

CHAPTER 13 - TRAFFIC AND TRANSPORT

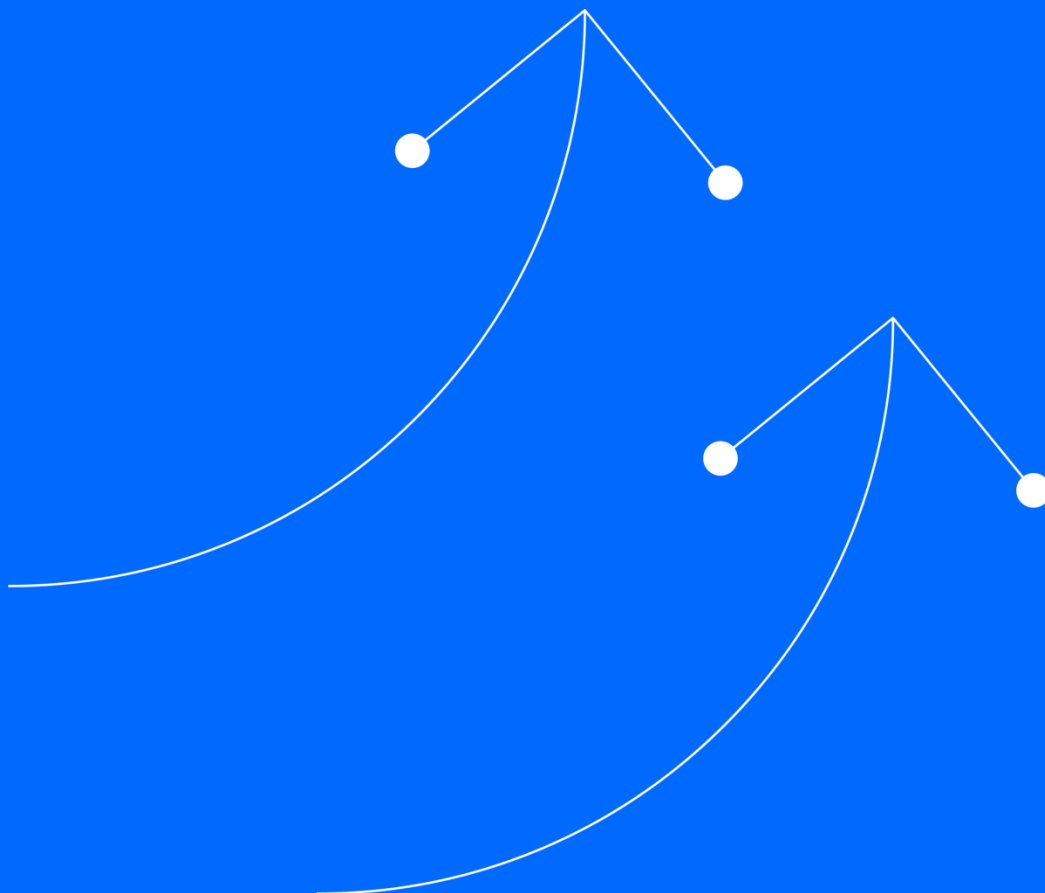


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13. Traffic and transport

This chapter provides a summary of the traffic and transport assessment. It describes the existing traffic and transport environment, identifies potential construction, operation and decommissioning impacts of the project, and provides measures to mitigate and manage the impacts identified.

The assessment indicates the project would have a minimal impact on existing transport networks around the project site, but there would be some adjustments needed to efficiently and safely construct the project and maintain network connectivity. Key roads and intersections within the study area would continue to operate well within their capacity and maintain good road network operations during the peak period of construction. No other impacts on transport infrastructure, including parking facilities, public and active transport, road safety, and rail freight operations, are expected following the implementation of the proposed mitigation and management measures.

The project would include movements of heavy vehicles, including oversize overmass (OSOM) loads associated with the delivery of plant and equipment, and pipe sections. Detailed trip and route planning would be conducted during the construction planning phase, and all OSOM movements would be conducted in accordance with the relevant permits.

Further information is provided in Technical Report 9 (Traffic and transport).

