Hunter Power Project

Traffic and Transport Assessment

Rev 0

12 April 2021

Snowy Hydro Limited

Hunter Power Project

Project No:	IS354500
Document Title:	Traffic and Transport Assessment
Revision:	Rev 0
Date:	12 April 2021
Client Name:	Snowy Hydro Limited
Project Manager:	K Ivanusic
Author:	C Li
File Name:	IS354500_Hunter Power Station EIS_Traffic_Final

Jacobs Group (Australia) Pty Limited
ABN 37 001 024 095
Level 4, 12 Stewart Avenue
Newcastle West, NSW 2302
PO Box 2147
Dangar, NSW 2309
Australia
T +61 2 4979 2600
F +61 2 4979 2666
www.jacobs.com

Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
Rev 0	12/04/2021	Final	C Li	M De Marco, A Wanasili	M Terei, M Luger	K Ivanusic

Contents

List of figures

List of tables

Executive Summary

The proposal

Snowy Hydro Limited (Snowy Hydro) ('the Proponent') proposes to develop a gas fired power station near Kurri Kurri, NSW ('the Proposal'). Snowy Hydro is seeking approval from the NSW Minister for Planning and Public Spaces under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Proposal.

The Proposal involves the construction and operation of a power station and electrical switchyard, together with other associated supporting infrastructure. The power station would have a capacity of up to approximately 750 megawatts (MW) which would be generated via two heavy duty gas turbines. Although primarily a gas fired power station, the facility would also be capable of operating on diesel fuel.

The Proposal would operate as a "peak load" generation facility supplying electricity at short notice when there is a requirement in the National Electricity Market. The major supporting infrastructure that is part of the Proposal would be a 132 kV electrical switchyard located within the Proposal Site. The Proposal would connect into existing 132 kV electricity transmission infrastructure located adjacent to the Proposal Site. A new gas lateral pipeline and gas receiving station will also be required and this would be developed by a third party and be subject of a separate environmental assessment and planning approval. Other ancillary elements of the Proposal include:

- Water storage tanks and other water management infrastructures
- Fire water storage and firefighting equipment such as hydrants and pumps
- Stormwater detention basin
- Maintenance laydown areas
- Diesel fuel storage tank(s) and truck unloading facilities
- Site access roads and car parking
- Office/administration, amenities, workshop/storage areas.

Construction activities are anticipated to commence early 2022 and the Proposal is intended to be operational by the end of 2023. Further description of the Proposal is provided in Chapter 2 of the Environmental Impact Statement.

The Proposal Site is located in the small suburb of Loxford in the Hunter Valley region of New South Wales, approximately three km north of the town of Kurri Kurri, approximately 30 km west of Newcastle CBD and 125 km north of Sydney. The Proposal Site is located within the Cessnock City Council local government area (LGA). The Proposal Site forms part of the former Kurri Kurri aluminium smelter site which is owned by Hydro Aluminium Kurri Kurri Pty Ltd (Hydro Aluminium). The aluminium smelter ceased operation in late 2012 and was permanently closed in 2014. Demolition and site remediation works are ongoing but would be completed at the Proposal Site prior to construction of the Proposal.

This report

This traffic and transport impact assessment has been prepared on behalf of Snowy Hydro to support the environmental impact statement (EIS) for the Proposal and to respond to the Secretary's Environmental Assessment Requirements (SEARs).

This report provides a description of the existing traffic and transport network conditions and consideration of the likely impacts of construction and operation activities. Recommended mitigation and management measures were identified in response to the impact assessment findings.

Existing environment

The existing road network near the Proposal Site includes the M15 Hunter Expressway and Hart Road. Site observations identified that traffic volumes at the Hart Road interchange with the Hunter Expressway are generally low.

No public transport services operate on Hart Road or the Hunter Expressway in the vicinity of the Proposal Site. No formal off-road pedestrian or cycling facilities are provided on Hart Road or the Hunter Expressway. Pedestrian and cycling volumes are typically zero or very low in the vicinity of the Proposal Site.

Crash rates are low on roads forming part of the proposed construction vehicle routes. In the five-year period from 1 April 2015 to 1 March 2020, a total of 24 crashes were recorded on the Hunter Expressway between Hart Road and Main Road as well as Hart Road between Government Road and Dickson Road.

Impacts from the Proposal during construction

Potential impacts of the Proposal during construction have been identified as follows:

- Additional construction vehicle movements generated by the Proposal are expected to have a minimal impact on the operation of the surrounding road network. The Hunter Expressway and Hart Road have spare capacity to accommodate additional construction vehicles
- No impacts to parking are expected as all parking for construction vehicles would be provided on-site or on adjacent properties by agreement with the land holder Hydro Aluminium and/or the Industrial Estate Developer
- No impacts to public transport, pedestrians and cyclists and road access are expected
- Additional construction traffic has the potential to impact road safety on roads forming part of the proposed construction vehicle routes. However, existing crash rates on roads forming part of the proposed construction vehicle routes are low
- Due to the very low number of oversized overmass (OSOM) movements during construction, combined with the fact that OSOM vehicles would travel outside of peak periods, the traffic impact of OSOM vehicles on the existing network is expected to be minimal
- Cumulative construction impacts associated with the former Hydro Aluminium Kurri Kurri Smelter Demolition and Remediation works are expected to have a minimal impact on the operation of the surrounding road network.

Impacts from the Proposal during operation

Potential impacts of the Proposal during operation have been identified as follows:

- Operational vehicle movements are expected to have a minimal impact on the operation of the surrounding road network as roads have spare capacity to accommodate the relatively very low increase in operational traffic
- No impacts to parking are expected as all parking for operational vehicles would be provided on-site
- No impacts to public transport, pedestrians and cyclists and road access are expected.

Recommended mitigation measures

A Construction Traffic Management Plan (CTMP) would be implemented by the construction contractor and would minimise potential impacts of the Proposal during construction. Relevant traffic safety measures included in the CTMP would include traffic control and signage, driver conduct, safety protocols and management of oversized overmass vehicles.

1. Introduction

Snowy Hydro Limited (Snowy Hydro) ('the Proponent') proposes to develop a gas fired power station near Kurri Kurri, NSW ('the Proposal'). Snowy Hydro is seeking approval from the NSW Minister for Planning and Public Spaces under the NSW Environmental Planning and Assessment Act 1979 (EP&A Act) for the Proposal.

The Proposal involves the construction and operation of a power station and electrical switchyard, together with other associated infrastructure. The power station would have a capacity of up to approximately 750 megawatts (MW) which would be generated via two heavy duty gas turbines. Although primarily a gas fired power station, the power station would also be capable of operating on diesel.

The Proposal would operate as a "peak load" generation facility supplying electricity at short notice when there is a requirement in the National Electricity Market. The major supporting infrastructure that is part of the Proposal would be a 132 kV electrical switchyard located within the Proposal Site. The Proposal would connect into existing 132 kV electricity transmission infrastructure located adjacent to the Proposal Site. A new gas lateral pipeline will also be required and this would be developed by a third party and be subject of a separate environmental assessment and planning approval. Other ancillary elements of the Proposal include:

- Water storage tanks and other water management infrastructure
- Fire water storage and firefighting equipment such as hydrants and pumps
- Stormwater detention basin
- Maintenance laydown areas
- Diesel fuel storage tank(s) and truck unloading facilities
- Site access roads and car parking
- Office/administration, amenities, workshop/storage areas.

Construction activities are anticipated to commence early 2022 and the Proposal is intended to be operational by the end of 2023. Further description of the Proposal is provided in Chapter 2 of the Environmental Impact Statement.

