CHAPTER

20

Traffic, Transport and Access

Inland Rail is a subsidiary of
Australian Rail Track Corporation

INLAND RAIL

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20. Traffic, transport and access

20.1 Scope of chapter

The purpose of this chapter is to assess the traffic, transport and access impacts of the construction and operation of the Environmental Impact Statement (EIS) of the Inland Rail New South Wales (NSW)/Queensland (QLD) Border to Gowrie Project (B2G) (the Project) on the surrounding transport infrastructure based on the current design of the Project. This chapter addresses the transport section of the Terms of Reference (ToR), inclusive of ToR items 11.107 to 11.116, of which Appendix A2: Terms of Reference Cross-reference Table provides section links from this report to the relevant ToR. This chapter also addresses the additional requests for information issued by the Office of Coordinator-General following the public notification of the draft Environmental Impact Statement (EIS).

For this assessment, the consideration of transport and access networks includes the following infrastructure types:

- Rail
- Road
  - State-controlled roads (SCR) in New South Wales and Queensland
  - local government roads (LGR)
- Public transport services
- School bus routes
- Long-distance coach services
- Stock routes
- Strategic touring routes
- Cycling and pedestrian networks
- Ports and airports
- Pavement
- Parking
- Emergency services
- Transport infrastructure.

This chapter assesses the potential impact of the Project on these transport and access networks by providing the following:

- An overview of existing transport network conditions, including traffic volumes
- A description of the Project works in relation to transport infrastructure
- An overview of baseline operations associated with intersections, road links, pavements, existing road-rail interface locations and road safety
- A summary of the anticipated construction task, including routes and resulting traffic forecast
- A summary of rail operational traffic and maintenance processes
- A summary of the traffic impact assessment (TIA) associated with intersections, road links, road–rail interface locations, pavements, road safety and access
- Mitigation measures relevant to traffic, transport and access issues.

This chapter is supported by Appendix AA: Traffic Impact Assessment (including all appendices).

20.2 Regulatory environment

The transport planning frameworks, policies, plans and guidelines that are applicable to this assessment are outlined in Table 20-1.

Legislation that is applicable to transport infrastructure, and to issues included in this assessment, is as follows:

- *Transport Planning and Coordination Act 1994 (*Qld)
- *Heavy Vehicle (Mass, Dimension and Loading) National Regulation* (Queensland Government 2013)
- *Land Act 1994* (Qld)
- *Local Government Act 2009* (Qld)
- *Rail Safety National Law (Queensland) Act 2017 (*Qld)
- *Road Transport Act of 2013* (NSW)
- *Stock Route Management Act 2002 (*Qld)
- *Transport Administration Act 1988* (NSW)
- *Transport Coordination Plan 2017-2027* (Qld) (Department of Transport and Main Roads (DTMR, 2017c)
- *Transport Infrastructure Act 1994* (Qld)
- *Transport Operations (Road Use Management) Act 1995* (Qld)
- *Transport Planning and Coordination Act 1994* (Qld)
- *Environmental Protection Act 1994* (Qld).

The relevance of the listed legislation to the Project is discussed in Chapter 3: Legislation and Project Approvals Process.

TABLE 20-1 POLICIES, STANDARDS AND GUIDELINES RELEVANT TO THIS ASSESSMENT

Policy/standards or guideline	Relevance to the Project
Plans and strategies	
South East Queensland Regional Plan (Department of State Development, Infrastructure, Local Government and Planning (DSDILGP), 2023a)	The purpose of the *South East Queensland Regional Plan* (SEQRP), 2017 (also known as Shaping SEQ) is to manage regional growth and change in the most sustainable way to protect and enhance quality of life in the region. It is the Queensland Government's plan to guide the future of the South East Queensland region and was prepared in collaboration with the region's 12 local councils ensuring that land use and infrastructure planning are integrated in South East Queensland and maximising the use of existing infrastructure and planning for smarter solutions for new infrastructure. The Project is consistent with the outcomes sought through the SEQRP by reinforcing South East Queensland as the apex of Australia's strategic freight network, and further strengthens the Toowoomba Regional Economic Hub as a significant inland port.
State Planning Policy 2017 (Department of Infrastructure, Local Government and Planning, 2017a)	The *State Planning Policy* (SPP) is a key component of the Queensland land use planning system which articulates the Queensland Government's 17 State interests in land use planning and development across the following five key themes: ▸ Liveable communities and housing ▸ Economic growth ▸ Environment and heritage ▸ Safety and resilience to hazards ▸ Infrastructure. The SPP is a statutory instrument and requires that State interests are integrated into local government planning schemes. Some State interests in the SPP include assessment benchmarks that apply to certain types of development where a local government planning scheme does not appropriately integrate the relevant State interest. The responses to SPP are provided in Chapter 3: Legislation and Project Approvals Process. State interests relevant to the Project include: ▸ Infrastructure integration: The Project supports this State interest through the expansion of existing infrastructure associated with the introduction of a heavy freight rail between Melbourne and Brisbane. The Project will also improve efficiencies and performance of rail infrastructure through the Toowoomba Range and interoperability between the Australian Rail Track Corporation (ARTC) and Queensland Rail (QR) networks. The Project is also open access so passenger services can utilise the rail corridor, while the design does not preclude a fast rail passenger service within the Gowrie to Grandchester future State transport corridor at a future date (e.g. the design avoids proposed passenger stations). ▸ Transport infrastructure: The Project supports this State interest by utilising the existing West Moreton System rail corridor and the Gowrie to Grandchester future State transport corridor where possible. Furthermore, the Project has considered and assessed potential impacts to surrounding transport networks and land uses ▸ Strategic airports and aviation facilities: The Project will not create incompatible intrusions or compromise the safety or function of the strategic airports in the region, including Toowoomba Wellcamp Airport, Toowoomba City Aerodrome and Royal Australian Air Force Amberley. There is also the potential for better linkage between Inland Rail and these airports in the future.
Queensland Walking Strategy 2019-2029	The *Queensland Walking Strategy 2019–2029* coordinates and integrates the State's approach to walking so communities can be made better for people of all ages and abilities. The strategy suite includes several documents aimed at integrating walking as part of a single integrated transport system for all Queenslanders. The Project, both through construction and operation, will ensure appropriate measures are implemented to mitigate the impacts to pedestrians through impacted areas.
Queensland Cycling Strategy 2017-2027	The *Queensland Cycling Strategy 2017–2027* sets the strategic direction for cycling in Queensland over the next 10 years, detailing priorities and action areas. The Project, both through construction and operation, will ensure appropriate measures are implemented to mitigate the impacts to cyclists through impacted areas.
Cycling Infrastructure Policy (DTMR, 2017c)	The *Cycling Infrastructure Policy* aims to deliver the Queensland Government's vision for more cycling, more often and DTMRs' vision of a single integrated transport system accessible to everyone. This policy ensures that facilities are planned, designed and constructed to be fit for purpose, as a part of Project delivery.

Policy/standards or guideline	Relevance to the Project
Road Planning and Design Manual (DTMR, 2021)	The *Road Planning and Design Manual* is DTMR's reference document for the planning and design of roads. It refers designers to the relevant Austroads publications for technical requirements, and outlines where DTMR practice supplements or differs from the Austroads guides. Preliminary road designs undertaken as a part of the Project will be designed in accordance with the Road Planning and Design Manual in Queensland.
Darling Downs Regional Transport Plan (DTMR, 2019b)	The *Darling Downs Regional Transport Plan* outlines regional transport initiatives, priorities, and actions aimed at developing a transport system that supports the community, economy, and environment in the region. This plan plays an essential role in shaping local strategies and policy choices, addressing transport system objectives, problems, and priorities at a regional level, while aligning with broader community goals. The Project section alignment, traverses multiple local government areas (LGA) within the Darling Downs region. The implementation of the Project presents opportunities for enhancing freight movement efficiency and alleviating congestion in passenger traffic across the network, as the plan emphasises that the region's current freight network primarily relies on major roads. Overall, the Project aligns with the broader transport objectives listed in the *Darling Downs Regional Transport Plan*, including Objective 1.1, which focuses on providing safe, efficient, and reliable freight movement to industrial areas, intermodal facilities, and export gateways, as well as Objective 1.2, which emphasises the importance of creating a competitive freight system capable of maximizing efficiency gains. Objective 3.1 also underscores the need to minimise crash opportunities in the region through the implementation of infrastructure that ensures customer safety and security. Lastly, it also aligns with Objective 4.1, to design, construct, operate and maintain the transport system that can be resilient to disruptions and support environmental sustainability.
Toowoomba City Centre Master Plan: Master Plan Report (Toowoomba Regional Council (TRC), 2010)	The *Toowoomba City Centre Master Plan* aims to guide land use planning and transport, as well as identify key projects that will support the overall strategy outlined in the plan. It provides recommendations on how planning schemes can be developed to achieve the aims of the master plan and consists of an implementation plan which comprises of a series of action plans that support the overall master plan vision in the short, medium and long term. The Project passes through the Toowoomba LGA. In accordance with Schedule 6, Part 5, Section 26(2) of the Planning Regulation 2017, the provisions of local government planning schemes do not apply to the Project. Notwithstanding this, the zoning intent for these areas as determined by the planning schemes has been taken into consideration when determining impacts of the Project on future land uses in the area.
Toowoomba Region Sustainable Transport Strategy (TRC, 2022b)	The purpose of the *Toowoomba Region Sustainable Transport Strategy* is to guide transport policy, integrated land use and transport planning, and future transport investment decisions to ensure sustainable economic growth of the region. The strategy sets out the Toowoomba Regional Council (TRC) policy directions and actions around transport elements such as land use integration, public transport, active transport, freight and air travel and sets out key plans and projects to implement this policy direction. As the Project passes through the Toowoomba LGA, the Project will aim to adopt the actions/policies outlined in the strategy to improve land use integration, public transport, active transport, freight and air travel where necessary.
Toowoomba Local Government Infrastructure Plan (TRC, 2017c)	The *Toowoomba Local Government Infrastructure Plan* (LGIP) identifies trunk infrastructure plans for five networks, including transport. The purpose of the LGIP is to integrate infrastructure planning with the land use planning identified in Toowoomba Regional Planning Scheme 2012 and ensure that trunk infrastructure is planned and provided in an efficient and orderly manner. The LGIP provides a summary of the existing and projected demand for the transport network within the Toowoomba LGA. These projections have been a point of reference when validating the data inputs to the traffic modelling for the Project.
Goondiwindi Local Government Infrastructure Plan (GRC, 2018b)	The *Goondiwindi Local Government Infrastructure Plan* (LGIP) identifies trunk infrastructure plans for five networks, including transport. The purpose of the Goondiwindi LGIP is to integrate infrastructure planning with the land use planning identified in *Goondiwindi Region Planning Scheme 2018* and ensure that trunk infrastructure is planned and provided in an efficient and orderly manner. The LGIP provides a summary of the existing and projected demand for the transport network within the Goondiwindi LGA. These projections have been a point of reference when validating the data inputs to the traffic modelling for the Project.

