CHAPTER

Traffic, transport and access

ILLABO TO STOCKINBINGAL ENVIRONMENTAL IMPACT STATEMENT





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11. Traffic, transport and access

This chapter provides a summary of the traffic, transport and access impact assessment of the Inland Rail—Illabo to Stockinbingal project (the proposal). It describes the existing traffic, transport and access environment, assesses the impacts of construction and operation, and provides recommended mitigation and management measures. The full assessment report is provided as Technical Paper 3: Traffic, transport and access (Technical Paper 3).

11.1 Overview

Potential traffic, transport and access impacts, including those raised during stakeholder and community consultation, were considered during design development. These related to road user safety on the road network and at level crossings, the need for access points to cross the rail corridor, traffic impacts to the surrounding road network and property impacts associated with land fragmentation and access.

Design has avoided/minimised potential impacts during construction, by:

- utilising the project site (construction corridor) for transport of materials (primarily bulk earthworks) as far as possible and by minimising the amount of material transported on the public road network
- > winning of material within the construction site to minimise need for import of materials
- minimising temporary road closures and diversionary routes.

Design has avoided/minimised potential impacts during operation, by:

- maintaining public road network through a combination of level crossings and grade separated crossings at road rail interfaces
- minimising severance of private land through the installation of private level crossings and stock underpasses in consultation with landowners
- improving road safety with the removal of a level crossing from provision of a road-over-rail grade separation for the interface of the project with Burley Griffin Way, an important state highway.

The proposal is located between sections of existing rail line, which carry freight and passenger trains. Existing traffic activity in proximity to the proposal site is low.

During construction, the key potential impacts and proposed measures to address them are as follows:

- The proposal has potential to impact road safety from increased road use and turning movements at intersections and construction site access gates. There would be no significant traffic impacts associated with the proposal as the road network and intersections are sufficient to cater for the estimated construction traffic without an unacceptable impact on level of service. To mitigate impacts, as part of preconstruction, Road Safety Audits (RSAs) and a risk assessment would be undertaken by the construction contractor to ensure the safety of all road users. Local Land Services would be notified of increased heavy vehicle movements along livestock highways during the construction phase as well as periods of changed traffic operations.
- There may be temporary delays to local and regional traffic due to road closures and diversions in the vicinity of the proposal site, with temporary diversionary routes for proposed level crossings and bridges. This work would impact local roads with low traffic volumes; however, to realign Burley Griffin Way at Stockinbingal, the proposal would require the western end of Hibernia Street (Burley Griffin Way at this point) to be closed temporarily, with traffic diverted onto Dudauman Street and Troy Street. Input would be sought from affected residents and relevant stakeholders prior to this alternative route being established in accordance with the project-specific communication management plan. Consultation with relevant stakeholders would also be undertaken regarding the need to temporarily relocate the Stockinbingal bus stop during the temporary closure of Hibernia Street. Appropriate traffic control measures would be implemented where appropriate.
- Construction activities would require possessions where works may disrupt the operation of the existing rail lines. To mitigate, the timing and duration of the possessions would be agreed with affected train operators, track stakeholders and relevant government departments. It is assumed these activities would occur during existing scheduled track possession periods.

During operation, the key potential impacts are:

There would be a permanent modification to the traffic and road network through the new Burley Griffin Way road bridge over the proposed rail alignment and the requirement for the existing Burley Griffin Way/Hibernia Street and Troy Street to be realigned. The realignment of Burley Griffin Way would have a positive impact on road safety by eliminating the existing level crossing in Stockinbingal and reducing travel times for residents and other road users.

- There is potential for an increase in travel times due to new public level crossings at Ironbong Road, Old Sydney Road and Corbys Lane, as well as at three unnamed roads, resulting in wait times associated with length and frequency of trains. It was found the introduction of level crossings would result in a vehicle delay of a maximum of 131 seconds (common to all crossings), which is considered negligible.
- Maintenance and repair vehicles accessing the proposal would generate minimal traffic and are not expected to impact the surrounding road network.

To address any impacts, measures including further consideration of the proposed road–rail interfaces and consultation with the road asset owners and broader stakeholders, would be undertaken during design development.

11.2 Approach

A summary of the approach to the assessment is provided in this section, including the legislation, guidelines and/or policies driving the approach and the methodology used to undertake the assessment. A more detailed description of the approach and methodology is provided in Technical Paper 3.

11.2.1 Legislative and policy context

The traffic and transport assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

- Guide to Traffic Generating Developments Version 2.2 (Roads and Traffic Authority of NSW (NSW RTA), 2002)
- Guide to Traffic Management—Part 3 Traffic Studies and Analysis (Austroads, 2007)
- Cycling aspects of Austroads guides (Austroads, 2014)
- NSW bicycle guidelines version 1.2 (NSW RTA, 2005)
- Planning Guidelines for Walking and Cycling (Department of Infrastructure, Planning and Natural Resources (DIPNR), 2004b)
- Construction of New Level Crossing Policy (Transport for NSW (TfNSW), n.d.)
- Future Transport 2056 Strategy (TfNSW, 2018a)
- NSW Freight and Ports Plan 2018–2023 (TfNSW, 2018c)
- NSW Sustainable Design Guidelines Version 4.0 (TfNSW, 2017a) (which form part of the Transport Projects Sustainability Framework)
- Australian Level Crossing Assessment Model (ALCAM, 2016)
- Level Crossing Closures Policy (TfNSW, n.d.)
- Level Crossing Assessment Handbook (National ALCAM Committee, 2017)
- Railway Crossing Safety Series 2011, Plan: Establishing a Railway Crossing Safety Management Plan (NSW RTA, 2011)
- Safe System Assessment Framework (Austroads, 2016)

A detailed description of the legislative and policy context for the assessment is provided in Chapter 2 of Technical Paper 3.

11.2.2 Secretary's Environmental Assessment Requirements

The Secretary's Environmental Assessment Requirements (SEARs) relevant to traffic, transport and access, together with a reference to where they are addressed in the EIS, are provided in Appendix A.

11.2.3 Methodology

11.2.3.1 Study area

The study area was defined as all road, rail and other transport infrastructure that is potentially impacted by the construction and operation of the proposal, including routes designated for construction vehicles, or routes impacted as a result of traffic diversions.

11.2.3.2 Key tasks

The key tasks in the traffic, transport and access assessment involved:

- review of existing features relevant to traffic, transport and access within the study area, such as:
 - surrounding roads and population centres to the proposal
 - roads (links) that provide access to the proposal from the identified population centres (construction routes)
 - existing intersections on the construction routes with the highest levels of background traffic, on which construction vehicles will undertake turning movements (construction route intersections)
 - intersections (existing and proposed) that would provide direct access to the proposal from the roads that form the construction routes (construction access intersections)
 - stock routes near the proposal using NSW Local Land Services, Travelling Stock Reserves (TSRs) online mapping software
 - > public and active transport infrastructure and services in the vicinity of the proposal
 - analysis of the most recently available crash data, a five-year period (2016–2020), on proposed construction routes
- > determination of existing traffic volumes through review of available traffic count data
- estimation of future baseline traffic volumes by applying a compounding 0.5 per cent annual growth rate to the received traffic count data (see below) for:
 - > 2024–2026, years of peak construction
 - first year of operation (2027, applied conservatively, after opening of the proposal in late 2026)
 - 2037, 10-year design horizon¹
- > modelling for level crossings and key intersections using traffic modelling software (SIDRA) as follows:
 - modelling construction route intersection and construction access intersection assessments during peak period of construction
 - > assessing Degree of Saturation (DoS), Level of Service (LoS) and back of queue length
- assessment of potential construction impacts (including background traffic for peak periods and construction vehicle volumes) including:
 - > review of forecast workforce and construction vehicle types, quantities and staging
 - identification of peak workforce and construction vehicle requirements
 - completion of link assessment of roads identified for use as construction routes, during the peak period of construction, using guidelines from NSW RTA (2002)
 - assessment of construction route intersections and construction access intersections, using SIDRA modelling software
 - identification of detour routes and associated travel time, using Google Maps
 - > identification of stock routes, using NSW LLS and TSR online mapping
- > assessment of operational impacts, including:
 - qualitative review of the impacts on the road network considering local and regional roads, cycling, public and freight transport, and the broader NSW rail network
 - rail maintenance workforce movements
 - > qualitative assessment of the realignment of Burley Griffin Way and Ironbong Road
 - > calculation of delay at level crossings, determined using crossing frequency and speed of train service
 - assessment of the feasibility of level crossings.