The Proposal Site is located in the small suburb of Loxford in the Hunter Valley region of New South Wales, approximately three km north of the town of Kurri Kurri, approximately 30 km west of Newcastle CBD and 125 km north of Sydney. The Proposal Site is located within the Cessnock City Council local government area (LGA). The Proposal Site forms part of the former Kurri Kurri aluminium smelter site which is owned by Hydro Aluminium Kurri Kurri Pty Ltd (Hydro Aluminium) and which ceased operation in late 2012 and was permanently closed in 2014. Demolition and site remediation works are ongoing but would be completed at the Proposal Site prior to construction of the Proposal.

1.1 Secretary's Environmental Assessment Requirements (SEARs)

An environmental impact statement (EIS) for the Proposal has been prepared under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This Traffic and Transport Assessment has been prepared to support the EIS. The purpose of this report is to address the relevant sections of the Secretary's Environmental Assessment Requirements (SEARs) issued on 5 February 2021 (SSI 12590060). The report preparation has also taken cognizance of any applicable agency comments. Table 1.1 outlines the SEARs relevant to this assessment.

Table 1.1: SEARs relevant to this assessment

Secretary's requirement
Transport – including an assessment of the transport impacts of the project on the capacity, condition, safety and efficiency of the local and State road network
An assessment of the likely transport impacts to the site access route and site access point having regard to Oversized or Over mass vehicles (if required)
A description of the measures that would be implemented to mitigate any impacts during construction
A description of any proposed road upgrades developed in consultation with the relevant road authorities (if required)

2. Assessment approach and methodology

2.1 Study area

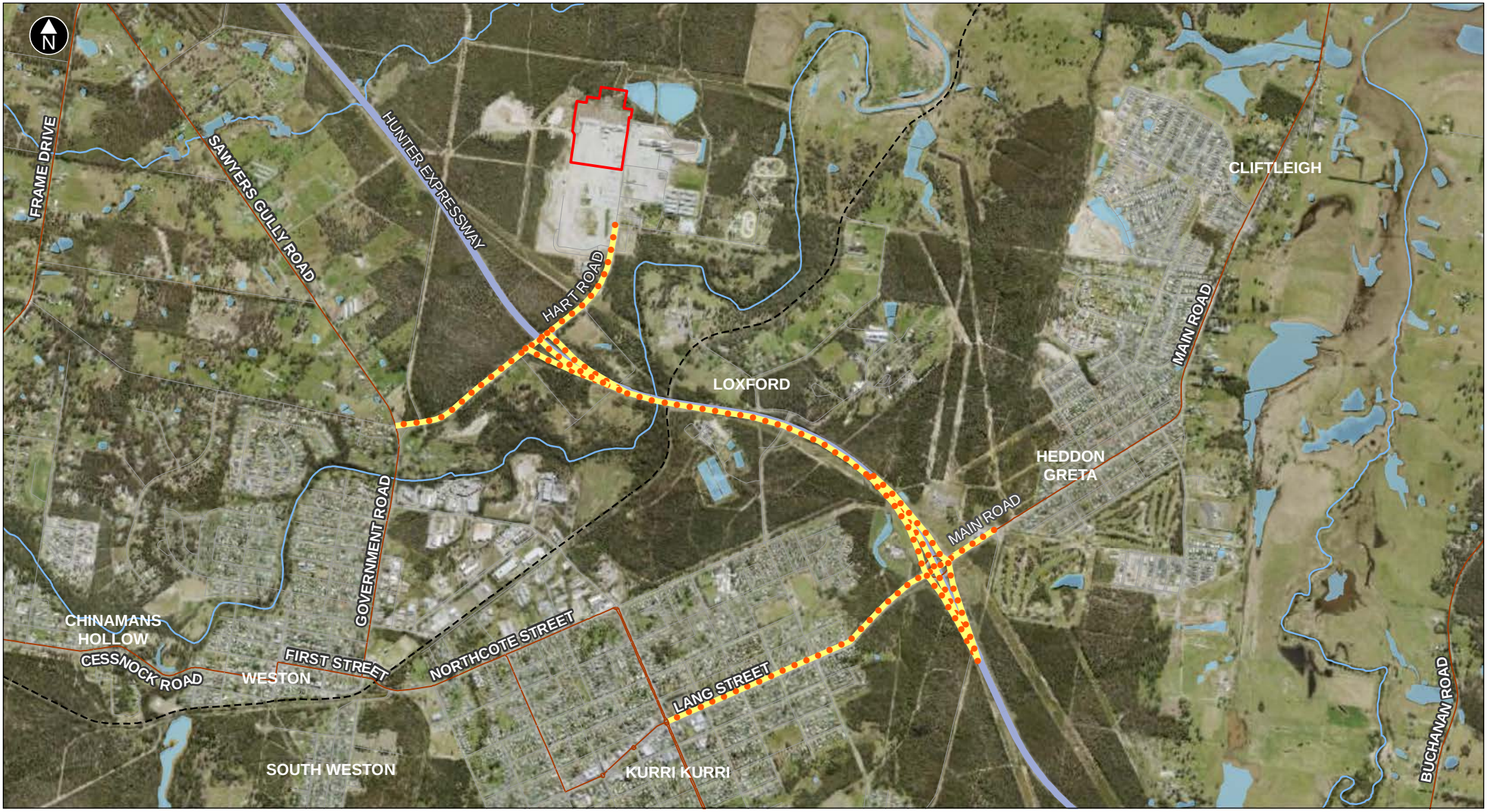
The study area for this traffic and transport assessment is comprised of the transport network which forms part of the proposed access routes for construction and operational vehicles and includes the roads between the Proposal Site and the nearest arterial road or motorway. The study area is shown in Figure 2.1.

2.2 Methodology

A summary of the methodology used to assess the impact of the Proposal on the transport network is provided in Table 2.1.

Table 2.1: Summary of the traffic and transport assessment approach

Component of transport and traffic assessment	Assessment approach
Impacts on the road network	Analysis of the expected performance of the road network during construction and operation of the Proposal
Impacts on parking	Analysis of existing parking provisions compared with parking provisions during construction and operation of the Proposal
Impacts on access	Analysis of existing access provisions compared with access provisions during construction and operation of the Proposal
Impacts on public transport	Analysis of potential impacts on public transport operations during construction and operation of the Proposal
Impacts on pedestrians and cyclists	Analysis of potential impacts on access to and availability of cycleways and footpaths during construction and operation of the Proposal
Impacts on safety	Analysis of expected impacts to road safety for roads forming part of the proposed construction vehicle routes
Impacts of oversized overmass (OSOM) vehicles	Analysis of expected impacts of OSOM vehicles as well as controls required to manage these impacts



Proposal site
Motorway
Main roads
Roads
Railway
Waterbodies
Access routes

0 1 2 km

1:30,000 at A4
Coordinate System: GDA2020 MGA Zone 56

Data sources:
Jacobs 2020
Metromap (Aerometrex) 2020
NSW Spatial Services

Figure 2-1 Study area: Traffic and access

Date: 8/03/2021 Path: J:\IE\Projects\04_Eastern\IS354500\22_Spatial\GIS\Directory\Templates\Figures\KurriKurriEIS\Specialists\Traffic\IS354500_KKOCGT_EIS_Traffic_F003_Traffic&Access_R1.mxd
Created by : AA | QA by : KI

snowy hydro renewable energy
Jacobs

3. Existing conditions

3.1 Existing road network

The road network near the Proposal Site includes the M15 Hunter Expressway and Hart Road. The Hunter Expressway is a motorway that provides connectivity between the Pacific Motorway at the Newcastle Link Road interchange at Cameron Park and the New England Highway at Lower Belford. Near the Proposal Site, the Hunter Expressway is a four-lane, two-way dual carriageway road with a posted speed limit of 110 kilometres per hour.

Hart Road is accessible from the Hunter Expressway via on and off-ramps to and from the east only. To travel west, an interchange is located at the intersection of the Hunter Expressway and Main Road, approximately three km east of the Proposal Site, allowing eastbound traffic to turn and head west on the Hunter Expressway. Site observations identified that traffic volumes at the Hart Road interchange are generally low.