Policy/standards or guideline	Relevance to the Project
Guidelines	
Office of National Rail Safety Regulator Guideline: Major Projects (ONRSR, 2016)	The Office of National Rail Safety Regulator (ONRSR) is a regulatory agency that has been established under the Rail Safety National Law (RSNL) to administer a national system of rail safety regulation. All major railway projects will result in a requirement to either vary or obtain accreditation under the RSNL. The *Regulator Guideline: Major Projects* describes the minimum processes to be followed, from the onset of a major project, to support accreditation applications. The ONRSR has developed this guideline to: ▸ Provide guidance to duty holders about their duties and related obligations under the RSNL ▸ Explain the ONRSR's minimum expectations when reviewing the processes and associated evidence used to demonstrate that safe outcomes are being planned and have been achieved by major projects. In relation to the delivery of major projects, the following are areas of particular interest to all parties: ▸ Demonstration that the concept design minimises macro risk ▸ Identification of the accredited parties ▸ Demonstration of effective management and control to ensure the safe management of change across all entities involved with the Project ▸ Assuring safe outcomes to gain confidence that safety risk is managed, 'so far as is reasonably practicable', in a manner appropriate to the complexity of the Project. As a major project, this Project is expected to be compliant with the requirements of the RSNL. Adherence to the requirements of this guideline facilitates that compliance.
ONRSR Guideline: Meaning of duty to ensure safety so far as is reasonably practicable (ONRSR, 2021a)	Sections 52, 53 and 54 of the RSNL provide that rail transport operators and associated industry participants (contractors, manufacturers, designers and suppliers)–referred to collectively as duty holders–have an obligation to ensure the safety of railway operations. These statutory duties do not require safety at any cost. Under section 46 of the RSNL, duty holders are required: ▸ To eliminate risks to safety 'so far as is reasonably practicable' ▸ If it is not reasonably practicable to eliminate risks to safety, to minimise those risks 'so far as is reasonably practicable'. The *ONRSR Guideline: Meaning of duty to ensure safety so far as is reasonably practicable* provides guidance on the interpretation and application of the term 'so far as is reasonably practicable' (SFAIRP) in considering the standard that a duty holder is expected to meet under the RSNL and national regulations. In this context, and under the RSNL (s47), reasonably practicable means that which is, or was at a particular time, reasonably able to be done to ensure safety, taking into account and weighing up all relevant matters including: ▸ The likelihood of the hazard or the risk concerned occurring ▸ The degree of harm that might result from the hazard or the risk ▸ What the person concerned knows, or ought reasonably to know, about the hazard or risk, and ways of eliminating or minimising the risk ▸ The availability and suitability of ways to eliminate or minimise the risk ▸ After assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk. The revised reference design for the Project, including locations of intersection with the existing transport network, has been developed to comply with requirements of the RSNL and the principles of SFAIRP.
ONRSR Policy: Level Crossings (ONRSR, 2019a)	*ONRSR Policy: Level Crossings* sets out ONRSR's approach and broader expectations for improving the safety of railway operations with regard to existing level crossings and the early design of future road and rail intersections. The policy sets out the expectations that ONRSR has for the rail industry, road managers and governments to reduce the safety risk of level crossings. The design decision making process for road-rail intersections along the Project alignment has been conducted in reference to this policy.

Policy/standards or guideline	Relevance to the Project
Austroads Guide to Traffic Management Part 12: Traffic Impact Assessments (Austroads, 2020c)	The *Austroads Guide to Traffic Management Part 12: Traffic Impact* Assessments helps traffic and transport practitioners identify and manage the impacts on the road arising from land use developments. The impacts being considered are those directly affecting road users of all classes, from large freight vehicles and buses to cyclists and pedestrians. Transport that runs on separate alignments or are grade separated such as elevated bus rapid transit, metro rail or rail projects are not directly considered.
Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis (Austroads, 2017a)	*Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis* outlines the importance of traffic data and its analysis for the purpose of traffic management and traffic control within a network. It serves to ensure some degree of consistency in conducting traffic studies and surveys. It provides guidance on the different types of traffic studies and surveys that can be undertaken, their use and application, and methods for traffic data collection and analysis. Traffic surveys undertaken for the Project were undertaken consistent with this guide.
Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (Austroads, 2017b)	*Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* provides guidance on intersection sight distances, as well as left and right turn treatments, including the incorporation of auxiliary lanes at intersections and the use and size of traffic islands. This is to ensure the proposed intersection improvements as a part of the Project are designed in accordance with the requirements.
Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossing Management. (Austroads, 2019b)	*Management Part 6: Intersections, Interchanges and Crossing Management* is concerned with traffic management at all types of intersections where road users must join or cross another stream of traffic. It focuses on traffic management issues and treatments related to intersections, interchanges and crossings. Guidance on turning treatment warrants for the Project were adopted in determining the appropriate turn treatments at intersections.
Austroads Guide to Traffic Management Part 4: Network Management Strategies. (Austroads, 2020a)	*Austroads Guide to Traffic Management Part 4: Network Management Strategies* provides guidance on how to manage the road corridor network at the strategic level based on good practice, with the guide recommending any practices differing from the guide be based on sound engineering judgement and approved by the relevant road agency. Guidance is provided on the movement and place considerations for network types based on the user group (e.g. rural networks, bicycle networks, heavy vehicle networks and others) which has been incorporated into the Project, where relevant.
Cycling Aspects of Austroads Guides (Austroads, 2017c)	*Cycling Aspects of Austroads Guides* contains information that relates to the planning, design and traffic management of cycling facilities. The guideline provides: ▸ An overview of planning and traffic management considerations and cross-references to other Austroads guides and texts for further detailed information A summary of design guidance and criteria relating to on-road and off-road bicycle facilities together with a high level of cross-referencing to the relevant Austroads guides for further information Information and cross-references on the provision for cyclists at structures, traffic control devices, construction and maintenance considerations and end-of-trip facilities.
Queensland Level Crossing Safety Strategy 2012-2021 (DTMR, 2012a)	The *Queensland Level Crossing Safety Strategy 2012–2021* complements the *National Railway Level Crossing Safety Strategy 2012-2020*, released by the Australian Transport Council in 2016 to promote national consistency in addressing this important issue. The strategy focuses on all users of level crossings, including train crew and passengers, road vehicle drivers, riders, passengers and pedestrians. The strategy excludes private (occupational) crossings and crossings that are part of the cane rail network. These crossings, including any which may be accessible to the public, are a workplace health and safety matter and are managed under separate arrangements. For the purpose of the traffic, transport and access impact assessment, the *Queensland Level Crossing Safety Strategy 2012–2021* has been used, with its associated key performance indicators, to ensure that mitigation measures determined for all public road-rail interface locations (level crossings) through the analysis process focus on safety, risk and operational efficiency.

Policy/standards or guideline	Relevance to the Project
Guide to Traffic Impact Assessment, December 2018 (DTMR, 2018b)	The *Guidelines to Traffic Impact Assessment* (GTIA) has been used as the basis for the traffic and transport assessment, as it relates to roads and intersections affected by the construction and operation of the Project. GTIA provides information about the processes involved to assess road impacts triggered by a proposed development. The GTIA provides a basis for the assessment of road impacts and has been adopted for the preliminary assessment on traffic and pavement impacts by the Project. Although the guidelines only apply to SCR, local councils may choose to adopt or use this as a reference. In general, the DTMR will consider a development's road impacts to be 'insignificant' if the development generates an increase in traffic on SCR of less than 5 per cent over existing levels, either measured in terms of annual average daily traffic (AADT) or standard axle repetitions (SAR). Inputs to the GTIA process typically include the existing traffic levels, the Project construction timeframe, and that of other projects, volume of construction materials, haul vehicles and their capacities, and therefore the number of new or additional Project-related trips likely to use the network. The use of the assessment process recommended in the GTIA will provide the Project with clarification on likely traffic impacts on nominated haulage routes, intersections and other affected roads. As the Project follows the coordinated EIS process, the TIA may need to be updated during detailed design stage of the Project, or if the final traffic generation changes. This is consistent with the GTIA.
Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment December 2018 (DTMR, 2018b)	This *Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment* provides further guidance beyond the GTIA for industry on how to prepare a Pavement Impact Assessment (PIA) using the new marginal cost methodology and the concept of SAR. This practice note supports Chapter 13 of the GTIA. The Project has prepared the PIA consistent with the methodology outlined in this note.
Manual of Uniform Traffic Control Devices Part 7: Railway Crossings (DTMR, 2019f)	The use of signs, markings and other devices at railway level crossings, based on uniform standards and practices, is essential in the interests of safety for both rail traffic and road users. Part 7 of the *Manual of Uniform Traffic Control Devices* sets out the various controls used at railway, cane railway and combined railway/cane railway level crossings and describes the devices and assemblies, their use and location to achieve these controls.
Guide to Development in a Transport Environment: Rail (DTMR, 2015)	The *Guide to Development in a Transport Environment: Rail* provides important information for the planning, design or delivery of development in the vicinity of railways in Queensland. It is intended for use as a technical reference document. The guide provides specific technical guidance to assist development proponents to achieve compliance with the performance outcomes and acceptable outcomes in the Queensland State Development Assessment Provisions in relation to managing impacts of development on railway safety, structural integrity and operation. The guide also provides useful information in relation to the operational constraints and requirements when undertaking construction work within the railway environment.
Road Safety Policy (DTMR, 2022c)	The *Road Safety Policy* aims to implement safe system principles, processes and practices that will deliver reductions in the number of fatal and serious injury crashes on Queensland roads. This will contribute to moving towards the Queensland Government's vision of zero road deaths and serious injuries, as well as achieving the objective of building safe, caring and connected communities. The traffic, transport and access impact assessment considers permanent mitigation measures consistent with the Road Safety Policy.
DTMR Cost-Benefit Analysis Manual, Part 4: Technical Guide *(DTMR, 2011)*	The *Cost–Benefit Analysis Manual, Part 4: Technical Guide* is a practical reference tool for DTMR staff and consultants evaluating the economic merits of transport and road projects. The manual provides theoretical road capacities that DTMR uses to support the Project evaluation process. These road capacities are provided for various road types and terrains. The manual is used to provide guidance on the assessment approach for mid-block capacity assessments and was used as a reference in conjunction with the above-mentioned documents.
EIS Information Guideline–Transport (*DES, 2022h)*	This guideline advises proponents about the information and assessment requirements for the transport section when preparing an EIS. The EIS is generally consistent with the requirements of the guideline, and is structured in line with the TMR GTIA requirement and Appendix AA: Traffic Impact Assessment. Assessment related to other disciplines is contained within the relevant chapters, including: ▸ Land (Chapter 8: Land Use and Tenure) ▸ Ecology (Chapter 11: Flora and Fauna) ▸ Air (Chapter 12: Air Quality) ▸ Noise (Chapter 16: Noise and Vibration.

Policy/standards or guideline	Relevance to the Project
Australian Level Crossing Assessment Model (ALCAM, 2016)	ALCAM is an assessment tool used to identify key potential risks at level crossings and to assist in the prioritisation of crossings for upgrades. The risk model is used to support a decision-making process regarding both road and pedestrian level crossings and to help determine traffic cost effective treatments. This was used as the basis of the assessment that was undertaken to determine road-rail interface treatments for the Project.
Street Design Manual: Walkable Neighbourhoods (Institute of Public Works Engineering Australasia Queensland, 2020)	The *Street Design Manual: Walkable Neighbourhoods* is a contemporary guide for the design and development of Queensland's residential neighbourhoods. These design guidelines were considered where roads and streets are designed in residential neighbourhoods as a part of the Project.

20.3 Methodology

This section provides an overview of the spatial extent of assessment, the data accessed for assessment and the methodologies applied in assessing impacts associated with the Project.