¹ Due to revisions to the construction program developed during completion of the assessment, the assessment years vary to those modelled: 2026 (construction link assessment); 2025 (SIDRA models of construction route intersections); and 2024 (SIDRA models of construction access intersections). Considering the traffic growth rate for roads in the study area (refer to section 11.3.3), the relative change in volumes was considered to be negligible and not significant to the assessment outcomes.

identification of potential mitigation measures for the proposal.

Definitions

Level of service for roads

Level of Service (LoS), is defined as the operational performance of traffic on a roadway, traffic lane, approach, intersection, route or network, based on measures such as delay and degree of saturation during a given time period. It provides a means of classifying a performance measure or measures that represent quality of service, and is measured on an A to F scale, with LoS A representing the best operation conditions from the traveller's perspective and LoS F the worst. During weekdays on major and minor rural roads LOS C is the performance standard. LOS D is noted as the performance standard on weekends (NSW RTA, 2002).

Degree of saturation

The degree of saturation (DoS) measures the demand relative to the total capacity during a given flow period. It is also known as the volume to capacity ratio, utilisation ratio, utilisation factor and traffic intensity.

11.2.4 Risks identified

The environmental risk assessment for the proposal (refer to Appendix G) included consideration of potential traffic, transport and access risks. Traffic, transport and access risks with an overall assessed rating of medium or above, as identified by the environmental risk assessment (pre-mitigated), included:

During construction:

- impacts to road safety as a result of increased road use and turning movements at intersections and construction site access gates
- construction traffic impacts, including temporary delays to local and regional traffic due to road closures and diversions
- impacts to condition of rural roads due to construction traffic
- impacts on access to private properties
- Impacts to emergency services through delays in access due to works
- > changes to road network performance due to additional construction vehicles
- loss of parking spaces in towns near construction areas
- > realignment of Burley Griffin Way resulting in detours and change to traffic control
- > impacts to bus routes and services as a result of increased road use, and diversions due to road realignment
- > impacts to livestock highways as a result of increased construction traffic
- rural roads unsuitable for construction traffic (e.g. size and land use).

During operation:

- increase in travel times due to introduction of new level crossings, resulting in wait times associated with length and frequency of trains
- impacts on access to private properties.

The traffic, transport and access assessment considered the potential risks identified by the environmental risk assessment, in addition to the potential risks and impacts identified by the scoping report, the SEARS and relevant guidelines and policies (refer to section 11.2.1).

11.2.5 How potential impacts have been avoided/minimised

The development and assessment process for the proposal is summarised in Chapter 6: Alternatives and proposal options. As noted in Chapter 6, the shortlist of route options was subject to assessment, and the proposed alignment was refined based on evaluation of key considerations, including environmental impacts.

Potential environmental impacts, including in relation to traffic and transport, were included in the list of selection criteria used for the analysis of options. This included avoiding some public and private crossings.

Potential traffic, transport and access impacts have been further avoided/minimised where possible by using the project site (construction corridor) for transport of materials (primarily bulk earthworks) as far as possible and by minimising the amount of material transported on the public road network.

A range of impact mitigation measures have been included in the proposal to mitigate potential traffic, transport and access impacts, as provided in section 11.6. Any residual impacts would be managed as discussed in section 11.6.5.

11.3 Existing environment

The proposal is located between sections of existing rail line near the townships of Illabo in the south and Stockinbingal in the north. These townships are predominantly surrounded by large rural properties connected by minor local roads. There are no major towns located along the proposal site between Illabo and Stockinbingal. The existing traffic and transport network are discussed further in the following sections.

11.3.1 Road network

The road network within the study area consists of two state highways (Burley Griffin Way and Olympic Highway), local roads and private property access roads through primarily agricultural land. The road network is shown in Figure 11-1 and described below.

11.3.1.1 State roads

Burley Griffin Way

Burley Griffin Way is a state-controlled road (by TfNSW). The road name changes to Hibernia Street through the township of Stockinbingal, however, remains a state-controlled road. Burley Griffin Way is about 289 kilometres (km) long, connecting the Hume Highway, south-east of Binalong in the east and Griffith in the west. The posted speed limit of Burley Griffin Way is 100 km per hour (km/hr) outside of settlements, and 60 km/hr within Stockinbingal. The road is one lane with two-way traffic and about 7 metres (m) wide.

Burley Griffin Way passes through Stockinbingal, intersecting the northern end of the proposal, where a section of the road becomes Hibernia Street. At this location, the road is generally 7 m wide and provides one travel lane in each direction, and is an identified route for B-double vehicles 19 m to 26 m long and a livestock highway. Burley Griffin Way/Hibernia Street has a posted speed limit of 60 km/hr.

Olympic Highway

The Olympic Highway is about 318 km in length (controlled by TfNSW), connecting to the Hume Highway north of Albury and Grenfell Road in Cowra. The highway has a posted speed limit of generally 100 km/hr. The road is one lane with two-way traffic and about 8 m wide.

Olympic Highway passes the southern end of the proposal site (on the southern side of the Main South Rail Line) at Illabo. This section of the highway is about 8 m wide and has one travel lane in each direction. The highway is an identified route for B-double vehicles 19 m to 26 m long and a livestock highway.

11.3.1.2 Local roads

The local road network provides direct access to properties and larger roads like Burley Griffin Way and Olympic Highway. Details of local roads are summarised in Table 11-1 and shown in Figure 11-1.

Heavy vehicles have limitations on which roads they may use within the NSW road network. B-double vehicles are restricted from many roads due to their length, height and mass. TfNSW have designated which roads may be used by B-doubles without permission being granted, to ensure safety of road users and the longevity of roads. Five of the local roads, as identified in Table 11-1, are approved B-double routes.

TABLE 11-1: LOCAL ROADS

| Road name | Local road control (Council) | Sealed and delineated | No. of lanes | Width ³ (approx. in metres) | Speed limit (kmph) | Road intersected by the proposal |
|----------------------------|---------------------------------|-------------------------------------|-----------------------|--|--------------------------|--|
| Hibernia Street | Cootamundra- Gundagai | Yes | One lane (two-way) | 6 | 60 | No |
| Grogan Road | Cootamundra- Gundagai | Yes | One lane (two-way) | 7 | 100 | Yes |
| Troy Street | Cootamundra- Gundagai | Sealed, delineated at intersections | One lane (two-way) | 5 | 50 ² | No |
| Dudauman Road ¹ | Cootamundra- Gundagai | Sealed, delineated at intersections | One lane (two-way) | 7 | 100 ² | No |

| Road name | Local road control (Council) | Sealed and delineated | No. of lanes | Width ³ (approx. in metres) | Speed limit (kmph) | Road intersected by the proposal |
|--------------------------------------|---------------------------------|---------------------------|-----------------------|--|--------------------------|--|
| Corbys Lane | Cootamundra- Gundagai | No | One lane (two-way) | 7 | 100 ² | Yes |
| Old Cootamundra Road ¹ | Cootamundra- Gundagai | Yes | One lane (two-way) | 6 | 100 ² | Yes |
| Blackgate Road | Junee | Sealed, no delineation | One lane (two-way) | 5 | 100 ² | No |
| Dirnaseer Road ¹ | Junee | Yes | One lane (two-way) | 7 | 100 ² | Yes |
| Ironbong Road | Junee | Sealed, no delineation | One lane (two-way) | 5 | 100 ² | Yes |
| Old Sydney Road | Junee | No | One lane (two-way) | 5 | 100 ² | Yes |
| Goldfields Way ¹ | Junee | Yes | One lane (two-way) | 7 | 100 ² | No |
| Retreat Road | Junee | Sealed, no delineation | One lane (two-way) | 5 | 100 ² | No |
| Junee Reefs Road | Junee | Sealed, no delineation | One lane (two-way) | 5 | 100 ² | No |
| Stockinbingal Road ¹ | Cootamundra- Gundagai | Yes | One lane (two-way) | 8 | 100 ² | No |

1. Approved B-double routes for B-double vehicles between 19 m to 26 m

2. Default speed limit adopted

3. Determined by measuring road width on Google Maps

11.3.1.3 Travelling stock reserves and livestock highways

TSRs are parcels of Crown land reserved under the *Crown Land Management Act 2016* (NSW) for use by travelling stock. TSRs include stock routes, which are corridors on Crown lands that connect smaller watering and camping reserves. Stock routes may be alongside public roads. The proposal site does not intersect any existing TSRs.