Hart Road is a connector road that facilitates access between industrial and recreational land uses at Loxford to the Hunter Expressway as well as to local roads at Weston and Kurri Kurri. Near the Proposal Site, the posted speed limit is 70 kilometres per hour. Dickson Road is a local two-lane, two-way no-through road that connects Hart Road to the industrial and recreational land uses to the east of the Proposal Site.

Traffic volumes on the Hunter Expressway were obtained from the nearest Transport for NSW permanent classifier station (ID HEXBUCHW-PR) located to the south-east of the Proposal Site, 960 m south of John Renshaw Drive, Buchanan. The average annual weekday traffic volumes are shown in Table 3.1. Heavy vehicles account for approximately 14% of the total traffic volume travelling along the Hunter Expressway.

Table 3.1: Average annual weekday total traffic volumes on Hunter Expressway

	2018	2019	2020[1]
Eastbound (vehicles per weekday)	16,607	17,275	16,287
Westbound (vehicles per weekday)	16,824	17,043	16,244
Total	33,431	34,318	32,531

Source: *Transport for NSW Traffic Volume Viewer* (December 2020) (Transport for NSW, 2020)

Near the Proposal Site, the Hunter Expressway and Hart Road both permit 25/26 m B-double and 4.6 m high vehicles. The Hunter Expressway and Hart Road are also part of the oversize overmass load carrying vehicles network (which permits eligible vehicles operating under the Multi-State Class 1 Load Carrying Vehicles Mass Exemption Notice and the Multi-State Class 1 Load Carrying Vehicles Dimension Exemption Notice), with the travel condition that vehicles or combinations exceeding 3.2 m in width are not permitted to travel from Monday to Friday from 5:00 am to 9:00 am and from Monday to Friday from 4:00 pm to 6:00 pm (except on State-wide public holidays).

3.2 Public transport network

No public transport services operate on Hart Road or the Hunter Expressway in the vicinity of the Proposal Site.

[1] Between January 2020 and November 2020

3.3 Pedestrian and cycling network

No formal off-road pedestrian or cycling facilities are provided on Hart Road or the Hunter Expressway. Site observations identified that pedestrian and cycling volumes are generally zero or very low in the vicinity of the Proposal Site.

3.4 Existing road safety

Crash data for the Hunter Expressway and Hart Road was sourced from Transport for NSW's CrashLink database (Transport For NSW, 2020). The crash records comprise self-reported crashes in the most recent five-year period of available data from 1 April 2015 to 1 March 2020.

Key crash statistics include:

- In the five-year period from 1 April 2015 to 1 March 2020, a total of 24 crashes were recorded
- 75 per cent of all crashes resulted in an injury
- No fatal crashes were recorded during the five-year period
- The most common crash type involved vehicles travelling in the adjacent direction (38 per cent of all crashes) followed by vehicles travelling in the same direction (29 per cent of all crashes)
- 25 per cent of crashes occurred in wet surface conditions and 42 per cent of crashes occurred in dark lighting conditions
- Crash rates are low on roads forming part of the proposed access route.

Crashes by injury severity are shown in Table 3.2. Crashes by road user movement (RUM) group are shown in Table 3.3. Crashes by surface and lighting conditions are shown in Table 3.4. Crash rates per kilometre per year are shown in Table 3.5.

Table 3.2: Crashes by injury severity

Road	Number of crashes					
	Fatal	Serious injury	Moderate injury	Minor injury	Non-casualty	Total
Hunter Expressway between Hart Road and Main Road (including ramps)	0	1	6	3	3	**13**
Hart Road between Government Road and Dickson Road	0	1	5	2	3	**11**
Total	**0**	**2**	**11**	**5**	**6**	**24**

Table 3.3: Crashes by road user movement group and number

Road	RUM group[2]										Total
	Pedestrians (00-09)	Adjacent direction (10-19)	Opposing direction (20-29)	Same direction (30-39)	Manoeuvring (40-49)	Overtaking (50-59)	On path (60-69)	Off path on straight (70-79)	Off path on curve (80-89)	Miscellaneous (90-99)	
Hunter Expressway between Hart Road and Main Road (including ramps)	0	0	0	6	0	0	0	2	5	0	**13**
Hart Road between Government Road and Dickson Road	0	9	0	1	0	0	0	1	0	0	**11**
Total	**0**	**9**	**0**	**7**	**0**	**0**	**0**	**3**	**5**	**0**	**24**

Table 3.4: Crashes by surface and lighting conditions

Road	Wet surface conditions	Dark lighting conditions[3]
Hunter Expressway between Hart Road and Main Road (including ramps)	5 (38%)	5 (38%)
Hart Road between Government Road and Dickson Road	1 (9%)	5 (45%)
Total	**6 (25%)**	**10 (42%)**

Table 3.5: Crash rates per kilometre per year

Road	Length (km)	Fatal and serious injury crash rate	Casualty crash rate	Crash rate
Hunter Expressway between Hart Road and Main Road (including ramps)	3.14	0.06	0.64	0.83
Hart Road between Government Road and Dickson Road	1.84	0.11	0.87	1.20

[2] RUM group refers to road user movement group, which includes a group of movements or actions (classified by RUM number) undertaken by the vehicles involved directly before the crash.

[3] Crashes occurring in dark lighting conditions includes crashes occurring in darkness or at dawn or dusk.

4. The Proposal

4.1 Construction schedule and working hours

The Proposal is anticipated to commence construction in January 2022 with completion by the end of 2023.

The following standard construction hours are proposed:

- Monday to Friday 7:00 am to 6:00 pm
- Saturday 7:00 am to 1:00 pm
- No work on Sundays or public holidays.

4.2 Construction vehicles and access

The following vehicle movements would be generated during construction of the Proposal:

- Light vehicles: passenger vehicles including cars, utility vehicles and light buses to transport workers between the Proposal Site and accommodation. Due to the prevalence of local amenities, it is assumed that accommodation would typically be within a 20 km radius of the Proposal Site. Group transport for workstreams utilising more than 20 persons as well as partial ride sharing may be implemented depending on the construction contractor.
- Heavy rigid: transport of bulk materials including gravel, concrete (or components including sand, gravel and cement)
- Semi-trailer (2 and 3-axle): delivery of structural, mechanical and electrical equipment (other than those requiring oversize transport), temporary offices and lunchrooms
- B double: fuel supply for first fill and commissioning
- Oversize overmass: delivery of major loads, including the gas turbine (GT), generator, generator step-up transformer, exhaust stack segments and electrical switchroom(s)
- Cranage: assumed two mobile all terrain cranes, one large crawler for peak construction (between September 2022 and May 2023) and two mobile Franna cranes. Two mobile Franna cranes otherwise during other parts of construction
- Heavy machinery: sourced locally and transported via low-loader. Assumed to remain onsite for the duration of individual assignments (e.g. earthmoving equipment).

During construction, access to and from the Proposal Site would be via Hart Road and the Hunter Expressway. Materials and equipment are expected to be transported from the east including from Port of Newcastle, and workers are most likely to be drawn from the lower Hunter Valley local government areas of Cessnock, Maitland and Newcastle. A low number of workers are expected to travel to and from north-west of the Proposal Site from areas including Singleton.

All parking would be accommodated on-site or on adjacent properties by agreement with the land holder Hydro Aluminium and/or Industrial Estate Developer.

Forecast traffic generation during construction is summarised in Table 4.1. During peak construction periods, approximately 200 light vehicle movements are expected during the hour prior to shift commencement (between approximately 6:00 am to 7:00 am) and during the hour after shift end (between approximately 3:30 pm to 4:30 pm) during weekdays. The trip distribution of these light vehicle movements is shown in Figure 4.1 and Figure 4.2. Note that the afternoon peak may be spread over a longer period of time. Saturday morning peaks are expected to be lower than weekday peaks and are not considered further.

