 330 m to the right, both meeting the minimum requirement.



Source: Google Streetview

Photograph 4.8 View to the left from Wolgan Road to Castlereagh Highway



Source: Metro Map

Figure 4.7 Sight distance to the left from Wolgan Road to Castlereagh Highway (235 m)



Source: Google Streetview

Photograph 4.9 View to the right from Wolgan Road to Castlereagh Highway



Source: Metro Map

Figure 4.8 Sight distance to the right from Wolgan Road to Castlereagh Highway (330 m)

4.3.5 Castlereagh Highway/Boulder Road intersection

Castlereagh Highway near Boulder Road has a sign posted speed limit of 100 km/h. The minimum SISD required for a design speed of 110 km/h and a general driver reaction of two seconds is 300 m.

Figure 4.9 and Figure 4.10 indicate that visibility from Boulder Road to both the left and right falls short of the minimum requirement. Despite this shortfall, several existing traffic safety measures mitigate potential risks at the intersection, including:

- the left-turn movement from Boulder Road onto the Castlereagh Highway northbound is facilitated by a dedicated continuous slip lane, allowing vehicles to merge safely into the traffic stream
- the right-turn movement from Boulder Road onto the Castlereagh Highway southbound is supported by a dedicated approach lane, enabling vehicles to decelerate safely before making the turn
- advanced warning signs indicating an 85 km/h advisory speed are installed on both approaches to the intersection along Castlereagh Highway
- “Boulder Road” is clearly signposted on both highway approaches
- “Island” signs are installed in both directions on the highway to alert motorists to the presence of traffic islands
- dedicated left- and right-turn lanes are provided for vehicles entering Boulder Road.

Given the comprehensive safety measures already in place, no further mitigation measures are considered necessary for this intersection.



Photograph 4.10 View to the left from Boulder Road to Castlereagh Highway



Source: Metro Map

Figure 4.9 Sight distance to the left from Boulder Road to Castlereagh Highway (232 m)



Photograph 4.11 View to the left and right from Boulder Road to Castlereagh Highway



Source: Metro Map

Figure 4.10 Sight distance to right from Boulder Road to Castlereagh Highway (214 m)

4.4 Impact on public transport, and active transport

Public transport services, including school buses, and regional coach routes operating along the Great Western Highway and Castlereagh Highway, share the same route as haulage traffic. However, heavy vehicles associated with Clarence Colliery will have limited interaction with public transport due to the infrequency of public transport services, resulting in minimal traffic impact to these facilities and services.

There is minimal existing pedestrian activity and no dedicated cycle paths along the Castlereagh Highway on the haulage routes. Therefore, the proposed modifications are not expected to have any impact on active transport users.

4.5 Heavily vehicle movements during school zone hours

As per Centennial's current commitment to LCC, the heavy vehicle movement to/from Clarence Colliery will be restricted during school zone hours which are 8:00 am to 9:30 am and 2:30 pm to 4:00 pm during NSW school terms.

Due to this restriction, there will be no impact to school traffic from the continuation of the mine operation.

4.6 Traffic management plan

Clarence Colliery has a traffic management plan (TMP), approved under Mod 10 (see Annexure C). The TMP outlines:

- measures for pedestrian and vehicle safety within the site
- total production volumes for the haulage
- timing of the product haulage
- prescribed haulage routes
- complaint handling and monitoring procedures
- Drivers Code of Conduct.

The current TMP will be updated to comply with the approval conditions of Mod 11.

4.7 Parking impact

There are sufficient parking provisions at Clarence Colliery for light vehicles of staff and visitors. There will be no impact to parking as a result of the proposed modification.

5 Conclusions and summary

Centennial is seeking to extend the current approval for mine operations at Clarence Colliery by five years. This TIA report has been prepared to assess traffic impact due to the proposed extension of time of the mine operation.

Traffic impact associated with the modification have been assessed, with the following key findings:

- All key intersections will continue to operate at acceptable levels of service under projected 2031 traffic conditions. No significant adverse impact on intersection performance is anticipated as a result of the modification.
- Intersection levels of service: the following intersections are projected to maintain good levels of service (LOS A, B, or C), indicating minimal delays under the assessed scenarios:
 - Castlereagh Highway/Boulder Road.
 - Castlereagh Highway/Main Street/Wolgan Road.
 - Chifley Road/Clarence Colliery Road.
 - Great Western Highway/Station Street.
- Great Western Highway/Harley Avenue intersection:
 - Most approaches are projected to operate well within capacity, achieving LOS A and B.
 - The right-turn movement from Harley Avenue onto the Great Western Highway westbound is expected to experience higher average delays, resulting in LOS C during the 2031 AM peak and LOS D during the PM peak. These conditions remain within acceptable operational limits and affect only one light vehicle turning right, during the AM peak hour.
 - No vehicles associated with Clarence Colliery will turn right at this intersection.
- Transport associated with Clarence Colliery will continue to be restricted during school zone hours (8:00 am to 9.30 am and 2.30 pm to 4:00 pm during NSW school terms).
- The TMP will be updated following an approval of Mod 11.
- Sight distance deficiencies have been identified. However, the currently provided sign-controlled risk management measures are adequate, and no further mitigation measures are required.

In summary, the proposed modification application is not expected to result in any adverse traffic impact on the surrounding road network or intersections.

References

Austrroads 2020, *Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments*

Austrroads 2023, *Guide to Road Design Part 4A: Unsignalised and Signalised Intersections*

Google Maps 2024, *Online Mapping Service*, Google

Lithgow Buslines 2024, *School Services – Student Travel Planner*

TfNSW 2024, *Guide to Transport Impact Assessment*

TfNSW 2024, *Interactive crash statistics – NSW Centre for Road Safety*, Transport for New South Wales

TfNSW 2024, *Routes and timetables (Cullen Bullen Coach Stop)*, Transport for New South Wales

TfNSW 2024, *W2-4L Side Road Intersection on Straight Left (Symbolic)*, Transport for New South Wales.

Annexure A

Traffic count data

A.1 Castlereagh Highway/Boulder Road intersection



Intersection of Boulder Rd and Castlereagh Hwy, Blackmans

GPS	-33.347222 150.022884	Survey	AM: 6:00 AM-9:00 AM PM: 3:00 PM-6:00 PM
Date	Tue 30/07/24	North	Castlereagh Hwy
Weather	Fine	East	N/A
Suburban	Blackmans Flat	South	Castlereagh Hwy
Custom	EMM	West	Boulder Rd
Survey		Traffic	AM: 6:00 AM-7:00 AM PM: 3:00 PM-4:00 PM

Time		North Approach Castlereagh			South Approach Castlereagh			West Approach Boulder			Hourly Total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Peak
06:00	06:15	0	1	8	0	19	26	0	10	2	264
06:15	06:30	0	0	10	0	13	30	0	4	1	258
06:30	06:45	0	3	15	0	13	22	0	21	1	252
06:45	07:00	0	6	15	0	12	25	0	6	1	243
07:00	07:15	0	1	17	0	18	17	0	7	0	240
07:15	07:30	0	2	9	0	21	11	0	9	0	254
07:30	07:45	0	1	19	0	21	11	0	11	3	253
07:45	08:00	0	3	18	0	15	14	0	11	1	245
08:00	08:15	0	2	19	0	24	15	0	12	2	239
08:15	08:30	0	1	10	0	16	9	0	14	1	
08:30	08:45	0	2	16	0	18	9	0	10	3	
08:45	09:00	0	3	13	0	18	11	0	9	2	
15:00	15:15	0	2	22	0	21	12	0	30	3	360
15:15	15:30	0	1	34	0	32	19	0	18	3	335
15:30	15:45	0	2	17	0	21	5	0	17	4	311
15:45	16:00	0	2	23	0	20	13	0	35	4	311
16:00	16:15	0	0	19	0	20	13	0	12	1	295
16:15	16:30	0	2	29	0	23	13	0	14	2	289
16:30	16:45	0	0	27	0	16	12	0	11	0	273
16:45	17:00	0	0	30	0	20	13	0	17	1	267
17:00	17:15	0	2	24	0	19	8	0	6	0	244
17:15	17:30	0	3	12	0	26	10	0	14	2	
17:30	17:45	0	0	16	0	14	11	0	19	0	
17:45	18:00	0	1	16	0	21	11	0	9	0	

Peak Time		North Approach Castlereagh			South Approach Castlereagh			West Approach Boulder			Peak total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
06:00	07:00	0	10	48	0	57	103	0	41	5	264
15:00	16:00	0	7	36	0	34	49	0	100	14	360

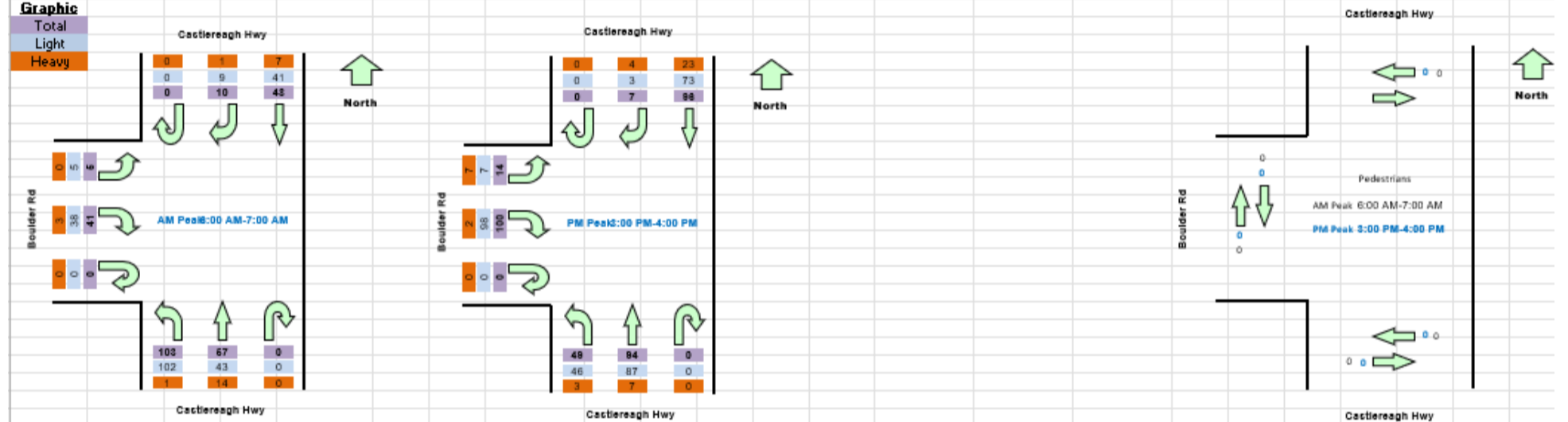
Time		East Approach Boulder		West Approach Boulder		North Approach Boulder		South Approach Boulder		Hourly Total
Period Start	Period End	U	R	U	R	U	R	U	R	Peak
06:00	06:15	0	0	0	0	0	0	0	0	0
06:15	06:30	0	0	0	0	0	0	0	0	0
06:30	06:45	0	0	0	0	0	0	0	0	0
06:45	07:00	0	0	0	0	0	0	0	0	0
07:00	07:15	0	0	0	0	0	0	0	0	0
07:15	07:30	0	0	0	0	0	0	0	0	0
07:30	07:45	0	0	0	0	0	0	0	0	0
07:45	08:00	0	0	0	0	0	0	0	0	0
08:00	08:15	0	0	0	0	0	0	0	0	0
08:15	08:30	0	0	0	0	0	0	0	0	0
08:30	08:45	0	0	0	0	0	0	0	0	0
08:45	09:00	0	0	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0	0	0

Peak Time		East Approach Boulder		West Approach Boulder		North Approach Boulder		South Approach Boulder		Peak total
Period Start	Period End	U	R	U	R	U	R	U	R	total
06:00	07:00	0	0	0	0	0	0	0	0	0
15:00	16:00	0	0	0	0	0	0	0	0	0

Time		East Approach Boulder		West Approach Boulder		North Approach Boulder		South Approach Boulder		Hourly Total
Period Start	Period End	U	R	U	R	U	R	U	R	Peak
06:00	06:15	0	0	0	0	0	0	0	0	0
06:15	06:30	0	0	0	0	0	0	0	0	0
06:30	06:45	0	0	0	0	0	0	0	0	0
06:45	07:00	0	0	0	0	0	0	0	0	0
07:00	07:15	0	0	0	0	0	0	0	0	0
07:15	07:30	0	0	0	0	0	0	0	0	0
07:30	07:45	0	0	0	0	0	0	0	0	0
07:45	08:00	0	0	0	0	0	0	0	0	0
08:00	08:15	0	0	0	0	0	0	0	0	0
08:15	08:30	0	0	0	0	0	0	0	0	0
08:30	08:45	0	0	0	0	0	0	0	0	0
08:45	09:00	0	0	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0	0	0

Peak Time		East Approach Boulder		West Approach Boulder		North Approach Boulder		South Approach Boulder		Peak total
Period Start	Period End	U	R	U	R	U	R	U	R	total
06:00	07:00	0	0	0	0	0	0	0	0	0
15:00	16:00	0	0	0	0	0	0	0	0	0

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



Time		North Approach Castlereagh			South Approach Castlereagh			West Approach Boulder		
Period Start	Period End	U	R	SB	U	NB	L	U	R	L
06:00	06:15	0	1	6	0	14	26	0	9	2
06:15	06:30	0	0	9	0	11	29	0	3	1
06:30	06:45	0	3	13	0	13	22	0	20	1
06:45	07:00	0	5	13	0	5	25	0	6	1
07:00	07:15	0	0	16	0	10	16	0	7	0
07:15	07:30	0	0	8	0	13	8	0	8	0
07:30	07:45	0	0	14	0	18	9	0	10	0
07:45	08:00	0	1	12	0	13	13	0	10	0
08:00	08:15	0	0	17	0	18	11	0	10	0
08:15	08:30	0	0	8	0	13	9	0	13	0
08:30	08:45	0	0	15	0	17	7	0	10	0
08:45	09:00	0	0	10	0	16	10	0	7	0
15:00	15:15	0	1	19	0	20	11	0	30	2
15:15	15:30	0	0	23	0	29	18	0	18	1
15:30	15:45	0	1	16	0	20	4	0	17	3
15:45	16:00	0	1	15	0	18	13	0	33	1
16:00	16:15	0	0	17	0	20	12	0	10	1
16:15	16:30	0	0	27	0	20	11	0	14	0
16:30	16:45	0	0	21	0	16	11	0	9	0
16:45	17:00	0	0	22	0	18	13	0	16	1
17:00	17:15	0	2	19	0	19	8	0	5	0
17:15	17:30	0	2	12	0	26	9	0	13	2
17:30	17:45	0	0	14	0	13	11	0	19	0
17:45	18:00	0	1	14	0	19	10	0	7	0

Peak Time		North Approach Castlereagh			South Approach Castlereagh			West Approach Boulder			Peak total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
06:00	07:00	0	9	41	0	43	102	0	38	5	238
15:00	16:00	0	3	73	0	87	46	0	98	7	314

Time		East Approach Boulder		West Approach Boulder		North Approach Boulder		South Approach Boulder		
Period Start	Period End	U	R	U	R	U	R	U	R	
06:00	06:15	0	0	2	0	5	0	0	1	0
06:15	06:30	0	0	1	0	2	1	0	1	0
06:30	06:45	0	0	2	0	0	0	0	1	0
06:45	07:00	0	1	2	0	7	0	0	0	0
07:00	07:15	0	1	1	0	8	1	0	0	0
07:15	07:30	0	2	1	0	8	3	0	1	0
07:30	07:45	0	1	5	0	3	2	0	1	3
07:45	08:00	0	2	6	0	2	1	0	1	1
08:00	08:15	0	2	2	0	6	4	0	2	2
08:15	08:30	0	1	2	0	3	0	0	1	1
08:30	08:45	0	2	1	0	1	2	0	0	3
08:45	09:00	0	3	3	0	2	1	0	2	2
15:00	15:15	0	1	3	0	1	1	0	0	1
15:15	15:30	0	1	11	0	3	1	0	0	2
15:30	15:45	0	1	1	0	1	1	0	0	1
15:45	16:00	0	1	8	0	2	0	0	2	

A.2 Chifley Road/Main Street/Wolgan Road intersection



TURNING MOVEMENT SURVEY

Intersection of Castlereagh Hwy and Wolgan Rd, Wallerawang

Date:	Thu 03/04/25	North:	Wolgan Rd	Survey	AM: 6:00 AM-9:00 AM
Weather:	Fine	East:	Castlereagh Hwy	Period	PM: 3:00 PM-6:00 PM
Suburban:	Wallerawang	South:	Main St	Traffic	AM: 6:00 AM-7:00 AM
Customer:	EMM	West:	Castlereagh Hwy	Peak	PM: 4:45 PM-5:45 PM

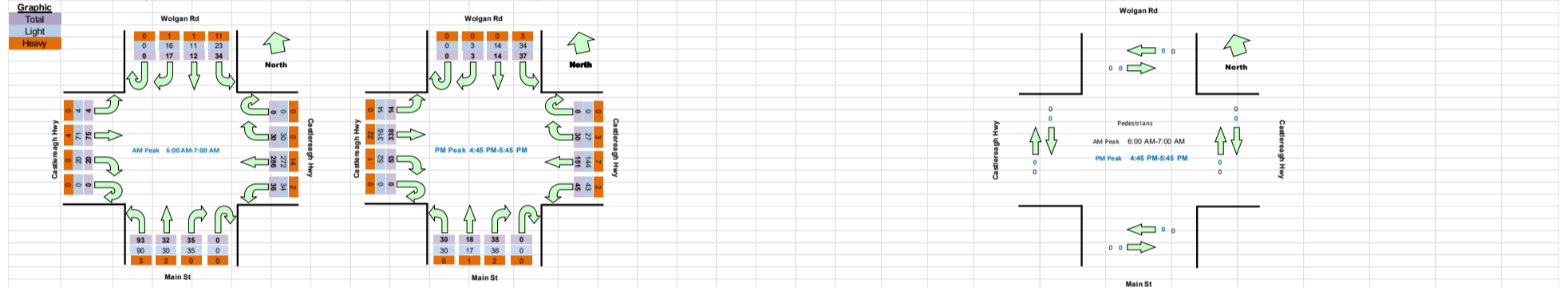
Time		North Approach Wolgan Rd				East Approach Castlereagh Hwy				South Approach Main St				West Approach Castlereagh Hwy				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
06:00	06:15	0	9	1	6	0	0	70	6	0	8	6	21	0	5	13	0	674	
06:15	06:30	0	3	4	6	0	13	109	6	0	2	5	31	0	4	15	2	638	
06:30	06:45	0	1	2	4	0	7	70	10	0	11	10	32	0	1	18	0	508	
06:45	07:00	0	4	5	18	0	10	37	14	0	14	11	9	0	10	29	2	445	
07:00	07:15	0	0	5	6	0	5	33	10	0	2	5	4	0	7	31	1	391	
07:15	07:30	0	2	1	4	0	1	16	7	0	5	3	3	0	2	25	1	397	
07:30	07:45	0	0	1	8	0	7	36	6	0	11	2	11	0	2	18	1	413	
07:45	08:00	0	0	2	6	0	5	24	5	0	7	5	7	0	5	43	0	416	
08:00	08:15	0	2	9	8	0	8	25	3	0	5	5	4	0	1	43	2	397	
08:15	08:30	0	3	4	7	0	5	24	6	0	2	2	2	0	1	29	1		
08:30	08:45	0	0	3	11	0	5	27	6	0	6	0	4	0	11	33	0		
08:45	09:00	0	0	6	8	0	8	22	5	0	4	2	8	0	4	20	3		
15:00	15:15	0	1	6	12	0	5	41	13	0	17	12	5	0	5	35	2	598	
15:15	15:30	0	1	7	13	0	5	36	8	0	8	7	2	0	10	37	2	586	
15:30	15:45	0	3	13	13	0	10	41	5	0	8	5	3	0	3	36	4	591	
15:45	16:00	0	1	10	7	0	6	40	11	0	10	5	2	0	16	54	2	562	
16:00	16:15	0	2	3	7	0	11	44	19	0	9	4	6	0	9	25	3	564	
16:15	16:30	0	1	6	10	0	6	42	10	0	13	8	10	0	5	30	0	580	
16:30	16:45	0	1	1	2	0	5	40	9	0	10	3	9	0	6	29	0	637	
16:45	17:00	0	2	2	9	0	9	45	11	0	9	2	12	0	2	63	0	771	Peak
17:00	17:15	0	1	3	6	0	7	29	12	0	9	6	4	0	18	60	3	751	
17:15	17:30	0	0	2	8	0	8	41	9	0	12	4	5	0	18	86	5		
17:30	17:45	0	0	7	14	0	6	36	13	0	8	6	9	0	15	129	6		
17:45	18:00	0	3	2	6	0	9	44	6	0	6	6	8	0	11	43	2		