A livestock highway, although not a TSR under the *Crown Land Management Act 2016*, is a public road used for travelling stock.

A livestock highway uses the same roads as three of the proposed workforce and construction vehicle routes, namely:

- Olympic Highway
- Goldfields Road
- Grogan Road
- Old Cootamundra Road
- Dudauman Road.

The livestock highway currently crosses the existing Stockinbingal–Parkes Line on Grogan Road. TSRs, livestock highways and Crown land are discussed further in Chapter 18: Land use and property.



11.3.1.4 Parking

There is no formal public parking or parking restrictions along the extent of the proposal as the proposal is within a rural setting with extensive unrestricted on-street parking and low demand. It is noted that provision for on-street parking is found on Hibernia Street in Stockinbingal, servicing the local town centre. Parking on other roads is limited to informal parking within the road verges.

11.3.2 Traffic volumes

Background two-way average annual daily traffic (AADT) and heavy vehicle (HV) percentages were estimated for local roads from available traffic data. For ease of readability, AADT in Table 11-2 is from the 2018 data source as most roads include that data set. In cases where 2018 data is unavailable, the latest available AADT is provided. Detailed AADT year source can be found in Table 4.3 of Technical Paper 3.

Traffic data was not available for Grogan Road, Goldfields Way, Stockinbingal Road, Eulomo Settlement Road, Warrens Lane or Troy Street so background demands have been identified based on adjacent roads of the same form. Detail of assumed traffic volumes for roads are in section 4.2.1 of Technical Paper 3.

It is noted that background traffic volumes are likely influenced by agricultural land use in the area and may fluctuate due to the seasonal nature of farming activities, such as periods of harvest. This may result in periods of higher traffic volumes. The variation in traffic volumes between peak and off-peak harvesting seasons may be significant, however are regarded as insignificant as overall numbers are low compared to the maximum capacity of the road.

Table 11-2 identifies the estimated AADT and percentage of heavy vehicles.

TABLE 11-2: BACKGROUND TRAFFIC VOLUMES

| Road name | AADT | HV % |
|---|--------------------|------|
| Burley Griffin Way (East of Ellwood Street) | 825 | 37 |
| Burley Griffin Way (West of Temora Street) | 1,058 | 32 |
| Grogan Road | 83 ² | 34 |
| Burley Griffin Way/Hibernia Street | 1187 ¹ | 26 |
| Blackgate Road | 66 | 15 |
| Troy Street | 28 ¹² | 26 |
| Dudauman Road | 83 | 34 |
| Corbys Lane | 28 ¹ | 26 |
| Old Cootamundra Road | 266 | 26 |
| Dirnaseer Road (East of Ironbong Road) | 66 | 15 |
| Ironbong Road | 24 | 26 |
| Old Sydney Road | 16 | 12 |
| Eulomo Settlement Road | 24 ² | 26 |
| Olympic Highway (West of Bethungra) | 1,705 | 21 |
| Warrens Lanes | 44 ¹² | 14 |
| Retreat Road | 44 ¹ | 14 |
| Junee Reefs Road | 36 | 16 |
| Goldfields Way | 1,705 ² | 21 |
| Stockinbingal Road | 266 ² | 26 |
| Suttons Lane | 36 ¹ | 16 |

1. No 2018 AADT is available and the latest AADT is provided. Burley Griffin Way/Hibernia Street, Troy Street, and Corbys Lane: 2019, Warrens Lanes and Retreat Road: 2016, Suttons Lane: 2006

2. Traffic data not available for these roads—AADT based on nearby roads of the same form, e.g. traffic volumes for Grogan Road have been based on Dudauman Road

11.3.3 Traffic growth rate

A review of changes in historic traffic data was undertaken to determine a traffic growth rate. The review indicated a decrease in traffic volumes on the roads for which more than one year's worth of traffic data was available. This can be seen in Table 4.3 of Technical Paper 3, on Ironbong Road and Old Sydney Road.

A review of Australian Bureau of Statistics (ABS) population data of surrounding population centres was undertaken to assist in determining an appropriate growth rate. The review of ABS data showed an overall population growth rate between 2011–2016, across the urban areas of Stockinbingal, Junee Bethungra and Cootamundra, of 0.3 per cent as shown in Table 11-3.

TABLE 11-3: TOWN POPULATION

| Location | 2011 | 2016 | Annual % growth |
|---------------|--------|--------|-----------------|
| Stockinbingal | 244 | 202 | -3.7 |
| Junee | 4,578 | 4,922 | 1.5 |
| Bethungra | 414 | 164 | -16.9 |
| Cootamundra | 5,579 | 5,669 | 0.3 |
| Total | 10,815 | 10,957 | 0.3 |

A compounding annual growth rate of 0.5 per cent per year has been used to determine future background traffic volumes, which provides a conservative growth rate above recorded population growth rates. Higher background traffic volumes provide a more conservative analysis of the links and intersections under assessment, as their performance is directly related to traffic volumes.

11.3.4 Road safety

Crash data for a five-year period (2016–2020) was taken from TfNSW crash and causality statistics on roads near the proposal site. Data was assessed by relevant Local Government Areas (LGAs) including Junee Shire, Temora Shire, Cootamundra–Gundagai Regional Council, Hilltops Council and Wagga City Council. A summary is provided as follows:

- Junee Shire—crash statistics are clustered in Junee town centre, along the Olympic Highway and Goldfields Way. One fatal crash occurred on Goldfields Way, south of Old Junee Road in 2019, and one on the Olympic Highway in 2020.
- Temora Shire—crash statistics are centred around Temora town centre, with moderate-to-serious injury crashes along Burley Griffin Way. Seven crashes involving serious injuries were recorded on Burley Griffin Way.
- Cootamundra–Gundagai Regional Council—crash statistics are centred around Cootamundra town centre with seven serious crashes on Temora Street and the Olympic Highway. There were also two crashes along Old Cootamundra Road. From the town of Young, on the Olympic Highway towards Cootamundra, there were four serious crashes.
- Wagga City Council—a concentration (relative to the wider proposal site) of six crashes occurred along the Olympic Highway)
- Hilltops Council—a concentration of three crashes in the town centre of Young along the Olympic Highway.

Further discussion of council crash data and detailed crash data figures are included in section 4.5 of Technical Paper 3.

11.3.5 Existing rail network

The existing rail network in the area is shown on Figure 11-2 and includes the Main South Line, the Lake Cargelligo Line and the Stockinbingal–Parkes Line. The Main South Line runs from Albury, in a north–east direction, through Illabo to Cootamundra where it continues to Goulburn, Mittagong and Sydney. The Lake Cargelligo Line branches off from Cootamundra north to Stockinbingal, continuing to Lake Cargelligo. The Stockinbingal–Parkes Line runs north–south, joining Stockinbingal to Parkes on the Main West Line.

The rail network also includes a grain siding adjacent to the former Stockinbingal Railway Station site.

The Stockinbingal–Parkes Line begins at Stockinbingal and runs north to the towns of Forbes and Parkes. The Illabo and Stockinbingal stations are no longer in use as passenger stations.

11.3.5.1 Level crossings

There are four existing public level crossings located on:

- Dudauman Street between Hibernia Street and Troy Street on the Lake Cargelligo Line
- Burley Griffin Way between West Street and Troy Street on the Lake Cargelligo Line
- Grogan Road about 160 m north of McLaughlins Lane on the Stockinbingal Parks Line
- Unnamed road from Olympic Highway at chainage 2800 m (on the new rail alignment) and on the Main Southern Line.

Both level crossings in Stockinbingal have active traffic controls in place, while the level crossing on Grogan Road and unnamed road is passive.

Four private roads cross the existing rail network. These are indicated in Figure 11-3 and are described as:

- Private level crossing 1: unnamed road within private property about 2.5 km north west of the Burley Griffin Way crossing in Stockinbingal on the Stockinbingal–Parkes Line. Nearest road connection is to Grogan Road.
- Private level crossing 2: unnamed road within private property about 1.2 km north west of the Burley Griffin Way crossing in Stockinbingal on the Stockinbingal–Parkes Line. Nearest road connection is to Grogan Road.
- Private level crossing 3: unnamed road within private property about 0.7 km north west of the Burley Griffin Way crossing in Stockinbingal on the Stockinbingal–Parkes Line. Nearest road connection is to Burley Griffin Way.
- Private level crossing 4: Unnamed road from Burley Griffin Way about 1.1 km west of the Burley Griffin Way crossing in Stockinbingal on the Lake Cargelligo Line. Nearest road connection is to Burley Griffin Way.