13.1 Approach

13.1.1 Overview

The traffic and transport assessment has been carried out in accordance with the *Guide to Transport Impact Assessment* (NSW Government, 2024) and *Guide to Traffic Management Part 12: Integrated Transport Assessments for Development* (Austroads, 2020), as key guiding documents to assess potential traffic impacts for projects in NSW. The assessment has also been undertaken in accordance with the SEARs and other relevant policies and guidelines, including traffic modelling guidelines and Austroads traffic management.

An overview of the approach to the assessment is provided below. Further information on the assessment methodology is provided in section 2 of Technical Report 9 (Traffic and transport).

13.1.2 Methodology

Study area

The study area for the assessment encompasses the project site and the key roads and intersections leading to and from the project site, including the roads that provide access to workforce accommodation facilities in Narrabri and Boggabri.

The study area is shown on Figure 2.1 in Technical Report 9 (Traffic and transport).

Key tasks

The traffic and transport assessment involved the following tasks:

- Reviewing the characteristics of the existing environment through aerial imagery, site inspections, traffic counts (at three locations), intersection turning movement counts (at two locations), and stakeholder feedback.
- Reviewing the proposed construction activities, including workforce resources, workforce accommodation locations, construction facilities/compound, traffic volumes, heavy vehicle haulage routes and site accesses.
- Identifying and assessing the potential impacts of the project during construction, including impacts on intersections, the performance of the road network, and the potential for disruptions to transport infrastructure and property access.

- Reviewing conditions expected during operation (including maintenance) and decommissioning of the project.
- Assessing the potential for cumulative impacts with other projects.
- Identifying measures to manage the potential impacts identified.

Traffic modelling, using traffic modelling software (SIDRA 9), was undertaken to assess the potential impacts of construction traffic at key intersections.

13.2 Existing environment

13.2.1 Road network

The road network within the study area includes:

- classified arterial roads:
 - Newell Highway between the intersection with X-line in the Pilliga East State Forest to the south, and Tibbereena Street in Narrabri to the north
 - Kamilaroi Highway between Boggabri to the south, and the Newell Highway at Narrabri to the north
- local (public) roads between the project site and the Kamilaroi and Newell highways
- forestry tracks within and in the vicinity of the Pilliga East and Bibblewindi State forests.

Key roads that would be used by construction traffic are summarised below. The road and transport network in the vicinity of the project site is shown on Figure 13.1 and Figure 13.2, and in more detail on the figures in Appendix B (Map book).

Main roads

Newell Highway

The Newell Highway (A39) is a classified State road and an important freight route that connects Victoria and Queensland via regional NSW. The Newell Highway is a major road on the western side of the study area, providing access to the Leewood and Bibblewindi facilities and Narrabri (including the workforce accommodation facility).

Outside of built-up areas, the Newell Highway generally has a posted speed limit of 110 kilometres per hour. It generally comprises a single lane of travel in each direction on a single carriageway. Overtaking lanes are provided in some locations.

Kamilaroi Highway

The Kamilaroi Highway (B51/B76) is a classified State road that extends between Bourke in north-western NSW and the New England Highway near Quirindi in the south-east, via Gunnedah, Boggabri, Baan Baa, Narrabri and Moree. The Kamilaroi Highway is a major road on the eastern side of the study area, providing access to Boggabri (including the workforce accommodation facility) and the proposed location for the Baan Baa construction compound. It intersects with the Newell Highway at a roundabout on the southern side of Narrabri.

Outside of built-up areas, the Kamilaroi Highway generally has a posted speed limit of 100 kilometres per hour. It generally comprises a single lane of travel in each direction on a single carriageway.