Time		North Approach Wolgan Rd		East Approach Castlereagh Hwy		South Approach Main St		West Approach Castlereagh Hwy		Hourly Total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	Hourly Total
06:00	06:15	0	0	0	0	0	0	0	0	0
06:15	06:30	0	0	0	0	0	0	0	0	1
06:30	06:45	0	0	0	0	0	0	0	0	5
06:45	07:00	0	0	0	0	0	0	0	0	5
07:00	07:15	0	0	1	0	0	0	0	0	7
07:15	07:30	2	0	2	0	0	0	0	0	7
07:30	07:45	0	0	0	0	0	0	0	0	5
07:45	08:00	0	0	1	1	0	0	0	0	5
08:00	08:15	0	0	0	1	0	0	0	0	3
08:15	08:30	0	0	2	0	0	0	0	0	
08:30	08:45	0	0	0	0	0	0	0	0	
08:45	09:00	0	0	0	0	0	0	0	0	
15:00	15:15	0	0	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0	0	2
17:15	17:30	0	0	0	0	0	0	0	0	
17:30	17:45	0	0	0	0	0	0	0	0	
17:45	18:00	0	0	0	2	0	0	0	0	

Peak Time		North Approach Wolgan Rd				East Approach Castlereagh Hwy				South Approach Main St				West Approach Castlereagh Hwy				Peak total
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Peak total
06:00	07:00	0	17	12	34	0	30	286	36	0	35	32	93	0	20	75	4	674
16:45	17:45	0	3	14	37	0	30	151	45	0	38	18	30	0	53	338	14	771

Peak Time		North Approach Wolgan Rd		East Approach Castlereagh Hwy		South Approach Main St		West Approach Castlereagh Hwy		Peak hour total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	Peak hour total
06:00	07:00	0	0	0	0	0	0	0	0	0
16:45	17:45	0	0	0	0	0	0	0	0	0

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



Time		North Approach Wolgan Rd				East Approach Castlereagh Hwy				South Approach Main St				West Approach Castlereagh Hwy			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
06:00	06:15	0	9	1	3	0	0	65	6	0	8	6	20	0	5	13	0
06:15	06:30	0	3	4	4	0	13	106	5	0	2	5	30	0	4	13	2
06:30	06:45	0	1	2	3	0	7	64	9	0	11	8	31	0	1	17	0
06:45	07:00	0	3	4	13	0	10	37	14	0	14	11	9	0	10	28	2
07:00	07:15	0	0	3	5	0	4	24	8	0	1	5	3	0	7	28	1
07:15	07:30	0	1	1	4	0	1	13	7	0	5	2	1	0	2	23	1
07:30	07:45	0	0	1	7	0	4	23	5	0	8	2	9	0	2	16	1
07:45	08:00	0	0	1	6	0	4	21	3	0	5	5	4	0	4	39	0
08:00	08:15	0	2	7	7	0	7	18	3	0	4	5	4	0	1	38	2
08:15	08:30	0	2	3	7	0	5	22	6	0	2	2	2	0	1	26	1
08:30	08:45	0	0	3	11	0	5	25	6	0	6	0	3	0	11	28	0
08:45	09:00	0	0	6	7	0	6	18	4	0	4	2	8	0	3	16	2
15:00	15:15	0	1	5	12	0	4	38	12	0	16	12	5	0	4	30	2
15:15	15:30	0	1	6	13	0	4	34	6	0	8	5	2	0	9	30	1
15:30	15:45	0	3	13	13	0	9	37	5	0	8	5	3	0	3	33	4
15:45	16:00	0	1	8	7	0	6	36	11	0	10	5	2	0	14	47	2
16:00	16:15	0	2	3	7	0	10	39	16	0	8	4	6	0	9	23	3
16:15	16:30	0	1	6	10	0	6	40	9	0	13	7	9	0	5	26	0
16:30	16:45	0	1	1	2	0	5	36	7	0	8	3	9	0	5	24	0
16:45	17:00	0	2	2	8	0	8	41	11	0	8	1	12	0	2	57	0
17:00	17:15	0	1	3	6	0	6	29	12	0	9	6	4	0	18	60	3
17:15	17:30	0	0	2	7	0	8	40	9	0	12	4	5	0	18	84	5
17:30	17:45	0	0	7	13	0	5	34	11	0	7	6	9	0	14	115	6
17:45	18:00	0	3	2	6	0	9	43	5	0	5	6	7	0	10	41	2

Time		North Approach Wolgan Rd		East Approach Castlereagh Hwy		South Approach Main St		West Approach Castlereagh Hwy	
Period Start	Period End	U	R	SB	L	U	R	WB	L
06:00	06:15	0	0	0	3	0	0	5	0
06:15	06:30	0	0	0	2	0	0	3	1
06:30	06:45	0	0	0	1	0	0	6	1
06:45	07:00	0	1	1	5	0	0	0	0
07:00	07:15	0	0	2	1	0	1	9	2
07:15	07:30	0	1	0	0	0	0	3	0
07:30	07:45	0	0	0	1	0	3	13	1
07:45	08:00	0	0	1	0	0	1	3	2
08:00	08:15	0	0	2	1	0	1	7	0
08:15	08:30	0	1	1	0	0	0	2	0
08:30	08:45	0	0	0	0	0	0	2	0
08:45	09:00	0	0	0	1	0	0	2	4
15:00	15:15	0	0	1	0	0	1	3	1
15:15	15:30	0	0	1	0	0	1	2	2
15:30	15:45	0	0	0	0	0	1	4	0
15:45	16:00	0	0	2	0	0	0	4	0
16:00	16:15	0	0	0	0	0	1	5	3
16:15	16:30	0	0	0	0	0	0	2	1
16:30	16:45	0	0	0	0	0	0	4	2
16:45	17:00	0	0	0	1	0	1	4	0
17:00	17:15	0	0	0	0	0	1	0	0
17:15	17:30	0	0	0	1	0	0	1	0
17:30	17:45	0	0	0	1				

A.3 Chifley Road/Clarence Colliery Road intersection



TURNING MOVEMENT SURVEY

Intersection of Chifley Rd and Clarence Colliery Rd, C

GPS: 33.472864, 150.235856	North: Clarence Colliery Rd	Survey Period AM: 6:00 AM-9:00 AM
Date: Thu 03/04/25	East: Chifley Rd	PM: 3:00 PM-4:30 PM
Weather: Fine	South: N/A	Traffic Peak AM: 8:00 AM-9:00 AM
Suburban: Clarence	West: Chifley Rd	PM: 3:30 PM-4:30 PM
Customer: EMM		

Time		Approach Clarence Colliery Rd			East Approach Chifley Rd			West Approach Chifley Rd			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
06:00	06:15	0	2	2	0	2	14	0	9	5	110	
06:15	06:30	0	0	2	0	3	4	0	9	1	118	
06:30	06:45	0	2	0	0	3	16	0	11	2	145	
06:45	07:00	0	0	0	0	2	11	0	6	4	144	
07:00	07:15	0	3	0	0	0	28	0	8	3	183	
07:15	07:30	0	3	2	0	1	20	0	19	1	188	
07:30	07:45	0	2	0	0	0	21	0	8	2	194	
07:45	08:00	0	0	1	0	2	19	0	15	5	225	
08:00	08:15	0	12	2	0	2	30	0	19	2	226	Peak
08:15	08:30	0	13	3	0	0	24	0	10	2		
08:30	08:45	0	1	1	0	5	35	0	19	3		
08:45	09:00	0	0	0	0	3	18	0	22	0		
15:00	15:15	0	6	1	0	1	20	0	23	1	221	
15:15	15:30	0	5	0	0	1	28	0	28	0	248	
15:30	15:45	0	3	4	0	2	20	0	22	0	262	Peak
15:45	16:00	0	3	1	0	1	20	0	31	0	261	
16:00	16:15	0	27	7	0	1	21	0	23	0	281	
16:15	16:30	0	20	4	0	0	31	0	20	1	234	
16:30	16:45	0	6	3	0	0	14	0	25	2	212	
16:45	17:00	0	4	0	0	0	19	0	32	1	214	
17:00	17:15	0	4	1	0	0	17	0	30	0	215	
17:15	17:30	0	5	2	0	1	22	0	24	0		
17:30	17:45	0	2	3	0	0	15	0	30	2		
17:45	18:00	0	0	1	0	2	20	0	31	3		

Time		Westbound		Eastbound		Northbound		Southbound		Hourly Total	
Period Start	Period End	Westbound	Eastbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Hourly Total	
06:00	06:15	0	0	0	0	0	0	0	0	0	
06:15	06:30	0	0	0	0	0	0	0	0	0	
06:30	06:45	0	0	0	0	0	0	0	0	0	
06:45	07:00	0	0	0	0	0	0	0	0	0	
07:00	07:15	0	0	0	0	0	0	0	0	0	
07:15	07:30	0	0	0	0	0	0	0	0	0	
07:30	07:45	0	0	0	0	0	0	0	0	0	
07:45	08:00	0	0	0	0	0	0	0	0	0	
08:00	08:15	0	0	0	0	0	0	0	0	0	
08:15	08:30	0	0	0	0	0	0	0	0	0	
08:30	08:45	0	0	0	0	0	0	0	0	0	
08:45	09:00	0	0	0	0	0	0	0	0	0	
15:00	15:15	0	0	0	0	0	0	0	0	0	
15:15	15:30	0	0	0	0	0	0	0	0	0	
15:30	15:45	0	0	0	0	0	0	0	0	0	
15:45	16:00	0	0	0	0	0	0	0	0	0	
16:00	16:15	0	0	0	0	0	0	0	0	0	
16:15	16:30	0	0	0	0	0	0	0	0	0	
16:30	16:45	0	0	0	0	0	0	0	0	0	
16:45	17:00	0	0	0	0	0	0	0	0	0	
17:00	17:15	0	0	0	0	0	0	0	0	0	
17:15	17:30	0	0	0	0	0	0	0	0	0	
17:30	17:45	0	0	0	0	0	0	0	0	0	
17:45	18:00	0	0	0	0	0	0	0	0	0	

Peak Time		Approach Clarence Colliery Rd			East Approach Chifley Rd			West Approach Chifley Rd			Peak total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Peak total	
08:00	09:00	0	26	6	0	10	107	0	70	7	226	
15:30	16:30	0	53	16	0	4	92	0	98	1	262	

Peak Time		Westbound		Eastbound		Northbound		Southbound		Peak total	
Period Start	Period End	Westbound	Eastbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Peak total	
08:00	09:00	0	0	0	0	0	0	0	0	0	
15:30	16:30	0	0	0	0	0	0	0	0	0	

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



Time		Approach Clarence Colliery Rd			East Approach Chifley Rd			West Approach Chifley Rd			Peak total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Peak total	
08:00	06:15	0	2	0	0	2	12	0	6	5		
06:15	06:30	0	0	0	0	1	2	0	5	0		
06:30	06:45	0	1	0	0	0	13	0	9	2		
06:45	07:00	0	0	0	0	2	10	0	6	4		
07:00	07:15	0	1	0	0	0	22	0	7	3		
07:15	07:30	0	1	0	0	0	16	0	15	1		
07:30	07:45	0	1	0	0	0	19	0	7	1		
07:45	08:00	0	0	0	0	1	17	0	14	2		
08:00	08:15	0	12	0	0	2	25	0	13	2		
08:15	08:30	0	12	2	0	0	20	0	10	2		
08:30	08:45	0	1	0	0	1	28	0	15	3		
08:45	09:00	0	0	0	0	1	13	0	17	0		
15:00	15:15	0	6	0	0	0	18	0	20	1		
15:15	15:30	0	4	0	0	0	28	0	25	0		
15:30	15:45	0	3	3	0	0	18	0	21	0		
15:45	16:00	0	3	1	0	0	20	0	30	0		
16:00	16:15	0	26	5	0	0	20	0	22	0		
16:15	16:30	0	20	4	0	0	27	0	20	1		
16:30	16:45	0	6	2	0	0	14	0	23	2		
16:45	17:00	0	4	0	0	0	19	0	31	1		
17:00	17:15	0	4	1	0	0	16	0	28	0		
17:15	17:30	0	5	2	0	0	22	0	23	0		
17:30	17:45	0	2	2	0	0	15	0	29	1		
17:45	18:00	0	0	1	0	0	18	0	28	3		

Time		Approach Clarence Colliery Rd			East Approach Chifley Rd			West Approach Chifley Rd			Peak total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Peak total	
08:00	06:15	0	0	2	0	0	2	0	3	0		
06:15	06:30	0	0	2	0	2	2	0	4	1		
06:30	06:45	0	1	0	0	3	3	0	2	0		
06:45	07:00	0	0	0	0	0	1	0	0	0		
07:00	07:15	0	2	0	0	0	6	0	1	0		
07:15	07:30	0	2	2	0	1	4	0	4	0		
07:30	07:45	0	1	0	0	0	2	0	1	1		
07:45	08:00	0	0	1	0	1	2	0	1	3		
08:00	08:15	0	0	2	0	0	5	0	6	0		
08:15	08:30	0	1	1	0	0	4	0	0	0		
08:30	08:45	0	0	1	0	4	7	0	4	0		
08:45	09:00	0	0	0	0	2	5	0	5	0		
15:00	15:15	0	0	1	0	1	2	0	3	0		
15:15	15:30	0	1	0	0	1	0	0	3	0		
15:30	15:45	0	0	1	0	2	2	0	1	0		
15:45	16:00	0	0	0	0	1	0	0	1	0		
16:00	16:15	0	1	2	0	1	1	0	1	0		
16:15	16:30	0	0	0	0	0	4	0	0	0		
16:30	16:45	0	0	1	0	0	0	0	2	0		
16:45	17:00	0	0	0	0	0	0	0	1	0		
17:00	17:15	0	0	0	0	0	1	0	4	0		
17:15	17:30	0	0	0	0	1	0	0	1	0		
17:30	17:45	0	0	1	0	0	0	0	1	1		
17:45	18:00	0	0	0	0	2	2	0	3	0		

A.4 Great Western Highway/Station Street intersection



TURNING MOVEMENT SURVEY

Intersection of Great Western Hwy and Station St, Mc

GPS	-33.830643, 151.254734	North	Station St	Survey Period	AM: 6:00 AM-9:00 AM
Date	Thu 03/04/25	East	Great Western Hwy	PM	3:00 PM-4:45 PM
Weather	Fine	South	N/A	Traffic Peak	AM: 8:00 AM-9:00 AM
Suburban	Mount Victoria	West	Great Western Hwy	PM	3:45 PM-4:45 PM
Customer	EMM				

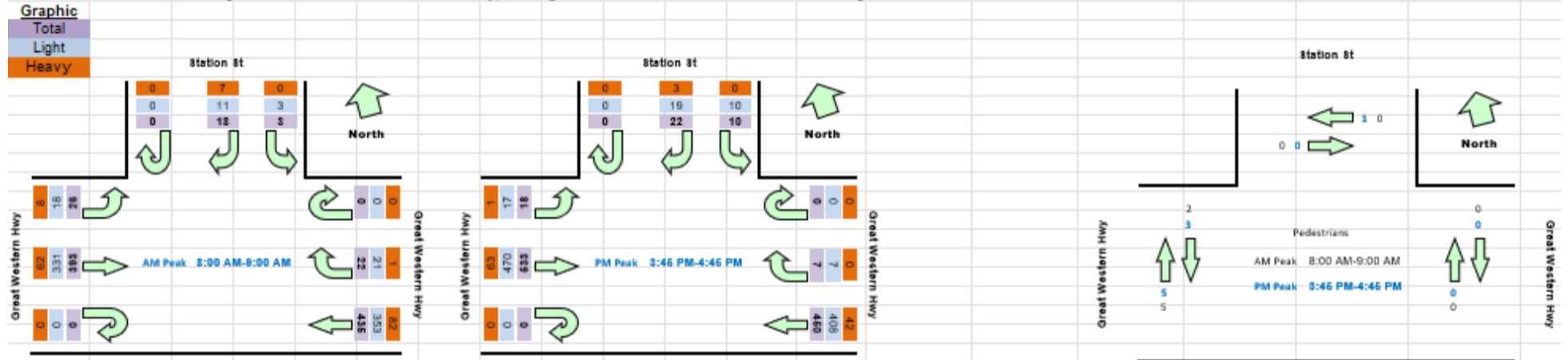
Time		North Approach Station St			Approach Great Western			Approach Great Western			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
06:00	06:15	0	1	1	0	2	83	0	59	8	571	
06:15	06:30	0	6	1	0	1	83	0	55	0	608	
06:30	06:45	0	1	0	0	1	87	0	63	8	650	
06:45	07:00	0	2	0	0	1	74	0	73	5	690	
07:00	07:15	0	1	2	0	2	84	0	75	5	726	
07:15	07:30	0	2	0	0	2	91	0	68	5	780	
07:30	07:45	0	2	2	0	4	108	0	78	4	836	
07:45	08:00	0	3	2	0	1	108	0	71	8	858	
08:00	08:15	0	6	2	0	6	110	0	90	9	897	Peak
08:15	08:30	0	5	0	0	4	103	0	109	3		
08:30	08:45	0	1	1	0	5	99	0	104	10		
08:45	09:00	0	6	0	0	7	123	0	90	4		
15:00	15:15	0	1	4	0	3	118	0	124	8	989	
15:15	15:30	0	3	4	0	2	113	0	113	5	996	
15:30	15:45	0	2	6	0	2	103	0	114	5	1014	
15:45	16:00	0	5	2	0	1	105	0	144	4	1040	Peak
16:00	16:15	0	7	0	0	1	110	0	141	4	1015	
16:15	16:30	0	4	5	0	2	113	0	130	4	975	
16:30	16:45	0	6	3	0	3	122	0	118	6	972	
16:45	17:00	0	7	4	0	6	102	0	111	8	915	
17:00	17:15	0	11	4	0	0	102	0	103	3	906	
17:15	17:30	0	3	2	0	6	115	0	124	5		
17:30	17:45	0	7	2	0	4	96	0	88	8		
17:45	18:00	0	1	2	0	2	109	0	112	1		