Approximately 120 heavy rigid and semi-trailer vehicle movements per day (i.e. 60 inbound trips and 60 outbound trips), spread across standard construction hours, is expected to occur between July 2022 and May 2023. The trip distribution of these heavy vehicle movements is shown in Figure 4.3.

Table 4.1: Construction traffic volumes and timing

Vehicle Class	Maximum vehicle movements (per day)	Peak Timing, AM	Peak Timing, PM	Proposal Dates (approx.)[4]
Passenger	400 (200 during each peak hour e.g. AM and PM)	6:00 am to 7:00 am	3:30 pm to 4:30 pm	January 2022 – December 2023
Heavy rigid	100	7:00 am to 3:00 pm		January 2022 – May 2023
Semi-trailer	20	7:00 am to 3:00 pm		July 2022 – May 2023
B-double	12	8:00 am to 4:00 pm		May 2023 – December 2023
Oversize overmass	2	Off-peak (at night)		September 2022 – November 2022
Cranage	4	Off-peak period		July 2022 – May 2023
Heavy machinery (via low loader)	4	Off-peak period		January 2022 – May 2023

[4] Project dates assume commencement of construction in January 2022.

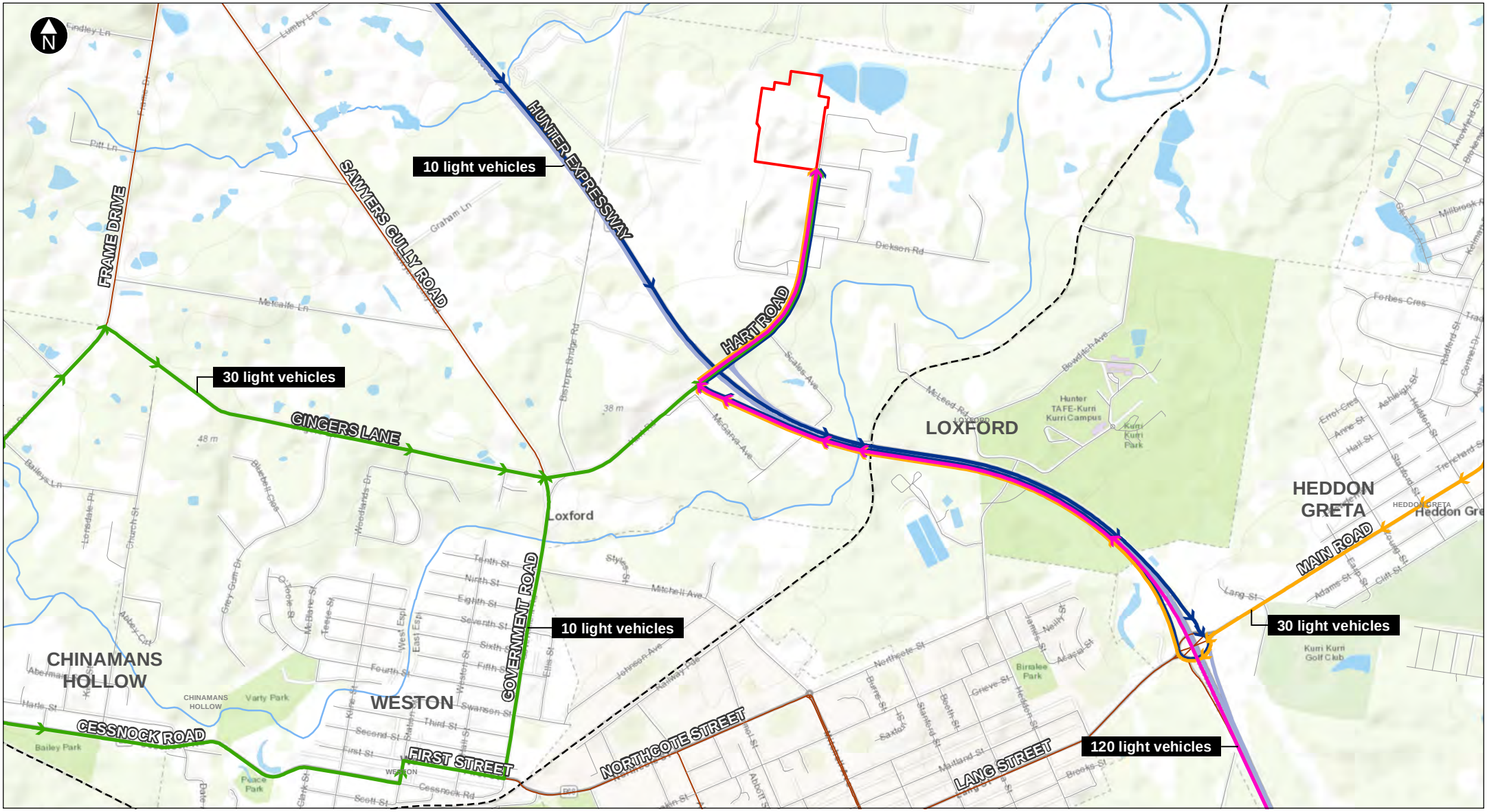


Figure 4-1 Light vehicle routes to the site - Weekday AM peak hour (6:00 am to 7:00 am) during peak construction