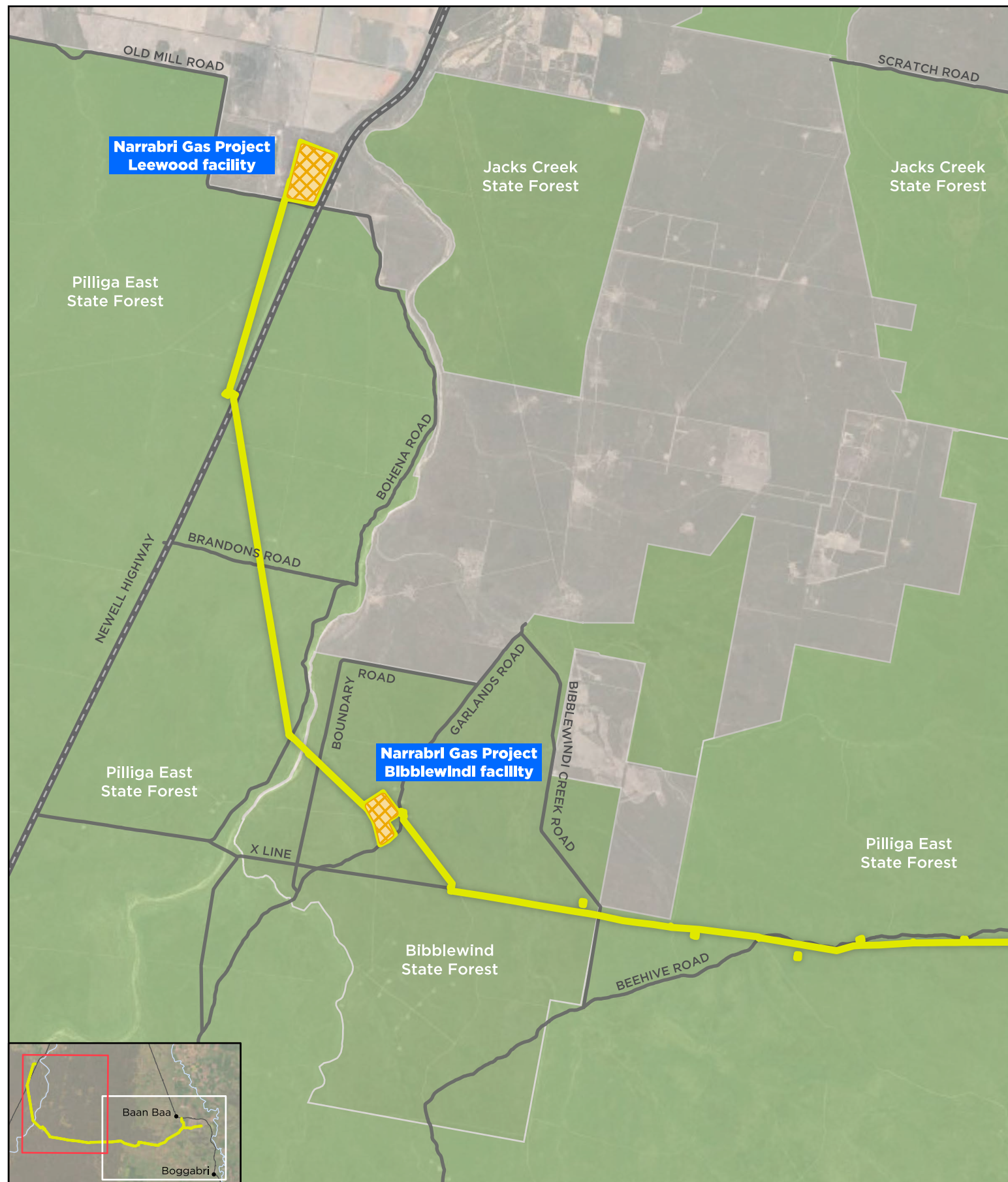


Figure 13.1 Road network and transport infrastructure – map 1

Legend

Project infrastructure: — Project site Construction facility

Highway Local roads





Legend

Project infrastructure: — Project site Construction facility

— Stage 2 Hunter Gas Pipeline - Indicative pipeline route — Stage 3 Hunter Gas Pipeline - Indicative pipeline route
● Town Highway Local roads Railway line

Figure 13.2 Road network and transport infrastructure - map 2



Local roads and forestry tracks

The study area includes a network of local roads and forestry access tracks. The following local roads/forestry tracks would be used to access the work areas:

- Curracabah Road
- Bundah Street
- Baranbah Street
- Baan Baa Road
- Caloola Road
- Delwood Road
- Towri Road
- Beehive Road
- Garlands Road
- Boundary Road
- Bohena Creek Road
- Brandons Road
- X-line
- Old Mill Road.

There are also a number of unnamed unsealed tracks within the Pilliga East and Bibblewindi State Forest, used mainly for forestry operational purposes, that intersect the project site and would be used by the project.

Heavy vehicle routes

The Newell and Kamilaroi highways are approved to accommodate OSOM vehicles.

Parking

There is no formal on-street or designated off-street parking facilities along or near the project site.