Peak Time		North Approach Station St			Approach Great Western			Approach Great Western			Peak total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Peak total
08:00	09:00	0	18	3	0	22	435	0	393	26	897
15:45	16:45	0	22	10	0	7	450	0	533	18	1040

Time		North Approach Station St		Approach Great Western		Approach Great Western		Hourly Total	
Period Start	Period End	Westbound	Eastbound	Northbound	Southbound	Northbound	Southbound	Hour	Peak
06:00	06:15	1	0	0	0	0	0	1	
06:15	06:30	0	0	0	0	0	0	0	
06:30	06:45	0	0	0	0	0	0	0	
06:45	07:00	0	0	0	0	0	0	0	
07:00	07:15	0	0	1	0	1	0	2	
07:15	07:30	0	0	0	0	1	1	2	
07:30	07:45	0	0	0	0	0	0	0	
07:45	08:00	0	0	0	0	0	0	0	
08:00	08:15	0	0	0	0	1	0	1	
08:15	08:30	0	0	0	0	1	1	2	
08:30	08:45	0	0	0	0	0	1	1	
08:45	09:00	0	0	0	0	0	3	3	
15:00	15:15	0	0	0	0	1	0	1	
15:15	15:30	0	0	0	0	4	0	4	
15:30	15:45	0	2	0	0	2	0	2	
15:45	16:00	0	0	0	0	2	1	3	
16:00	16:15	0	0	0	0	0	3	3	
16:15	16:30	1	0	0	0	0	1	1	
16:30	16:45	0	0	0	0	1	0	1	
16:45	17:00	0	1	0	1	0	4	5	
17:00	17:15	0	0	0	0	1	0	1	
17:15	17:30	0	0	0	0	0	0	0	
17:30	17:45	0	0	0	0	0	0	0	
17:45	18:00	0	0	0	0	2	0	2	

Peak Time		North Approach Station St		Approach Great Western		Approach Great Western		Peak total
Period Start	Period End	Westbound	Eastbound	Northbound	Southbound	Northbound	Southbound	Peak total
08:00	09:00	0	0	0	0	2	5	7
15:45	16:45	1	0	0	0	3	5	9

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



Time		North Approach Station St			Approach Great Western			Approach Great Western			Peak total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Peak total
06:00	06:15	0	1	1	0	2	38	0	37	8	
06:15	06:30	0	5	1	0	1	45	0	38	0	
06:30	06:45	0	1	0	0	0	67	0	48	8	
06:45	07:00	0	2	0	0	0	54	0	59	4	
07:00	07:15	0	1	1	0	2	63	0	61	5	
07:15	07:30	0	2	0	0	1	69	0	53	4	
07:30	07:45	0	1	2	0	4	93	0	60	4	
07:45	08:00	0	3	2	0	1	88	0	58	8	
08:00	08:15	0	4	2	0	6	94	0	78	6	
08:15	08:30	0	2	0	0	4	81	0	90	1	
08:30	08:45	0	1	1	0	5	80	0	90	9	
08:45	09:00	0	4	0	0	6	98	0	73	2	
15:00	15:15	0	1	3	0	2	97	0	105	3	
15:15	15:30	0	3	2	0	2	101	0	96	5	
15:30	15:45	0	2	6	0	2	92	0	103	4	
15:45	16:00	0	5	2	0	1	95	0	129	4	
16:00	16:15	0	7	0	0	1	94	0	123	3	
16:15	16:30	0	2	5	0	2	106	0	115	4	
16:30	16:45	0	5	3	0	3	113	0	103	6	
16:45	17:00	0	7	4	0	6	92	0	102	6	
17:00	17:15	0	10	4	0	0	93	0	89	3	
17:15	17:30	0	3	2	0	6	104	0	105	5	
17:30	17:45	0	7	2	0	4	91	0	76	6	
17:45	18:00	0	1	2	0	2	105	0	99	0	

Time		North Approach Station St			Approach Great Western			Approach Great Western			Peak total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Peak total
06:00	06:15	0	0	0	0	0	25	0	22	0	
06:15	06:30	0	1	0	0	0	18	0	17	0	
06:30	06:45	0	0	0	0	1	20	0	17	0	
06:45	07:00	0	0	0	0	1	20	0	14	1	
07:00	07:15	0	0	1	0	0	21	0	14	0	
07:15	07:30	0	0	0	0	1	22	0	15	1	
07:30	07:45	0	1	0	0	0	15	0	18	0	
07:45	08:00	0	0	0	0	0	18	0	13	0	
08:00	08:15	0	2	0	0	0	16	0	12	3	
08:15	08:30	0	3	0	0	0	22	0	19	2	
08:30	08:45	0	0	0	0	0	19	0	14	1	
08:45	09:00	0	2	0	0	1	25	0	17	2	
15:00	15:15	0	0	1	0	1	21	0	19	3	
15:15	15:30	0	0	2	0	0	12	0	17	0	
15:30	15:45	0	0	0	0	0	11	0	11	1	
15:45	16:00	0	0	0	0	0	10	0	15	0	
16:00	16:15	0	0	0	0	0	16	0	18	1	
16:15	16:30	0	2	0	0	0	7	0	15	0	
16:30	16:45	0	1	0	0	0	9	0	15	0	
16:45	17:00	0	0	0	0	0	10	0	9	0	
17:00	17:15	0	1	0	0	0	9	0	14	0	
17:15	17:30	0	0	0	0	0	11	0	19	0	
17:30	17:45	0	0	0	0	0	5	0	10	0	
17:45	18:00	0	0	0	0	0	4	0	13	1	

A.5 Great Western Highway/Harley Avenue intersection



TURNING MOVEMENT SURVEY

Intersection of Great Western Hwy and Harley Ave, M

GPS	-33.682171, 150.258382	North	Harley Ave	Survey Period	AM: 6:00 AM-9:00 AM PM: 3:00 PM-6:00 PM
Date	Thu 03/04/25	East	Great Western Hwy	Traffic Peak	AM: 8:00 AM-9:00 AM PM: 3:45 PM-4:45 PM
Weather	Fine	South	N/A		
Suburban	Mount Victoria	West	Great Western Hwy		
Customer	EMM				

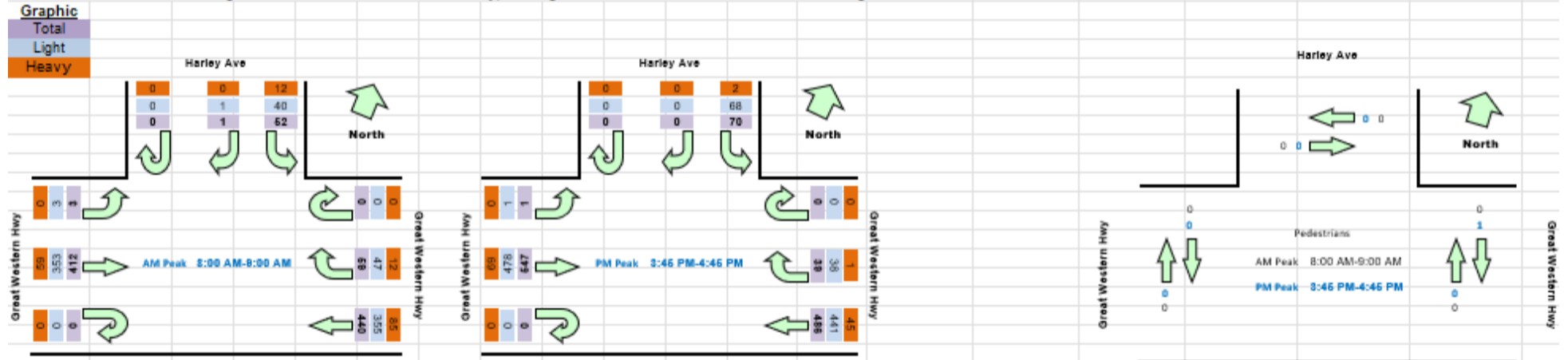
Time		North Approach Harley Av			Approach Great Western			Approach Great Western			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
06:00	06:15	0	0	14	0	6	63	0	54	0	608	
06:15	06:30	0	0	8	0	5	82	0	61	0	639	
06:30	06:45	0	0	7	0	17	89	0	61	0	673	
06:45	07:00	0	0	6	0	11	68	0	76	0	721	
07:00	07:15	0	0	7	0	7	86	0	68	0	753	
07:15	07:30	0	0	9	0	12	79	0	70	0	823	
07:30	07:45	0	0	11	0	15	113	0	83	0	900	
07:45	08:00	0	0	4	0	18	99	0	72	0	916	
08:00	08:15	0	0	15	0	10	116	0	96	1	967	Peak
08:15	08:30	0	0	14	0	18	103	0	110	2		
08:30	08:45	0	1	8	0	18	98	0	115	0		
08:45	09:00	0	0	15	0	15	123	0	91	0		
15:00	15:15	0	0	18	0	10	116	0	131	0	1091	
15:15	15:30	0	0	20	0	13	114	0	111	0	1087	
15:30	15:45	0	0	15	0	13	108	0	128	0	1121	
15:45	16:00	0	0	17	0	12	129	0	138	0	1143	Peak
16:00	16:15	0	0	7	0	15	105	0	143	1	1095	
16:15	16:30	0	0	25	0	3	120	0	144	0	1056	
16:30	16:45	0	0	21	0	9	132	0	122	0	1029	
16:45	17:00	0	0	18	0	12	100	0	118	0	962	
17:00	17:15	0	0	19	0	9	103	0	101	0	955	
17:15	17:30	0	0	19	0	10	114	0	122	0		
17:30	17:45	0	0	13	0	11	93	0	100	0		
17:45	18:00	0	0	10	0	18	104	0	109	0		

Time		North Approach Harley Ave		East Approach Great Western Hwy		West Approach Great Western Hwy		Hourly Total	
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Southbound	Northbound	Hour	Peak
06:00	06:15	0	0	1	0	0	0	1	
06:15	06:30	0	0	0	0	0	0	0	
06:30	06:45	0	0	0	0	0	0	0	
06:45	07:00	0	0	0	0	0	0	0	
07:00	07:15	0	0	0	0	0	0	0	
07:15	07:30	0	0	0	0	0	0	0	
07:30	07:45	0	0	0	0	0	0	0	
07:45	08:00	0	0	0	0	0	0	0	
08:00	08:15	0	0	0	0	0	0	0	
08:15	08:30	0	0	0	0	0	0	0	
08:30	08:45	0	0	0	0	0	0	0	
08:45	09:00	0	0	0	0	0	0	0	
15:00	15:15	0	0	0	0	0	0	0	
15:15	15:30	0	0	0	0	0	0	0	
15:30	15:45	0	0	0	0	0	0	0	
15:45	16:00	0	0	0	0	0	0	0	
16:00	16:15	0	0	0	0	0	0	0	
16:15	16:30	0	0	1	0	0	0	1	
16:30	16:45	0	0	0	0	0	0	0	
16:45	17:00	0	0	1	0	0	0	1	
17:00	17:15	0	0	0	0	0	0	0	
17:15	17:30	0	0	0	0	0	0	0	
17:30	17:45	0	0	0	0	0	0	0	
17:45	18:00	0	0	0	0	0	0	0	

Peak Time		North Approach Harley Av			Approach Great Western			Approach Great Western			Peak total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Peak total
08:00	09:00	0	1	52	0	59	440	0	412	3	967
15:45	16:45	0	0	70	0	39	486	0	547	1	1143

Peak Time		North Approach Harley Ave		East Approach Great Western Hwy		West Approach Great Western Hwy		Peak total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Southbound	Northbound	Peak total
08:00	09:00	0	0	0	0	0	0	0
15:45	16:45	0	0	1	0	0	0	1

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



Time		North Approach Harley Av			Approach Great Western			Approach Great Western			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
06:00	06:15	0	0	10	0	3	34	0	35	0		
06:15	06:30	0	0	5	0	3	47	0	44	0		
06:30	06:45	0	0	4	0	16	68	0	44	0		
06:45	07:00	0	0	4	0	10	47	0	61	0		
07:00	07:15	0	0	7	0	7	64	0	61	0		
07:15	07:30	0	0	9	0	8	56	0	55	0		
07:30	07:45	0	0	7	0	11	95	0	66	0		
07:45	08:00	0	0	3	0	18	81	0	59	0		
08:00	08:15	0	0	13	0	9	97	0	85	1		
08:15	08:30	0	0	10	0	15	83	0	92	2		
08:30	08:45	0	1	8	0	14	78	0	102	0		
08:45	09:00	0	0	9	0	9	99	0	74	0		
15:00	15:15	0	0	15	0	10	97	0	112	0		
15:15	15:30	0	0	16	0	12	102	0	92	0		
15:30	15:45	0	0	15	0	13	95	0	114	0		
15:45	16:00	0	0	15	0	11	119	0	124	0		
16:00	16:15	0	0	7	0	15	88	0	122	1		
16:15	16:30	0	0	25	0	3	111	0	126	0		
16:30	16:45	0	0	21	0	9	123	0	106	0		
16:45	17:00	0	0	17	0	12	91	0	109	0		
17:00	17:15	0	0	18	0	8	92	0	88	0		
17:15	17:30	0	0	19	0	10	105	0	100	0		
17:30	17:45	0	0	13	0	10	88	0	88	0		
17:45	18:00	0	0	9	0	17	100	0	98	0		

Time		North Approach Harley Av			Approach Great Western			Approach Great Western			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
06:00	06:15	0	0	4	0	3	29	0	19	0		
06:15	06:30	0	0	3	0	2	15	0	17	0		
06:30	06:45	0	0	3	0	1	21	0	17	0		
06:45	07:00	0	0	2	0	1	21	0	15	0		
07:00	07:15	0	0	0	0	0	22	0	7	0		
07:15	07:30	0	0	0	0	4	23	0	15	0		
07:30	07:45	0	0	4	0	4	18	0	17	0		
07:45	08:00	0	0	1	0	0	18	0	13	0		
08:00	08:15	0	0	2	0	1	19	0	11	0		
08:15	08:30	0	0	4	0	3	20	0	18	0		
08:30	08:45	0	0	0	0	2	22	0	13	0		
08:45	09:00	0	0	6	0	6	24	0	17	0		
15:00	15:15	0	0	3	0	0	19	0	19	0		
15:15	15:30	0	0	4	0	1	12	0	19	0		
15:30	15:45	0	0	0	0	0	13	0	12	0		
15:45	16:00	0	0	2	0	1	10	0	14	0		
16:00	16:15	0	0	0	0	0	17	0	21	0		
16:15	16:30	0	0	0	0	0	9	0	18	0		
16:30	16:45	0	0	0	0	0	9	0	16	0		
16:45	17:00	0	0	1	0	0	9	0	9	0		
17:00	17:15	0	0	1	0	1	11	0	13	0		
17:15	17:30	0	0	0	0	0	9	0	22	0		
17:30	17:45	0	0	0	0	1	7	0	12	0		
17:45	18:00	0	0	1	0	1	4	0	11	0		

Annexure B

SIDRA modelling results

MOVEMENT SUMMARY

Site: [110.1] 1. CRH/Boulder Rd - 2025 Base AM (2025 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
 Site Category: (None)
 Give-Way (Two-Way)
 Site Scenario: 1 | 2025 Base AM

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]	v/c	sec		[Veh.]	[Dist]		Rate		km/h
			veh/h	%	veh/h	%				veh	m				
South: Castlereagh Highway															
1	L2	All MCs	108	1.0	108	1.0	0.056	8.8	LOS A	0.0	0.0	0.00	0.64	0.00	72.4
2	T1	All MCs	60	24.6	60	24.6	0.038	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			168	9.4	168	9.4	0.056	5.6	NA	0.0	0.0	0.00	0.41	0.00	80.2
North: Castlereagh Highway															
8	T1	All MCs	51	14.6	51	14.6	0.029	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	11	10.0	11	10.0	0.007	8.6	LOS A	0.0	0.2	0.16	0.59	0.16	60.7
Approach			61	13.8	61	13.8	0.029	1.5	NA	0.0	0.2	0.03	0.10	0.03	89.9
West: Boulder Road															
10	L2	All MCs	5	0.0	5	0.0	0.003	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	53.5
12	R2	All MCs	43	7.3	43	7.3	0.046	6.8	LOS A	0.2	1.3	0.32	0.56	0.32	58.1
Approach			48	6.5	48	6.5	0.046	6.6	LOS A	0.2	1.3	0.28	0.55	0.28	57.6
All Vehicles			278	9.8	278	9.8	0.056	4.9	NA	0.2	1.3	0.06	0.37	0.06	76.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
 Two-Way Sign Control Capacity Model: SIDRA Standard.
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [110.2] 1. CRH/Boulder Rd - 2025 Base PM (2025 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
 Site Category: (None)
 Give-Way (Two-Way)
 Site Scenario: 1 | 2025 Base AM

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]	v/c	sec		[Veh.]	[Dist]				km/h
			veh/h	%	veh/h	%				veh	m				
South: Castlereagh Highway															
1	L2	All MCs	52	6.1	52	6.1	0.028	8.9	LOS A	0.0	0.0	0.00	0.63	0.00	70.9
2	T1	All MCs	99	7.4	99	7.4	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			151	7.0	151	7.0	0.054	3.0	NA	0.0	0.0	0.00	0.22	0.00	87.6
North: Castlereagh Highway															
8	T1	All MCs	101	24.0	101	24.0	0.064	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	7	57.1	7	57.1	0.006	10.1	LOS A	0.0	0.3	0.23	0.58	0.23	58.1
Approach			108	26.2	108	26.2	0.064	0.7	NA	0.0	0.3	0.02	0.04	0.02	95.3
West: Boulder Road															
10	L2	All MCs	15	50.0	15	50.0	0.012	6.1	LOS A	0.0	0.0	0.00	0.50	0.00	51.8
12	R2	All MCs	105	2.0	105	2.0	0.118	7.2	LOS A	0.5	3.4	0.38	0.61	0.38	59.0
Approach			120	7.9	120	7.9	0.118	7.0	LOS A	0.5	3.4	0.34	0.60	0.34	58.0
All Vehicles			379	12.8	379	12.8	0.118	3.6	NA	0.5	3.4	0.11	0.29	0.11	76.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
 Two-Way Sign Control Capacity Model: SIDRA Standard.
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [110.3] 1. CRH/Boulder Rd - 2031 Base AM (2031 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
 Site Category: (None)
 Give-Way (Two-Way)
 Site Scenario: 1 | 2025 Base AM

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Veh.]	[Dist]									
			veh/h	%	veh/h	%	v/c	sec			veh	m			km/h
South: Castlereagh Highway															
1	L2	All MCs	120	0.9	120	0.9	0.062	8.8	LOS A	0.0	0.0	0.00	0.64	0.00	72.5
2	T1	All MCs	67	25.0	67	25.0	0.043	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			187	9.6	187	9.6	0.062	5.6	NA	0.0	0.0	0.00	0.41	0.00	80.3
North: Castlereagh Highway															
8	T1	All MCs	57	14.8	57	14.8	0.033	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	12	9.1	12	9.1	0.007	8.6	LOS A	0.0	0.2	0.17	0.59	0.17	60.7
Approach			68	13.8	68	13.8	0.033	1.5	NA	0.0	0.2	0.03	0.10	0.03	90.1
West: Boulder Road															
10	L2	All MCs	6	0.0	6	0.0	0.003	5.6	LOS A	0.0	0.0	0.00	0.53	0.00	53.5
12	R2	All MCs	47	6.7	47	6.7	0.052	6.9	LOS A	0.2	1.5	0.34	0.57	0.34	58.2
Approach			54	5.9	54	5.9	0.052	6.8	LOS A	0.2	1.5	0.30	0.56	0.30	57.6
All Vehicles			309	9.9	309	9.9	0.062	4.9	NA	0.2	1.5	0.06	0.37	0.06	76.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
 Two-Way Sign Control Capacity Model: SIDRA Standard.
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [110.4] 1. CRH/Boulder Rd - 2031 Base PM (2031 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
 Site Category: (None)
 Give-Way (Two-Way)
 Site Scenario: 1 | 2025 Base AM