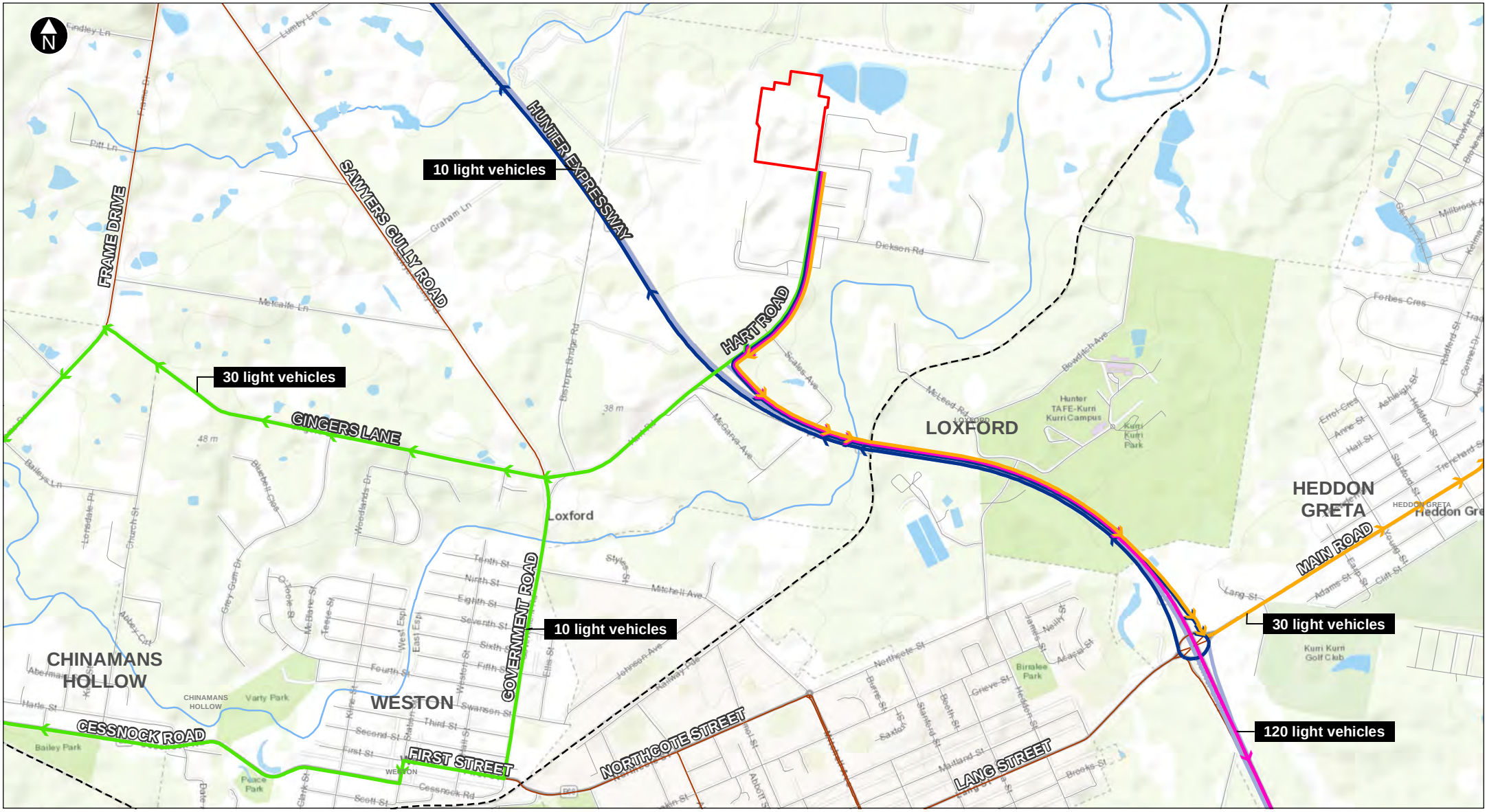
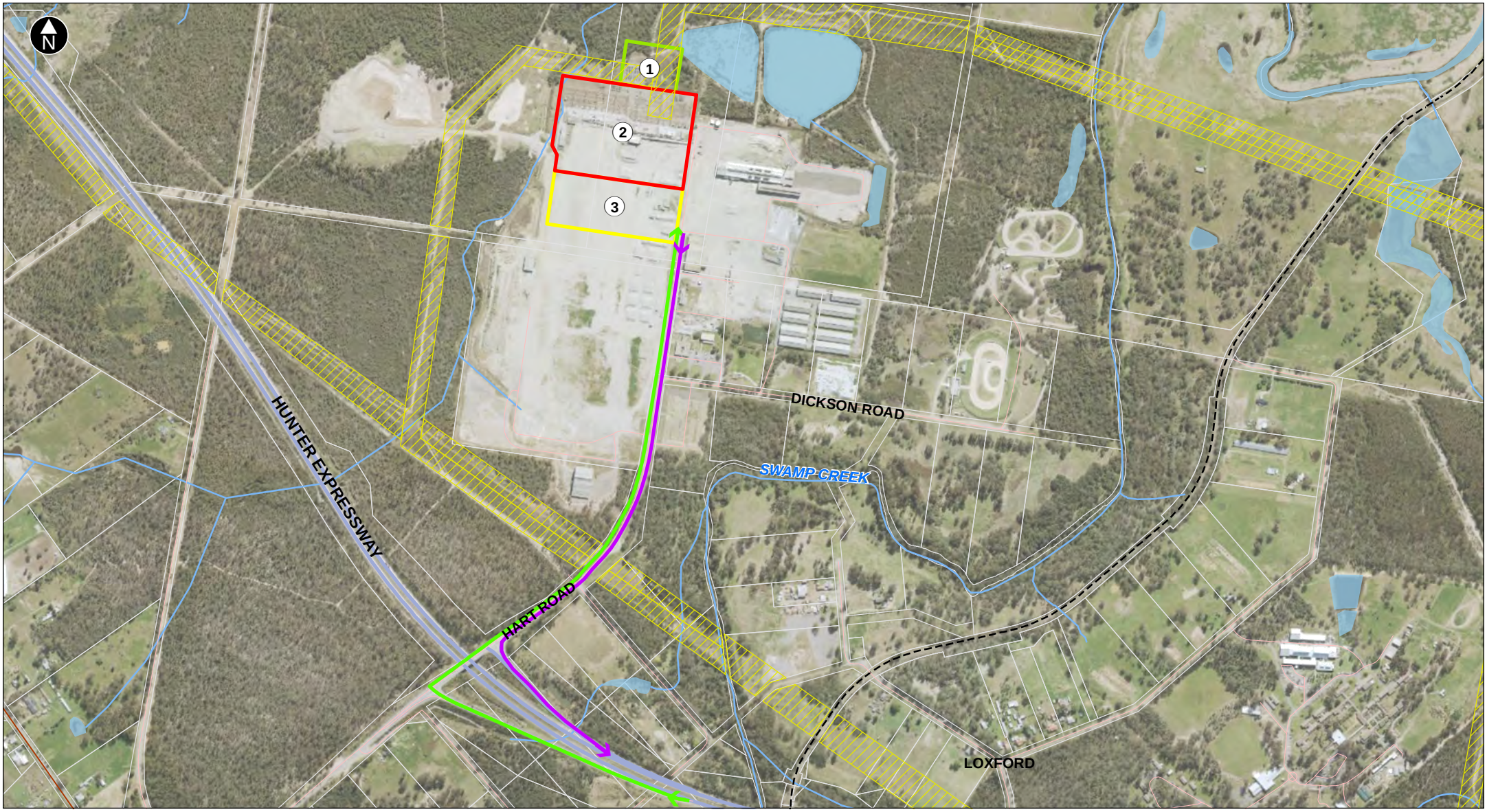


Figure 4-2 Light vehicle routes from the site - Weekday PM peak hour (3:30 pm to 4:30 pm) during peak construction

Data sources:
Jacobs 2020
Metromap (Aerometrex) 2020
NSW Spatial Services

Date: 14/04/2021 Path: J:\IE\Projects\04_Eastern\IS354500\22_Spatial\GIS\Directory\Templates\Figures\KurriKurriEIS\Specialists\Traffic\IS354500_KKOCGT_EIS_Traffic_F005_LVRoutesFromSite_R2.mxd
Created by : AA | QA by : KI

snowy hydro renewable energy
Jacobs



1. Proposed Switchyard Area
2. Proposed Plant Area
3. Proposed Buffer Area
Existing electrical transmission easement

Motorway
Main roads
Roads
Railway
Waterbodies

Heavy Vehicle Access Routes
Inbound
Outbound

0 250 500 m

1:12,000 at A4
Coordinate System: GDA2020 MGA Zone 56

Data sources:
Jacobs
Metromap (Aerometrex) 2020
NSW Spatial Services

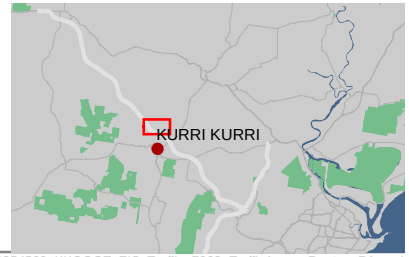


Figure 4-3 Heavy Vehicle Access Routes

Date: 22/02/2021 Path: J:\IE\Projects\04_Eastern\IS354500\22_Spatial\GIS\Directory\Templates\Figures\KurriKurriEIS\Specialists\Traffic\IS354500_KKOCGT_EIS_Traffic_F002_TrafficAccessRoutes_R1.mxd
Created by : AA | QA by : KI

4.3 Operation

Typical operation of the Proposal would involve permanent onsite staff performing regular office based work, maintenance, functional tests and facility upkeep activities between approximately 7:00 am and 4:00 pm on weekdays. However, site staff numbers are not expected to exceed an average of 10 full-time equivalent persons. As such, typical operation would generate an estimated 10 light vehicle trips in the hour before shift commencing and in the hour after shift ending. A small number of additional support staff and deliveries of consumables, waste disposal, sanitary services, and specialist maintenance staff may also be generated on a weekly basis.