11.3.6 Public and active transport

A bus service (four buses per day) operates between Cootamundra and Griffith on Hibernia Street, Burley Griffin Way and Stockinbingal Road, and services Temora, Stockinbingal and Cootamundra. There is one bus stop located on Burley Griffin Way/Hibernia Street, about 80 m west of Dudauman Street.

Daily passenger and school bus services operate between Junee and Wagga Wagga traveling on Olympic Highway. A coach service also operates between Junee and Cootamundra but does not stop in Illabo.

The Cootamundra and Junee railway stations remain open to passengers travelling on the Main South Line; however, as identified previously, neither the Illabo or Stockinbingal stations currently service passengers. NSW TrainLink operates two services a day in each direction between Sydney and Melbourne along the line.

There are no formal pedestrian or cyclist paths crossing or located in the immediate vicinity of the proposal site. The remote nature of the proposal site infers that pedestrian and cyclist activity is low.





Data Sources: IRDJV, ARTC, LPI, OEH

11.4 Impact assessment—construction

A description of the indicative construction methodology is provided in Chapter 8: Proposal description construction. Construction would be staged across six sections. The activities (and associated construction traffic to be generated) would occur within each section on an individual program; however, the timing for activities would overlap within different sections.

In addition to construction of the rail line, two roads are also proposed for realignment. Burley Griffin Way, in construction section 6, will undergo major realignment to use a new bridge to cross the proposed rail line. Within construction section 2, Ironbong Road will undergo a minor realignment around the proposed level crossing to improve sight lines and provide a safer crossing for vehicles (refer to Figure 8.3 in Chapter 8).

Given the length of the proposal site, the access routes that would be used for construction traffic would vary depending on the origin of construction vehicles and the location of each construction work site. The construction routes would extend from surrounding population centres, including Temora, Cootamundra and Wagga Wagga with some overflow anticipated from Gundagai and Young. Access to construction compounds and the construction work areas would primarily be undertaken from public roads (refer to Table 8.9 and Figure 8.8 in Chapter 8).

To minimise construction traffic movements and associated impacts on the public road network, haul roads would be constructed within the proposal site as part of the establishment of the rail maintenance access road.

The haul roads would generally allow for:

- > safe separation of light and heavy vehicles within the proposal site
- > heavy vehicle haulage (i.e. cut/fill movements) along the proposal site
- > plant and equipment deliveries, including equipment relocation between work fronts and compounds
- > personnel movements between work fronts, using both shuttlebuses and light vehicles.

An overview of construction haulage, routes and access points are shown in Figure 11-4.

The construction impact assessment was based on the following worst-case assumptions:

- construction would occur from mid-2023 to mid-2024 (subject to approval)
- construction traffic from the peak construction period has been assumed to occur in 2024 (the same year in which construction ends). This provides a conservative assessment, as background traffic will be higher in 2024 than in the previous year of construction due to the compounding annual growth rate applied to background traffic
- a trip distribution of 55 per cent of workforce vehicles arriving from the east and 45 per cent from the west of the proposal from Temora/Young, Cootamundra/Gundagai and Wagga Wagga/Junee
- the maximum workforce estimated to be required for construction of the proposal is 425, with a surge capacity of 450. Refer to Appendix I: Workforce accommodation camp for further details
- the workforce will arrive to the construction sites two per vehicle (on average). Note that the possibility of workers being transported to the construction sites by bus would be explored during detailed design, which would reduce the number of vehicles travelling to the sites. The assumption of two persons per vehicle has been maintained to be conservative
- construction hours would follow those described in Chapter 8, with the following assumptions:
 - all the workforce will arrive in the AM peak hour (6 am to 10 am) and all depart in the PM peak hour (3 pm to 7 pm), where the AM and PM peak hours coincide with the peak background traffic. Although it is likely that the construction peaks would be different to the background traffic peaks, this is done to provide a more robust (conservative) assessment
 - construction (heavy) vehicles will arrive and depart in the same AM and PM peak hours as workforce vehicles, as a worst case
- haulage movements associated with bulk earthworks will require further access to the public road network, as identified in Figure 11-4
- water tankers will transport water from Cootamundra and Stockinbingal to construction compounds 4, 7, 11, 25 and 28 (as shown on Figure 8.1)
- materials sourced for road pavement, structural fill, capping and ballast would be from nearby quarries (e.g. Cootamundra Quarry), where possible, and are included in the estimated construction vehicles.

Construction includes the following activities:

- enabling works
- site establishment
- main construction works
- new alignments for power connections
- utility relocations and property adjustments
- earthworks and drainage
- track works
- road overbridges, under bridges and pavement works
- signalling, testing and commissioning
- finishing and landscaping.



11.4.1 Traffic and road network impacts

11.4.1.1 Construction vehicle generation

Construction of the proposal would generate additional vehicle movements, including light and heavy vehicles. Light vehicles would generally be generated by construction workers moving to and from the construction work areas and/or compounds. Heavy vehicle movements include delivery trucks for equipment and materials, as well as water tankers.

The construction workforce (estimated at a maximum of 450 workers) would be travelling from surrounding population centres on the road network in the study area. Refer to section 11.4 for details of construction trip assumptions. For the purposes of this assessment, the earthworks and drainage phase involving the greatest workforce numbers is assessed for a conservative approach.

In terms of light vehicles (workforce), the workforce will arrive to the construction sites two per vehicle (on average). Note that the possibility of workers being transported to the construction sites by bus would be explored during detailed design, which would reduce the number of vehicles travelling to the sites.

In terms of heavy vehicle (construction vehicle) trips, the number of vehicles required during the busiest phase is assumed as follows:

- > plant and equipment deliveries would use the road network at a rate of 32 vehicles per day
- quarry deliveries would arrive at a construction section at a rate of 63 vehicles per day. This is based on importing 2,000 tonnes of material per day per crew. Fluctuations to this number would occur due to operational capacity of quarries, the distance of the quarry from the site, and the number of quarry haulage vehicles engaged at one time
- concrete deliveries would arrive at a construction section at a rate of 45 vehicles per day. This is based on a pour rate of 40 cubic metres (m3) per hour
- haulage of formation material between construction sections on designated roads at a rate of 72 vehicles per day
- > earthworks general fill haulage expected to a construction section at a rate of 136 vehicles per day
- water tankers likely through a construction section access at a rate of 18 times per day.

Total peak hour construction trips

The traffic generated during the earthworks and drainage phase of construction has been used to assess the potential impacts resulting from peak workforce and construction vehicle movements on the road network for each section of the project. As it is unlikely that construction workers will arrive at the same time as construction vehicles, this is considered to provide a robust assessment.

Table 11-4 shows the estimated total number of light vehicles (workforce) and heavy vehicles (construction vehicles) required in the AM and PM peak hours of the earthworks and drainage phase.

TABLE 11-4: AM AND PM PEAK HOUR CONSTRUCTION TRIPS

| Peak construction phase | Vehicle | AM in | PM out |
|-------------------------|---------|-------|--------|
| Earthworks and drainage | Light | 29 | 29 |
| | Heavy | 80 | 80 |

11.4.1.2 Impact on Level of service for roads

Level of Service (LoS) is defined as the operational performance of traffic on a roadway, traffic lane, approach, intersection, route or network, based on measures such as delay and degree of saturation during a given time period.

Table 11-5 presents the results of the link assessment conducted in accordance with the methodology presented in section 11.2.3. This summarises the LoS of the roads used as routes to the alignment for the 2026 assessment year, with and without two-way peak-hour construction vehicles, against the background traffic volumes. The assessment year has been adopted to ensure a conservative assessment.

Without the proposal, all roads operate with a LoS of B, indicating they have stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is little less than that of the highest LoS of A.

With the proposal, all assessed roads would maintain operation at an LoS of B during the construction of the proposal (in other words there would be no change to existing LoS). Hibernia Street, Troy Street and Olympic Highway (west of Bethungra) decline in LoS with the addition of construction vehicles, but remain at a satisfactory performance level.

Impacts of heavy vehicle movements were identified to fluctuate during construction peak but, given the low volumes of traffic, the variations would not be expected to be significant.