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]	v/c	sec		[Veh.]	[Dist]				km/h
			veh/h	%	veh/h	%				veh	m				
South: Castlereagh Highway															
1	L2	All MCs	57	5.6	57	5.6	0.031	8.9	LOS A	0.0	0.0	0.00	0.63	0.00	71.0
2	T1	All MCs	111	7.6	111	7.6	0.060	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach			167	6.9	167	6.9	0.060	3.0	NA	0.0	0.0	0.00	0.22	0.00	87.7
North: Castlereagh Highway															
8	T1	All MCs	113	24.3	113	24.3	0.071	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
9	R2	All MCs	7	57.1	7	57.1	0.006	10.1	LOS A	0.0	0.3	0.25	0.58	0.25	58.0
Approach			120	26.3	120	26.3	0.071	0.6	NA	0.0	0.3	0.02	0.04	0.02	95.7
West: Boulder Road															
10	L2	All MCs	17	50.0	17	50.0	0.014	6.1	LOS A	0.0	0.0	0.00	0.50	0.00	51.8
12	R2	All MCs	117	1.8	117	1.8	0.135	7.4	LOS A	0.5	3.9	0.41	0.63	0.41	58.9
Approach			134	7.9	134	7.9	0.135	7.2	LOS A	0.5	3.9	0.36	0.61	0.36	57.9
All Vehicles			421	12.8	421	12.8	0.135	3.7	NA	0.5	3.9	0.12	0.29	0.12	77.0

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
 Two-Way Sign Control Capacity Model: SIDRA Standard.
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [121.1] 2.1 CHR/Main Street - 2025 Base AM (2025 Base AM)

Network: [9] 2025 Base AM (Main Street and Wolgan Road)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Give-Way (Two-Way)

Network Scenario: 1 | Local Volumes

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m			km/h	
South: Main Street															
1	L2	All MCs	98	3.2	98	3.2	0.252	6.4	LOS A	0.4	2.9	0.52	0.70	0.52	50.4
3	R2	All MCs	71	3.0	71	3.0	0.252	10.4	LOS A	0.4	2.9	0.52	0.70	0.52	41.1
Approach			168	3.1	168	3.1	0.252	8.0	LOS A	0.4	2.9	0.52	0.70	0.52	47.5
East: Castlereagh Highway															
4	L2	All MCs	51	6.2	51	6.2	0.028	3.1	LOS A	0.0	0.0	0.00	0.59	0.00	58.7
5	T1	All MCs	319	5.0	319	5.0	0.172	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
Approach			369	5.1	369	5.1	0.172	0.4	NA	0.0	0.0	0.00	0.08	0.00	76.1
West: Castlereagh Highway															
11	T1	All MCs	83	5.1	83	5.1	0.043	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
12	R2	All MCs	21	0.0	21	0.0	0.022	8.3	LOS A	0.0	0.2	0.42	0.66	0.42	52.4
Approach			104	4.0	104	4.0	0.043	1.7	NA	0.0	0.2	0.08	0.13	0.08	68.0
All Vehicles			642	4.4	642	4.4	0.252	2.6	NA	0.4	2.9	0.15	0.25	0.15	62.2

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: C:\Users\janmuller\OneDrive - EMM Consulting\Documents\E250102 - Clarence Mod 11\E250094 Clarence Mod 11 SIDRA v3.sipx

MOVEMENT SUMMARY

Site: [121.2] 2.1 CHR/Main Street - 2025 Base PM (2025 Base PM)

Network: [10] 2025 Base PM (Main Street and Wolgan Road)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Give-Way (Two-Way)

Network Scenario: 1 | Local Volumes

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m			km/h	
South: Main Street															
1	L2	All MCs	32	0.0	32	0.0	0.199	5.3	LOS A	0.3	2.1	0.57	0.69	0.57	49.1
3	R2	All MCs	59	5.4	59	5.4	0.199	13.9	LOS A	0.3	2.1	0.57	0.69	0.57	38.7
Approach			91	3.5	91	3.5	0.199	10.9	LOS A	0.3	2.1	0.57	0.69	0.57	43.4
East: Castlereagh Highway															
4	L2	All MCs	62	3.4	62	3.4	0.034	3.1	LOS A	0.0	0.0	0.00	0.59	0.00	60.3
5	T1	All MCs	162	4.5	162	4.5	0.087	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach			224	4.2	224	4.2	0.087	0.9	NA	0.0	0.0	0.00	0.16	0.00	73.3
West: Castlereagh Highway															
11	T1	All MCs	371	6.2	371	6.2	0.194	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
12	R2	All MCs	56	1.9	56	1.9	0.049	7.6	LOS A	0.1	0.6	0.33	0.64	0.33	52.8
Approach			426	5.7	426	5.7	0.194	1.0	NA	0.1	0.6	0.04	0.08	0.04	71.4
All Vehicles			741	5.0	741	5.0	0.199	2.2	NA	0.3	2.1	0.09	0.18	0.09	65.7

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [121.3] 2.1 CHR/Main Street - 2031 Base AM (2031 Base AM)

Network: [11] 2031 Base AM (Main Street and Wolgan Road)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Give-Way (Two-Way)

Network Scenario: 1 | Local Volumes

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh]	[Dist]			km/h	
South: Main Street															
1	L2	All MCs	107	2.9	107	2.9	0.292	6.9	LOS A	0.5	3.6	0.55	0.75	0.61	49.9
3	R2	All MCs	77	2.7	77	2.7	0.292	11.6	LOS A	0.5	3.6	0.55	0.75	0.61	40.4
Approach			184	2.9	184	2.9	0.292	8.8	LOS A	0.5	3.6	0.55	0.75	0.61	47.0
East: Castlereagh Highway															
4	L2	All MCs	55	5.8	55	5.8	0.031	3.1	LOS A	0.0	0.0	0.00	0.59	0.00	59.0
5	T1	All MCs	349	4.8	349	4.8	0.188	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
Approach			404	4.9	404	4.9	0.188	0.4	NA	0.0	0.0	0.00	0.08	0.00	76.2
West: Castlereagh Highway															
11	T1	All MCs	91	4.7	91	4.7	0.046	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
12	R2	All MCs	23	0.0	23	0.0	0.025	8.5	LOS A	0.0	0.3	0.44	0.67	0.44	52.3
Approach			114	3.7	114	3.7	0.046	1.7	NA	0.0	0.3	0.09	0.14	0.09	67.9
All Vehicles			702	4.2	702	4.2	0.292	2.8	NA	0.5	3.6	0.16	0.26	0.17	61.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [121.4] 2.1 CHR/Main Street - 2031 Base PM (2031 Base PM)

Network: [12] 2031 Base PM (Main Street and Wolgan Road)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Give-Way (Two-Way)

Network Scenario: 1 | Local Volumes

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue	Prop. Qued	Eff. Stop of Cycle	Number of Cycles to Depart	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh]	[Dist] m			km/h	
South: Main Street															
1	L2	All MCs	35	0.0	35	0.0	0.239	5.5	LOS A	0.4	2.6	0.62	0.73	0.64	48.2
3	R2	All MCs	64	4.9	64	4.9	0.239	15.9	LOS B	0.4	2.6	0.62	0.73	0.64	37.6
Approach			99	3.2	99	3.2	0.239	12.2	LOS A	0.4	2.6	0.62	0.73	0.64	42.5
East: Castlereagh Highway															
4	L2	All MCs	67	3.1	67	3.1	0.037	3.1	LOS A	0.0	0.0	0.00	0.59	0.00	60.4
5	T1	All MCs	178	4.7	178	4.7	0.096	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
Approach			245	4.3	245	4.3	0.096	0.8	NA	0.0	0.0	0.00	0.16	0.00	73.4
West: Castlereagh Highway															
11	T1	All MCs	405	6.2	405	6.2	0.213	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
12	R2	All MCs	61	1.7	61	1.7	0.055	7.7	LOS A	0.1	0.6	0.34	0.64	0.34	52.7
Approach			466	5.6	466	5.6	0.213	1.0	NA	0.1	0.6	0.05	0.08	0.05	71.4
All Vehicles			811	4.9	811	4.9	0.239	2.3	NA	0.4	2.6	0.10	0.19	0.10	65.4

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [122.1] 2.2 CHR/Wolgan Road - 2025 Base AM (2025 Base AM)

Network: [9] 2025 Base AM (Main Street and Wolgan Road)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Give-Way (Two-Way)

Network Scenario: 1 | Local Volumes

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows	Arrival Flows	Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed		
			[Total HV]	[Total HV]	v/c	sec		[Veh. veh	Dist]			km/h		
			veh/h	%	veh/h	%		m						
East: Castlereagh Highway														
5	T1	All MCs	339 5.0	339 5.0	0.162	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	0.00	79.9
6	R2	All MCs	32 0.0	32 0.0	0.025	7.4	LOS A	0.0	0.3	0.26	0.61	0.26	0.26	53.0
Approach			371 4.5	371 4.5	0.162	0.7	NA	0.0	0.3	0.02	0.05	0.02	0.02	74.1
North: Wolgan Road														
7	L2	All MCs	36 32.4	36 32.4	0.036	5.4	LOS A	0.1	0.5	0.23	0.48	0.23	0.23	46.9
9	R2	All MCs	31 6.9	31 6.9	0.073	10.7	LOS A	0.1	0.7	0.56	0.76	0.56	0.56	38.9
Approach			66 20.6	66 20.6	0.073	7.8	LOS A	0.1	0.7	0.38	0.61	0.38	0.38	44.1
West: Castlereagh Highway														
10	L2	All MCs	38 5.6	38 5.6	0.021	3.1	LOS A	0.0	0.0	0.00	0.59	0.00	0.00	59.1
11	T1	All MCs	116 3.6	116 3.6	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	0.00	80.0
Approach			154 4.1	154 4.1	0.062	0.8	NA	0.0	0.0	0.00	0.15	0.00	0.00	73.6
All Vehicles			591 6.2	591 6.2	0.162	1.5	NA	0.1	0.7	0.06	0.14	0.06	0.06	67.0

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [122.2] 2.2 CHR/Wolgan Road - 2025 Base PM (2025 Base PM)

Network: [10] 2025 Base PM (Main Street and Wolgan Road)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Give-Way (Two-Way)

Network Scenario: 1 | Local Volumes

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh]	[Dist]			km/h
East: Castlereagh Highway														
5	T1	All MCs	206	4.6	206	4.6	0.085	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
6	R2	All MCs	32	10.0	32	10.0	0.038	9.4	LOS A	0.1	0.4	0.47	0.70	51.8
Approach			238	5.3	238	5.3	0.085	1.3	NA	0.1	0.4	0.06	0.09	71.0
North: Wolgan Road														
7	L2	All MCs	39	8.1	39	8.1	0.048	6.7	LOS A	0.1	0.5	0.44	0.61	50.6
9	R2	All MCs	18	0.0	18	0.0	0.052	12.6	LOS A	0.1	0.5	0.65	0.82	37.3
Approach			57	5.6	57	5.6	0.052	8.6	LOS A	0.1	0.5	0.50	0.68	47.4
West: Castlereagh Highway														
10	L2	All MCs	34	3.1	34	3.1	0.019	3.1	LOS A	0.0	0.0	0.00	0.59	60.4
11	T1	All MCs	396	6.4	396	6.4	0.216	0.0	LOS A	0.0	0.0	0.00	0.00	79.9
Approach			429	6.1	429	6.1	0.216	0.2	NA	0.0	0.0	0.00	0.05	77.9
All Vehicles			724	5.8	724	5.8	0.216	1.2	NA	0.1	0.5	0.06	0.11	70.4

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [122.3] 2.2 CHR/Wolgan Road - 2031 Base AM (2031 Base AM)

Network: [11] 2031 Base AM (Main Street and Wolgan Road)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Give-Way (Two-Way)

Network Scenario: 1 | Local Volumes

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]	v/c	sec		[Veh. veh]	[Dist]			km/h
East: Castlereagh Highway														
5	T1	All MCs	371	4.8	371	4.8	0.177	0.0	LOS A	0.0	0.0	0.00	0.00	79.9
6	R2	All MCs	35	0.0	35	0.0	0.028	7.5	LOS A	0.0	0.3	0.27	0.61	53.0
Approach			405	4.4	405	4.4	0.177	0.7	NA	0.0	0.3	0.02	0.05	74.0
North: Wolgan Road														
7	L2	All MCs	39	32.4	39	32.4	0.039	5.4	LOS A	0.1	0.5	0.24	0.48	46.8
9	R2	All MCs	34	6.2	34	6.2	0.087	11.6	LOS A	0.1	0.9	0.59	0.80	38.2
Approach			73	20.3	73	20.3	0.087	8.3	LOS A	0.1	0.9	0.40	0.63	43.8
West: Castlereagh Highway														
10	L2	All MCs	41	5.1	41	5.1	0.023	3.1	LOS A	0.0	0.0	0.00	0.59	59.3
11	T1	All MCs	126	3.3	126	3.3	0.067	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach			167	3.8	167	3.8	0.067	0.8	NA	0.0	0.0	0.00	0.14	73.7
All Vehicles			645	6.0	645	6.0	0.177	1.5	NA	0.1	0.9	0.06	0.14	66.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [122.4] 2.2 CHR/Wolgan Road - 2031 Base PM (2031 Base PM)

Network: [12] 2031 Base PM (Main Street and Wolgan Road)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Give-Way (Two-Way)

Network Scenario: 1 | Local Volumes

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows	Arrival Flows	Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed			
			[Total HV]	[Total HV]	v/c	sec		[Veh. veh	Dist]			km/h			
			veh/h	%	veh/h	%		m							
East: Castlereagh Highway															
5	T1	All MCs	226	4.7	226	4.7	0.094	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
6	R2	All MCs	35	9.1	35	9.1	0.044	9.7	LOS A	0.1	0.5	0.49	0.72	0.49	51.5
Approach			261	5.2	261	5.2	0.094	1.3	NA	0.1	0.5	0.07	0.10	0.07	70.9
North: Wolgan Road															
7	L2	All MCs	42	7.5	42	7.5	0.054	7.0	LOS A	0.1	0.6	0.46	0.64	0.46	50.5
9	R2	All MCs	19	0.0	19	0.0	0.061	14.1	LOS A	0.1	0.6	0.69	0.85	0.69	36.3
Approach			61	5.2	61	5.2	0.061	9.2	LOS A	0.1	0.6	0.53	0.70	0.53	47.1
West: Castlereagh Highway															
10	L2	All MCs	37	2.9	37	2.9	0.020	3.1	LOS A	0.0	0.0	0.00	0.59	0.00	60.6
11	T1	All MCs	433	6.3	433	6.3	0.236	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
Approach			469	6.1	469	6.1	0.236	0.2	NA	0.0	0.0	0.00	0.05	0.00	77.9
All Vehicles			792	5.7	792	5.7	0.236	1.3	NA	0.1	0.6	0.06	0.11	0.06	70.3

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [140.1] 4. Chifley Rd/Clarence Colliery Rd - 2025 Base AM (2025 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Existing site
 Site Category: (None)
 Give-Way (Two-Way)
 Site Scenario: 1 | 3. 2025 Base AM

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]	v/c	sec		[Veh.]	[Dist]		Rate		km/h
			veh/h	%	veh/h	%				veh	m				
East: Chifley Road															
5	T1	All MCs	113	19.6	113	19.6	0.069	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
6	R2	All MCs	11	60.0	11	60.0	0.008	8.3	LOS A	0.0	0.4	0.20	0.58	0.20	51.9
Approach			123	23.1	123	23.1	0.069	0.7	NA	0.0	0.4	0.02	0.05	0.02	76.4
North: Clarence Colliery Road															
7	L2	All MCs	6	66.7	6	66.7	0.035	5.2	LOS A	0.1	0.9	0.01	0.51	0.01	41.6
9	R2	All MCs	27	3.8	27	3.8	0.035	4.6	LOS A	0.1	0.9	0.01	0.51	0.01	52.8
Approach			34	15.6	34	15.6	0.035	4.7	LOS A	0.1	0.9	0.01	0.51	0.01	50.3
West: Chifley Road															
10	L2	All MCs	7	0.0	7	0.0	0.005	7.3	LOS A	0.0	0.1	0.06	0.59	0.06	53.7
11	T1	All MCs	74	21.4	74	21.4	0.046	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach			81	19.5	81	19.5	0.046	0.7	LOS A	0.0	0.1	0.01	0.05	0.01	76.5
All Vehicles			238	20.8	238	20.8	0.069	1.3	NA	0.1	0.9	0.01	0.12	0.01	71.2

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
 Two-Way Sign Control Capacity Model: SIDRA Standard.
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [140.2] 4. Chifley Rd/Clarence Colliery Rd - 2025 Base PM (2025 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Existing site
 Site Category: (None)
 Give-Way (Two-Way)
 Site Scenario: 1 | 3. 2025 Base AM

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]	v/c	sec		[Veh.]	[Dist]		Rate		km/h
			veh/h	%	veh/h	%				veh	m				
East: Chifley Road															
5	T1	All MCs	97	7.6	97	7.6	0.053	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	80.0
6	R2	All MCs	4	100.0	4	100.0	0.004	9.3	LOSA	0.0	0.2	0.25	0.57	0.25	49.6
Approach			101	11.5	101	11.5	0.053	0.4	NA	0.0	0.2	0.01	0.02	0.01	78.0
North: Clarence Colliery Road															
7	L2	All MCs	17	18.8	17	18.8	0.071	4.8	LOSA	0.2	1.7	0.01	0.52	0.01	49.6
9	R2	All MCs	56	1.9	56	1.9	0.071	4.6	LOSA	0.2	1.7	0.01	0.52	0.01	53.2
Approach			73	5.8	73	5.8	0.071	4.6	LOSA	0.2	1.7	0.01	0.52	0.01	52.3
West: Chifley Road															
10	L2	All MCs	1	0.0	1	0.0	0.001	7.3	LOSA	0.0	0.0	0.04	0.60	0.04	53.8
11	T1	All MCs	101	3.1	101	3.1	0.053	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	80.0
Approach			102	3.1	102	3.1	0.053	0.1	LOSA	0.0	0.0	0.00	0.01	0.00	79.6
All Vehicles			276	6.9	276	6.9	0.071	1.4	NA	0.2	1.7	0.01	0.15	0.01	69.5

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
 Two-Way Sign Control Capacity Model: SIDRA Standard.
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [140.3] 4. Chifley Rd/Clarence Colliery Rd - 2031 Base AM (2031 Base AM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Existing site
 Site Category: (None)
 Give-Way (Two-Way)
 Site Scenario: 1 | 3. 2025 Base AM