At specific intervals throughout the operational lifetime of the Proposal, additional traffic would be generated by the following activities:

- Diesel fuel delivery: B-double road tankers would be used to refill the onsite diesel storage tanks if any when they are used. The refilling of the storage tanks is dependent on the number of times and hours the power station is run on diesel and is highly variable but could be expected to occur up to three times annually.
- If unused, diesel may need to be replaced at approximately 12 to 24 month intervals (depending on the condition of the diesel). For planning and assessment purposes the assumption is a maximum of six tankers will enter Site each day (12 movements total), until the tanks are drained and refilled.
- GT overhaul: there would be a need to undertake minor inspections, hot gas path inspections and major inspections of each gas turbine and auxiliaries. The timings of each will be largely dependent on the equivalent operating hours, starts per year, operation conditions and the service agreement philosophy adopted. The major overhaul event may increase staff numbers by up to 30 to 50 workers for a period of approximately six to eight weeks, depending on outage requirements.

During operation, access and egress to the Proposal Site is expected to be primarily to and from the east towards Cessnock, Maitland or the Newcastle LGA via Hart Road and the Hunter Expressway. Deliveries are expected to be transported from the east including from Port of Newcastle and workers are expected to be housed in major population centres towards Newcastle.

All parking would be accommodated on the Proposal Site.

Forecast traffic generation during operation of the Proposal is summarised in Table 4.2. During typical operation, a peak of approximately 10 light vehicle movements is expected during the hour prior to shift commencement (between approximately 6:00 am to 7:00 am) and in the hour after shift end (between approximately 4:00 pm to 5:00 pm).

Table 4.2: Operational traffic volumes and timing

Event	Vehicle type	Maximum vehicle movements (per day)	Typical Arrival / Departure	Timing
Typical operation	Passenger	20 (10 during each peak hour e.g. AM and PM	7:00 am / 4:00 pm	Weekdays
Deliveries etc.	Light commercial vehicle	4	Off-peak	Weekly
Diesel fuel refilling	B double (3 axle)	12	8:00 am / 4:00 pm	Daily during or post operation of the GT on diesel, up to 3 times per year
GT major overhaul	Passenger (cars, vans, utilities)	80	7:00 am / 4:00pm	6-week period, every ~10 years (6 days per week)
GT major overhaul	Heavy rigid (cranes, trucks)	10	Off-peak	Ad-hoc arrivals prior/finish of overhaul, every ~10 years

5. Traffic impact assessment

5.1 Construction

5.1.1 Impacts on road network performance

During peak construction periods of the Proposal, the morning and evening peak hours of construction traffic generation would be the hour prior to shift commencement (between approximately 6:00 am to 7:00 am) and after shift end (between approximately 3:30 pm to 4:30 pm). Approximately 200 light vehicle movements are expected during the morning peak hour and the afternoon peak hour.

Hourly traffic volumes on the Hunter Expressway on an average weekday is shown in Figure 5.1. The maximum hourly traffic volume is approximately 1,750 passenger car units (pcu) per hour in the eastbound direction and approximately 1,550 pcu per hour in the westbound direction.

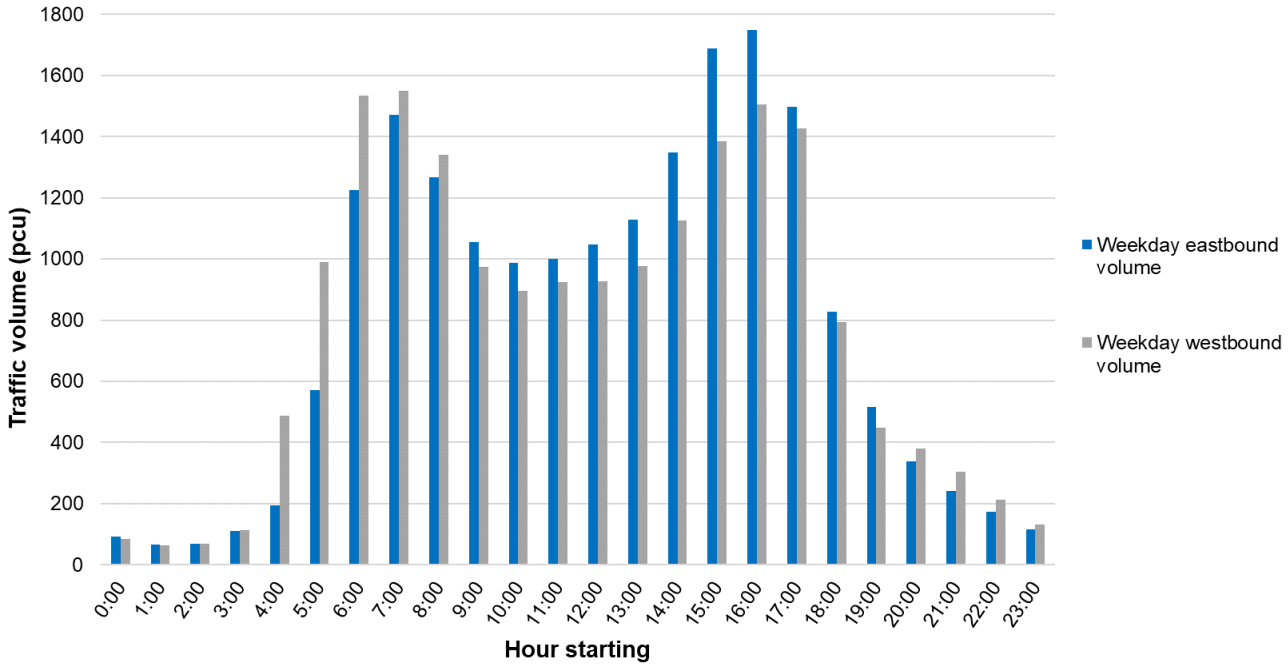


Figure 5.1: Hunter Expressway average weekday traffic volumes (passenger car units) (2020)[5]

Source: *Transport for NSW Traffic Volume Viewer* (December 2020) (Transport for NSW, 2020)

[5] A pcu factor of 2.4 has been assumed to convert heavy vehicles to passenger car units in accordance with the Roads and Maritime *Traffic Modelling Guidelines* (Roads and Maritime Services, 2013).

To assess the capacity of a freeway, Exhibit 12-4 of the *Highway Capacity Manual 2010* specifies the base capacity of a freeway based on the free-flow speed and is shown in Table 5.1.

Table 5.1: Base capacity of a freeway

Free flow speed (kilometres/hour)	Base capacity (pcu/hour/lane)
113	2,400
105	2,350
97	2,300
89	2,250

Source: Highway Capacity Manual 2010

As discussed in Section 3.1, the Hunter Expressway is a four-lane, two-way dual carriageway road with a posted speed limit of 110 kilometres per hour. For a free flow speed of 110 kilometres per hour and two lanes in each direction, the base capacity of the Hunter Expressway is approximately 4,800 passenger car units per hour in each direction. This indicates that there is capacity to accommodate the additional traffic generation on the Hunter Expressway without significantly impacting the operation of the highway.

Additional construction vehicle movements generated by the Proposal are expected have a minimal impact on the operation of the Hart Road interchange and surrounding local roads (such as Government Road and Cessnock Road). The interchange and these local roads currently carry low traffic volumes and have spare capacity to accommodate additional construction traffic.

No impacts to road access are expected as no public roads are proposed to be closed during construction of the Proposal. Existing access to surrounding land uses and for emergency vehicles would be maintained throughout construction works.

No road upgrades are proposed as part of the Proposal.

5.1.2 Impacts on parking

As discussed in Section 4.2, all parking would be accommodated on the Proposal Site. Therefore, no impacts on parking are expected on the surrounding road network.

5.1.3 Impacts on public transport

As discussed in Section 3.2, no public transport services operate in the vicinity of the Proposal Site. Therefore, the Proposal is not expected to have an impact on the operation of public transport.