TABLE 11-5: CONSTRUCTION LINK ASSESSMENT (2026)

| | Peak-hour volumes | Peak-hour LoS | Peak-hour volumes (with | Peak-hour LoS |
|---|---------------------------|------------------------|----------------------------------|--|
| Road | (without the proposal_ | (without the proposal) | construction of the proposal) | (with construction of the proposal) |
| Burley Griffin Way (east of Ellwood Street) | 77 | В | 209 | В |
| Burley Griffin Way (west of Temora Street) | 99 | В | 215 | В |
| Grogan Road | 8 | В | 153 | В |
| Burley Griffin Way/ Hibernia Street | 111 | В | 370 | В |
| Troy Street ¹ | 113 | В | 402 | С |
| Dudauman Road | 8 | В | 183 | В |
| Old Cootamundra Road | 25 | В | 284 | В |
| Dirnaseer Road (east of Ironbong Road) | 6 | В | 138 | В |
| Ironbong Road | 2 | В | 204 | В |
| Old Sydney Road | 1 | В | 103 | В |
| Olympic Highway (west of Bethungra) | 160 | В | 361 | С |
| Retreat Road | 4 | В | 177 | В |
| Junee Reefs Road | 4 | В | 177 | В |
| Goldfield Road | 160 | В | 333 | В |
| Stockinbingal Road | 25 | В | 156 | В |

1. Figures taking into consideration closure of Hibernia Street and diversion onto Troy Street.

11.4.1.3 Construction route intersection impacts

All intersections on the construction routes were compared and those found to have higher volumes of traffic based on the connecting link road results were further assessed in SIDRA. The methodology is outlined in section 11.2.3.2 with detail provided in section 5.4.1 of Technical Paper 3. The assessment also accounted for any overlap in the use of intersections where construction of different sections overlap.

The intersections on the construction routes likely to be most impacted from workforce and construction vehicles are:

- Olympic Highway/Goldfields Way
- Olympic Highway/Dirnaseer Road
- > Old Cootamundra Road/Dudauman Road
- Hibernia Street/Dudauman Street
- Troy Street/Dudauman Street
- Olympic Highway/Baylis Street.

The performance of these intersections was not quantified as part of the assessment as all other local intersections within the area are generally intersections with low traffic volumes on the side roads and relatively low through movements.

Without the proposal, all approaches on the intersections under assessment operate with very low levels of DoS and delay and most operate at LoS A in both the AM and PM peaks. This means there are minimal wait times and the intersection is performing under the best operation conditions from the driver's perspective.

With the proposal, and the addition of a worst-case scenario for construction traffic for each intersection, all approaches remain operational at an acceptable level.

The LoS is observed to decrease to LoS B at:

- Dirnaseer Road (intersection of Olympic Highway)
- Dudauman Street (intersection with Hibernia Street)
- > Talbingo Lane (minor approach to Olympic Highway at intersection with Goldfields Way).

The LoS has decreased further to LoS C (the performance standard during weekdays) at:

- Olympic Highway (east approach to Goldfields Way intersection)
- Baylis Street (minor approach to Olympic Highway intersection in Bethungra).

With traffic controls intended for the Hibernia Street and Dudauman Street intersection (refer to section 11.6), the increased traffic demand and change in traffic flow can be managed effectively and queuing across the existing level crossing can be avoided.

Further discussion on the assessment of construction route intersections is included in section 5.3.7 of Technical Paper 3.

11.4.1.4 Construction access intersection impacts

Construction vehicles would access the proposal site from one of 11 proposed access points, which are detailed in Table 11-6 and shown in Figure 11-4. Access point 9 and access point 10 are not on the alignment; however, they provide access to the alignment near Stockinbingal via existing public and private roads.

| Access point number | Access location (road) | Access location (chainage) ¹ | Extent of proposal site accessed ¹ |
|---------------------------|------------------------------------|---|--|
| 1 | Olympic Highway (south) | 0 | 0–750 |
| 2 | Olympic Highway (north) | 2750 | 750–5500 |
| 3 | Old Sydney Road | 5500 | 750–7940 |
| 4 | Ironbong Road | 8150 | 7940–14400 |
| 5 | Dirnaseer Road | 18500 | 14400–28250 |
| 6 | Old Cootamundra Road | 28250 | 18500–30850 |
| 7 | Dudauman Road | 30850 | 28300–37300 |
| 8 | Burley Griffin Way (east) | 37300 | 30850-42600 |
| 9 | Burley Griffin Way (west) | 37300 (1,000 m west of alignment) | RMAR on existing alignment west of Stockinbingal |
| 10 | Burley Griffin Way/Hibernia Street | 37750 (800 m east of alignment) | RMAR on existing alignment in Stockinbingal |
| 11 | Grogan Road | 40250 | 37300–42600 |

TABLE 11-6: CONSTRUCTION ACCESS POINTS AND ROUTE DISTRIBUTION

1. distance in metres from southern limit of the proposal

For the 11 construction access points, SIDRA modelling concluded that all approaches on the public road network have a satisfactory DoS during the AM and PM peak plus construction vehicles scenarios and operate at LoS A. An acceptable LoS is therefore expected at the intersections used by construction vehicles accessing the site.

Further discussion on the assessment of construction access intersections is included in section 5.3.8 of Technical Paper 3.

11.4.1.5 Property access

The temporary occupation of land for construction purposes, e.g. construction access and laydown areas, could potentially impact internal and external access on affected properties. As discussed in Chapter 8: Proposal description—construction, access to construction compounds and the construction work areas would primarily be undertaken from public roads and identified access points, as shown in Figure 11-4.

Construction of the proposal may affect a landowner's ability to traverse their land and access public roads. For the construction of the new Burley Griffin Way overpass ramp, access would be maintained for residents; however, alternative internal paths and public road accesses would need to be used, which may add to journey times. Proposed diversions are discussed in section 11.4.1.8.

11.4.1.6 Road safety

As the assessment has primarily considered the capacity of the road network rather than the appropriateness of use of certain roads by construction vehicles, a Road Safety Audit (RSA) and risk assessment would be undertaken by the construction contractor.

Further measures to minimise the risks posed to road users are provided in section 11.6.

Table 11-7 identifies locations where there are road safety risks for access and egress to and from the classified road network based on the crash data summarised in section 11.3.3 and detailed in section 4.5 of Technical Paper 3: Transport, Traffic and Access Impact Assessment. The table also identifies turning movements required to assess locations where there is higher risk to road safety. Areas in which crashes have been identified along the proposed construction routes would also be considered in the RSA to assess the risk and safety of all road users.

| Crash location | No. of and severity of crash | Construction route impact | movements required |
|--|---|--|---|
| Goldfields Way, south of Old Junee Road | 1 x fatal | Between site access 4 and 5 Wagga Wagga Potential quarry delivery routes | No |
| Olympic Highway in Junee LGA | 14 x serious | Between site access 1–3 and Wagga Wagga Potential quarry delivery routes | No |
| Olympic Highway near Warrens Lane | 2 x moderate | Between site access 3 and Wagga Wagga Potential quarry delivery routes | Yes |
| Olympic Highway in Wagga Wagga LGA | 7 x serious 7 x moderate 5 x minor | Between site access 1–5 and Wagga Wagga Potential quarry delivery routes | No |
| Burley Griffin Way in Temora | 2 x moderate | Between site access 8–10 and Temora Potential quarry delivery routes | No |
| Burley Griffin Way between Temora and Stockinbingal | 2 x fatal 4 x serious 5 x moderate 1 x minor | Between site access 8–10 and Temora Potential quarry delivery routes | No |
| Temora St in Cootamundra | 2 x serious 3 x moderate | Between site access 6–11 and Cootamundra Between site access 6 and 7 and Young Potential quarry delivery routes | No |
| Olympic Highway between Cootamundra and Burley Griffin Way | 4 x serious 4 x moderateª 1 x minor | Between site access 6–11 and Cootamundra Between site access 6 and 7 and Young Potential quarry delivery routes | No ^a Yes —1 crash at intersection with Burley Griffin Way |
| Olympic Highway between Cootamundra and Bethungra | 2 x fatal 6 x serious 6 x moderate 2 x minor | Between site access 1–5 and Cootamundra Potential quarry delivery routes | No |

TABLE 11-7: CRASH LOCATIONS ON CONSTRUCTION ROUTES

| Crash location | No. of and severity of crash | Construction route impact | Turning movements required |
|--|---|---|--|
| Old Cootamundra Road between Stockinbingal Road and the proposal | 2 x serious 1 x moderate ^b | Between site access 6 and 7 and Cootamundra or Young Potential quarry delivery routes | No ^b Yes—1 crash at intersection with Suttons Lane |
| Hibernia Street, Stockinbingal | 1 x serious 1 x minor | Between site access 8–11 and Cootamundra or Young Potential quarry delivery routes | No |
| Burley Griffin Way between Stockinbingal and Olympic Highway | 3 x serious 3 x moderate 1 x minor | Between site access 8–11 and Young | No |
| Olympic Highway between Young and Burley Griffin Way | 3 x serious 14 x moderate 2 x minor | Between site access 6–11 and Young | No |

11.4.1.7 Livestock highways

Construction vehicle movements could pose additional risks for the transport of livestock along the routes discussed in section 11.3.1.3 as a result of construction traffic volumes on these roads and associated intersections. Therefore, LLS need to be notified when increased construction traffic is expected on these roads. Further discussion on stock movements is in Chapter 18: Land use and property.