Vehicle Movement Performance												
Mov ID	Turn	Mov Class	Demand Flows	Arrival Flows	Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV] veh/h %	[Total HV] veh/h %	v/c	sec		[Veh. Dist] veh m				km/h
East: Chifley Road												
5	T1	All MCs	123 19.7	123 19.7	0.076	0.0	LOS A	0.0 0.0	0.00	0.00	0.00	80.0
6	R2	All MCs	12 63.6	12 63.6	0.009	8.5	LOS A	0.0 0.4	0.22	0.58	0.22	51.8
Approach			135 23.4	135 23.4	0.076	0.7	NA	0.0 0.4	0.02	0.05	0.02	76.4
North: Clarence Colliery Road												
7	L2	All MCs	6 66.7	6 66.7	0.038	5.2	LOS A	0.1 1.0	0.01	0.51	0.01	41.6
9	R2	All MCs	29 3.6	29 3.6	0.038	4.6	LOS A	0.1 1.0	0.01	0.51	0.01	52.8
Approach			36 14.7	36 14.7	0.038	4.7	LOS A	0.1 1.0	0.01	0.51	0.01	50.4
West: Chifley Road												
10	L2	All MCs	8 0.0	8 0.0	0.005	7.3	LOS A	0.0 0.1	0.06	0.59	0.06	53.7
11	T1	All MCs	80 21.1	80 21.1	0.050	0.0	LOS A	0.0 0.0	0.00	0.00	0.00	80.0
Approach			88 19.0	88 19.0	0.050	0.7	LOS A	0.0 0.1	0.01	0.06	0.01	76.4
All Vehicles			259 20.7	259 20.7	0.076	1.3	NA	0.1 1.0	0.01	0.12	0.01	71.3

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
 Two-Way Sign Control Capacity Model: SIDRA Standard.
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [140.4] 4. Chifley Rd/Clarence Colliery Rd - 2031 Base

PM (2031 Base PM)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Existing site

Site Category: (None)

Give-Way (Two-Way)

Site Scenario: 1 | 3. 2025 Base AM

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]	v/c	sec		[Veh.]	[Dist]		Rate		km/h
			veh/h	%	veh/h	%				veh	m				
East: Chifley Road															
5	T1	All MCs	106	7.9	106	7.9	0.059	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
6	R2	All MCs	4	100.0	4	100.0	0.004	9.4	LOS A	0.0	0.2	0.27	0.57	0.27	49.5
Approach			111	11.4	111	11.4	0.059	0.4	NA	0.0	0.2	0.01	0.02	0.01	78.1
North: Clarence Colliery Road															
7	L2	All MCs	18	17.6	18	17.6	0.078	4.7	LOS A	0.3	2.0	0.01	0.52	0.01	49.8
9	R2	All MCs	61	1.7	61	1.7	0.078	4.6	LOS A	0.3	2.0	0.01	0.52	0.01	53.3
Approach			79	5.3	79	5.3	0.078	4.6	LOS A	0.3	2.0	0.01	0.52	0.01	52.4
West: Chifley Road															
10	L2	All MCs	1	0.0	1	0.0	0.001	7.3	LOS A	0.0	0.0	0.04	0.60	0.04	53.8
11	T1	All MCs	111	2.9	111	2.9	0.058	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach			112	2.8	112	2.8	0.058	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	79.6
All Vehicles			301	6.6	301	6.6	0.078	1.4	NA	0.3	2.0	0.01	0.15	0.01	69.6

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

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

 **Site: [150.1] 5. GWH/Station St - 2025 Base AM (2025 Base AM)**

Network: [1] 2025 Base AM (Station Street and Harley Avenue)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Existing Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 126.0 seconds (Site User-Given Cycle Time)

Network Scenario: 1 | Local Volumes Site Scenario: 1 | 4. 2025 Base AM

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows	Arrival Flows	Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	v/c	sec		[Veh. veh]	[Dist] m				km/h
SouthEast: Great Western Highway													
5	T1	All MCs	458 18.9	458 18.9	*0.330	2.1	LOS A	5.8	47.4	0.23	0.21	0.23	38.9
6	R2	All MCs	23 4.5	23 4.5	0.035	6.5	LOS A	0.3	2.2	0.22	0.54	0.22	36.5
Approach			481 18.2	481 18.2	0.330	2.4	LOS A	5.8	47.4	0.23	0.22	0.23	38.8
NorthEast: Station Street													
7	L2	All MCs	3 0.0	3 0.0	0.029	67.7	LOS E	0.2	1.3	0.96	0.63	0.96	18.8
9	R2	All MCs	19 38.9	19 38.9	*0.268	72.7	LOS F	1.2	11.3	0.99	0.71	0.99	26.4
Approach			22 33.3	22 33.3	0.268	71.9	LOS F	1.2	11.3	0.99	0.70	0.99	25.6
NorthWest: Great Western Highway													
10	L2	All MCs	27 30.8	27 30.8	0.313	8.0	LOS A	5.5	44.1	0.22	0.23	0.22	54.0
11	T1	All MCs	414 15.8	414 15.8	0.313	2.1	LOS A	5.5	44.1	0.22	0.23	0.22	55.7
Approach			441 16.7	441 16.7	0.313	2.5	LOS A	5.5	44.1	0.22	0.23	0.22	55.5
All Vehicles			944 17.8	944 17.8	0.330	4.0	LOS A	5.8	47.4	0.24	0.24	0.24	42.6

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

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

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Qued	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped]	[Dist] m			sec	m	m/sec
NorthEast: Station Street											
P3	Full	1	57.1	LOS E	0.0	0.0	0.95	0.95	211.0	200.0	0.95
NorthWest: Great Western Highway											
P4	Full	7	57.2	LOS E	0.0	0.0	0.95	0.95	211.0	200.0	0.95
All Pedestrians		8	57.2	LOS E	0.0	0.0	0.95	0.95	211.0	200.0	0.95

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

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

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

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MOVEMENT SUMMARY

 Site: [150.2] 5. GWH/Station St - 2025 Base PM (2025 Base PM)

Network: [2] 2025 Base PM (Station Street and Harley Avenue)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Existing Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 126.0 seconds (Site User-Given Cycle Time)

Network Scenario: 1 | Local Volumes Site Scenario: 1 | 4. 2025 Base AM

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows	Arrival Flows	Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed	
			[Total HV]	[Total HV]	v/c	sec		[Veh. veh	Dist]				km/h	
			veh/h	%	veh/h	%		veh	m					
SouthEast: Great Western Highway														
5	T1	All MCs	474 9.3	474 9.3	0.314	2.1	LOS A	6.0	45.0	0.23	0.20	0.23	39.0	
6	R2	All MCs	7 0.0	7 0.0	0.013	7.1	LOS A	0.1	0.7	0.24	0.53	0.24	36.2	
Approach			481 9.2	481 9.2	0.314	2.2	LOS A	6.0	45.0	0.23	0.21	0.23	38.9	
NorthEast: Station Street														
7	L2	All MCs	11 0.0	11 0.0	0.096	68.5	LOS E	0.6	4.5	0.97	0.68	0.97	18.7	
9	R2	All MCs	23 13.6	23 13.6	*0.261	71.2	LOS F	1.5	11.4	0.99	0.71	0.99	26.9	
Approach			34 9.4	34 9.4	0.261	70.4	LOS E	1.5	11.4	0.99	0.70	0.99	24.8	
NorthWest: Great Western Highway														
10	L2	All MCs	19 5.6	19 5.6	*0.393	8.0	LOS A	8.0	61.9	0.25	0.24	0.25	55.0	
11	T1	All MCs	561 11.8	561 11.8	0.393	2.4	LOS A	8.0	61.9	0.25	0.24	0.25	55.4	
Approach			580 11.6	580 11.6	0.393	2.5	LOS A	8.0	61.9	0.25	0.24	0.25	55.4	
All Vehicles			1095 10.5	1095 10.5	0.393	4.5	LOS A	8.0	61.9	0.26	0.24	0.26	43.2	

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

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

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Qued	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist]			sec	m	m/sec
					ped	m					
NorthEast: Station Street											
P3	Full	1	57.1	LOS E	0.0	0.0	0.95	0.95	211.0	200.0	0.95
NorthWest: Great Western Highway											
P4	Full	8	57.2	LOS E	0.0	0.0	0.95	0.95	211.0	200.0	0.95
All Pedestrians		9	57.2	LOS E	0.0	0.0	0.95	0.95	211.0	200.0	0.95

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

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

 **Site: [150.3] 5. GWH/Station St - 2031 Base AM** (2031 Base AM)

Network: [3] 2031 Base AM (Station Street and Harley Avenue)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Existing Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 126.0 seconds (Site User-Given Cycle Time)

Network Scenario: 1 | Local Volumes Site Scenario: 1 | 4. 2025 Base AM

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows	Arrival Flows	Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number Rate to Depart	Aver. Speed
			[Total HV]	[Total HV]	v/c	sec		[Veh. veh	Dist]				km/h
			veh/h	%	veh/h	%		veh	m				
SouthEast: Great Western Highway													
5	T1	All MCs	502 18.9	502 18.9	*0.361	2.2	LOS A	6.6	54.0	0.24	0.22	0.24	38.9
6	R2	All MCs	25 4.2	25 4.2	0.040	6.7	LOS A	0.3	2.5	0.23	0.54	0.23	36.4
Approach			527 18.2	527 18.2	0.361	2.4	LOS A	6.6	54.0	0.24	0.23	0.24	38.8
NorthEast: Station Street													
7	L2	All MCs	3 0.0	3 0.0	0.029	67.7	LOS E	0.2	1.3	0.96	0.63	0.96	18.8
9	R2	All MCs	21 40.0	21 40.0	*0.300	72.9	LOS F	1.4	12.7	0.99	0.71	0.99	26.3
Approach			24 34.8	24 34.8	0.300	72.3	LOS F	1.4	12.7	0.99	0.70	0.99	25.6
NorthWest: Great Western Highway													
10	L2	All MCs	31 31.0	31 31.0	0.344	8.1	LOS A	6.3	50.2	0.23	0.24	0.23	53.9
11	T1	All MCs	454 15.8	454 15.8	0.344	2.2	LOS A	6.3	50.2	0.23	0.24	0.23	55.5
Approach			484 16.7	484 16.7	0.344	2.6	LOS A	6.3	50.2	0.23	0.24	0.23	55.3
All Vehicles			1036 17.9	1036 17.9	0.361	4.1	LOS A	6.6	54.0	0.25	0.25	0.25	42.6

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

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

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Qued	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist]			sec	m	m/sec
					ped	m					
NorthEast: Station Street											
P3	Full	1	57.1	LOS E	0.0	0.0	0.95	0.95	211.0	200.0	0.95
NorthWest: Great Western Highway											
P4	Full	7	57.2	LOS E	0.0	0.0	0.95	0.95	211.0	200.0	0.95
All Pedestrians		8	57.2	LOS E	0.0	0.0	0.95	0.95	211.0	200.0	0.95

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

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

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

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MOVEMENT SUMMARY

 Site: [150.4] 5. GWH/Station St - 2031 Base PM (2031 Base PM)

Network: [4] 2031 Base PM (Station Street and Harley Avenue)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Existing Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 126.0 seconds (Site User-Given Cycle Time)

Network Scenario: 1 | Local Volumes Site Scenario: 1 | 4. 2025 Base AM

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number Rate to Depart	Aver. Speed
			[Total HV]	[Total HV]			v/c	sec		[Veh. veh]	[Dist] m				km/h
SouthEast: Great Western Highway															
5	T1	All MCs	519	9.3	519	9.3	0.344	2.2	LOS A	6.8	51.1	0.24	0.21	0.24	38.9
6	R2	All MCs	8	0.0	8	0.0	0.016	7.5	LOS A	0.1	0.9	0.26	0.54	0.26	36.1
Approach			527	9.2	527	9.2	0.344	2.3	LOS A	6.8	51.1	0.24	0.22	0.24	38.9
NorthEast: Station Street															
7	L2	All MCs	12	0.0	12	0.0	0.106	68.6	LOS E	0.7	4.9	0.97	0.68	0.97	18.7
9	R2	All MCs	25	12.5	25	12.5	*0.282	71.3	LOS F	1.6	12.3	0.99	0.72	0.99	26.9
Approach			37	8.6	37	8.6	0.282	70.4	LOS E	1.6	12.3	0.99	0.70	0.99	24.8
NorthWest: Great Western Highway															
10	L2	All MCs	21	5.0	21	5.0	*0.431	8.1	LOS A	9.3	71.2	0.26	0.26	0.26	54.9
11	T1	All MCs	615	11.8	615	11.8	0.431	2.5	LOS A	9.3	71.2	0.26	0.26	0.26	55.2
Approach			636	11.6	636	11.6	0.431	2.7	LOS A	9.3	71.2	0.26	0.26	0.26	55.2
All Vehicles			1200	10.4	1200	10.4	0.431	4.6	LOS A	9.3	71.2	0.27	0.25	0.27	43.1

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

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

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Qued	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped]	[Dist] m			sec	m	m/sec
NorthEast: Station Street											
P3	Full	1	57.1	LOS E	0.0	0.0	0.95	0.95	211.0	200.0	0.95
NorthWest: Great Western Highway											
P4	Full	8	57.2	LOS E	0.0	0.0	0.95	0.95	211.0	200.0	0.95
All Pedestrians		9	57.2	LOS E	0.0	0.0	0.95	0.95	211.0	200.0	0.95

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

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

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

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MOVEMENT SUMMARY

STOP Site: [160.1] 6. GWH/Harley Av - 2025 Base AM (2025 Base AM)

Network: [1] 2025 Base AM (Station Street and Harley Avenue)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Existing Site

Site Category: (None)

Stop (Two-Way)

Network Scenario: 1 | Local Volumes

Site Scenario: 1 | 5. 2025 Base AM

Vehicle Movement Performance												
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %	Arrival Flows [Total HV] veh/h %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh.] veh	Prop. Queued Dist] m	Eff. Stop of Cycle Rate to Depart	Number of Cycles	Aver. Speed km/h
East: Great Western Highway												
5	T1	All MCs	463 19.3	463 19.3	0.283	0.1	LOS A	0.0	0.0	0.00	0.00	59.8
6	R2	All MCs	62 20.3	62 20.3	0.086	8.8	LOS A	0.3	2.6	0.51	0.73	46.7
Approach			525 19.4	525 19.4	0.283	1.1	NA	0.3	2.6	0.06	0.09	56.5
North: Harley Avenue												
7	L2	All MCs	55 23.1	55 23.1	0.105	12.5	LOS A	0.4	2.9	0.53	0.98	44.7
9	R2	All MCs	1 0.0	1 0.0	0.105	27.7	LOS B	0.4	2.9	0.53	0.98	38.7
Approach			56 22.6	56 22.6	0.105	12.8	LOS A	0.4	2.9	0.53	0.98	44.6
West: Great Western Highway												
10	L2	All MCs	3 0.0	3 0.0	0.002	5.5	LOS A	0.0	0.0	0.00	0.58	52.0
11	T1	All MCs	434 14.3	434 14.3	0.254	0.1	LOS A	0.0	0.0	0.00	0.00	59.8
Approach			437 14.2	437 14.2	0.254	0.1	NA	0.0	0.0	0.00	0.00	59.8
All Vehicles			1018 17.4	1018 17.4	0.283	1.3	NA	0.4	2.9	0.06	0.10	57.0

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

STOP Site: [160.2] 6. GWH/Harley Av - 2025 Base PM (2025 Base PM)

Network: [2] 2025 Base PM (Station Street and Harley Avenue)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Existing Site

Site Category: (None)

Stop (Two-Way)

Network Scenario: 1 | Local Volumes

Site Scenario: 1 | 5. 2025 Base AM

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m		Rate		km/h
East: Great Western Highway															
5	T1	All MCs	512	9.3	512	9.3	0.287	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
6	R2	All MCs	41	2.6	41	2.6	0.060	9.1	LOS A	0.2	1.5	0.55	0.77	0.55	46.6
Approach			553	8.8	553	8.8	0.287	0.8	NA	0.2	1.5	0.04	0.06	0.04	57.6
North: Harley Avenue															
7	L2	All MCs	74	2.9	74	2.9	0.149	12.7	LOS A	0.5	3.6	0.60	1.00	0.60	44.8
9	R2	All MCs	1	0.0	1	0.0	0.149	37.1	LOS C	0.5	3.6	0.60	1.00	0.60	38.1
Approach			75	2.8	75	2.8	0.149	13.0	LOS A	0.5	3.6	0.60	1.00	0.60	44.8
West: Great Western Highway															
10	L2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.0
11	T1	All MCs	576	12.6	576	12.6	0.333	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			577	12.6	577	12.6	0.333	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles			1204	10.2	1204	10.2	0.333	1.2	NA	0.5	3.6	0.06	0.09	0.06	57.4

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

STOP Site: [160.3] 6. GWH/Harley Av - 2031 Base AM (2031 Base AM)

Network: [3] 2031 Base AM (Station Street and Harley Avenue)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Existing Site

Site Category: (None)

Stop (Two-Way)

Network Scenario: 1 | Local Volumes

Site Scenario: 1 | 5. 2025 Base AM

Vehicle Movement Performance												
Mov ID	Turn	Mov Class	Demand Flows [Total HV]	Arrival Flows [Total HV]	Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue [Veh.]	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			veh/h %	veh/h %	v/c	sec		veh	Dist] m			km/h
East: Great Western Highway												
5	T1	All MCs	507 19.3	507 19.3	0.310	0.1	LOS A	0.0	0.0	0.00	0.00	59.8
6	R2	All MCs	68 20.0	68 20.0	0.102	9.3	LOS A	0.4	3.0	0.54	0.76	46.4
Approach			576 19.4	576 19.4	0.310	1.2	NA	0.4	3.0	0.06	0.09	56.3
North: Harley Avenue												
7	L2	All MCs	60 22.8	60 22.8	0.125	13.3	LOS A	0.4	3.5	0.56	1.01	44.3
9	R2	All MCs	1 0.0	1 0.0	0.125	33.2	LOS C	0.4	3.5	0.56	1.01	38.1
Approach			61 22.4	61 22.4	0.125	13.6	LOS A	0.4	3.5	0.56	1.01	44.2
West: Great Western Highway												
10	L2	All MCs	3 0.0	3 0.0	0.002	5.5	LOS A	0.0	0.0	0.00	0.58	52.0
11	T1	All MCs	476 14.4	476 14.4	0.279	0.1	LOS A	0.0	0.0	0.00	0.00	59.8
Approach			479 14.3	479 14.3	0.279	0.1	NA	0.0	0.0	0.00	0.00	59.8
All Vehicles			1116 17.4	1116 17.4	0.310	1.4	NA	0.4	3.5	0.06	0.10	56.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

STOP Site: [160.4] 6. GWH/Harley Av - 2031 Base PM (2031 Base PM)

Network: [4] 2031 Base PM (Station Street and Harley Avenue)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Existing Site

Site Category: (None)

Stop (Two-Way)

Network Scenario: 1 | Local Volumes

Site Scenario: 1 | 5. 2025 Base AM

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]	v/c	sec		[Veh. veh	[Dist] m		Rate		km/h
East: Great Western Highway															
5	T1	All MCs	560	9.2	560	9.2	0.314	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
6	R2	All MCs	45	2.3	45	2.3	0.073	9.8	LOS A	0.3	1.8	0.58	0.80	0.58	46.3
Approach			605	8.7	605	8.7	0.314	0.8	NA	0.3	1.8	0.04	0.06	0.04	57.5
North: Harley Avenue															
7	L2	All MCs	81	2.6	81	2.6	0.182	13.7	LOS A	0.6	4.4	0.66	1.00	0.66	44.3
9	R2	All MCs	1	0.0	1	0.0	0.182	46.7	LOS D	0.6	4.4	0.66	1.00	0.66	37.3
Approach			82	2.6	82	2.6	0.182	14.1	LOS A	0.6	4.4	0.66	1.00	0.66	44.3
West: Great Western Highway															
10	L2	All MCs	1	0.0	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	52.0
11	T1	All MCs	632	12.7	632	12.7	0.365	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach			633	12.6	633	12.6	0.365	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.7
All Vehicles			1320	10.2	1320	10.2	0.365	1.3	NA	0.6	4.4	0.06	0.09	0.06	57.3

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Annexure C

Current traffic management plan



Traffic Management Plan

Clarence Colliery and Lidsdale Siding

13 June 2024

DOCUMENT CONTROL

DOCUMENT CONTROL		
DOCUMENT DETAILS	Title:	Traffic Management Plan
	Applicant / Mine:	Clarence Colliery Lidsdale Siding
	Date:	13 June 2024
	Revision No.:	Rev.1.0
	Approved by	CHPP Manager and REA Controller – Clarence Colliery

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1 INTRODUCTION

This Transport Management Plan (**TMP**) has been prepared by Centennial Coal Company Pty Ltd (**Centennial**) to manage the haulage of coal product between Clarence Colliery (DA 504-00) and Lidsdale Siding (SSD 08_0023). This TMP has been prepared to satisfy Condition 19B, Schedule 3 of DA 504-00.