5.1.4 Impacts on pedestrians and cyclists

The Proposal would not result in any change or impact to pedestrian or cycling facilities.

5.1.5 Impacts on road safety and road condition

During construction of the Proposal, additional construction traffic has the potential to impact road safety on roads forming part of the proposed construction vehicle routes. This includes construction personnel commuting between accommodation and the Proposal Site as well as heavy vehicles transporting materials and equipment. However, as discussed in Section 3.4, existing crash rates on roads forming part of the proposed construction vehicle routes are low. To minimise the impacts of additional construction vehicles on road safety, appropriate driver induction, training, safety measures and protocols would be outlined in a Construction Traffic Management Plan (CTMP) adhered to by construction personnel.

5.1.6 Impacts of oversized overmass vehicles

The use of oversized or overmass (OSOM) vehicles would be required to transport certain oversized equipment for the Proposal from the Port of Newcastle to the Proposal Site. A vehicle or vehicle combination is considered to be OSOM if it exceeds any general access mass or dimension limits. As discussed in Section 4.2, approximately 20 (e.g. 10 inbound trips and 10 outbound trips) oversized overmass vehicle movements would be required during the construction phase.

Potential OSOM vehicle routes from the Port of Newcastle have been assessed via a route survey, which aligns with the *NSW OSOM load carrying vehicles network map* (Transport For NSW, 2020). The *NSW OSOM load carrying vehicles network map* displays the network for eligible vehicles operating under the following Heavy Vehicle National Law notices:

- Multi-State Class 1 Load Carrying Vehicles Mass Exemption Notice 2020, which authorises the use of class 1 load carrying vehicles that are up to 5.5 m wide, 35 m long and five m high
- Multi-State Class 1 Load Carrying Vehicles Dimension Exemption Notice 2020, which authorises the use of class 1 load carrying vehicles that are up to 115 tonnes.

The proposed OSOM vehicle route from the Port of Newcastle and the relevant restrictions from the *NSW OSOM load carrying vehicles network map* is described in Table 5.2 and shown graphically in Figure 5.2.

Table 5.2: Proposed OSOM vehicle route

Proposed routes	**Distance (km)**	***NSW OSOM load carrying vehicles network map* restrictions**
From the Port of Newcastle via A43 Pacific Highway including a U-turn at Old Maitland Road on the Pacific Highway. Turn left onto A37 Newcastle Inner City Bypass, turn right onto A15 Newcastle Road, travel on M15 Hunter Expressway and turn right onto Hart Road to the Proposal Site	42	Hunter Expressway between Pacific Motorway and Hart Road – vehicles or combinations exceeding 3.2 m wide are not permitted to travel from Monday to Friday between 5:00 am and 9:00 am and 4:00 pm to 6:00 pm (except public holidays)

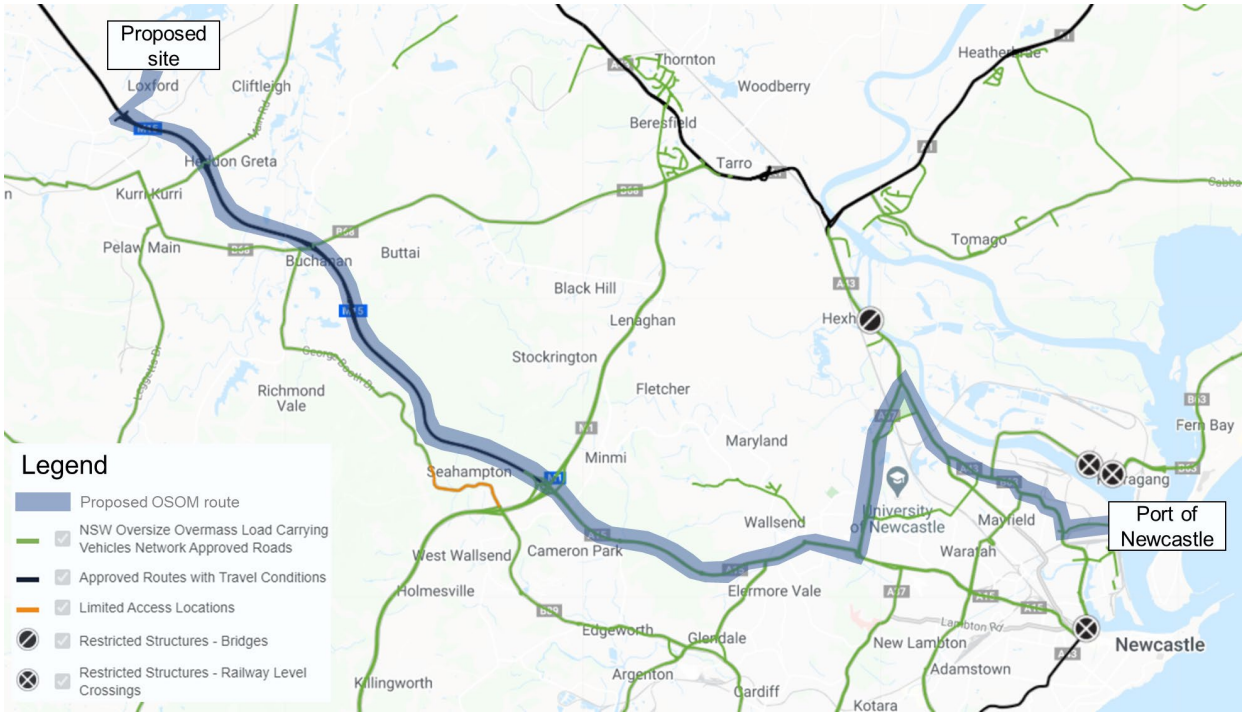


Figure 5.2: Proposed OSOM vehicle route

OSOM vehicle movements would be required to comply with the following:

- *Additional Access Conditions: Oversize and overmass heavy vehicles and loads* (Transport For NSW, 2020)including pilot or escort requirements
- Preparation and adherence to a separate OSOM Transport Management Plan as the OSOM movement is classified as high-risk due to the total combination weight
- Full route survey assessment including review of allowable heights, bridge/overpass capacities, etc.
- State-wide oversize holiday curfews
- Rail Infrastructure Manager approval (if the proposed route is required to travel over a railway level crossing).

To manage these OSOM vehicles, a permit will be sought from the NHVR. This permit would undergo a separate approval process and a suitable contractor would be engaged for transportation. As part of the permit, the contractor would develop a separate OSOM Transport Management Plan and determine the suitable route based on the required OSOM vehicle dimensions and mass in consultation with Snowy Hydro and the NHVR. These traffic movements would be undertaken at night under escort and in accordance with any OSOM permit conditions.

The OSOM Transport Management Plan for the movement of these OSOM vehicles would be undertaken to identify risks and minimise impacts to the wider road network. The plan would cover as a minimum:

- Identification of route
- Measures to provide an escort for the loads
- Times of transporting to minimise impacts on the road network
- Communication strategy and liaising with emergency services and police.

As part of the OSOM vehicle movements, it is anticipated that minor temporary civil infrastructure works may be required. These temporary works would be confirmed as part of the OSOM Transport Management Plan and may include temporary removal of medians, temporary adjustment of traffic infrastructure such as posts etc, minor roadworks at intersections and the expected laydown of some additional hardstand/surface to conduct the U-turn required on Old Maitland Road on the Pacific Highway.

Due to the low expected number of OSOM vehicle movements required, combined with the fact that these OSOM vehicles would travel outside of peak periods, it is expected that the traffic impact of OSOM vehicles on the road network would be minimal.