13.2.2 Traffic volumes and performance

Traffic volumes

Traffic surveys (counts) were performed in June 2023 during which morning and afternoon traffic volumes for key roads within the study area were observed. The peak hours were identified from the survey information and determined to be:

- Newell Highway – 10am to 11am (morning peak) and 12pm to 1pm (afternoon peak)
- Kamilaroi Highway – 9am to 10am (morning peak) and 5pm to 6pm (afternoon peak).

The traffic counts at Curracabah Road indicated that traffic volumes are negligible, as less than 10 vehicles were counted per day, with a maximum of two vehicles per direction in any hour.

The results of the traffic counts are summarised in Table 13.1.

Table 13.1 Summary of weekday traffic volumes on key roads (2023)

Time	Northbound			Southbound		
	Light vehicles	Heavy vehicles	Total	Light vehicles	Heavy vehicles	Total
Newell Highway						
Weekday daily	545	309 (36%)	854	475	325 (40%)	800
AM peak	52	23	75	40	17	57
PM peak	48	23	71	42	22	64
Kamilaroi Highway						
Weekday daily	1,073	263 (20%)	1,336	1,061	260 (20%)	1,321
AM peak	61	29	90	85	25	110
PM peak	103	12	115	74	18	92

Road and intersection performance

An assessment was undertaken of the performance of the key roads identified in Table 13.1 based on the survey data. The assessment concluded the roads operate with traffic volumes well below their maximum capacity.

The performance of the road network is largely dependent on the operating performance of intersections that form critical capacity control points. Level of service is the standard measure used to assess operational performance of the network and intersections, as described in *Guide to Traffic Generating Developments* (RTA, 2002). There are six levels of service, ranging from level of service A, which represents the best performance, to level of service F, which represents the worst performance.

A review of the existing performance of the following intersections with the potential to be affected by traffic generated by the project was undertaken:

- Newell Highway/Kamilaroi Highway/Kelvin Vickery Avenue/Old Newell Highway (roundabout), Narrabri
- Kamilaroi Highway/Baranbah Street, Baan Baa.

These two intersections were found to be operating well within their capacity at level of service A during both the AM and PM peak hour periods.

13.2.3 Other transport and infrastructure facilities

Public transport

Bus services

Five bus services operated by Forest Coach Lines operate within the study area. Bus routes 457A, 457B and 457C operate within Narrabri and between Narrabri and Narrabri West, and bus routes 457D and 457E run from Narrabri to Gunnedah along the Kamilaroi Highway, passing through Baan Baa and Boggabri. There are also school bus services operating along the Newell Highway and Old Turrawan Road/Kamilaroi Highway.

Passenger rail

The Mungindi Railway Line is located at the eastern end of the project site. The Mungindi Railway Line branches from the Main North Line at Werris Creek Station and heads north-west through the towns of Gunnedah, Boggabri, Baan Baa and Narrabri to Moree. NSW TrainLink's North Western Xplorer (to Moree) operates along the line, servicing Narrabri and Boggabri stations. A single passenger service operates in each direction daily. It is noted that passenger trains do not stop at Baan Baa Station.

Freight rail

Freight trains carrying coal, grain and general freight services operate on the Mungindi railway line, passing through Boggabri, Baan Baa and Narrabri at different times of the day, comprising:

- one to two general freight services per day per direction
- one grain service per day per direction
- 15 coal services per day per direction, operating between 12 and 15 hours per day.

Rail crossings

There are three rail crossings located within the study area:

- Narrabri – Newell Highway between Kamilaroi Highway and Mooloolbar Street
- Baan Baa – Baranbah Street between Bundah Street and Kamilaroi Highway
- Boggabri – Boston Street/Caloola Road, west of Kamilaroi Highway.

Road markings are provided at the Narrabri crossing, and boom gates and warning lights are provided at the Boggabri and Baan Baa crossings.

Pedestrian and cyclists

There are no formal active transport facilities in the vicinity of the project site.

13.3 Construction impacts

13.3.1 Construction vehicle movements

Construction would generate additional vehicle movements, including light and heavy vehicles. Light vehicles would generally be used by construction workers moving to and from the construction work areas, accommodation and construction facilities/compound. Heavy vehicle movements would generally be associated with trucks delivering construction materials, including pipes, plant, fuel and water, to the project site. OSOM vehicles would be used to transport pipes and construction plant and equipment to the site. No high risk OSOM vehicle movements are expected to be required.