The transport activities outlined in this TMP principally relate to the transport of coal product from Clarence Colliery to Lidsdale Siding (or to Mt Piper Power Station (**MPPS**)), via the haulage routes set out in MOD10 of DA 504-00 and MOD5 of SSD08_0023.

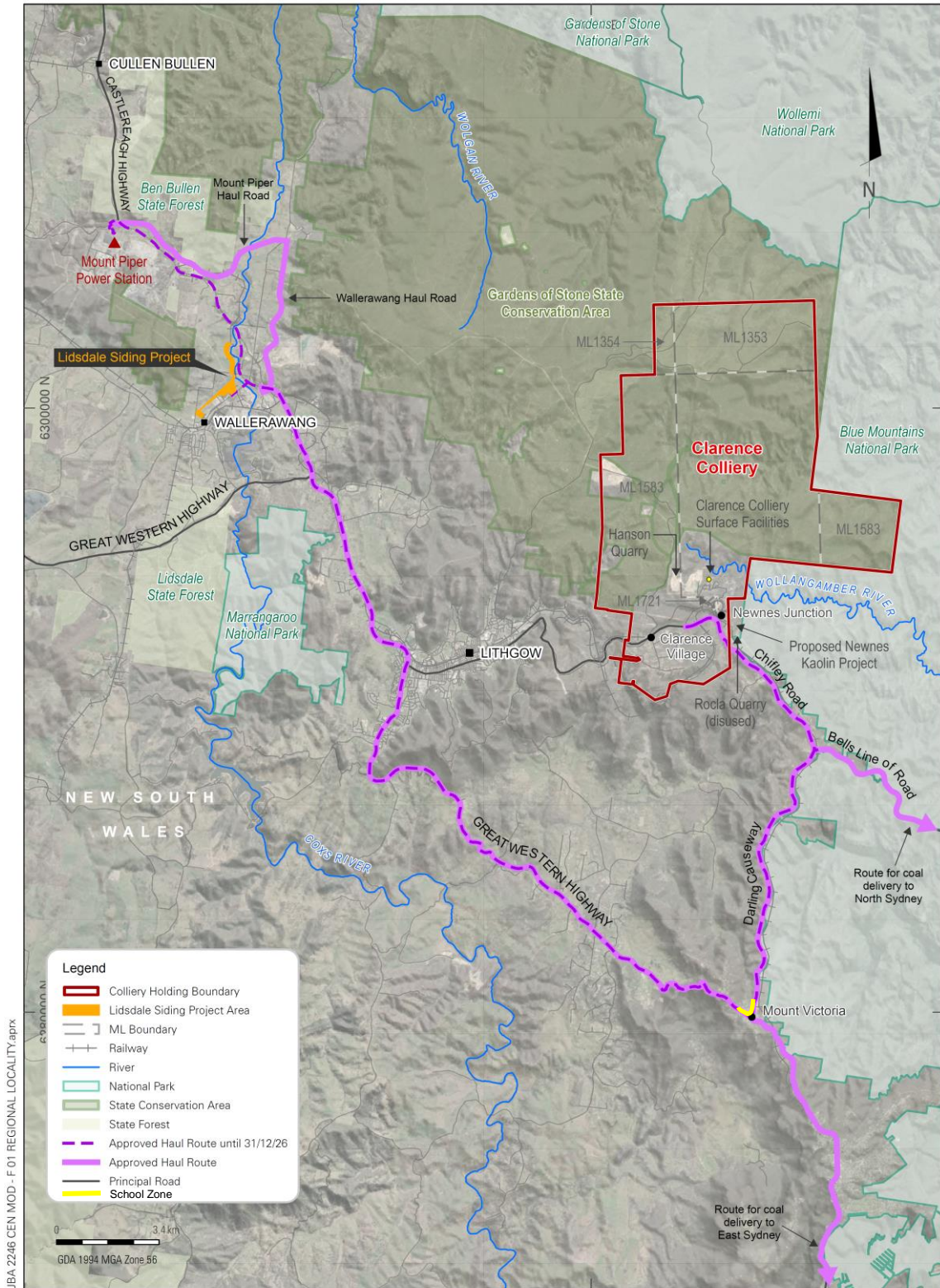
Figure 1 presents the MOD10 specific approved transport route which is shown by the dark purple dashed line. **Figure 2** presents all the approved haulage routes.

Whilst Clarence Colliery has approval to truck limited quantities of coal to the east of Lithgow via Bells Line of Road and the Great Western Highway, this TMP has been developed to assist in the management of potential transport related issues during the haulage of coal product between Clarence Colliery and Lidsdale Siding (or MPPS), via the approved haulage route (**Figure 1**) which was approved by MOD 10.

In addition to this TMP, Clarence Colliery and Lidsdale Siding have a number of site specific standards and procedures to manage internal traffic and surface transportation at each site. These documents are updated from time to time in accordance with the internal Centennial review requirements and include:

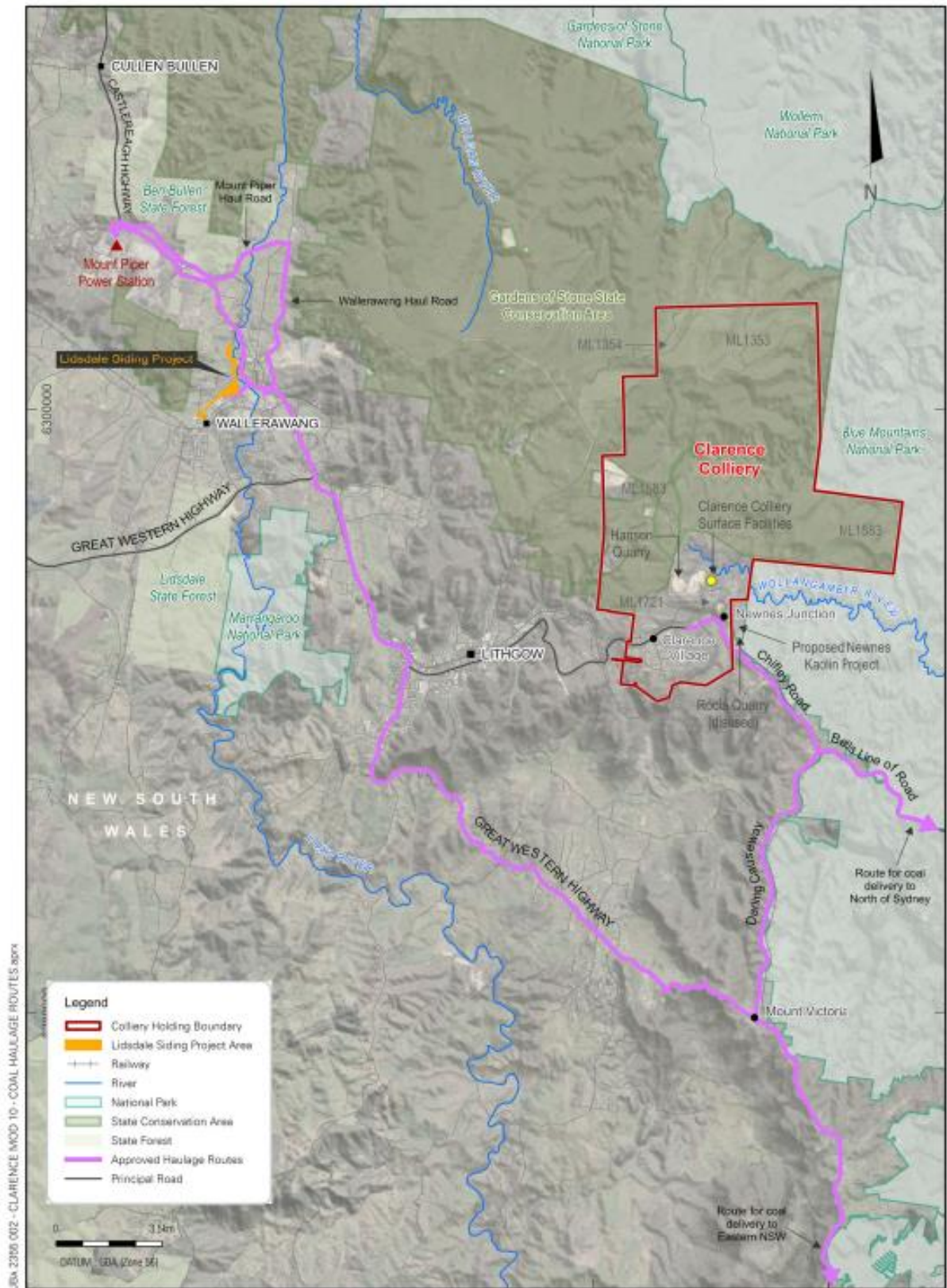
- Centennials *Air Quality and Greenhouse Gas Management Plan Western Region 2021*
- Clarence Colliery:
 - *CL 29 Surface Transport Management Plan 2022*
 - *CL-29-01 Operation of Surface Transport Standard 2019*
 - *CL-29-02 Haulage Management Standard 2022*
 - *Colliery Environmental Management Strategy 2021*
- Lidsdale Siding:
 - *SCSO-TA-1216 Coal Truck Delivery Induction 2022*
 - *SCSO-MS-004 Roads and Other Vehicle Operating Areas Management*
 - *Environmental Management Strategy Springvale Coal Services Operations 2021*

This TMP is not intended to supersede any of these existing standards and procedures. This TMP is intended to outline transport management measures for coal haulage trucks utilising the public road network to destinations to the west (Lidsdale Siding or MPPS) of Clarence Colliery as approved by MOD10.



CENTENNIAL COAL

Figure 1 –Coal Transport Routes (as approved by DA504-00, MOD10)



CENTENNIAL COAL
Coal Haulage Routes

Figure 2 –Coal Transport Routes

1.1 Site location

Clarence Colliery is an underground coal mine within the Western Coalfield of New South Wales (**NSW**) approximately 10 kilometres (**km**) east of Lithgow in the Lithgow local government area (**LGA**). Clarence has been operating since around the 1980's. The Clarence pit top surface facilities are located on freehold land to the north of Chifley Road (a continuation of Bells Line of Road) and to the north of the Main Western Rail Line. Road access to Clarence Colliery is directly from the Clarence Colliery Road. Land uses surrounding Clarence include extractive industries, rural residential dwellings, conservation and forestry.

Lidsdale Siding is an existing rail loading facility, used for the blending, transfer and dispatch of coal to and from Centennial's Western Coal Services (**WCS**) Project and to MPPS. The facility is approximately 500 metres (**m**) north of Wallerawang and approximately 9 km north-west of Lithgow. The Lidsdale Siding site access is via Main Street, Wallerawang, via the Castlereagh Highway. The primary land uses immediately around Lidsdale Siding include, community, commercial and industrial uses.

1.2 Transport limitations

Centennial is approved to transport up to 300,000 tpa of coal by road in total until the lapse of DA 504-00, including up to 200,000 tpa of coal by road to Eastern NSW or to the north of Sydney and up to 200,000 tpa of coal to the west via two authorised traffic routes (see **Table 1**). The volumes of coal being transported to the west will be delivered to MPPS either directly or via the Lidsdale Siding facility. The primary purpose of which is to maintain current coal supply volumes and energy security at the MPPS. Development consent has been granted to transport these volumes of coal until the lapse of DA 504-00 in December 2026.

Table 1 summarises the relevant statutory requirements associated with the transportation limits as set out in each of the development consents that authorise:

- Clarence Colliery to transport coal to the Lidsdale Siding or MPPS (including return unladen trucks back to Clarence Colliery), and
- Lidsdale Siding to accept and unload the coal from Clarence Colliery.

Table 1 – Relevant Statutory Requirements

Activity	Approved operations under MOD10 and MOD5
Clarence Colliery – DA 504-00	
Coal transported by road	A total of up to 300,000 tpa of coal products can be transported by road from site, including: <ul style="list-style-type: none"> • Up to 200,000 tpa to the west via the Darling Causeway and the Great Western Highway and approved routes to the MPPS and/or the Lidsdale Siding; and/or • Up to 200,000 tpa to locations north of Sydney or Eastern NSW.
Road transport hours	Haulage of coal to the west is authorised between the hours of: <ul style="list-style-type: none"> • 7 am to 10 pm Monday to Saturday; and • 8 am to 10 pm on Sunday and public holidays.

Activity	Approved operations under MOD10 and MOD5
Eastern haulage route	<ul style="list-style-type: none"> • Left from Clarence Colliery Road to head east on Chifley Road; or • From the intersection of Chifley Road and Darling Causeway, either: <ul style="list-style-type: none"> • Turn right onto Darling Causeway, travel south towards Mount Victoria until turning left from Station Street onto Harley Avenue and left again onto the Great Western Highway (for delivery of coal to eastern NSW); or • Continue to north of Sydney via Bells Line of Road.
Western haulage route	<p>Option 1 (Western Haulage Route) to the MPPS:</p> <ul style="list-style-type: none"> • East on Chifley Road, Right onto Darling Causeway, Station Street, right to Great Western Highway and the Castlereagh Highway, left to Wallerawang Haul Road and left onto Mount Piper Haul Road into the MPPS; or <p>Option 2 (alternate Western Haulage Route) to MPPS or Lidsdale Siding:</p> <ul style="list-style-type: none"> • Chifley Road, Darling Causeway, Station Street, Great Western Highway, Castlereagh Highway then either: <ul style="list-style-type: none"> ○ left onto Main Street at Wallerawang and then right off Main Street into the Lidsdale Siding; or ○ Continue further 8 km, left onto Boulder Road, left off Boulder Road into the MPPS.
Road transport Route	No coal truck movements through the City of Lithgow without the prior approval of the Council.
Lidsdale Siding – SSD 08_0223	
Coal receipt and transport	By conveyor, by rail and by truck. Truck deliveries are authorised up until 31 December 2026.
Coal receipt by truck	<p>Receive up to 25 laden coal trucks per day between hours of:</p> <ul style="list-style-type: none"> • 7 am to 10 pm Monday to Saturday; and • 8 am to 10 pm on Sundays and public holidays.

1.3 Objectives and outcomes

The primary objective of this TMP is to ensure the transport operations between Clarence Colliery and Lidsdale Siding or MPPS are undertaken in a manner that minimises impacts to other road users and residents and, ensure that Clarence Colliery complies with DA5004-00, Schedule 3, Condition 19B.

Table 2 outlines the objectives and outcomes with respect to road transport management between Clarence Colliery and Lidsdale Siding or MPPS.

Table 2 – Objectives and outcomes

Objective	Outcome
a) To ensure compliance with the criteria of Clarence Colliery DA 504-00, Lidsdale Siding SSD 08_0023 and reasonable community expectations.	Compliance with all relevant criteria as nominated in: <ul style="list-style-type: none"> • Clarence Colliery DA 504-00 and Environment Protection Licence (EPL) 726, and • Lidsdale Siding SSD 08_0023 and EPL 5129, and • reasonable community expectations.
b) To implement transport management measures during all stages of road haulage	<ul style="list-style-type: none"> • All identified transport management measures implemented
c) To implement a monitoring program to establish compliance or otherwise relevant criteria during all stages of road haulage	<ul style="list-style-type: none"> • All identified monitoring undertaken in accordance with this TMP
d) To implement a complaints handling and response protocol	<ul style="list-style-type: none"> • Complaints (if any) handled and responded to in an appropriate manner in accordance with the EPL and the development consents for Clarence Colliery and Lidsdale Siding as relevant • All complaints recorded and reported in accordance with annual reporting requirements
e) To implement corrective and preventative actions, if required	<ul style="list-style-type: none"> • Corrective and preventative actions implemented, where required
f) To implement an incident reporting program, if required	<ul style="list-style-type: none"> • Incidents (if any) investigated and reported in an appropriate manner in accordance with the relevant legislation
g) To implement a program for continual improvement of strategies	<ul style="list-style-type: none"> • Periodic review of this TMP to ensure the outcomes of the TMP are achieved

Table 3 sets out the requirements of DA504-00 Schedule 3, Condition 19B including where each requirement has been addressed within this TMP. Condition 19A requires that prior to the commencement of coal haulage operations approved by MOD10, the “applicant must, in consultation with Transport for NSW (TfNSW), prepare and implement a Traffic Management Plan for the development”. The TMP must include the details set out in **Table 3**.

Table 3 – Requirements of the Traffic Management Plan

Objective	Section
Prior to the commencement of increased coal haulage approved under Modification 10, the Applicant must in consultation with TfNSW, prepare and implement a Traffic Management Plan for the development.	This document Section 1.4
a) Include details of i. all transport routes and traffic types to be used for coal haulage.	Section 2
ii. Measures to be implemented to minimise <ul style="list-style-type: none"> • Traffic safety issues and disruption to local road users during coal haulage including minimising potential for conflict with school bus operations, school zones, road works and high pedestrian activity areas • Impacts on road network efficiency along the coal haulage route 	Heavy vehicle speed – Section 4.2 Driver fatigue – Section 4.3 Compression braking – Section 4.4 Noise – Section 4.5 Covering of loads – Section 4.6 Vehicle departure / arrival – Section 4.7 Breakdowns / incidents – Section 4.8
b. Include a Drivers Code of Conduct to be applied to the Applicants employees and contractors	Section 4
c. Describe the measures to be put in place to ensure compliance with the Drivers Code of Conduct	Section 4.1.1 Section 5

1.4 Consultation

Centennial has consulted with TfNSW. **Table 4** presents the outcomes from the consultation with TfNSW and where comments have been addressed. **Appendix 1** provides a copy of the formal consultation and feedback.

Table 4 – Outcomes of Consultation with Transport for NSW

Comment	Outcome
Figure 1 in the TMP identifies the haulage routes approved under the consent for the modification for both Lidsdale Siding and Clarence Colliery operations. All identified school zones and high pedestrian areas should be clearly illustrated on the route map to confirm acknowledgement of potential for conflict during coal haulage.	School zones have been highlighted on the route map.

Comment	Outcome
Both the TMP and Section 4.2.1 in the Code of Conduct seeks to minimise the impact of laden trucks passing through school zones by ensuring no dispatch of coal from the Clarence Colliery occurs during 8am to 9am and 2pm to 3pm school days. TfNSW recommends these restrictions be extended to the full duration of school zone operation hours (8am to 9:30am and 2:30pm to 4pm) during the school term.	Dispatch times have been updated to cover full duration of school zone operation hours.