20.3.1 Traffic, transport and access study area

The transport study area sets the spatial limits for establishing the existing network conditions and assessing potential impacts associated with the Project. The GTIA provides guidance on the conditions for determining the spatial extent for a TIA based on required mitigation measures. This guidance is provided in Table 20-2.

TABLE 20-2 MITIGATION CRITERIA

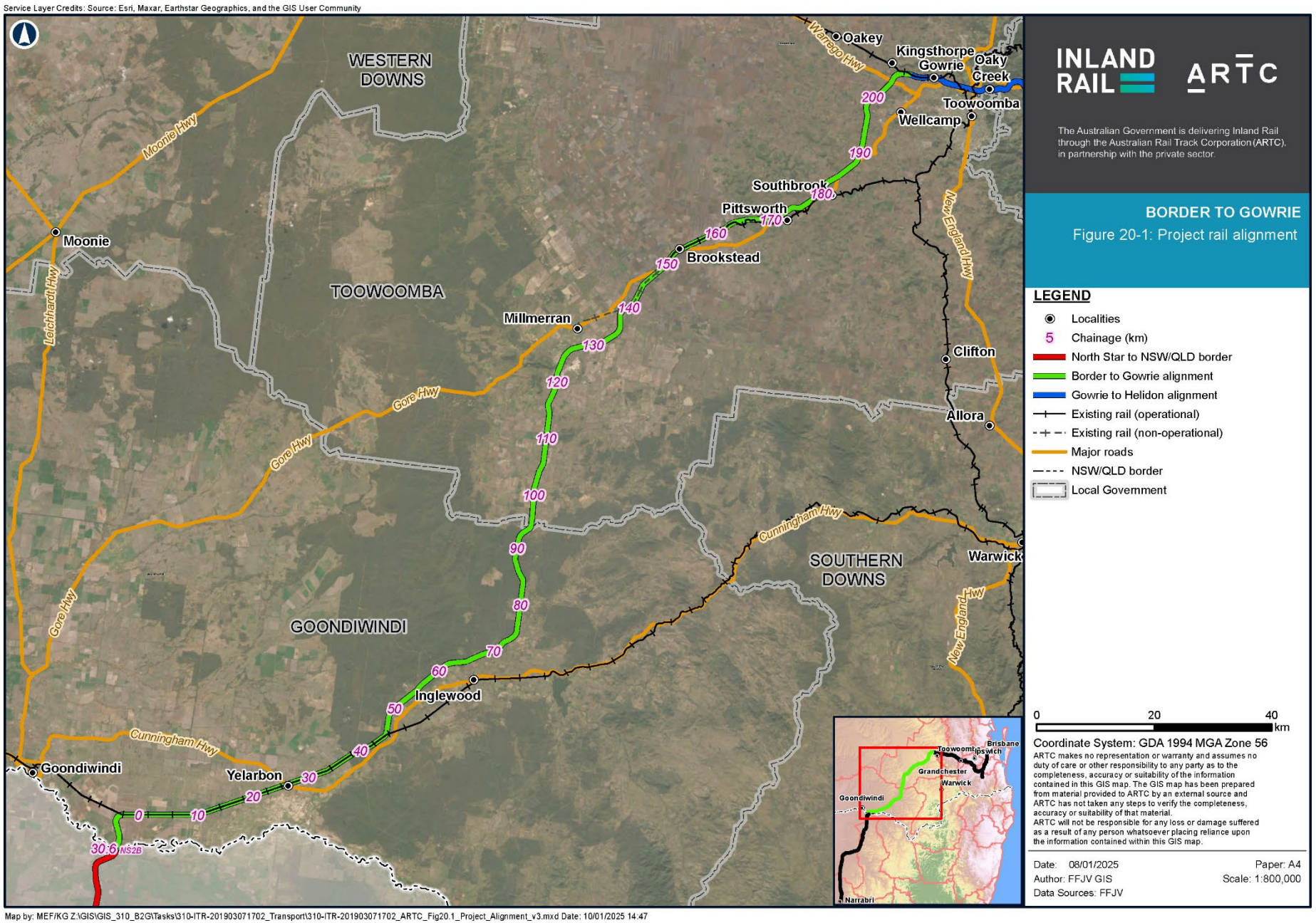
Impact type	Mitigation criteria
Road safety	The existing safety risk rating for the road link, intersection or road-rail interface is not worsened because of the Project and that any unacceptable safety risk is addressed.
Access and frontage	The SCR corridor for the extent of the geometric frontage of the site includes works on both the frontage side and potentially on the opposite side of the road. For the Project, this includes construction accesses and laydown areas on limited access roads in the DTMR and Transport for New South Wales (TfNSW) network [1].
Intersection delay	All intersections where the development traffic exceeds 5 per cent of the base traffic for any movement in the design peak periods in the year of opening of each stage.
Road link capacity	All road links where the development traffic exceeds 5 per cent of the base traffic in either direction on the link's AADT in the year of opening of each stage.
Pavement	All road links where the development SAR exceed 5 per cent of the base traffic in either direction on the link's SAR in the year of opening of each stage.
Transport infrastructure	All road links where the development traffic exceeds 5 per cent of the base traffic in either direction on the link's AADT in the year of opening of each stage or where DTMR or TfNSW identifies prevailing structural integrity issues of transport infrastructure (e.g. bridges or culverts).

Table note:
1 A road or part of a road declared as such under Section 54 of the *Transport Infrastructure Act 1994* (Qld)

Based on the guidance in Table 20-2, the study area consists of:

- The extent of the proposed rail corridor for the Project, including public roads intersecting the proposed rail corridor (road–rail interface locations)
- The road network anticipated to be used for the transport of workforce, materials and equipment during the construction works and operations stages of the Project
- Other transport facilities in proximity to the Project, such as airports
- The road–rail interface locations included in the impact assessment area are all public road crossings that are intersected by the revised reference design for the Project.

Figure 20-1 identifies the Project alignment and Figure 20-2 illustrates the road–rail interface locations in the revised reference design.


Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
WESTERN DOWNS
TOOWOOMBA
GOONDIWINDI
SOUTHERN DOWNS
Moonie
Millmerran
Brookstead
Pittsworth
Southbrook
Wellcamp
Toowoomba
Oaky Creek
Gowrie
Kingsthorpe
Oakey
Clifton
Allora
Warwick
Inglewood
Yelarbon
Goondiwindi
Moonie Hwy
Leichhardt Hwy
Gore Hwy
Cunningham Hwy
Warrego Hwy
New England Hwy
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
30.6
NS2B
Brisbane
Ipswich
Grandchester
Narrabri
INLAND RAIL
ARTC
The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.
BORDER TO GOWRIE
Figure 20-1: Project rail alignment
LEGEND
Localities
Chainage (km)
North Star to NSW/QLD border
Border to Gowrie alignment
Gowrie to Helidon alignment
Existing rail (operational)
Existing rail (non-operational)
Major roads
NSW/QLD border
Local Government
0
20
40
km
Coordinate System: GDA 1994 MGA Zone 56
ARTC makes no representation or warranty and assumes no duty of care or other responsibility to any party as to the completeness, accuracy or suitability of the information contained in this GIS map. The GIS map has been prepared from material provided to ARTC by an external source and ARTC has not taken any steps to verify the completeness, accuracy or suitability of that material.
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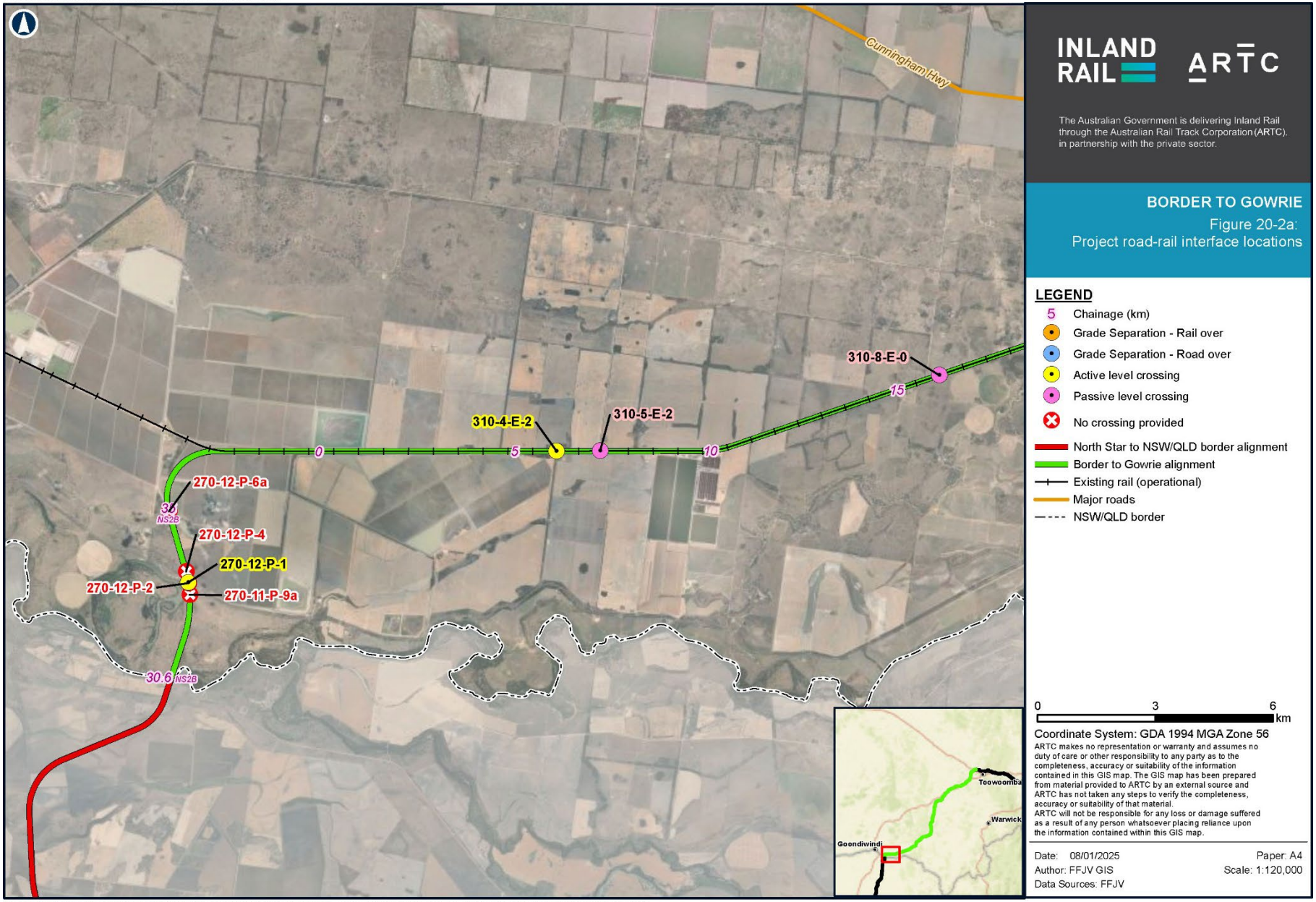
Date: 08/01/2025
Author: FFJV GIS
Data Sources: FFJV
Paper: A4
Scale: 1:800,000
Map by: MEF/KG Z:\GIS\GIS_310_B2G\Tasks\310-ITR-201903071702_Transport\310-ITR-201903071702_ARTC_Fig20.1_Project_Alignment_v3.mxd Date: 10/01/2025 14:47


Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Cunningham Hwy
310-8-E-0
310-4-E-2
310-5-E-2
270-12-P-6a
270-12-P-4
270-12-P-1
270-12-P-2
270-11-P-9a
30.6 NS2B
INLAND RAIL
ARTC
The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.
BORDER TO GOWRIE
Figure 20-2a:
Project road-rail interface locations
LEGEND
Chainage (km)
Grade Separation - Rail over
Grade Separation - Road over
Active level crossing
Passive level crossing
No crossing provided
North Star to NSW/QLD border alignment
Border to Gowrie alignment
Existing rail (operational)
Major roads
NSW/QLD border
0 3 6 km
Coordinate System: GDA 1994 MGA Zone 56
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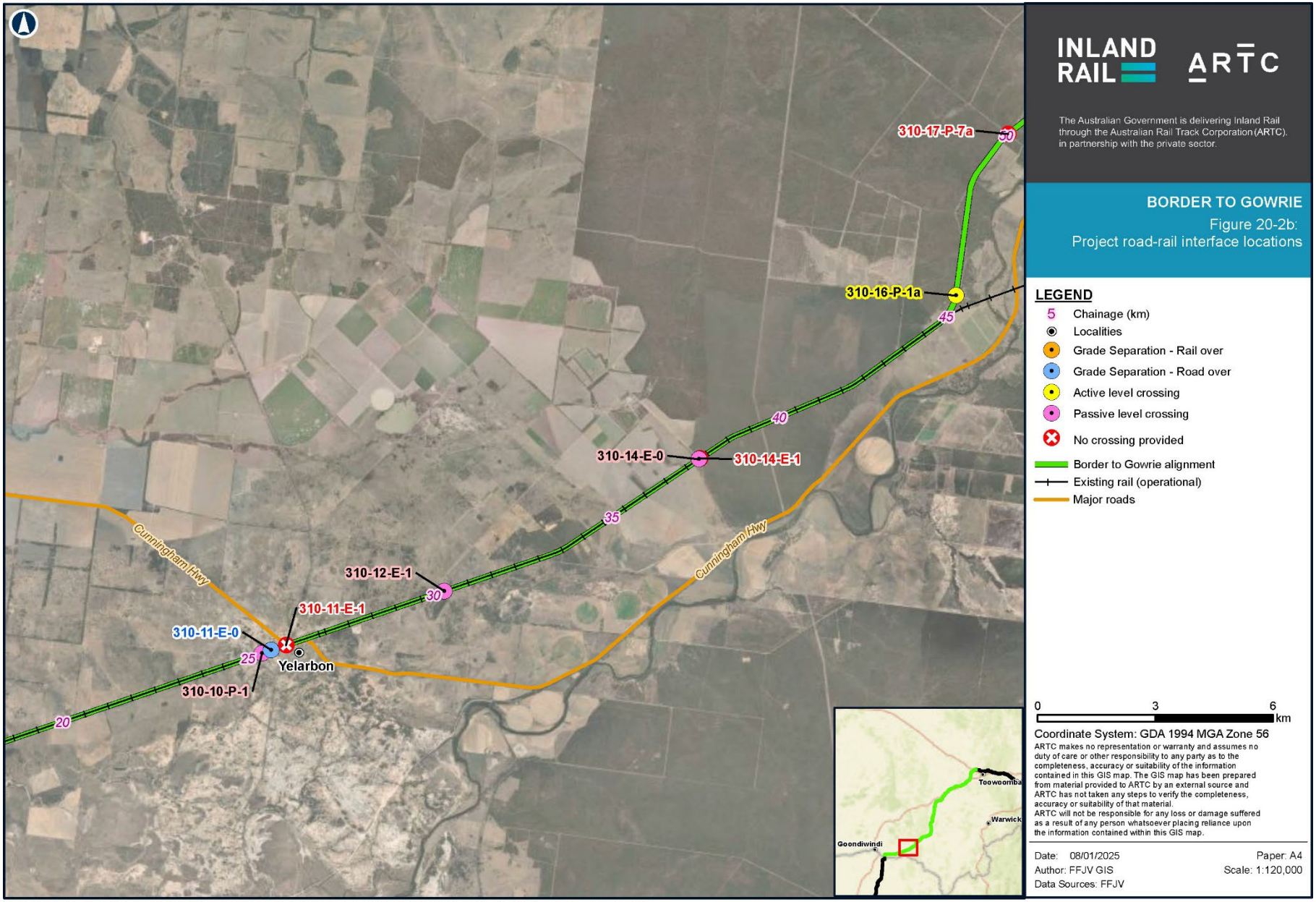
Paper: A4
Author: FFJV GIS
Scale: 1:120,000
Data Sources: FFJV
Toowoomba
Warwick
Goondiwindi
Map by: DMcP/MEF/KG/AWS Z:\GIS\GIS_310_B2G\Tasks\310-ITR-201903071702_Transport\310-ITR-201903071702_ARTC_Fig20.2_RRIF_v7.mxd Date: 10/01/2025 14:46


Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
310-17-P-7a
50
310-16-P-1a
45
40
310-14-E-0
310-14-E-1
35
Cunningham Hwy
Cunningham Hwy
310-12-E-1
30
310-11-E-1
310-11-E-0
25
Yelarbon
310-10-P-1
20
Toowoomba
Warwick
Goondiwindi
INLAND RAIL
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BORDER TO GOWRIE
Figure 20-2b:
Project road-rail interface locations
LEGEND
5 Chainage (km)
Localities
Grade Separation - Rail over
Grade Separation - Road over
Active level crossing
Passive level crossing
No crossing provided
Border to Gowrie alignment
Existing rail (operational)
Major roads
0
3
6
km
Coordinate System: GDA 1994 MGA Zone 56
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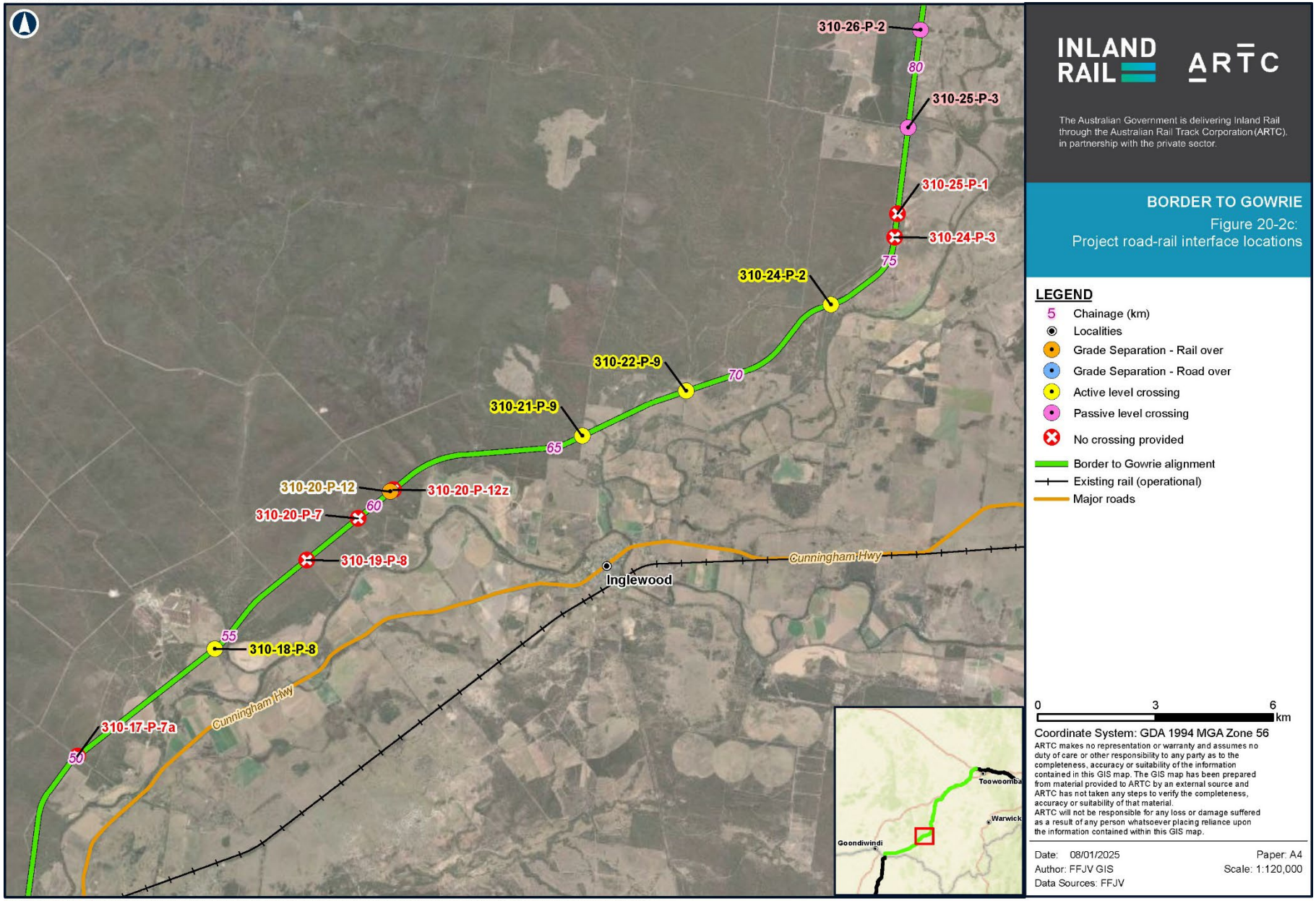
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310-26-P-2
80
310-25-P-3
310-25-P-1
310-24-P-3
75
310-24-P-2
310-22-P-9
70
310-21-P-9
65
310-20-P-12
310-20-P-12z
310-20-P-7
60
310-19-P-8
Inglewood
Cunningham Hwy
55
310-18-P-8
310-17-P-7a
50
Cunningham Hwy
Toowoomba
Warwick
Goondiwindi
INLAND RAIL
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BORDER TO GOWRIE
Figure 20-2c:
Project road-rail interface locations
LEGEND
5 Chainage (km)
Localities
Grade Separation - Rail over
Grade Separation - Road over
Active level crossing
Passive level crossing
No crossing provided
Border to Gowrie alignment
Existing rail (operational)
Major roads
0
3
6
km
Coordinate System: GDA 1994 MGA Zone 56
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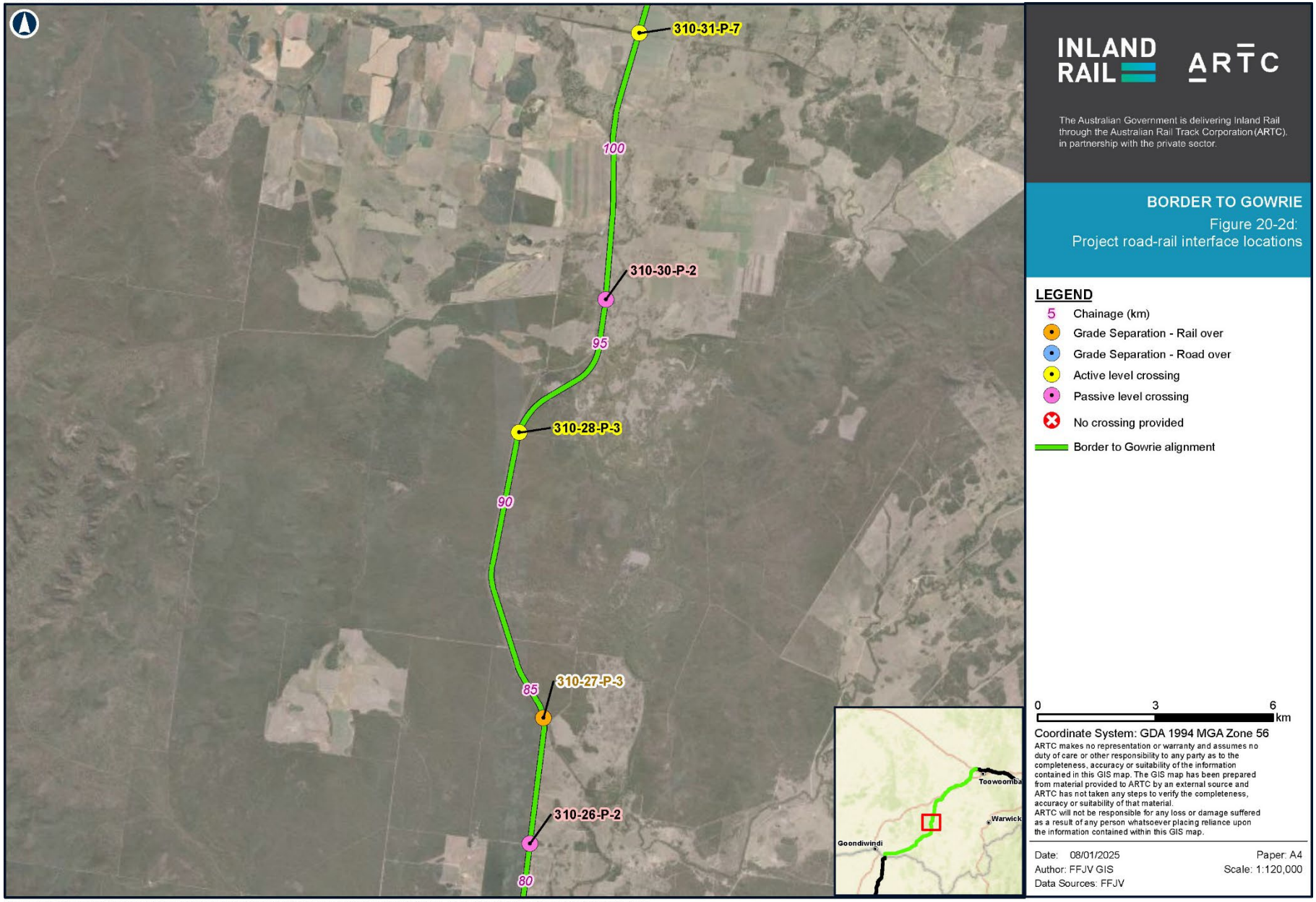
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310-31-P-7
100
310-30-P-2
95
310-28-P-3
90
310-27-P-3
85
310-26-P-2
80
Toowoomba
Warwick
Goondiwindi
INLAND RAIL
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BORDER TO GOWRIE
Figure 20-2d:
Project road-rail interface locations
LEGEND
5 Chainage (km)
Grade Separation - Rail over
Grade Separation - Road over
Active level crossing
Passive level crossing
No crossing provided
Border to Gowrie alignment
0 3 6 km
Coordinate System: GDA 1994 MGA Zone 56
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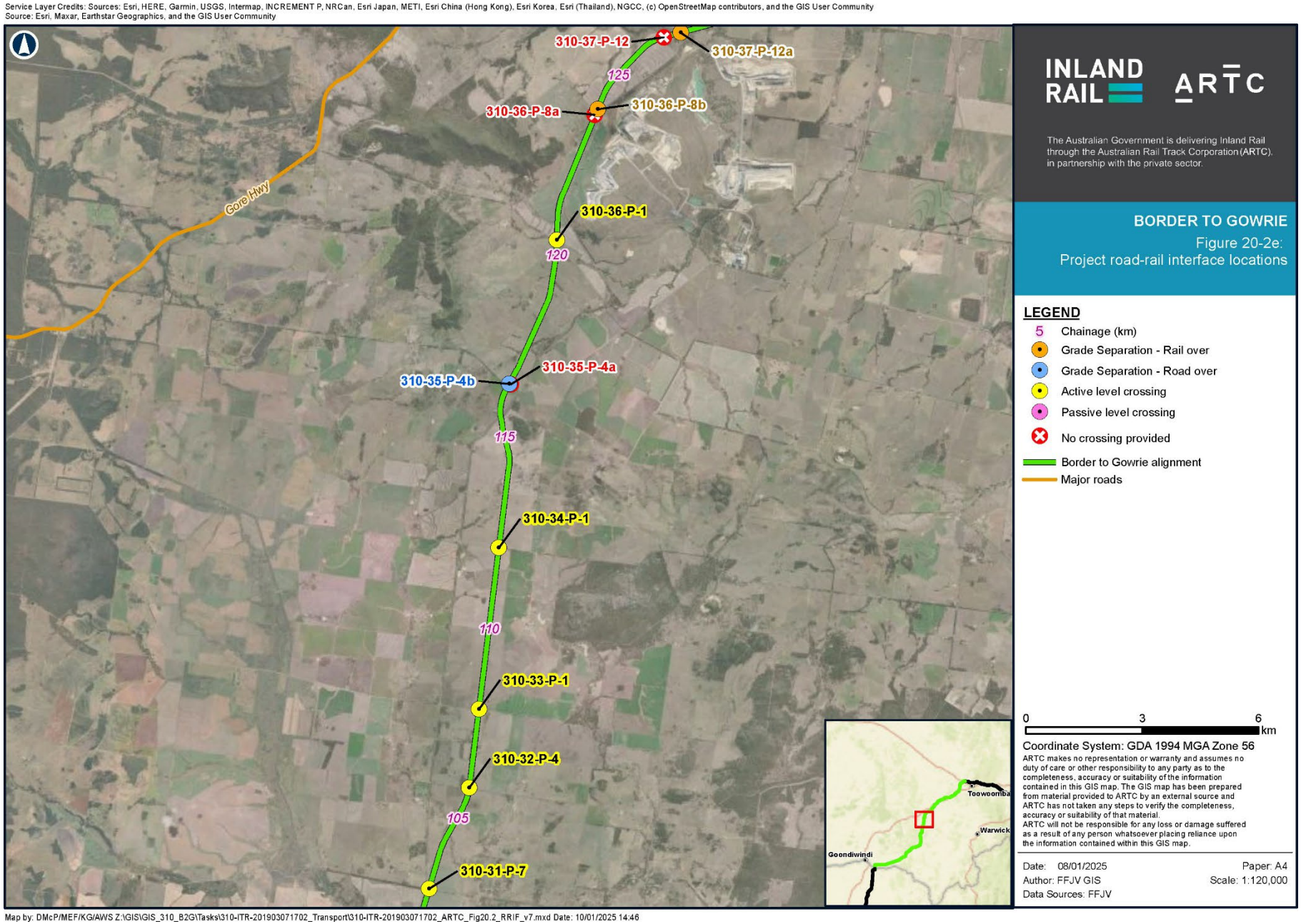
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310-37-P-12
310-37-P-12a
125
310-36-P-8a
310-36-P-8b
Gore Hwy
310-36-P-1
120
310-35-P-4b
310-35-P-4a
115
310-34-P-1
110
310-33-P-1
310-32-P-4
105
310-31-P-7
Toowoomba
Warwick
Goondiwindi
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BORDER TO GOWRIE
Figure 20-2e:
Project road-rail interface locations
LEGEND
5 Chainage (km)
Grade Separation - Rail over
Grade Separation - Road over
Active level crossing
Passive level crossing
No crossing provided
Border to Gowrie alignment
Major roads
0
3
6
km
Coordinate System: GDA 1994 MGA Zone 56
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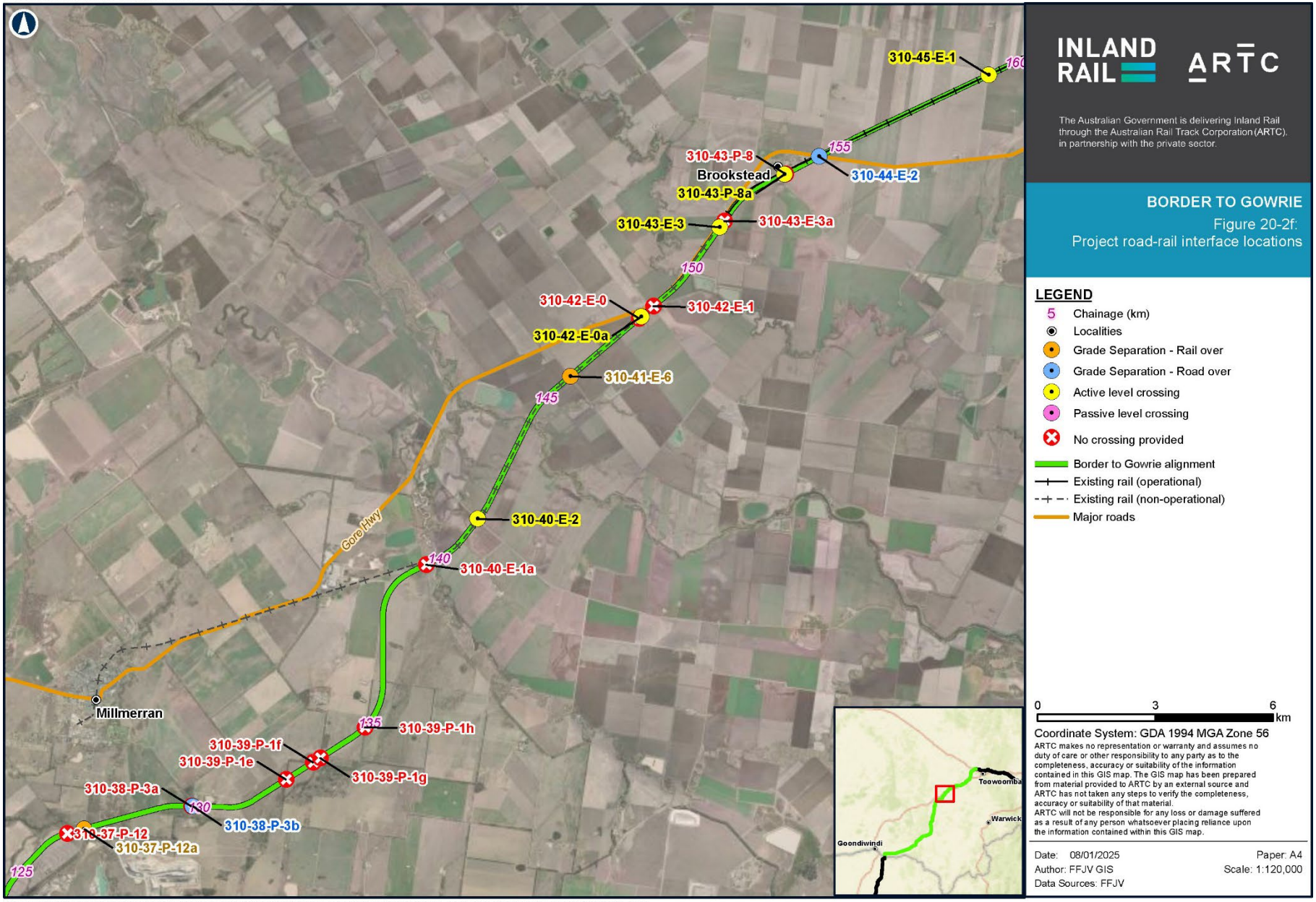