For the purposes of undertaking a conservative assessment of potential impacts, the following peak hour volumes of construction traffic have been adopted, aligned with potential peak construction activity:

- 100 light vehicle movements (for workers)
- eight OSOM movements (for pipe delivery)
- 32 fuel and water truck movements (for delivery to Leewood and Baan Baa facilities)
- 24 fuel and water truck movements (for delivery between the Leewood/Baan Baa facilities and the RoW).

Assuming construction workers are accommodated at either the Civeo Narrabri and/or Boggabri workforce accommodation, all workers would adopt one of the following routes to the project site:

- travel to either the Leewood or Bibblewindi facilities via the Kamilaroi and Newell highways from the Civeo Boggabri facility, or
- travel via the Kamilaroi Highway to the Baan Baa construction compound from the Civeo Narrabri facility.

The delivery of pipes from the Port of Newcastle (or Port of Brisbane) to the Leewood facility and Baan Baa construction compound would require about 700 OSOM vehicle trips in total. These deliveries would occur over a period of about 10 days, prior to the commencement of the main construction works. The subsequent movement of pipes from the Leewood facility and Baan Baa construction compound to the construction right of way would take place via Newell Highway/X-line and via Kamilaroi Highway/Baranbah Street, respectively, as well as other local roads and number about 16 (32 vehicle trips in total) movements per day.

Bulk water and fuel supplies would be stored at the Leewood and Bibblewindi facilities, Baan Baa construction compound and temporary workspaces before being transported to the construction right of way. Smaller trucks would be used to distribute water and fuel within the project site using the network of public and forestry roads.

Around 280 OSOM vehicle trips in total would be required to transport major pieces of construction equipment from a number of locations to the Leewood facility. These deliveries would occur over a period of about four weeks, prior to the commencement of the main construction works. A smaller number of OSOM movements would be required routinely during construction to move the construction equipment along the construction right of way e.g. around locations where trenchless crossings are proposed.

Analysis of potential OSOM routes to the site from Dubbo (Newell Highway), the Port of Newcastle (New England Highway/Kamilaroi Highway) or from Queensland (Newell Highway) indicated limited restrictions of an administrative nature for OSOM vehicles required for the project.

A swept path analysis for OSOM vehicles has also been undertaken from the highway network to the Leewood facility and Baan Baa construction compound as well as across the Mungindi railway line. The analysis indicated the turning movements can be safely performed at all the investigated intersections, while remaining within the existing road corridor.

Road network impacts

The Newell and Kamilaroi highways are the busiest of the roads likely to be used for construction access. Under current conditions, the Newell Highway accommodates about 57 to 75 vehicles per hour, and the Kamilaroi Highway accommodates about 90 to 115 vehicles per hour (see Table 13.1). Relative to a theoretical capacity of 900 vehicles per hour, these results indicate about 87 to 94 per cent spare capacity across the day.

It is estimated that total construction traffic using the Newell and Kamilaroi highways during the road network peak hours would be up to about 116 vehicles per hour, for both roads. This represents about 35 to 59 per cent of total vehicles on the Newell Highway and about 47 to 56 per cent of vehicles on the Kamilaroi Highway in 2027 when peak construction activity would be underway.

The analysis indicates that in 2027, the Newell and Kamilaroi highways would continue to operate well within their capacities with the expected additional construction traffic movements.

During road network peak hours, construction-related heavy vehicle trips are anticipated to comprise about 19 to 25 per cent of total heavy vehicle volumes on the Newell Highway and about 21 to 51 per cent of total heavy vehicle volumes on the Kamilaroi Highway. As noted above, both highways have substantial residual capacity to accommodate additional traffic. The assessment concluded that no perceptible changes to traffic conditions are expected during the peak construction phase.

For other local roads proposed for construction use, these roads typically carry low traffic volumes and do not serve major trip-generating facilities. As such, their operational capacity is unlikely to be affected by construction traffic, and they are expected to continue functioning at a good level of service.

Potential impacts of construction traffic at the key intersections are also not expected as the intersections have sufficient existing capacity to absorb increased traffic volumes due to very low existing traffic movements. All roads would continue to operate at their existing level of service (level of service A) in 2027 with the additional construction traffic movements.