2 ROAD NETWORK AND HAUALGE ROUTE

2.1 Existing road network

TfNSW in partnership with local governments establishes an administrative framework of State, Regional and Local Road categories to help manage the extensive network of roads.

State Roads are managed and financed by TfNSW, and Regional / Local Roads are managed and financed by Councils. Notwithstanding, Regional Roads perform an intermediate function between the main arterial network of State Roads and Council-controlled Local Roads and therefore received financial assistance from TfNSW. The key road network relevant to this TMP are outlined in **Table 5**.

Table 5 - Road Network between Clarence Colliery and Lidsdale Siding / MPPS

Road network	Description
Great Western Highway	The Great Western Highway is a State Highway (Number 5) in NSW, Australia. From east to west, the highway links Sydney with Bathurst, on the state's Central Tablelands. The highway is a high-standard arterial road, which either has multiple traffic lanes in each direction or where there is only a single traffic lane in each direction, the road has wide sealed shoulders
Castlereagh Highway	Castlereagh Highway is a State Highway (Number 18) located in NSW and Queensland, Australia. The highway's northern terminus is at a junction with the Carnarvon Highway, south of St George, Queensland. Its southern terminus is at a junction with the Great Western Highway at Marrangaroo, 10km northwest of Lithgow. Around the subject site, Castlereagh Highway has a single lane in each direction (with additional turning lanes provided at the Main Road and Boulder Road intersection). Most of the Castlereagh Highway is signposted at 100km/hr however has a speed limit of 80km/h near Main Road and Boulder Road intersection.
Clarence Colliery Road	Clarence Colliery Road is a private road and is the main access road connecting to the main car park and gates of Clarence pit top area. Clarence Colliery Road intersects Chifley Road approximately 10km east of Lithgow. Clarence Colliery Road is a two-lane two-way sealed road

Road network	Description
	with narrow shoulder widths. The road has a sign-posted speed limit of 50km/h.
Darling Causeway (Station Street)	The Darling Causeway is a State Road (No 184) and is approximately 10-km long from Bell to Mount Victoria. The road has been constructed to a generally similar sealed width as Chifley Road and the Bells Line of Road route east of Bell and is generally between 7–8 m wide. Darling Causeway has wide gravel shoulders along most sections. The sign-posted speed limit is generally 80km/h in the rural sections. Within the urban area of Mount Victoria, the road (Station Street) has a 60km/h speed limit and increased road width and kerb and guttering in the areas where kerbside parking occurs.
Chifley Road	Chifley Road south of Clarence Colliery Road is a State Road (No 516) that extends west to Lithgow and southeast to Bell. Most sections of Chifley Road are two-way two-lane sealed roads and some parts have additional lanes or increased shoulder widths to improve road safety. The general two-way two-lane road width between Clarence Colliery Road and Bell is approximately 7.2–7.6m. Chifley Road is approximately 20km long from Lithgow in the west to Bell in the east. The road has a sign-posted speed limit of 80km/h.
Boulder Road	Boulder Road is a local road under the care and maintenance of Lithgow City Council with a speed limit of 60km/h. The road is currently configured as three-lane with two lanes provided for the eastbound direction.
Main Street	Main Street is a local road under the care and maintenance of the Lithgow City Council with a speed limit of 50km/h. The road is currently configured as two-lane with one lane provided in each direction.

2.2 Haulage route

Under DA 504-00 there is approval for two main haulage routes, namely the Eastern Haulage Route (not the subject of this TMP but included for clarity) and the Western Haulage Route, of which there are two options. Details of each of the haulage routes are set out below.

- The Eastern Haulage Route, involving either:
 - Trucks turning left from Clarence Colliery Road onto Chifley Road; or
 - Trucks continue east to where Chifley Road intersects with Darling Causeway;
 - From the intersection of Chifley Road and Darling Causeway, there are two options:
 - The majority of trucks turn right onto Darling Causeway and travel south towards Mount Victoria until turning left from Station Street onto Harley Avenue and left again onto the Great Western Highway (for delivery of coal to eastern NSW); or
 - A small proportion of trucks continue to destinations via Bells Line of Road.
- The Western Haulage Route, which is made up of two options, including:

- Option 1: which entails the transport of coal from the Clarence Colliery to the MPPS via Chifley Road, the Darling Causeway, Station Street, Great Western Highway and the Castlereagh Highway to the private haul roads, Wallerawang Haul Road and the Mount Piper Haul Road; or
- Option 2 (alternate Western Haulage Route): Coal haulage from the Clarence along Chifley Road, Darling Causeway, Station Street, Great Western Highway, Castlereagh Highway followed by either:
 - Continuing along the Castlereagh Highway for a further 500 m beyond the Wallerawang Haul Road turn off and turn left onto Main Street at Wallerawang and then turning right off Main Street into the Lidsdale Siding; or
 - Continuing along the Castlereagh Highway for approximately 8 km beyond the Wallerawang Haul Road to turn left onto Boulder Road and then left off Boulder Road into the MPPS.

All trucks delivering coal to either the Lidsdale Siding and/or directly to the MPPS then return to Clarence via the reverse route. Trucks do not traverse through the City of Lithgow without the prior approval of the Lithgow City Council (**LCC**) (as stipulated within Schedule 2, Condition 7A of DA 504-00).

As noted in the MOD10 and MOD5 Modification report, Centennial has been unable to re-establish access to the private haul roads known as the Wallerawang Haul Road or the Mount Piper Haul Road (i.e. Option 1), since 2020, due to changes in land ownership and consequent loss of the former access arrangements.

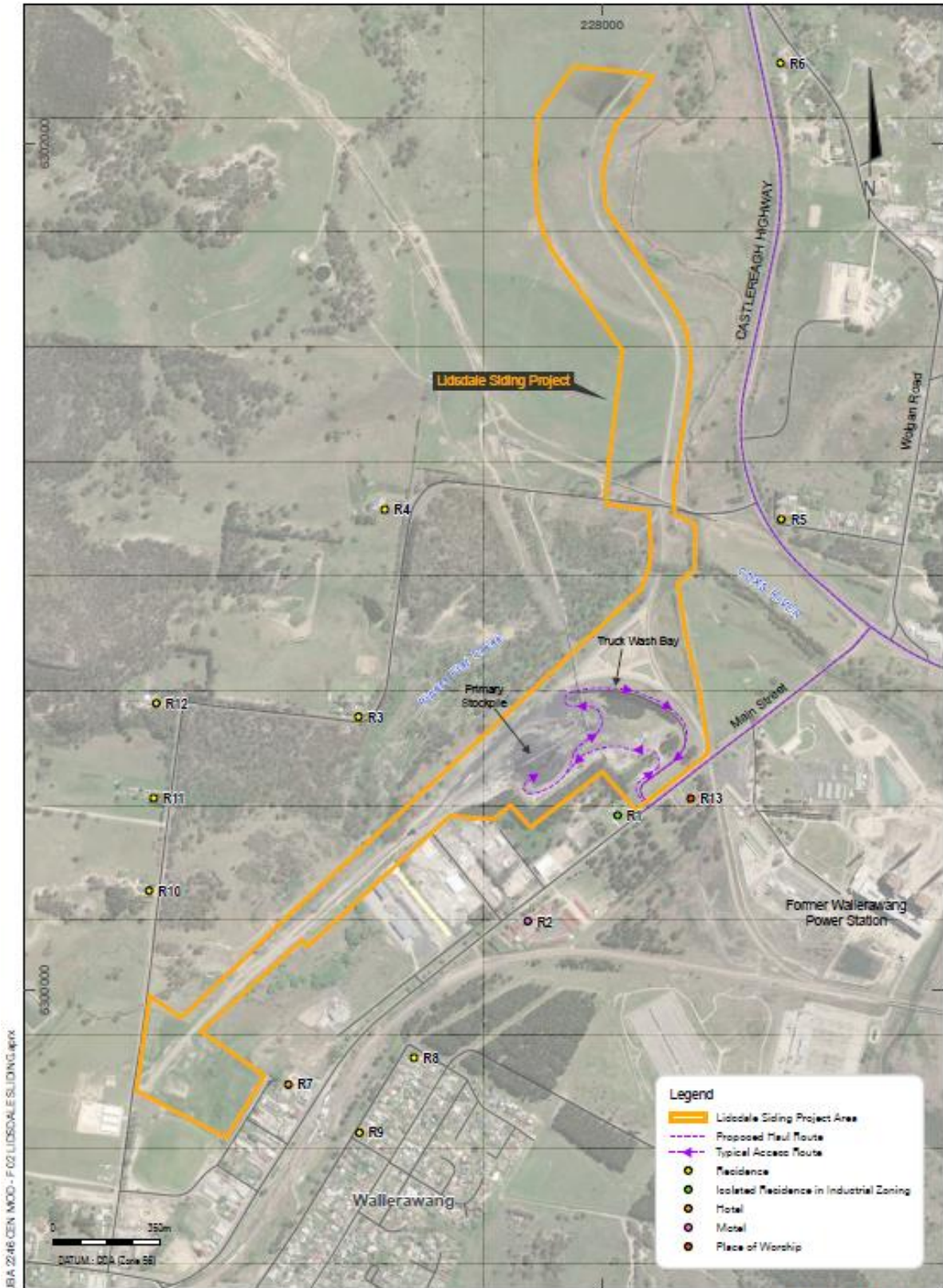
2.2.1 Lidsdale Siding

Lidsdale Siding is approved under SSD 08_0223 to receive up to 6.3 Mtpa of coal via overland conveyors and via train utilising unloading infrastructure and via trucks up until the 31 December 2026. Lidsdale Siding operates as a transfer facility enabling:

- coal to be received via conveyor,
- coal to be loaded onto or from trains,
- coal blending and stockpiling; and
- coal to be loaded onto a conveyor, transporting it directly to MPPS.

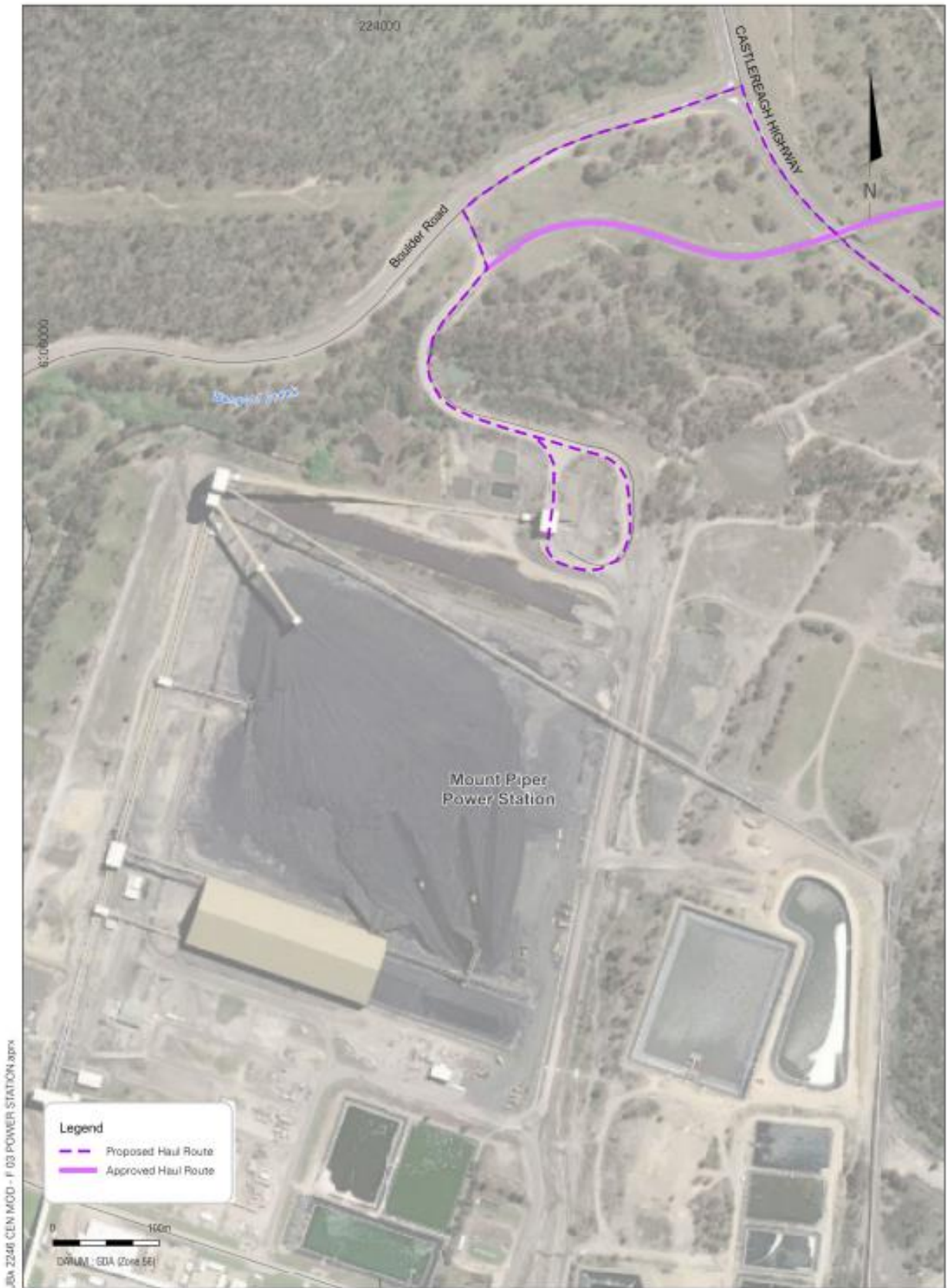
The receipt of coal via trucks is also approved (via MOD 5) until 31 December 2026. The MOD 5 authorises Lidsdale Siding to accept up to 200,000 tpa of coal by truck via the Castlereagh Highway, at a maximum of 25 laden trucks per day, until 31 December 2026.

The MOD 5 authorises the receipt of up to 25 trucks per day of coal to the main coal stockpile in the south western extent of the Lidsdale Siding. Access to the coal stockpile will be provided by the existing access roads at the Lidsdale Siding with no additional disturbance or construction required. Coal from this stockpile will either be blended with other coal at the Lidsdale Siding or be loaded directly onto the conveyor system for delivery to the MPPS using existing equipment and infrastructure. Empty trucks will travel via the vehicle wash bay to ensure the trucks are clean prior to leaving the Lidsdale Siding. The typical access (subject to safety requirements on the day of delivery) around the Lidsdale Siding is shown in **Figure 3**. The typical truck route around MPPS is shown in **Figure 4**.



CENTENNIAL COAL

Figure 3 – Typical Lidsdale Siding Access



CENTENNIAL COAL

Figure 4 – Typical Mount Piper Power Station Route

2.3 Traffic Volumes

As part of MOD10 and MOD5 a Traffic Impact Assessment was completed. The assessment considered the potential impacts of the additional truck movements proposed (and now approved) by Clarence Colliery on the regional road network.

Traffic volume growth in the area is considered to be relatively minor in recent years, based on count stations. **Table 6** below summarises the historical daily traffic volumes for arterial roads in the vicinity of the Western Haulage Route.

Table 6 – Traffic Growth

LOCATION	STATION ID	2017	2018	2019	2020	2021	2022	'17 to '22 GROWTH %
Great Western Highway	6105	8,371	8,458	8,407	7,606	7,082	8,398	0.06%pa
Bells Line of Road	T0384	3,170	3,100	3,038	2,881	2,356	2,870	-1.89%pa
Great Western Highway	6191	8,637	9,034	9,044	8,472	8,182	10,498	4.3%pa

Sourced: Appendix B. Clarence Colliery and Lidsdale Siding, Continuation of Product Transport Modification Report, 2023

Based on the traffic volume data from previous assessments (Clarence Colliery Modification 9) in conjunction with the 2% pa growth rate, the traffic volumes for the future year 2026, with and without MOD10 are summarised below in **Table 7** and **Table 8** for the peak hour daily traffic volumes, respectively.

Table 7 – Forecast Peak Hour Traffic Volumes

LOCATION	DIRECTION	2026 AM		2026 PM	
		PEAK HOUR VOLUME WITHOUT MOD 10	PEAK HOUR VOLUME WITH MOD 10	PEAK HOUR VOLUME WITHOUT MOD 10	PEAK HOUR VOLUME WITH MOD 10
Chifley Road (east of site access intersection)	Westbound	96	104	131	139
	Eastbound	103	111	124	132
Chifley Road (west of Darling Causeway)	Westbound	103	111	173	181
	Eastbound	81	89	114	122
Darling Causeway (south of Chifley Road)	Northbound	33	41	42	50
	Southbound	54	62	48	56
Station Street (north of Harley Avenue)	Northbound	51	59	54	62
	Southbound	70	78	70	78

Sourced: Appendix B. Clarence Colliery and Lidsdale Siding, Continuation of Product Transport Modification Report, 2023

Station Street (south of Harley Avenue)	Northbound	24	32	42	50
	Southbound	21	29	46	54
Castlereagh Highway (south of Boulder Road)	Northbound	121	129	154	162
	Southbound	145	153	216	224
Castlereagh Highway (south of Main Street)	Northbound	197	205	216	224
	Southbound	180	188	228	236
Main Street (west of Castlereagh Highway) ¹	Westbound	66	74	127	135
	Eastbound	132	140	78	86
Boulder Road (west of Castlereagh Highway) ¹	Westbound	48	56	47	55
	Eastbound	51	59	119	127

Notes: (1) Assumes 100% of dispatched trucks enter this access, however in reality the traffic load will be spread between Main Street and Boulder Road as required.

Sourced: Appendix B. Clarence Colliery and Lidsdale Siding, Continuation of Product Transport Modification Report, 2023

Table 8 – Forecast Daily Traffic Volumes

LOCATION	2026 WITHOUT MOD 10		2026 WITH MOD 10	
	DAILY VOLUME	HEAVY VEHICLE %	DAILY VOLUME	HEAVY VEHICLE %
Chifley Road (east of site access intersection)	2,258	12	2,308	13.9
Chifley Road (west of Darling Causeway)	2,349	10.6	2,399	12.5
Darling Causeway (south of Chifley Road)	875	17.9	925	22.3
Station Street (north of Harley Avenue)	1,215	12.4	1,265	15.9
Station Street (south of Harley Avenue)	654	11.6	704	17.9
Castlereagh Highway (south of Boulder Road)	3,176	12.4	3,226	13.8
Castlereagh Highway (south of Main Street)	4,153	11.6	4,203	12.7
Main Street (west of Castlereagh Highway) ¹	2,009	9.1	2,059	11.3
Boulder Road (west of Castlereagh Highway) ¹	1,318	10.2	1,368	13.4

Notes: (1) Assumes 100% of dispatched trucks enter this access, however in reality the traffic load will be spread between Main Street and Boulder Road as required.

Sourced: Appendix B. Clarence Colliery and Lidsdale Siding, Continuation of Product Transport Modification Report, 2023

Table 7 and **Table 8** show marginal increases in the peak hourly and daily traffic volumes, whereby the Level Of Service (LOS) (in accordance with Austroads Guide to Traffic Management Part 3) is maintained at the LOS A, with the additional truck movements approved by MOD10, whereby the peak hour traffic is below 600 – 800 vehicles per hour per lane.