11.4.1.8 Road diversions

There are a number of level crossings and bridges proposed where the proposal crosses the public road network. Temporary road closures would be required during the construction of these crossing structures.

Should traffic controls to maintain vehicle flow be unable to be implemented under a traffic management plan (e.g. potential queuing along Troy Street), temporary diversion routes would be required.

Proposed level crossings or bridges on private access roads or unnamed tracks are not included in this assessment and would be addressed as part of ongoing landowner consultation. The proposed level crossing on Corbys Lane would also be included in this stakeholder engagement process as it is part of the public road network and serves as the only connection to the wider public road network via its intersection with Dudauman Road.

Table 11-8 identifies the proposed diversionary routes and associated travel time change during construction of the proposal. Where road closures are required on approved B-double routes, such as in the case of Burley Griffin Way/Hibernia Street, diversion of B-doubles to another approved B-double route via Troy Street (directly parallel to Hibernia Street) and Dudauman Street has been proposed. Additional details of the diversion of Burley Griffin Way/Hibernia Street are also included in Chapter 8: Proposal description—construction.

TABLE 11-8: DIVERSIONARY ROUTES

| Road | Work occurring | Diversionary route | Existing travel time (min) | Diversion travel time (min) | Travel time change (min) |
|-------------------------|-------------------|--|-------------------------------------|--------------------------------------|-----------------------------------|
| Old Sydney Road | Level crossing | Olympic Highway and Warrens Lane | 9 | 12 | +3 |
| Ironbong Road | Level crossing | Old Sydney Road and Eulomo Settlement Road | 5 | 22 | +17 |
| Dirnaseer Road | Underbridge | Old Cootamundra Road and Blackgate Road | 19 | 31 | +12 |
| Old Cootamundra Road | Underbridge | Dirnaseer Road and Blackgate Road | 14 | 31 | +17 |
| Hibernia Street | Overbridge | Grogan Road, McLaughlins Lane and Lewins Lane | 1 | 2 | +1 |

The greatest increase in travel times is associated with the diversionary routes on Ironbong Road and Old Cootamundra Road. Only low volumes of traffic are currently experienced on these routes.

Due to the realignment of Burley Griffin Way, the western end of Hibernia Street will be temporarily closed to traffic, and traffic diverted onto Dudauman Street and Troy Street. The impact of these diversions is summarised in section 11.4.1.11.

Measures to manage the potential for impacts to access are provided in section 11.6.

11.4.1.9 Parking impacts

Light vehicle parking for construction workers would be provided within construction compounds. No parking outside the proposed compounds would be required.

Hibernia Street in Stockinbingal (which has on-street parking facilities) is expected to be used as a construction access route. The change in function of Hibernia Street would likely reduce the amount of on-street parking available in Stockinbingal.

11.4.1.10 Public and active transport

There may be short-term delays to some coach and local bus services (servicing between Cootamundra and Griffith) operating in the surrounding area during construction.

The current bus service uses Burley Griffin Way/Hibernia Street as the route through Stockinbingal with the bus stop located about 80 m west of Dudauman Street. During construction a diversion would be in place that would require the bus route to divert through Troy Street to reconnect with Burley Griffin Way. The time delay would be an additional minute and, as a result, the diversion impact would be negligible. In addition, relocation of the bus stop would be required during the temporary closure of Burley Griffin Way/Hibernia Street during construction.

There are no identified pedestrian or cyclist facilities within the proposal site. There are not expected to be any significant impacts to pedestrians and cyclists.

11.4.1.11 Summary of construction impacts from realignment of Burley Griffin Way

During the realignment of Burley Griffin Way, the western end of Hibernia Street will be temporarily closed to traffic, and traffic diverted onto Dudauman Street and Troy Street. This detour increases the turning movements at the intersection, causing some delays on the southern approach. The queuing is not expected to extend to a level crossing approximately 60 m south of the intersection but the possibility of this should be considered and mitigated against by traffic control engaged at the site. This diversion will also impact a current bus service, with Stockinbingal Coach Stop requiring relocation during the temporary closure of Hibernia Street.

11.4.2 Rail network

As discussed in Chapter 8: Proposal description—construction, the proposal would require possessions where works would impact the operation of existing rail lines. The timing and duration of the possessions would be agreed with affected train operators, track stakeholders and relevant government departments. It is assumed that the project will be able to be constructed during scheduled possessions, so no additional track possession requirements are expected to be needed.

For the southern connection, a standard 60-hour possession is planned to be scheduled in March 2025. Should extended possessions be required, services could be re-routed via Stockinbingal, Griffith and back to the Main South Line at Junee. The majority of the southern connection scope can be completed under Track Work Authority protection arrangements (or work in corridor). The major possession requirements will be for turnout installation.

For the northern connection, a standard 60-hour possession is planned to be scheduled in March 2026. An indicative five-stage approach has been developed to connect to the existing Lake Cargelligo Line and Stockinbingal–Parkes Line as well as the realignment of Burley Griffin Way highway.

Potential impacts related to rail possessions would be managed through detailed design and constructability as well as mitigation such as timing construction of the proposal in the same timing of pre-scheduled possessions.

11.5 Impact assessment—operation

11.5.1 Traffic and road network

During operation, maintenance and repair vehicles may be required to access the proposal on an ad-hoc basis for maintenance and repair purposes. Traffic during operation would be infrequent and would generate minimal traffic on the road network.

The surrounding road network (including route intersections, B-double movement roads and stock routes) are not expected to be impacted by operation traffic as there is no traffic generated by routine operation of the proposal except for low volumes of maintenance vehicles. B-double movement roads and stock routes would not be impacted and returned to existing conditions except for the new Burley Griffin Way road bridge, as discussed in the following section.

11.5.1.1 Permanent modifications of the road network

The new Burley Griffin Way road bridge over the proposed rail alignment has introduced the requirement for the existing Burley Griffin Way/Hibernia Street and Troy Street to be realigned as described in Section 7.2.8 of Chapter 7: Proposal description—operation. The following design changes are required for the new Burley Griffin Way road bridge:

- > removal of the level crossing and improve road safety with the realignment
- location would be between the existing Stockinbingal–Parkes Line and Burley Griffin Way, connecting with Hibernia Street west of Stockinbingal
- posted and design speed of 100 km/h.

The future treatment of the remaining section of Burley Griffin Way from Troy Street to Dudauman Creek will be determined following consultation with TfNSW and Cootamundra–Gundagai Council. The outcome of the future treatment of Burley Griffin Way will determine the future intersection with Temora Street, located parallel to the south of Troy Street.

In addition, Ironbong Road would also be realigned as part of the proposal, as the existing road has poor sight lines and curves, and the upgrade would allow for improved sight lines to the new level crossing. The realignment would also include an activated level crossing to provide a safe crossing for vehicles. Further design details of the Ironbong Road realignment are in section 7.2.8 of Chapter 7.

11.5.1.2 Rail safety at level crossings

The presence of level crossings may present safety risks to motorists due to potential collisions with trains. In accordance with the safety measures outlined in the ALCAM process, the proposed level crossings have been designed to ensure that all crossing points would have adequate safety measures to mitigate the likelihood of incidents between passing trains and passenger vehicles.

The proposed public level crossings listed in Table 11-9 would be designed to meet the strategic objective of the NSW Government's *Construction of New Level Crossings Policy* (TfNSW, n.d.). Given the very low traffic volumes recorded at each of the crossings, grade separation of the level crossings is not proposed.