13.3.2 Project site access

During construction, access would be required to the construction right of way and construction ancillary facilities for delivery of materials, equipment and workers. Existing public roads and private access tracks would be used as far as practicable; however, some new access tracks are proposed in addition to other road and intersection upgrades (see Table 4.2 of Technical Report 9 (Traffic and transport)).

Access track design and planning would include consultation with relevant landholders and the road owner to confirm detailed requirements. Indicative locations for new access tracks and road and intersection upgrades are shown in Appendix B (Map book).

Access to the Leewood and Bibblewindi facilities would be provided by intersection treatments at Old Mill Road and X-line approved as part of the Narrabri Gas Project.

Access to and from the proposed Baan Baa construction compound would be provided via an existing, unsealed access road that intersects the Kamilaroi Highway at a priority controlled T-intersection. The access track would be upgraded to facilitate movement of the proposed construction traffic. As described in section 3.6.3, the intersection with the Kamilaroi Highway is proposed to be upgraded to provide additional areas for left and right-turning traffic to maintain safe and efficient operation. The design and layout of the intersection would be developed in consultation with Transport for NSW and Council.

Any roads/tracks used for emergency purposes would be maintained in an operable condition throughout construction, as agreed with the landholder and emergency services.

13.3.3 Road crossings

As described in section 3.4.3, the project would also involve:

- trenchless crossings of the Newell Highway, Delwood Road (combined crossing with Tulla Mullen Creek) and Curracabah Road (combined crossing with Mungindi railway line)
- two trenched crossings of unsealed local roads (Towri Road and Caloola Road)
- 26 trenched crossings of unsealed forestry access tracks.

Trenched crossings of roads are expected to take about one to two days each, depending on their width. To maintain vehicle movement, options such as constructing the crossing in halves at separate times or using road plates, would be considered.

The local roads and forestry tracks that would be crossed are generally used for forestry operations or property access and do not accommodate substantial traffic. As there is anticipated to be only a short duration of construction works affecting these roads, and alternate means of maintaining access is readily available, the impacts of local road crossings by trenching are expected to be minimal.

There would be no impacts on the operation of the Newell Highway during construction.

13.3.4 Rail crossings

The proposed crossing of the Mungindi railway line (combined with the crossing of Curracabah Road near Baan Baa) would be undertaken via trenchless methods to minimise potential disruption to the railway line and rail freight activities. Vehicle access and train services would not be affected during this period.

13.3.5 Other impacts

Construction is not expected to impact rail freight operations or the operation of the level crossing at Baan Baa due to the limited number of anticipated vehicle movements. Some queueing of construction vehicles at the Baan Baa rail crossing may occur should vehicle movements coincide with freight train pass-bys. However, any queues would be temporary and are not expected to impact the operation or safety of the level crossing.

Construction is not expected to impact bus operations within the study area.

13.4 Operation impacts

Some access tracks proposed for use during construction would be retained and used during operation, in consultation with the landholder.

Occasional light vehicle movements associated with field personnel would be required for routine inspections and maintenance. Given the very small number of field staff required, traffic and transport impacts during operation are expected to be negligible.

13.5 Decommissioning impacts

At project closure, the pipeline would be decommissioned as described in section 3.8. Activities with the potential to affect traffic, transport and access (if inadequately managed) could include:

- temporary use of local roads for access to the work areas by equipment and personnel
- short-term road or access track closures or restrictions
- increased vehicle movements to and from work areas.

Decommissioning works would be significantly less intensive than construction activities, involving fewer personnel, less equipment and shorter durations of work at any given location (up to about a week). As such, vehicle volumes and traffic movements would be lower than during construction. Measures to manage potential traffic and access impacts during decommissioning will be defined in the decommissioning environmental management plan, which will include a traffic and access plan adapted from the construction traffic and access management plan.

Implementation of the structured, risk-based decommissioning processes and decommissioning environmental management plan would ensure that potential impacts on the local and regional road network, landholder access, and transport safety are identified and addressed. As a result, no adverse impacts on traffic, transport or access are expected.

Further information about the approach to environmental management during decommissioning is provided in section 20.4.