5.1.7 Cumulative construction impacts

5.1.7.1 Former Hydro Aluminium Kurri Kurri Smelter Demolition and Remediation

The Proposal Site forms part of the former Kurri Kurri aluminium smelter site which is owned by Hydro Aluminium and which ceased operation in late 2012 and was permanently closed in 2014. Demolition of the former aluminium smelter and site remediation of the land is an approved State Significant Development and was the subject of an Environmental Impact Statement that was publicly exhibited in 2016 and approved by NSW Department of Planning, Industry and Environment (DPIE) in December 2020. Works would be completed within the Proposal Site prior to construction of the Proposal. Demolition and remediation of the former aluminium smelter land outside of the Proposal Site is estimated to be ongoing to late 2023 and therefore concurrent with construction of the Proposal.

Activities associated with the demolition and remediation of the former Kurri Kurri aluminium smelter site are expected to generate traffic on roads forming part of the proposed construction vehicle routes. The *Hydro Kurri Kurri Aluminium Smelter Demolition and Remediation Project Traffic Impact Assessment* (Hyder, 2016) outlines the expected traffic generation associated with the demolition and remediation works. Traffic is expected to be generated between 7:00 am and 6:00 pm on weekdays and 7:00 am to 1:00 pm on Saturday and would travel on Hart Road and the Hunter Expressway via the Hart Road interchange. The peak traffic generation (associated with demolition activities) is expected to be low and is summarised below:

- Morning peak period – 25 light vehicles and four heavy vehicles travelling to the site and four heavy vehicles leaving the site
- Evening peak hour - 25 light vehicles and four heavy vehicles leaving the site and four heavy vehicles travelling to the site.

Furthermore, the *Hydro Kurri Kurri Aluminium Smelter Demolition and Remediation Project Traffic Impact Assessment* identified that the Hart Road interchange would operate satisfactorily at a Level of Service A both with and without construction traffic generated by the demolition and remediation works and has spare capacity to accommodate additional traffic.

As such, due to the low amount of traffic generated by the demolition and remediation works, the assessed potential traffic impacts of the Proposal are not expected to be increased by cumulative construction activities. Cumulative impacts on safety are expected to be minimal and no impacts to public transport, pedestrians and cyclists and road access are expected.

5.1.7.2 ReGrowth Kurri Kurri Rezoning, subdivision and industrial development

The rezoning, subdivision and industrial development of the Hydro Aluminium land is a major planning proposal by ReGrowth Kurri Kurri to rezone approximately 329 hectares of land at and around the former aluminium smelter from Rural Landscape (RU2) to residential and public recreation, business, heavy and general industrial, infrastructure and environmental conservation (B1, B5, IN1, IN3, R2, RE1 and SP2 (in part)), to reduce the minimum lot size from 40 ha to 450 m^2 (in part) and to identify the site as an urban release area. The rezoning proposal affects land in both the Cessnock and Maitland local government areas. Under this plan, the Proposal Site would be designated Heavy Industrial. On 1 December 2020 the NSW Department of Planning, Industry and Environment issued a Gateway Determination enabling Cessnock City Council to place the Hydro Kurri Kurri Planning Proposal on public exhibition for a minimum of 28 days. Submissions closed on 1 February 2021.

The rezoning proposal is subject to further approval and physical works would be subject to lodgement and approval of separate development applications. Development applications for development of the land following rezoning and subdivision are not expected until 2023, by which time the power station is anticipated to be under construction or even in operation (late 2023). Cumulative construction impacts are unlikely to be concurrent with the Demolition and Remediation project and therefore the overall cumulative impacts are not expected to be any greater than discussed above.

5.2 Operation

As discussed in Section 0, a very low amount of traffic would be generated by typical operation of the Proposal for onsite staff performing regular maintenance, functional tests and facility upkeep activities. At specific intervals throughout the operational lifetime of the Proposal, additional light and heavy vehicles would be generated for diesel fuel delivery and approximately every 10 years for a GT overhaul activities. Operational vehicle movements are expected to have a minimal impact on the operation of the surrounding road network as roads currently carry low traffic volumes and have spare capacity to accommodate the relatively low increase in operational traffic.

As with construction, operational impacts of the Proposal on safety are expected to be minimal.

All parking for operational vehicles would be accommodated on the Proposal Site.

No impacts to public transport, pedestrians and cyclists and road access are expected.

Due to the very low amount of traffic generated by typical operation of the Proposal and the nearby former Hydro Aluminium Kurri Kurri aluminium smelter demolition and remediation works, cumulative operation activities are expected to have a minimal impact on the operation of the Hart Road interchange and operation of the Hunter Expressway. Cumulative impacts on safety are expected to be minimal and no impacts to public transport, pedestrians and cyclists and road access are expected.

6. Mitigation and management measures

Recommended safeguards and mitigation measures to manage traffic and transport impacts of the Proposal's construction and operation are summarised in Table 6.1.

Table 6.1: Summary of environmental management measures

Ref	Impact	Mitigation measures
Detailed design and pre – construction		
TT1	Traffic, access and transport	A Construction Traffic Management Plan will be prepared and implemented by the construction contractor. The CTMP will include: ▪ Confirmation of haulage routes ▪ Access to construction site including entry and exit locations ▪ Times of transporting to minimise impacts on the road network ▪ Measures to minimise the number of workers using private vehicles ▪ Management of oversized vehicles ▪ Site specific traffic control measures (including signage) to manage and regulate traffic movement ▪ Relevant traffic safety measures including driver induction, training, safety measures and protocols ▪ Identify requirements for, and placement of, traffic barriers. ▪ Requirements and methods to consult and inform the local community of impacts on the local road network due to the development-related activities ▪ Consultation with Transport for NSW and Council ▪ Consultation with the emergency services to ensure that procedures are in place to maintain safe, priority access for emergency vehicles ▪ A response plan for any construction related traffic incident ▪ Monitoring, review and amendment mechanisms.
TT2	OSOM vehicles	To manage OSOM vehicle movements, a permit will be sought from the NHVR and a separate OSOM Transport Management Plan will be prepared and will include: ▪ Identification of route ▪ Measures to provide an escort for the loads ▪ Times of transporting to minimise impacts on the road network ▪ Communication strategy and liaising with emergency services and police
Construction		
TT3	Access	Affected parties including emergency services will be notified in advance of any disruptions to traffic and restriction of access impacted by project activities.

7. Conclusion

This report details the traffic and transport impact assessment for the Kurri Kurri Power Station project and addresses the relevant SEARs for the Proposal. This report provides an overview of the existing traffic and transport environment, an assessment of potential traffic and transport impacts of the Proposal and recommended mitigation measures.

The potential impacts on road network performance, parking, access, public transport, pedestrians and cyclists, safety and road condition during construction, cumulative construction and operation of the Proposal are expected to be minimal.

A CTMP implemented by the construction contractor would minimise potential impacts of the Proposal during construction. Relevant traffic safety measures included in the CTMP would be traffic control and signage, driver conduct, safety protocols and management of OSOM vehicles. Furthermore, a separate OSOM transport management plan would be prepared and would include a detailed overview of management measures for the OSOM movements, including identification of route, escort measures, time of transporting and a communications strategy.

8. References

Hyder. (2016). *Traffic Impact Assessment—Hydro Kurri Kurri Aluminium Smelter Redevelopment Hydro Redevelopment at Kurri Kurri.*

Roads and Maritime Services. (2013). *Traffic Modelling Guidelines.* Roads and Maritime Services.

Transport For NSW. (2020). *Additional Access Conditions Oversize and overmass heavy vehicles and loads.* Transport For NSW.

Transport For NSW. (2020). CrashLink Database.

Transport For NSW. (2020). *NSW Load Carrying Network*. Retrieved from Transport For NSW: https://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/nsw-load-carrying-network/map/index.html

Transport for NSW. (2020). *Traffic Volume Viewer*. Retrieved from Transport for NSW: https://www.rms.nsw.gov.au/about/corporate-publications/statistics/traffic-volumes/aadt-map/index.html#/?z=6