2.4 Intersection performance

Analysis of the intersection performance at the two intersections (i.e. the Castlereagh Highway/Boulder Road and the Castlereagh Highway/Main Street/Wolgan Road intersections) was undertaken using SIDRA Intersection software, as part of MOD10 Traffic Impact Assessment. The purpose of the intersection analysis was to identify capacity issues at the intersections identified as part MOD10 and assist in proposing any mitigation measures (if required) to ensure the satisfactory performance of these intersections.

The LOS for intersections has been assessed based on the RMS Guide with relevant outputs for Degree of Saturation and Average Delay. The intersection analysis was conducted in consideration of the additional truck movements set out in MOD10 (ie. Base + modification) and without the additional truck movements (Base case).

With regard to MOD10, the result intersection performance for the intersection of Castlereagh Highway / Boulder Road and Castlereagh Highway / Main Street / Wolgan Road are summarised in **Table 9**.

Table 9 – Forecast Intersection Performance (MOD10)

INTERSECTION	SCENARIO	PEAK HOUR	DOS	AD (s)	LOS	MAX 95TH QUEUE (m)
Castlereagh Highway / Boulder Road	2026 without MOD 10	AM	0.068	7.8	A	2.1
		PM	0.147	7.5	A	4.4
	2026 with MOD 10	AM	0.084	8.6	A	3.0
		PM	0.169	8.1	A	5.4
Castlereagh Highway / Main Street / Wolgan Road	2026 without MOD 10	AM	0.210	9.5	A	2.9
		PM	0.165	12.7	A	2.0
	2026 with MOD 10	AM	0.235	10.4	A	3.4
		PM	0.206	15.3	B	2.6

Notes: The LOS reported above is based on the worst movement for the intersection

Sourced: Appendix B. Clarence Colliery and Lidsdale Siding, Continuation of Product Transport Modification Report, 2023

The Traffic Impact Assessment results for Castlereagh Highway / Boulder Road intersection indicates that the additional traffic generated by the additional truck movements has a minimal overall impact on the operation of the intersections, with the LOS generally unchanged between the “Base” and “Base + Modification” scenarios. The Traffic Assessment results indicate there is little to no impact on the Castlereagh Highway / Main Street / Wolgan Road intersection performance as a result of MOD 10.

The Traffic Impact Assessment indicated that there are no foreseen road safety concerns with respect to the increased traffic generation under MOD 10, with the general road safety conditions of the external road network generally consistent with previous assessments.

2.5 Road Safety

As per the MOD10 Traffic Impact Assessment, it was noted in regard to the reported crashes in the most recent 5-year reporting period of 2017 to 2021 with no data available for 2022, there have not been substantial changes since previous assessments. Therefore, the proposals impact and overall nexus on road safety is consistent with prior assessments and approvals.

It is acknowledged that the Western Haulage Route traverses past residential areas of Mount Victoria, Hartley, Bowenfels and others such that at some point along the route there are likely to be various land uses such as public schools, aged care or other similar vulnerable pedestrian locations which may be more sensitive to the movement of heavy vehicles. In this regard, it is noted that the haulage routes are along state classified and regional roads whose primary service is the movement of vehicles. The road safety conditions along Castlereagh Highway are generally no different to previous assessments, whereby sight lines have been assessed to be sufficient for the additional trucks approved under MOD10. Additionally, the LOS performance, which takes into consideration the movement of larger trucks, is within acceptable range of LOS criteria and does not indicate adverse road safety conditions or adoption of reduced gaps in the traffic flow along Castlereagh Highway.

The overall interaction of various road users along state and regional road corridors is a regional network issue for relevant local and state authorities to review and manage, and not the individual operations in the region.

3 POTENTIAL TRAFFIC IMPACTS

The following potential impacts on traffic and transport have been identified for transport operations.

- Ongoing truck traffic and possible congestion noticed by other motorists
- Ongoing truck traffic (noise and vehicle emissions)
- Vehicle collision
- Public safety (i.e. pedestrians)
- Varied weather conditions (i.e. icy roads)
- Road safety and maintenance
- Noise emissions and vibration
- Social amenity
- Dust and air quality and greenhouse gas
- Coal spillage
- Cumulative impacts (i.e. increased noise, dust traffic etc)
- Periodic death or injury to native animals crossing the transport route
- Deterioration of the road surface

The Drivers Code of Conduct, outlined in **Section 4**, has been established and sets out management measures to address and mitigate these potential impacts.

4 DRIVERS CODE OF CONDUCT

4.1 General requirements

Heavy vehicle drivers responsible for loading and haulage of coal material must:

- All personnel conducting vehicle coal haulage must be suitably inducted prior to entering the mine site and appropriately licensed for registered vehicles as required by TfNSW.
- All persons operating equipment for the purpose of loading coal haulage trucks on the surface must be appointed by the Manager of Mining Engineering. (for Lidsdale Siding by the CHPP Manager)
- All haulage trucks must be registered and must be roadworthy, comprehensively insured and registered in full compliance with all relevant authorities.
- All coal haulage operators and site contractors:
 - a. must have current Public Liability Insurance and Workers Compensation coverage for their operations.
 - b. Must understand, be trained and comply with the *SWP-3192 Loading of Coal onto Road Transport and the Clarence Haulage Management Standard*.
 - c. Must complete weighbridge documentation ensuring compliance with the TfNSW guidelines. Including the Combined Vehicle Mass limits applicable to the specific haul route.
 - d. Must operate the vehicle in a safe manner within and external to the Clarence Colliery and Lidsdale Siding or MPPS sites.
 - e. Must comply with the direction of authorised site personnel when within the Clarence Colliery and Lidsdale Siding sites.
- Coal trucks entering Clarence Colliery and Lidsdale Siding must place their UHF radio to the applicable channel as directed prior entrance, as per SWP-2177 UHF Radio Protocol. Lidsdale Siding has VHF radio system and all hauliers must engage and utilise these radios when on site)
- Prior to entering the stockpile area at Clarence Colliery, the truck driver must contact the loader driver. If radio contact is not made, the truck driver must stop at the designated STOP sign and wait until authorised to enter the stockpile area, for further details refer to the Stockpile Management Plan (MP-1368).
- A driver shall remain in the cabin of a haul unit while the vehicle is being loaded unless directed to do otherwise by the loader driver.
- Coal Haulier inductions will include awareness and risks of the intersections of 1/ Castlereagh Highway/the entrance to the Power Station haul road at Lidsdale and 2/ Great Western Highway/Station Street at Mt Victoria (as identified in GHD (2013)).
- Haulage operators are to check and level loads prior to departure from site
- All trucks must pass through the designated washdown bay and be washed down to ensure and loose coal is removed from the outer extremities of the vehicle, before leaving both Clarence Colliery and Lidsdale Siding
- All haulage trucks are to have sealed tailgates to eliminate the potential for leakage and trailer covers fitted prior to departure from site
- All haulage trucks will have their Grain locks or inspection hatches where fitted locked prior to loading
- Comply with all development consent requirements outlined in **Section 1.2 and Section 1.3** of this TMP

4.1.1 Code of Conduct Compliance Checks

The Clarence Colliery Coal Handling and Preparation Plant Manager (**CHPP Manager**) will issue a copy of this TMP to each contractor transporting coal product to Lidsdale Siding and/or MPPS. The CHPP Manager (or his delegate) will carry out inductions of driver/operators which will include the Driver Code of Conduct. Records of training will be retained on site.

The following details of heavy vehicles leaving the Clarence Colliery pit top bound for Lidsdale Siding and/or MPSS will be recorded prior to leaving site:

- Vehicle weight
- Vehicle number plate
- Destination
- Load covered
- Time of dispatch

Records of vehicle road worthiness, requisite insurances and induction records will be retained on site and audited regularly.

Periodic inspections of laden heavy vehicles will be undertaken prior to laden trucks leaving site.

Periodic inspections of driver behaviour en-route to Lidsdale Siding and/or MPPS will be undertaken.

Non-compliances identified will be dealt with via official warning notification. Repeated non-compliances may result in removal from site and/or dismissal.

The Clarence Colliery CHPP Manager (or his delegate) will be responsible for scheduling and undertaking the above mentioned inspections.

4.2 Heavy vehicle speed

Increased speed means not only an increased risk of crashing but also increased severity if an accident occurs.

Vehicle speed on public roads is enforced by the NSW Police Service. The speed limits, which are accordingly signposted, are to be strictly maintained.

Road vehicle drivers are to adhere to the following speed limits on-site:

- The maximum speed for surface transport on site is 15 km/hr or as signposted.
- The maximum speed for vehicles going over the weighbridge is 5 km/hr.

Drivers are to observe the posted speed limits, with speed adjusted to suit the road environment and prevailing weather conditions, to comply with the Australian Road Rules. The vehicle speed must be suitable to ensure the safe movements of the vehicle based on the vehicle configuration. Higher vehicle speeds may increase the risk of colliding with wildlife. By simply slowing down, drivers can reduce the risk of collision and injury severity, increasing animals' chances of survival.

4.2.1 School zones

TfNSW help to provide road safety measures around schools through the implementation of school zones. School zones restrict the speed normal speed limit to 40km/h within these zones, during the hours of 8am to 9:30am and 2:30pm to 4:00pm. The 40km/h speed limit in school zones helps to protect children on their way to and from school. The lower speed limit reduces the risk and potential severity of a crash. School zone signs, dragon's teeth road markings and flashing lights improve the visibility and driver awareness of school zones

As discussed in **Section 2.1** of this management plan the haulage route is likely to pass public schools. Centennial has committed to Lithgow City Council that no empty coal trucks traveling from Mount Piper Power Station to Clarence Colliery shall occur during the hours of 8am to 9:30am and 2:30pm to 4pm.

To minimise the impact of laden trucks passing through school zones during the school term, there will be no dispatch of coal from the Clarence Colliery pit top during the hours of 8am to 9:30am and 2:30pm to 4pm, to minimise laden truck movements interacting with school zones. These restrictions will only occur during the school term.

4.3 Heavy vehicles driver fatigue

Fatigue is one of the biggest causes of accidents for heavy vehicle drivers. The Heavy Vehicle Driver Fatigue Reform was developed by the National Transport Commission (**NTC**) and approved by Ministers from all States and Territories in February 2007.

The heavy vehicle driver fatigue law commenced in NSW on 28 September 2008 (current version 1 October 2018) and applies to trucks and truck combinations over 12 tonne GVM, however Ministerial Exemption Notices that can apply.

Under the law, industry has the choice of operating under three fatigue management schemes:

- I. Standard Hours of Operation
- II. Basic Fatigue Management (**BFM**)
- III. Advanced Fatigue Management (**AFM**)

All heavy vehicle drivers operating out of Centennial are to be aware of their adopted Fatigue Management Scheme and operate within its requirements. By law, all drivers have a duty to not drive a fatigue-regulated heavy vehicle on a road while impaired by fatigue.

All coal hauliers are required to have a 10 hour break prior to the commencement of their shift to manage fatigue. All coal hauliers will maintain log books in accordance with TfNSW requirements.

4.4 Heavy vehicles compression braking

Compression braking by heavy vehicles is a source of irritation to the community generating many complaints, especially in the morning shoulder period when residents are especially sensitive to noise.

In some instances compression braking is required for safety reasons however when passing through or adjacent to residential areas or isolated farmsteads a reduction in the speed of the vehicle is recommended to reduce the instances and severity of compression braking.

All heavy vehicle drivers operating along the Western Haulage Routes are to ensure brakes are applied so as not to create excessive noise that could disturb local residents where possible.

4.5 Heavy Vehicle Noise

If drivers are required to wait for their next load they are to wait with engines turned off within the mine site in the designated on-site truck parking area.

4.6 Load covering

Loose material on the road surface has the potential to cause road crashes and vehicle damage. Uncovered loads represent the greatest risk to loose material on the road and an increase in dust impacts on neighbouring residents along haul routes. To prevent these issues from occurring and in accordance with Schedule 3, Condition 18 and Condition 19, all coal trucks must have loads tarped (i.e. covered) prior to leaving the site and are cleaned of materials that may fall on the road before they are allowed to leave Clarence Colliery.

Prior to leaving the Clarence Colliery pit top and the Lidsdale Siding facility, all haulage trucks are to pass through the truck wash to ensure they are in a clean state prior to accessing the public road network (ie. Sides, undercarriage, draw bars, etc). All truck drivers must ensure that any loose coal is removed from their truck prior to leaving site. There is to be no spillage from any part of the vehicle including the draw bars.

No person tarping (ie. covering) a load shall be permitted to climb on top of the load area to assist tarping.

4.7 Vehicle departure and arrival

All vehicles must follow the applicable departure and arrival protocols set out in the Clarence Colliery Haulage Management Standard and the Lidsdale Coal Delivery Induction, as well as any other relevant documents stipulated by Centennial.

The Clarence Colliery CHPP Manager will manage the potential for laden coal trucks to travel in convoy (ie noise to tail) through the loading of coal trucks process and/or authorisation for coal trucks to depart the Clarence Colliery. In addition, coal hauliers will be instructed not travel in convoy.

4.8 Breakdowns and incidents

In the case of a breakdown the vehicle must be towed to the nearest breakdown point as soon as possible. All breakdowns must be reported to Service NSW TMC (Transport Management Centre) on 131700 and the vehicle protected in accordance with the Heavy Vehicle Drivers handbook.

To ensure that traffic impacts are minimised in the event of an incident, rapid response from the haulage company is required. In order to ensure rapid response to incidents drivers must contact Service NSW on 131700, the site supervisor/manager as soon as the stranded vehicle and load is safely secured.

If there is a product spill while loading/unloading or enroute the driver must:

- I. Immediately warn persons in the area who may be at risk;
- II. Inform the site supervisor/manager. Manager must be immediately informed so that emergency services can be contacted and a clean up initiated;
- III. All spills must be adequately cleaned up and waste disposed of in an acceptable and environmental manner;
- IV. Put out warning triangles where it is safe to do so;
- V. Contact the NSW Police Service

If drivers find an injured, sick or distressed animal, drivers should contact a licensed wildlife carer as soon as possible. [Wires Rescue can be reached on 1300 094 737.](#)

If there is a product spill, Centennial and/or the coal haulier contractor (as relevant) will carry out the necessary investigations to understand the cause of the incident and then implement measure to avoid a recurrence.

4.9 Contact numbers

Table 10 sets out important phone numbers to be held by each driver hauling coal between Clarence and Lidsdale Siding / MPPS.

Table 10 – Contact name and numbers

Contact Name	Contact number
Service NSW Transport Management Centre	131 700

Contact Name	Contact number
Lithgow City Council	6354 9999
Clarence Colliery	6353 8000
Lidsdale Siding (WCS)	6355 9500
NSW Police Force (Lithgow)	(02) 6352 8399
Driver employee shift supervisor (to be supplied by driver if separate company)	
Wires	1300 094 737

5 COMPLIANCE MEASURES AND MONITORING

5.1 Overview

Review of this TMP and Drivers Code of Conduct is to occur every 3 years. In addition, regular reviews will be undertaken to track progress towards the objectives and targets and corrective actions required to address non-conformances, exceedances and/or community complaints.

Prior to the commencement of hauling coal to Lidsdale Siding and/or MPPS, the CHPP Manager will establish a Safe Work Method Statement (**SWMS**) for coal hauliers. This TMP will be attached to the SWMS and all drivers hauling coal to Lidsdale Siding and/or MPPS, will need to sign on to the SWMS stating that they understand the task, the road risks, hazards, controls and understand the requirements of the TMP as well as the site rules, standards and procedures.

This TMP and the Drivers Code of Conduct will also be reviewed should there be an incident associated with the haulage of coal along the Western Haulage Routes, including an incident associated with spill (**Section 4.8**). New controls, as appropriate, identified as a result of an incident investigation will be included within the TMP.

If it is determined that a review leads to a revision of the TMP, Centennial must submit the revisited document within four weeks of the review to relevant stakeholders.

Drivers inductions are refreshed every two years to ensure up to date information is communicated.

5.2 Incident management and notification

5.2.1 Complaints

Complaints (if any) handled and responded to in an appropriate manner, and in accordance with Clarence Colliery and Lidsdale Siding development consent and EPL requirements. All complaints will be recorded and reported in accordance with annual reporting requirements. All complaints will be directed to the relevant site Environment and Community Co-ordinator

5.2.2 Incident and Non-compliance notification

Consistent with Clarence Colliery DA 504-00 Schedule 5, Condition 5A and Lidsdale Siding SSD 08_0223 Schedule 5, Condition 7, Centennial must notify the Department of Planning, Housing and Infrastructure (**the**

Department) and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing via the Department's Major Projects Website and identify the development (including the development application number and name) and set out the location and nature of the incident.

Consistent with Clarence Colliery DA 504-00 Schedule 5, Condition 5B Centennial must notify the Department and any other relevant agencies within 7 days of becoming aware of a non-compliance. The notification must be in writing via the Department's Major Projects Website and identify:

- the development consent identifier (including the development application number and name),
- the relevant consent condition to which the non-compliance relates,
- what is the nature of the non-compliance,
- the reasons for the non-compliance (if known), and
- what actions have been, or will be, undertaken to address the noncompliance.

Appendix 1

11 June 2024

TfNSW reference: WST24/00035/003 | SF2024/031606

Your reference: DA500-00-Mod-10



Dennis Wallace
CC: Rodney Boland
Clarence Colliery (Centennial Coal)
By Email: rodney.boland@centennialcoal.com.au

Review of Traffic Management Plan for MOD 10 of DA504-00 and MOD 5 of SSD08_0023 – Clarence Colliery and Lidsdale Siding

Dear Dennis,

Reference is made to the Traffic Management Plan (TMP) submitted for Transport for NSW (TfNSW) consideration in accordance with consent Condition 19B, Schedule 3 of Notice of Determination for MOD10 of DA504-00 issued 17 May 2024.

TfNSW has reviewed the TMP prepared by Centennial Coal, dated 20 May 2024, and recommends the following amendments:

- Figure 1 in the TMP identifies the haulage routes approved under the consent for the modification for both Lidsdale Siding and Clarence Colliery operations. All identified school zones and high pedestrian areas should be clearly illustrated on the route map to confirm acknowledgement of potential for conflict during coal haulage.
- Both the TMP and Section 4.2.1 in the Code of Conduct seeks to minimise the impact of laden trucks passing through school zones by ensuring no dispatch of coal from the Clarence Colliery occurs during 8am to 9am and 2pm to 3pm school days. TfNSW recommends these restrictions be extended to the full duration of school zone operation hours (8am to 9:30am and 2:30pm to 4pm) during the school term.

The Planning Secretary should be satisfied that the above matters have been adequately addressed prior to approving the TMP.

If you have any questions, please contact Brendan Croft, on 1300 019 680 or email development.west@transport.nsw.gov.au.

Yours faithfully,

A handwritten signature in black ink that reads "Kylie-Anne Pont".

Kylie-Anne Pont

Team Leader Development Services (West)

Community and Place

Regional and Outer Metropolitan

Cc. Energy, Resources and Industry, Department of Planning, Housing and Infrastructure

OFFICIAL

Australia

SYDNEY

Level 10 201 Pacific Highway
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE

Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE

Level 1 87 Wickham Terrace
Spring Hill QLD 4000
T 07 3648 1200

CANBERRA

Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE

Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE

Suite 9.01 Level 9
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

PERTH

Suite 3.03
111 St Georges Terrace
Perth WA 6000
T 08 6430 4800

Canada

TORONTO

2345 Yonge Street Suite 300
Toronto ON M4P 2E5
T 647 467 1605

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422 Richards Street Unit 170
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T 604 999 8297

CALGARY

606 4th Street SW 11 Floor
Calgary Alberta T2P 1T1



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