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310-45-E-1
160
155
310-43-P-8
Brookstead
310-44-E-2
310-43-P-8a
310-43-E-3
310-43-E-3a
150
310-42-E-0
310-42-E-1
310-42-E-0a
310-41-E-6
145
310-40-E-2
Gore Hwy
140
310-40-E-1a
Millmerran
135
310-39-P-1h
310-39-P-1f
310-39-P-1e
310-39-P-1g
310-38-P-3a
130
310-38-P-3b
310-37-P-12
310-37-P-12a
125
Toowoomba
Warwick
Goondiwindi
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BORDER TO GOWRIE
Figure 20-2f:
Project road-rail interface locations
LEGEND
5 Chainage (km)
Localities
Grade Separation - Rail over
Grade Separation - Road over
Active level crossing
Passive level crossing
No crossing provided
Border to Gowrie alignment
Existing rail (operational)
Existing rail (non-operational)
Major roads
0
3
6
km
Coordinate System: GDA 1994 MGA Zone 56
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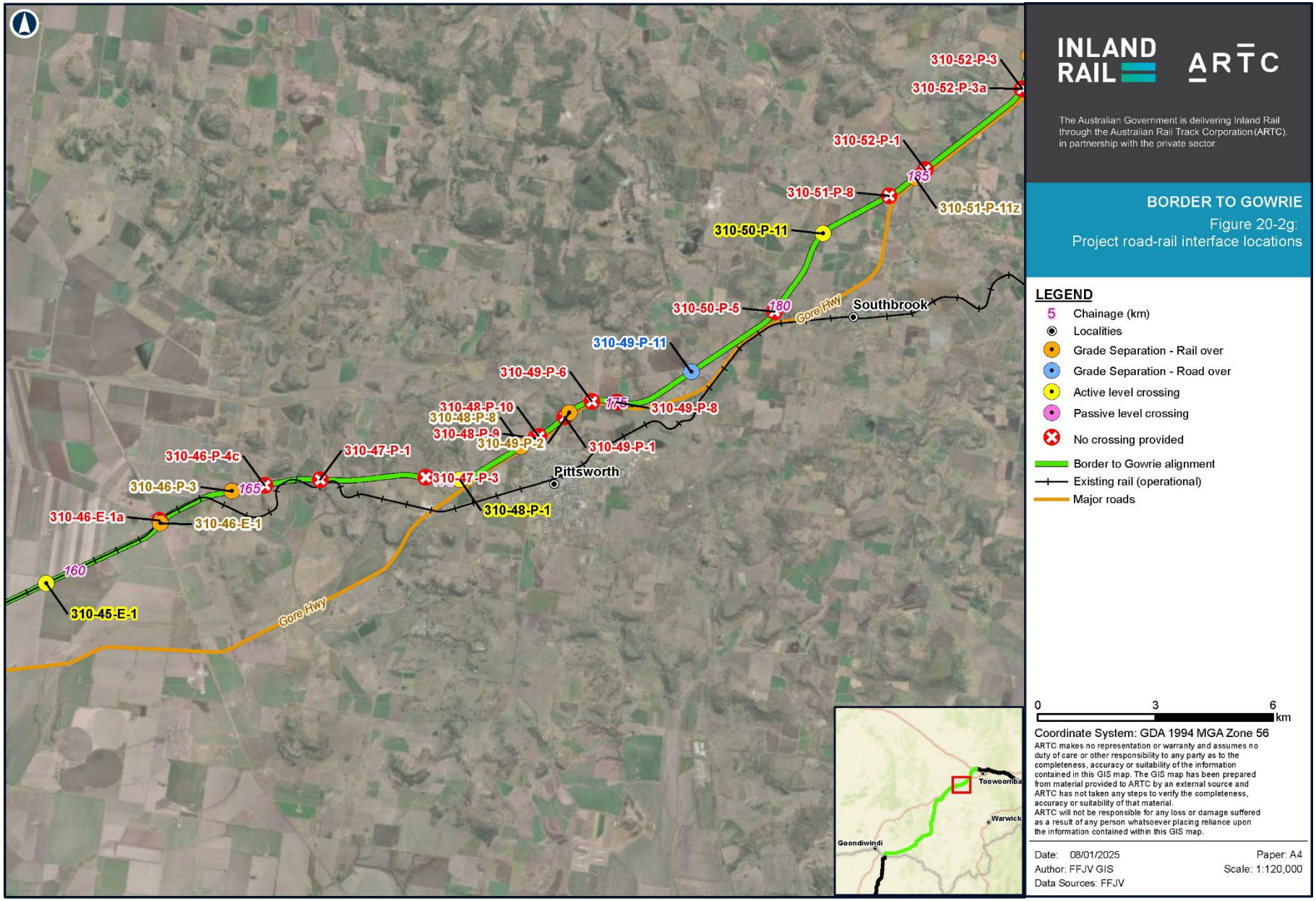
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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
310-52-P-3
310-52-P-3a
310-52-P-1
185
310-51-P-8
310-51-P-11z
310-50-P-11
310-50-P-5
180
Gore Hwy
Southbrook
310-49-P-11
310-49-P-6
175
310-48-P-10
310-48-P-8
310-48-P-9
310-49-P-2
310-49-P-8
310-49-P-1
310-46-P-4c
310-47-P-1
310-46-P-3
165
310-47-P-3
Pittsworth
310-48-P-1
310-46-E-1a
310-46-E-1
160
310-45-E-1
Gore Hwy
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BORDER TO GOWRIE
Figure 20-2g:
Project road-rail interface locations
LEGEND
5 Chainage (km)
Localities
Grade Separation - Rail over
Grade Separation - Road over
Active level crossing
Passive level crossing
No crossing provided
Border to Gowrie alignment
Existing rail (operational)
Major roads
Toowoomba
Warwick
Goondiwindi
0
3
6
km
Coordinate System: GDA 1994 MGA Zone 56
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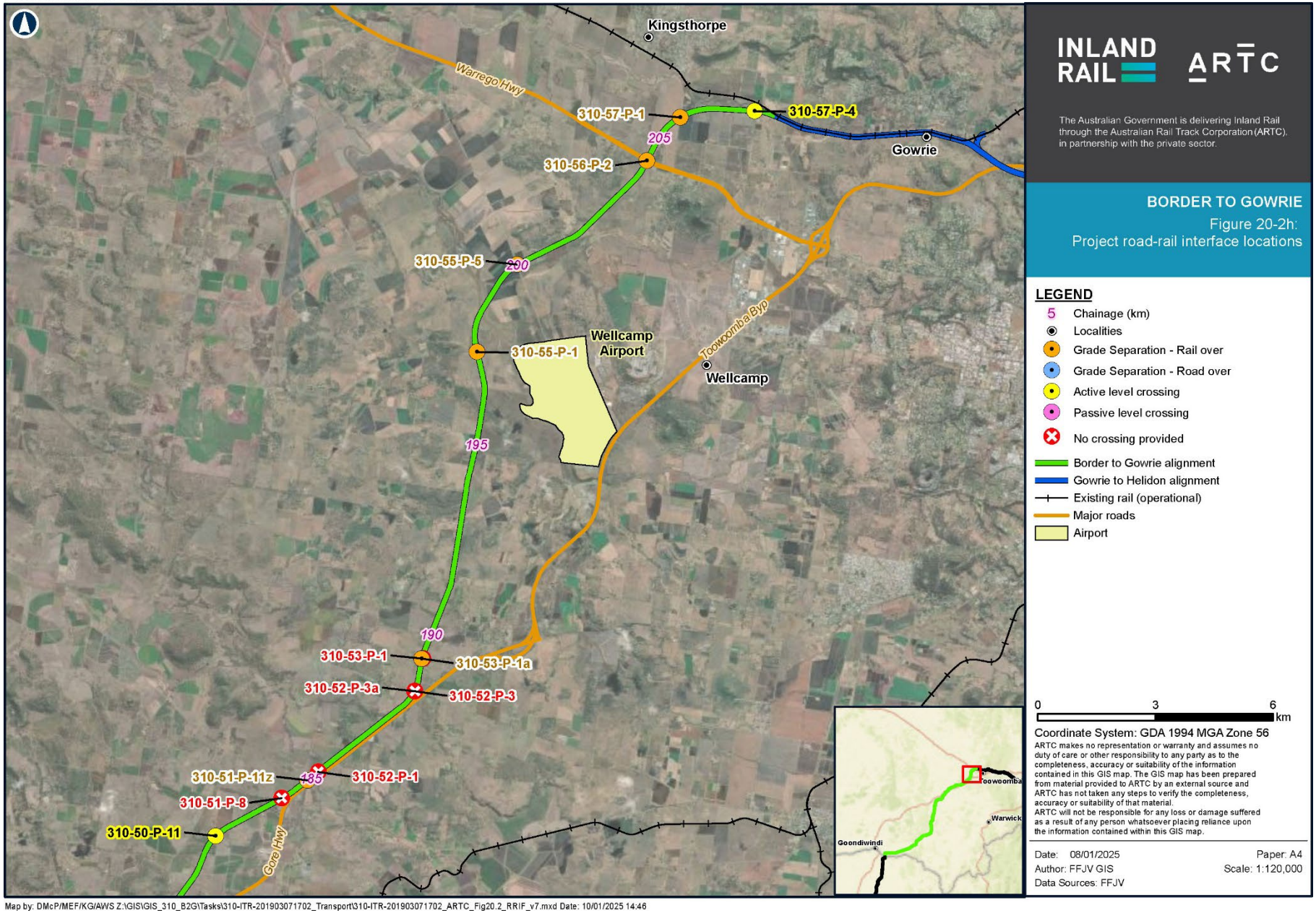
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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Kingsthorpe
Warrego Hwy
310-57-P-1
310-57-P-4
205
Gowrie
310-56-P-2
310-55-P-5
200
Wellcamp Airport
310-55-P-1
Toowoomba Byp
Wellcamp
195
190
310-53-P-1
310-53-P-1a
310-52-P-3a
310-52-P-3
310-51-P-11z
185
310-52-P-1
310-51-P-8
310-50-P-11
Gore Hwy
Toowoomba
Warwick
Goondiwindi
INLAND RAIL
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BORDER TO GOWRIE
Figure 20-2h:
Project road-rail interface locations
LEGEND
5 Chainage (km)
Localities
Grade Separation - Rail over
Grade Separation - Road over
Active level crossing
Passive level crossing
No crossing provided
Border to Gowrie alignment
Gowrie to Helidon alignment
Existing rail (operational)
Major roads
Airport
0
3
6
km
Coordinate System: GDA 1994 MGA Zone 56
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20.3.1.1 Impact assessment areas