13.6 Mitigation and management

13.6.1 Approach to mitigation and management

The project would have a limited impact on existing transport networks around the project site during construction; however, some adjustments are needed to efficiently and safely construct the project and maintain network connectivity.

Some users/areas may temporarily experience impacts, such as:

- an increase of construction-related vehicles sharing the road, particularly around the Leewood and Bibblewindi facilities, the Baan Baa construction compound, and at shift start and finish times
- movement of OSOM vehicles on State and local roads.

Measures are provided in section 13.6.2 to manage the safe movement of OSOM vehicles and ensure construction planning minimises impacts and inconvenience to local residents and users of the road network as far as practicable. This will include preparing and implementing a construction traffic and access management plan as a part of the CEMP. The plan will detail measures to minimise potential traffic, transport and access impacts during construction, including impacts on the safe and efficient operation of roads and transport infrastructure.

Further information on the CEMP is provided in chapter 20 (Approach to environment management and mitigation).

13.6.2 List of mitigation measures

Measures that will be implemented to address potential impacts on traffic and transport are listed in Table 13.2.

Table 13.2 Traffic and transport mitigation measures

Impact/issue	Ref	Mitigation measures	Timing
Impacts on roads, transport and access	TT1	Design and construction planning will continue to be refined to avoid or minimise impacts on the surrounding road and transport network and property access as far as practicable. Relevant stakeholders (including Narrabri Shire Council, Transport for NSW, Forestry Corporation of NSW, Australian Rail Track Corporation, emergency services and public transport/bus operators) will be consulted prior to finalising the design of those aspects of the project that have the potential to affect the operation of infrastructure under the management of these stakeholders. This will include confirming ongoing operation and maintenance arrangements.	Design, pre-construction
Improved access between the Baan Baa construction compound access and the Kamilaroi Highway	TT2	An appropriate treatment for the intersection of the Kamilaroi Highway/Baan Baa construction compound access track, and associated design (including safety) requirements, will be confirmed in consultation with Transport for NSW and Narrabri Shire Council.	Design

Impact/issue	Ref	Mitigation measures	Timing
Managing the potential for traffic, transport and access impacts during construction	TT3	A construction traffic and access management plan will be prepared and implemented as part of the CEMP. The plan will detail measures to minimise potential traffic, transport and access impacts during construction, including measures to maintain the safe and efficient operation of roads and transport infrastructure. Appropriate traffic control measures will be adopted to ensure the safety of all road users is not impacted by construction-related vehicles travelling to and from the project site. The plan will include a driver's code of conduct for haulage operations to define appropriate driver behaviour and safety requirements for drivers operating heavy vehicles on public roads. The plan will be prepared in consultation with relevant stakeholders, including Narrabri Shire Council, Transport for NSW and Forestry Corporation of NSW.	Pre-construction, construction
OSOM route planning and permitting	TT4	The construction contractor will confirm the dimensions and proposed routing of OSOM vehicles to be used and apply for the necessary permits prior to undertaking OSOM movements. The assessment will consider the shortest and least trafficked route for OSOM vehicles to minimise the risk to other motorists.	Pre-construction, construction
Minimise potential impacts on the rail network	TT5	Freight train timetables will be reviewed, and heavy vehicle movements will be scheduled (where practicable) to minimise the impacts of queueing at the Baan Baa level crossing.	Construction
Access impacts	TT6	Disruption to private property access and local roads will be minimised as far as practicable. Where temporary disruption to access cannot be avoided (such as during trenched road crossings), consultation will be undertaken with landholders of affected properties and road infrastructure owners to confirm access requirements and determine alternative arrangements. Alternative access arrangements will be implemented as needed during road crossings to maintain access, including for any roads used for emergency access.	Construction
Impacts on local roads	TT7	Condition surveys of local roads and access tracks proposed to be used or affected during construction will be completed prior to and following construction, and provided to the relevant road authority. Condition monitoring will also be carried out during construction. Where the condition of a road or track is adversely affected by the project, it will be restored to address any damage caused.	Pre-construction, construction
Decommissioning impacts	TT8	A traffic and access management plan will be included in the decommissioning environmental management plan and implemented during decommissioning to manage potential impacts on traffic, transport and access. The plan will include, but not be limited to: • appropriate traffic control measures • driver's code of conduct for haulage operations • consultation with relevant stakeholders, including landholders and Narrabri Shire Council.	Decommissioning