Design of the level crossings for this proposal include three passive and three active controls. Passive control would be considered where sight and geometric standards can be met as well as low volume of vehicles, and ARTC standard signage would be provided. At active crossings, including Ironbong Road, boom gates, flashing lights and bells would ensure passenger vehicles are aware of the passing train.

Operational short-stacking has been considered for all level crossings with a 26m B-double design vehicle adopted. With the exception of the level crossing at chainage 2,789m, the minimum clearance distances are achieved, and no short-stacking risk has been identified.

To prevent short-stacking risk at the level crossing at chainage 2,789m, the maximum design vehicle would need to be limited to no larger than 19m. To address this risk, signage and turn restrictions are considered as treatments within the design to restrict vehicle length to appropriate sizes. It is noted that this level crossing services an unnamed access road, and understood to be used infrequently as secondary access to a private property. ARTC is investigating the option of closure of this level crossing in consultation with the landowner.

The proposal is expected to be trafficked by an average of 6 trains per day (both directions) in late 2026, increasing to about 11 trains per day (both directions) in 2040.

The key traffic impact of the proposal would be impacts on travel time as a result of delays at level crossings. The location of new level crossings and their expected delay to vehicles is provided in Table 11-9 based on a 1.8 km train length.

TABLE 11-9: PUBLIC LEVEL CROSSINGS

| Chainage ¹ | Road | Proposed treatment | Max. expected delay (s) |
|-----------------------|---------------------------|--------------------|-------------------------|
| 2789 | Unnamed road ² | Active control | 131 |
| 5500 | Old Sydney Road | Passive control | 131 |

| Chainage ¹ | Road | Proposed treatment | Max. expected delay (s) |
|-----------------------|---------------------------|--------------------|-------------------------|
| 8200 | Ironbong Road | Active control | 131 |
| 11380 | Unnamed road ² | Active control | 131 |
| 15930 | Unnamed road ² | Passive control | 131 |
| 33750 | Corbys Lane | Passive control | 131 |

1. distance in metres from southern limit of the proposal

future traffic volumes for 'unnamed' roads, on which level crossings are proposed to be located, have been assumed as one vehicle during the peak hour. This assumption has been made due to the low peak hour volumes on the named roads on which level crossings are proposed to be located and the very low density of dwellings off unnamed roads around the proposal.

A delay of up to 131 seconds occurring once in a peak hour for a 1.8 km train, is considered negligible. The assessment of potential delays to vehicles (between one and three vehicles) crossing the rail alignment in these locations is conservative as it details a worst-case scenario. Due to the low numbers of crossing vehicles and scheduled trains, it is likely that most crossing vehicles would encounter no delay. An existing active level crossing on Dudauman Street, approximately 70 m south of Burley Griffin Way (Hibernia Street), would continue to create similar delays to the network.

For public crossings, ARTC would continue consultation with TfNSW and local councils to confirm preferred road crossing treatments at each location. The following steps would be followed in confirming road–rail interface solutions:

- working with the relevant road authority to understand existing local environmental conditions and gathering information on future development plans within the locality to inform the proposed design
- selecting the appropriate road crossing treatment on a case-by-case basis, with consideration given to current and future usage of the crossing, its location relative to other crossings of the rail corridor, and the road and rail geometry at the crossing location
- taking state and national guidelines and strategies into consideration during the development of the proposed treatments. The Office of the National Railway Safety Regulator (ONSR) and TfNSW both have policies to avoid building new level crossings or minimising proposals to construct a public level crossing along a new rail line.

The operation of public level crossings constructed as part of the proposal would be reviewed following the commencement of operation to confirm that the level of protection and the proposed infrastructure is appropriate for the traffic conditions. In addition, in accordance with National and State Rail Safety Law requirements, public level crossings would be subject to an interface agreement with the relevant road manager to ensure that safety risks are identified and minimised as far as reasonably practicable.

11.5.1.3 Property access

The proposal would interface with 72 private accesses, including 6 existing primary access tracks, 55 existing farm tracks and 11 stock crossings. Property access is discussed further in Chapter 18. ARTC would continue to consult with affected landowners to minimise disturbance within their property, including access.

No permanent direct impact to property access is anticipated as a result of the Burley Griffin Way realignment. The property adjacent to the overpass ramp, at 84 Hibernia Street, is currently, and would continue to be, accessed via West Street. Access along Burley Griffin Way/Hibernia Street would be maintained for all residents.

Due to Troy Street becoming a no-through road, residents of this street would experience minor increases to journey time when travelling to or from the west, as Troy Street would no longer have direct access to Burley Griffin Way.

11.5.1.4 Travelling stock reserves and livestock highways

The proposal does not cross or directly impact any TSRs.

A livestock highway uses the same roads as three of the proposed construction routes to the proposal site, namely along the roads:

- Olympic Highway
- Goldfields Road
- Old Cootamundra Road
- Dudauman Road
- Grogan Road.

The construction vehicle movements could pose additional risks for the transport of livestock along these routes, as well as cause delays for farmers, as a result of construction traffic volumes on these roads and associated intersections.

A discussion on stock movements is provided in Chapter 18.

11.5.1.5 Parking impacts

Where the Burley Griffin Way bridge replaces the existing Burley Griffin Way carriageway, roadside parking will no longer be available within this section of the road. No other changes to the existing parking allocation are expected in the short or long term as a result of the proposal.

11.5.1.6 Public and active transport impacts

At the completion of the proposal it is expected that the Stockinbingal Coach Stop would resume operation on Hibernia Street at its original location. The bus route would see minor improvements, with the new bridge proposed at Burley Griffin Way removing interactions with the existing level crossing.

At the completion of the construction of the proposal there would be no change to existing active transport links. There is no pedestrian or cycling infrastructure in place on Hibernia Street, Burley Griffin Way in Stockinbingal or on the Olympic Highway through Illabo. The operation of the proposal would have no impact on future needs of active transport participants.

11.5.1.7 Summary of operational impacts due to realignment of Burley Griffin Way

The realignment of Burley Griffin Way provides potential safety and operational benefits to the road network, including:

- > the removal of vehicle interaction at the Troy Street intersection, which the realignment would bypass
- the removal of vehicle interaction with the existing level crossing on Burley Griffin Way, which will be replaced with a road-over-rail (bridge) grade separation to the west of the existing level crossing.

No direct impact to property access is anticipated as a result of this realignment; however, as Troy Street will become a no-through road, some residents will experience minor increases to journey time to access Burley Griffin Way.

11.5.2 Rail network

As described in Chapter 5: Strategic context and need, the need for the proposal has been driven by continued growth in both road and rail freight volumes. Operation of the proposal would have a positive impact on the road network as the number of freight trains is expected to increase from 6 trains per day (both directions) in late 2026, increasing to about 11 trains per day (both directions) in 2040, decreasing the number of road freight heavy vehicles required on the road. This has the potential to reduce travel times for road users and improve road safety.

At completion of the construction of the proposal, it is expected that freight rail services would resume along all lines that were previously used prior to construction. With the introduction of the proposal, the rail network would have greater capacity, and train frequency is expected to increase in future years (to about 11 trains per day (both directions) in 2040).

Passenger rail services will continue at the completion of the proposal with no long-term impacts on the service delivery expected.

11.6 Mitigation and management

11.6.1 Approach to mitigation and management

11.6.1.1 Approach to managing the key potential impacts identified

The proposal has the potential to affect private and public access during construction, and private access arrangements during operation. The proposal would introduce changes to the local road network through the introduction of new level crossings at numerous local roads, changes to public roads (including road realignments) and changes to private property access along the rail alignment. A traffic, transport and access management plan would be prepared and implemented as part of the construction environmental management plan (CEMP). The plan would detail processes, relevant requirements and responsibilities to minimise potential traffic, transport and access impacts during construction. Further information on the CEMP is provided in Chapter 27: Approach to environmental management and mitigation. Consultation with the responsible road authority, landowners/landholders would be ongoing during detailed design and construction to identify appropriate measures to minimise the potential for access impacts during construction and operation, as far as reasonably practicable.

11.6.1.2 Approach to managing other potential impacts

The operation of all level crossings would be reviewed after the proposal commences operation to confirm that the level of protection is appropriate and that the infrastructure is appropriate for the traffic conditions.

Other measures are provided in section 11.6.4.