Consistent with GTIA, this chapter and TIA has considered the impact of the Project on the SCR network and this has been extended to the LGR network, subject to further discussion and agreement with local governments at the detailed design stage. It does not apply to private roads. While the use of the guideline is not mandatory for LGR, it provides a basis for assessing potential impacts from the construction works and operations stages of the Project.

The extent of the impacts of Project traffic on other users and on infrastructure can range from being localised to dispersed (i.e. construction routes covering the extent of the TIA study area). The study area encompasses all primary proposed construction routes and the Project's proposed alignment. The impact assessment area and impact assessment year for each assessment type has been provided in Table 20-3. These criteria have been adapted from the GTIA for the purpose of this study. The impact assessment year is the year at which the impacts of the Project are assessed for a structural or operational aspect of the road network. The impact assessment year varies depending on impact type because the effects of development can be different for construction and operational aspects of the road network. Mitigation measures have been provided for each assessment to address the impacts of the Project within the impact assessment area.

TABLE 20-3 IMPACT ASSESSMENT AREA BY ASSESSMENT TYPE

Assessment type	Impact assessment area	Impact assessment year
Road safety	▸ All road links where the Project traffic exceeds 5 per cent of base traffic in either direction on the link's AADT in the peak impact year. ▸ All intersections where the Project traffic exceeds 5 per cent of the base traffic for any turning movement in the peak periods of the peak impact year.	Peak impact year of construction
Access	▸ All access intersections interacting with the State or local government road network.	Peak impact year of construction
Intersection	▸ All intersections where the Project traffic exceeds 5 per cent of the base traffic for any turning movement in the peak periods of the peak impact year.	Peak impact year of construction
Road link capacity	▸ All intersections where the Project traffic exceeds 5 per cent of the base traffic for any turning movement in the peak periods of the peak impact year.	Peak impact year of construction
Pavement	▸ All road links where the Project SAR exceeds 5 per cent of the base SAR in either direction of the link in each year of construction.	Each year of construction
Transport infrastructure	▸ All road links where prevailing structural issues of transport infrastructure have been identified, or where construction vehicles for the Project exceed dimensions or weight of those anticipated for non-Project use.	Peak impact year of construction
Level crossing	▸ Existing level crossings that are impacted by construction traffic or proposed active and passive public road-rail interfaces.	Year of opening of each stage including the final stage

The majority of impact assessments have been carried out for the peak impact year of construction as it will identify the most significant impacts (i.e. more than 5 per cent from the construction activities). The pavement impact assessment considers each year of construction as it looks at the total impact over the complete duration of the construction. The transport infrastructure assessment considers the peak impact year of construction as well as the year of opening and 10 or 20 years post opening for the operations stage of the Project. Further assessments will be carried out during the detailed design stage of the Project for the year of opening and 10 or 20 years post opening, however, it is envisaged the likely impact from the operations stage of the Project, mainly from vehicles used for routine maintenance, would be negligible.

20.3.1.2 Construction transport routes

Primary construction transport routes refer to existing SCR and LGR between the Port of Brisbane and Thallon. The construction routes proposed are assumed feasible routes, which the Contractor will finalise. Transport includes movement of:

- Construction materials, plant, equipment and workforce
- Quarry materials (ballast, capping materials), other bulk materials, precast concrete, ready-mix concrete, earthworks materials, spoil, water, plant, equipment, other materials and workforce as most construction routes connect material suppliers or accommodation facilities to laydown areas along the rail alignment
- Materials (such as grain) that would otherwise have used existing rail facilities which will be temporarily closed during the Project construction period.

Further information regarding the materials transport and the specific assumed construction routes is shown in Appendix AA: Traffic Impact Assessment.

The routes pass through or near the townships of Toowoomba, Wellcamp, Westbrook, Athol, Southbrook, Pittsworth, Brookstead, Pampas, Millmerran, Inglewood, Yelarbon, Kurumbul, Goondiwindi, Toobeah, and Thallon. The assumed construction transport routes generally follow the shortest distance arterial road network most suitable to be used for the transport of each material type. Where possible, routes avoid populated areas such as town centres. All routes passing through or originating in Toowoomba have been formed using the haulage routes that were used for the construction of the Toowoomba Second Range Crossing (now Toowoomba Bypass) as a guide. The National Heavy Vehicle Regulator journey planner was also used to identify roads suitable for heavy vehicles.

In addition to the townships, construction routes travel between the Port of Brisbane and Toowoomba via the Warrego Highway, Ipswich Motorway, Logan Motorway, Gateway Motorway and Port of Brisbane Motorway. These roads were built to accommodate high traffic volumes and provide efficient and safe movement for vehicles travelling long distances.

While most construction activity related transport will be primarily by road, concrete sleepers and rail are expected to be delivered by the existing QR and ARTC rail network to the Whetstone Material Distribution Centre along the Project alignment.

The ultimate determination of the final construction and heavy vehicle (HV) routes will be subject to consultation between DTMR, local councils, and the Contractor and, where relevant QR, during the next stage of the Project. This is consistent with Section 7.5 of DTMR's GTIA, which states that the TIA, '*may be finalised when project contractors are appointed, and final traffic generation is clearer*'.

Figure 20-3 illustrates the primary construction transport routes that the Contractor may use. Although other roads may also be used for the transport of construction materials, these roads would not be the primary construction routes and will have significantly less construction traffic volumes. Impacts associated with the construction of the Project are explored in detail in Section 20.5.

Further details on construction transport routes are included in Appendix AA: Traffic Impact Assessment.

20.3.1.3 Operational transport routes

Rail maintenance workforce movement and the transportation of maintenance plant and materials are expected to be the major transport tasks during the operations stage of the Project. The existing road network will be used by maintenance crews to travel to the rail corridor. Once in the rail corridor, the rail maintenance access roads incorporated into the design of the Project will be used in preference to the existing road network for Project maintenance activities. These activities are likely to be infrequent and the related traffic volumes are likely to be minimal with no envisaged impact to operational conditions of the surrounding road network. These traffic volumes are forecast not to exceed 5 per cent of base conditions. This has been discussed and accepted by TRC, Goondiwindi Regional Council (GRC) and DTMR during consultation throughout the revised reference design process. Further details on this consultation can be found in Appendix E: Consultation Report.

Impacts associated with the operation of the Project are discussed in detail in Section 20.3.3.

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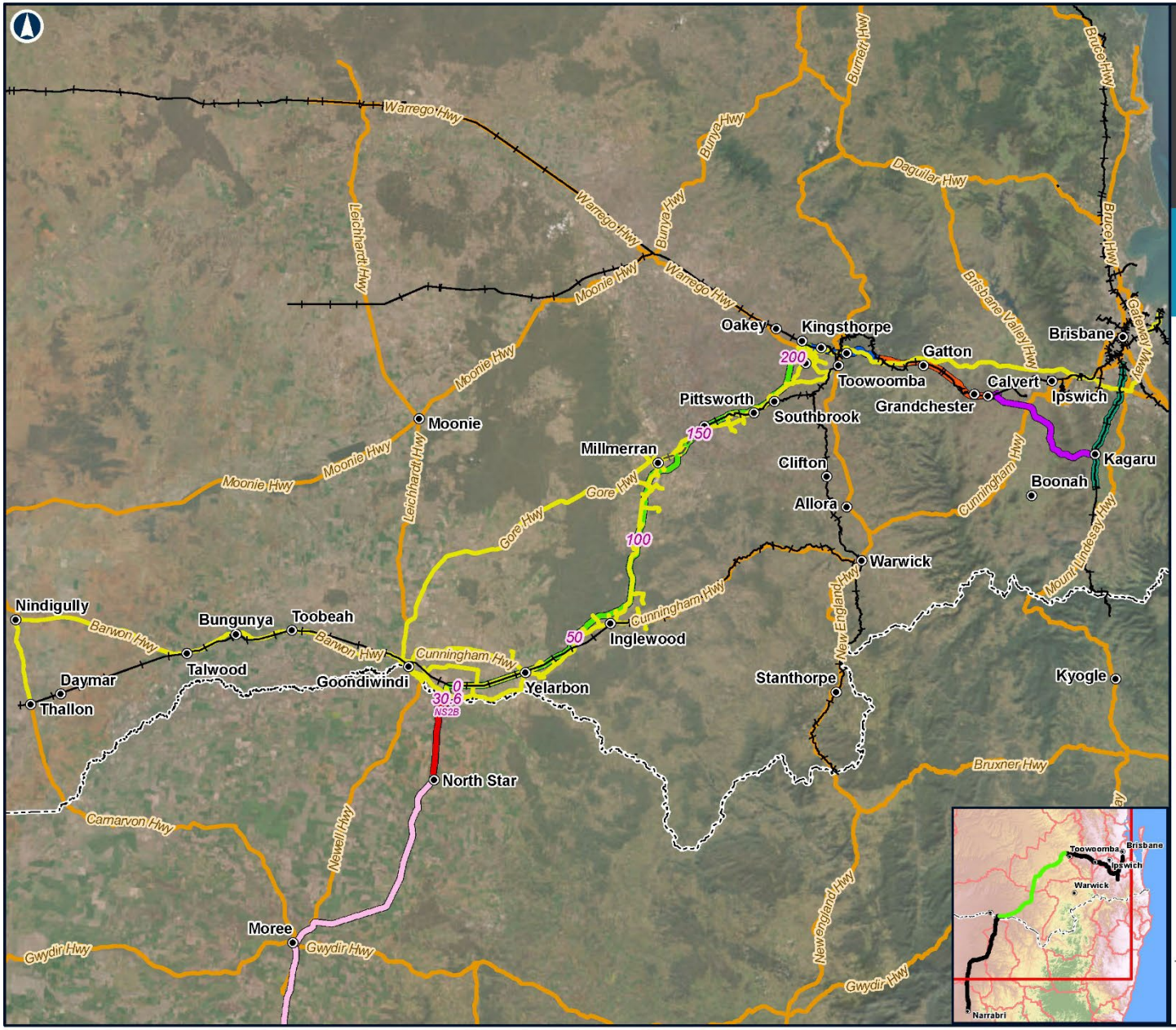

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BORDER TO GOWRIE

Figure 20-3: Proposed primary construction transport routes

LEGEND

- Localities
- 5 Chainage (km)
- Narrabri to North Star alignment
- North Star to NSW/QLD border alignment
- Border to Gowrie alignment
- Gowrie to Helidon alignment
- Helidon to Calvert alignment
- Calvert to Kagura alignment
- Kagaru to Acacia Ridge/Bromelton
- Existing rail (operational)
- Existing rail (non-operational)
- Construction routes
- Major roads
- NSW/QLD border

0 50 100 km

Coordinate System: GDA 1994 MGA Zone 56

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Data Sources: FFJV

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20.3.2 Data sources

The establishment of existing conditions has been informed by publicly available data and information provided by the road controlling authorities, including DTMR, TfNSW and local councils for the LGAs within the TIA study area.

The following information was requested from relevant State and local government transport authorities for use in the TIA:

- Public and school bus routes
- Local active transport infrastructure and plans
- Programmed road works and upgrades
- Future planned public transport network
- Approved and future development plans
- Road use management plans
- Standard axle loads and existing pavement conditions
- DTMR marginal cost contribution information
- Prevailing structural integrity issues (i.e. vulnerable structures)
- Structural capacity/life of structures.

The following information was obtained from online open data sources:

- Local government/State policies and strategies potentially influencing the TIA for the Project
- Road classification details, including typical cross-sections
- Development applications
- Land use
- Existing and historical traffic data
- Designated freight and seasonal traffic routes
- Public bus routes
- Long distance bus services
- Stock routes and travelling stock reserves
- Strategic touring routes
- Principal cycle network plan
- Heavy vehicle routes and restrictions, including bridge load and clearance restrictions, where available
- Emergency services
- Crash data.