11.6.2 Expected effectiveness

ARTC and its contractors have experience managing potential traffic and transport impacts associated with the construction and operational phases of rail development projects. The traffic, transport and access management plan would be prepared in accordance with the relevant parts of the *Guide to Road Design* (Austroads, 2017a and 2017b), *Traffic control at work sites* (Roads and Maritime Services (RMS), 2018) and AS 1742.3–2009: *Manual of uniform traffic control devices—Traffic control for works on roads* (Standards Australia, 2009a).

While access arrangements would be outlined in the traffic, transport and access management plan, those arrangements and the requirements for any alternative and/or temporary arrangements would be discussed with the affected landholders. The proposed mitigation measures are expected to be effective in providing satisfactory amenity and safety, and ensuring that the road and transport network operations would be retained at an acceptable level of service.

11.6.3 Interactions between mitigation measures

Mitigation measures to minimise potential impacts to traffic, transport and access would also be implemented as part of those identified for Chapter 16: Noise and vibration, Chapter 17: Social and economic and Chapter 24: Air quality.

11.6.4 Recommended mitigation measures

To manage and mitigate the potential for traffic, transport and access impacts, the mitigation measures outlined in Table 11-10 would be implemented.

TABLE 11-10: MITIGATION MEASURES

| Ref | Impact | Mitigation measure | Timing |
|-----|---|--|--|
| T-1 | Road user safety at changes to the road network | Road safety audits and risk assessment would be undertaken where changes to the road network are required, in accordance with relevant Austroads guidelines, to ensure the safety of all road users is considered in the design process. | Detailed design/pre- construction |
| T-2 | Road user safety at level crossings | Public level crossings would be designed in accordance with relevant guidelines and standards, including <i>AS 1742.7:2016: Manual of uniform traffic control devices</i> (Standards Australia, 2016) and in consultation with TfNSW. | Detailed design/pre- construction |
| Т-3 | Closure of level crossings | Consultation with Transport for NSW would be undertaken regarding the proposed closure of level crossings. | Detailed design/ pre- construction |
| T-4 | Pre-construction route at Troy Street and Hibernia Street | Input would be sought from affected residents and the local councils prior to the alternative route being established on Troy Street, in accordance with the Inland Rail Communications and Engagement Strategy. Consultation with relevant stakeholders will be undertaken regarding the need to temporarily relocate the Stockinbingal bus stop during the temporary closure of Hibernia Street. Stakeholders will include TfNSW and Cootamundra– | Detailed design/pre- construction |
| | | Gundagai Regional Council. | |

| Ref | Impact | Mitigation measure | Timing |
|-----|--|---|--------------|
| T-5 | General impacts of construction activities on traffic, transport, access, pedestrians and cyclists | A traffic, transport and access management plan would be prepared and implemented as part of the Construction Environmental Management Plan. The plan would include measures, processes and responsibilities to minimise the potential for impacts on the community and the operation of the surrounding road and transport environment during construction. | Construction |
| | | The plan would be developed in consultation with local councils, TfNSW, emergency services and public transport/bus operators. It would include, as appropriate, additional reasonable and feasible measures identified as an outcome of consultation undertaken under the Inland Rail Communications and Engagement Strategy. | |
| T-6 | General impacts of construction activities on traffic flow | Traffic controllers at Hibernia Street and Dudauman Street intersection would be engaged during construction to improve traffic flow due to diversion of vehicles through Troy Street and to prevent queuing across the level crossing for existing rail line. | Construction |
| T-7 | Emergency vehicle access | Emergency vehicle access routes that may be impacted by the proposal would be identified and appropriate control measures would be implemented, in consultation with the relevant emergency services providers. | Construction |
| T-8 | Heavy vehicles damaging local roads | A dilapidation survey would be undertaken of the made public roads within the proposed haulage routes at the commencement of construction and provided to the relevant road authority. Upgrades to pavements on construction routes would be undertaken prior to construction, as required. Pavement monitoring would be carried out during works. Rectification measures would be implemented as needed during and/or following completion of construction to address any damage caused by construction. | Construction |
| T-9 | Impact on livestock highways | LLS would be notified of increased heavy vehicle movements along livestock highways during the construction phase as well as periods of changed traffic operations. Construction staff would be informed of the location of the livestock highways. | Construction |

11.6.5 Managing residual impacts

Residual impacts are impacts of the proposal that may remain after implementation of:

- design and construction planning measures to avoid and minimise impacts (see Chapter 6: Alternatives and proposal options and Chapter 8: Proposal description—construction)
- specific measures to mitigate and manage identified potential impacts (see sections 11.6.4).

The key potential traffic and transport issues and impacts originally identified by the environmental risk assessment in Appendix G: Environmental risk assessment and are listed in Table 11-10. The (pre-mitigation) risks associated with these impacts, which were identified by the environmental risk assessment, are provided. Further information on the approach to the environmental risk assessment, including descriptions of criteria and risk ratings, is provided in Appendix G.

The potential issues and impacts identified by the environmental risk assessment were considered as part of the traffic and transport impact assessment, summarised in sections 11.4 and 11.5. The mitigation and management measures (listed in Table 11-10) that would be applied to manage these impacts are also identified. The significance of potential residual impacts (after application of these mitigation measures) is rated using the same approach as the original environmental risk assessment, and are found in Table 11-11. The approach to managing significant residual impacts (considered to be those rated medium or above) is also described.

| Phase | Potential impacts | Pre-mitigated risk | | | Mitigation | Residual risk | | | How residual impacts |
|--------------|---|--------------------|-------------|----------------|---------------------------------------|---------------|-------------|----------------|--|
| | | Likelihood | Consequence | Risk rating | measures (refer to Table 11-10) | Likelihood | Consequence | Risk rating | would be managed |
| Construction | Impacts to road safety as a result of increased road use and turning movements at intersections and construction site access gates. | Likely | Moderate | High | Т-3 | Possible | Minor | Low | n/a |
| | Construction traffic impacts, including temporary delays to local and regional traffic due to road closures and diversions. | Likely | Moderate | High | T-4 to T-5 | Likely | Moderate | High | The traffic, transport and access management plan would include measures, processes and responsibilities to minimise the potential for impacts on the community and the operation of the surrounding road and transport environment during construction. The plan would be developed in consultation with local councils, TfNSW, emergency services and public transport/bus operators. It would include, as appropriate, additional reasonable and feasible measures identified as an outcome of consultation undertaken under the Inland Rail Communications and Engagement Strategy. |
| | Impacts to condition of rural roads due to construction traffic. | Possible | Moderate | Medium | T-7 | Unlikely | Moderate | Low | n/a |
| | Impacts on access to private properties. | Likely | Moderate | High | LP-12 | Possible | Moderate | Medium | Access to individual residences, and for livestock across the rail corridor would be maintained during construction where reasonably practicable. |
| | Impacts to emergency services through delays in access due to works. | Unlikely | Major | Medium | T-6, HS-3 | Unlikely | Moderate | Low | n/a |

| Phase | Potential impacts | Pre-mitigated risk | | | Mitigation | Residual risk | | | How residual impacts | |
|-----------|---|--------------------|-------------|----------------|---------------------------------------|---------------|-----------------|----------------|----------------------|--|
| | | Likelihood | Consequence | Risk rating | measures (refer to Table 11-10) | Likelihood | Consequence | Risk rating | would be managed | |
| | Changes to road network performance due to additional construction vehicles. | Likely | Minor | Medium | T-1, T-3 | Possible | Minor | Low | n/a | |
| | Loss of parking spaces in towns near construction areas. | Almost certain | Minor | Medium | Т-3 | Possible | Minor | Low | n/a | |
| | Realignment of Burley Griffin Way resulting in detours and change to traffic control. | Almost certain | Moderate | High | T-4 to T-5 | Possible | Minor | Low | n/a | |
| | Impacts to bus routes and services as a result of increased road use and diversions due to road realignment. | Almost certain | Minor | Medium | T-4 to T-5 | Possible | Minor | Low | n/a | |
| | Impacts to livestock highways as a result of increased construction traffic. | Likely | Minor | Medium | Т-8 | Unlikely | Minor | Low | n/a | |
| | Rural roads unsuitable for construction traffic (e.g. size and land use. | Possible | Moderate | Medium | T-7 | Possible | Minor | Low | n/a | |
| Operation | Increase in travel times due to introduction of new level crossings, resulting in wait times associated with length and frequency of trains. | Almost certain | Minor | Medium | T-2 | Possible | Not Significant | Low | n/a | |
| | Impacts on access to private properties. | Likely | Moderate | High | T-3, LP-1, LP-6 | Unlikely | Moderate | Low | n/a | |