Assumptions were made in instances where requested data was not available. Where made, the basis of assumptions has been documented in this chapter and in Appendix AA: Traffic Impact Assessment, as appropriate.

Publicly available and supplied information was supplemented by traffic count data collected through surveys for the Project. The purpose of these traffic count surveys was to obtain background traffic data for locations where data was not available or could not be inferred from the surrounding network. Further details on the locations and method of traffic count surveys are provided in Appendix AA: Traffic Impact Assessment.

20.3.3 Traffic

The assessment of traffic impacts requires a background ‘without’ Project traffic scenario to be established for the road networks within the impact assessment area, and for this background to be compared to future scenarios that include construction and operation traffic for the Project (i.e. the ‘with Project’ scenario).

The assessment of background and Project-induced conditions, summarised in Figure 20-4, includes consideration of the Project’s activities and traffic impacts on road safety, access and frontage, intersections, road links, pavement and road-rail interfaces. Following the assessment of potential impacts, suitable mitigation and management measures can be developed and proposed.

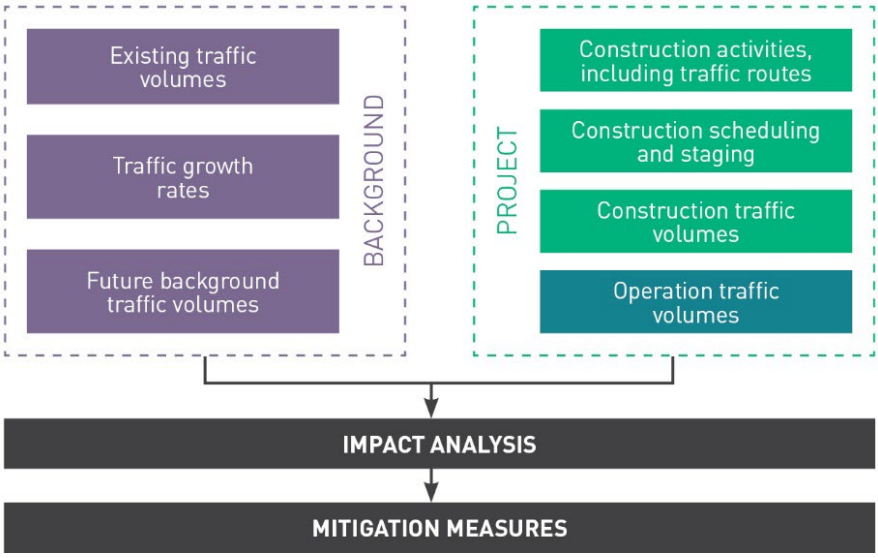


FIGURE 20-4 BACKGROUND TRAFFIC DATA AND PROJECT CONTRIBUTIONS REQUIRED FOR TRAFFIC IMPACT ASSESSMENT

The sections below describe the approach for establishing background traffic conditions for the impact assessment area, as well as traffic contributions from Project activities during construction and operation. A discussion is also provided on the assessment of this data to identify impacts and establish appropriate mitigation measures.

20.3.3.1 Background traffic

The following sections describe the process that has been followed for establishing background traffic volumes for existing conditions and future scenarios without the Project.

ARTC acknowledges that DTMR has previously provided growth rates for State-controlled roads affected by the Inland Rail alignment and permanent works. These growth rates have been used by ARTC in the design of permanent road works and road-rail interface assessments.

In contrast, the TIA encompasses construction routes that extend beyond the immediate alignment area and are not covered by the growth rates supplied by DTMR. To ensure consistency across the TIA assessment, historical annual average daily traffic and traffic count data have been used to calculate growth rates, consistent with standard traffic engineering practice and DTMR's GTIA, which states that background traffic growth rates are most commonly derived from extrapolations of past data. Additionally, to comply with GTIA expectations, seasonal variation factors have been applied to traffic count data where necessary. Furthermore, negative growth rates observed on the road network have been adjusted to 0 per cent to adopt a conservative approach, such as on the Millmerran—Inglewood Road.

The growth rates provided by DTMR exceed those calculated within the TIA using the historical method. As a result, the current approach yields lower baseline traffic volumes for the affected roads. This approach provides a more conservative impact assessment, as the construction traffic would currently create a higher differential percentage between the baseline traffic.

Existing traffic volumes

Background traffic volumes for links were obtained from a variety of sources, including road controlling authorities, intersection counts and link counts. Table 20-4 provides a summary of the data sources used for the purposes of the TIA.

Traffic data base year varies from 2006--2022 due to different sources, and where land use has not changed significantly, the older count data is considered reflective of operations. DTMR data was primarily sourced from 2019 count summaries to avoid under-estimation of traffic volumes due to COVID-19 anomalies.

TABLE 20-4 ROAD LINKS TRAFFIC DATA SOURCES

Source ID	Traffic data source
A	▸ DTMR detailed segment and weekly reports
B	▸ TfNSW opensource Traffic Viewer
C	▸ GRC
D	▸ TRC
E	▸ Road link tube or video count traffic surveys ▸ These link counts were undertaken over a number of years through different iterations of the TIA. The different link count instances are summarised below: ▸▸ March 2022–Research and Analytics ▸▸ October 2020–Austraffic ▸▸ August/September 2018–Austraffic ▸ These link counts were 7 or 14-day 24-hour counts. In some cases, several days of data were required to be disregarded due to unusual traffic patterns. This was primarily caused by road closures during flooding periods in early 2022.
F	▸ Intersection video count traffic surveys ▸ These intersection counts were undertaken over a number of years through different iterations of the TIA. The different intersection count instances are summarised below: ▸▸ May 2022–Matrix ▸▸ March 2022–Matrix, and Research and Analytics ▸▸ March 2021–Austraffic ▸ These intersection counts were 7-day 24-hour counts. In some cases, several days of data were required to be disregarded due to unusual traffic patterns. This was primarily caused by road closures during flooding periods in early 2022.
G	Assumed. In some instances where traffic data was not available from road controlling authorities or traffic surveys conducted, an assumed traffic volumes was adopted based on similar road segments with the intention of providing a conservative volume for the 5 per cent comparison.
H	▸ Difference between adjacent DTMR road segments ▸ In addition, traffic volumes and HV % for privately operated roads (e.g. Toowoomba Bypass, Logan Motorway) were determined by the difference between adjacent DTMR road segments. For example: ▸▸ Logan Motorway determined as difference in volumes from Ipswich Motorway before and after the Logan Motorway separation ▸▸ Toowoomba Bypass determined as difference in volumes between Warrego Highway and Toowoomba Connection Road.

During detailed design, once the construction routes are finalised with a construction contractor, it is recommended that traffic counts be obtained for updating the traffic analysis where recent data (i.e. previous five years) is not available to accurately determine impacts of final Project alignment, construction program, methodology, routes and vehicle volumes.

COVID-19 has had many impacts to the road network and traffic volumes. It remains unclear how travel will return post-COVID-19; however, sensitivity testing may be undertaken in the detailed design stage to account for differences in local growth due to COVID-19, as deemed necessary by stakeholders.

Future background traffic

The traffic growth rate and peak hour factor for all road links both determined based on the closest DTMR AADT site to the road link.

The growth rates for assessment have been determined based on the following order of hierarchy:

- 10-year growth rate
- 5-year growth rate
- 1-year growth rate
- 3 per cent per annum (PIA practice note (DTMR, 2018b) states ‘in the absence of site-specific data, an annual growth rate of three per cent per annum should be adopted’).

The growth rate was adopted from the closest DTMR AADT sites for all road links as many LGR had no historical counts to determine growth in the area. In the absence of available historical count data or forecast models, it was determined that the nearest DTMR AADT site be adopted as a representative of growth in the area. This assumption is considered reasonable for the revised reference design; however, further consideration may be required in detailed design to adopt growth rates based on local council preferences.

Similar to growth rate, the peak hour factor was also adopted from the nearest DTMR AADT site, using the DTMR hourly summary data available through the Queensland Government Open Data Portal. This approach was adopted as many intersection and link counts had very low traffic volumes. It was therefore determined that using the intersection counts to determine peak hour factors would be inappropriate due to significant fluctuation between days of the week. An analysis was undertaken of the intersection and link counts with higher traffic volumes across the traffic, transport and access study area and the peak hour factor was compared with that of the closest DTMR AADT site. A summary of this analysis is provided in Appendix AA: Traffic Impact Assessment. The analysis found that the closest DTMR AADT site could reasonably be used to represent the daily variation in the area.

20.3.3.2 Project traffic

The following sections describe the process followed for establishing traffic contributions from construction and operation of the Project.

Construction activities

The construction activities accounted for the assessment of traffic impacts include:

- Delivery of materials to the Project footprint
- Movement of workforce
- Transportation/collection of plant, equipment and other machinery
- Delivery of non-resident workforce accommodation cabins to site
- Rail-to-road diversions due to track closures.

The assessment of construction movements has been undertaken based on the construction task, material sources, quantities, modes, routes and durations identified in the Project constructability review. As discussed in Section 20.3.1.1, construction activity related transport will primarily be by road, with materials delivered to key laydown area delivery points along the rail corridor. Additionally, it is intended that rail track and rail sleepers will be delivered to the alignment by rail to Whetstone Material Distribution Centre with distribution to occur from this location primarily via rail, with some distribution by trucks allowed for on the road network. The ultimate determination of the final construction and heavy vehicle routes will be subject to detailed design and consultation between DTMR, the relevant local council, the Contractor and, where relevant, Queensland Rail.

Buffer factors have been applied to each construction activity to allow for additional journeys that may be required as a consequence of factors such as material quality compliance issues, bulking factors, and breakages. These buffer factors also cater for potential minor changes to material volumes resulting from design and rail alignment updates (horizontal or vertical). The adopted buffer factors are provided within Appendix AA: Traffic Impact Assessment and considered conservative. The buffer factors included are based on an understanding, from multiple projects and over 20 years of construction experience, of what happens to materials during delivery and on site. Such experience includes:

- Ballast:
  - tendency to spread out when it is placed, leading to overplacement, which makes it difficult to redistribute as it may become contaminated.
- Capping:
  - unbound materials can be imported with the moisture content over optimum moisture content, resulting in the movement of more water than required and the need further trucks than anticipated
  - to ensure compaction to the edges, there is potential for overplacement which may lead to material loss
  - if any double handling of this material is introduced, capping will be lost on the floor of the stockpile each time.
- Precast elements (and sleepers):
  - while the quality control on precast elements is good, these travel long distances over rough roads to reach site during which cracks can form and may lead to the element being rejected.

- In situ concrete:
  - over ordering of concrete leads to returned loads or dumped portions (e.g. ordering 6 m^3 for a 5.5 m^3 pour)
  - concrete rejected due to quality control issues such as excessive slump
  - over excavation in piles leading to more volume than a perfect cylinder
  - thicker than required blinding layers being installed.
- Imported fill:
  - there may be some variable compaction factors and optimum moisture content that need to be accounted for
  - over-compaction and the trimming leads to losses in the table drains
  - any stockpiling for double handling will lead to material loss on the floor of the stockpile.
- Water:
  - evaporation
  - poor targeting of placement
  - extra wetting of access roads and entrances
  - wetting of stockpiles, if required
  - variable optimum moisture content of material types.

It is also envisaged that these factors would cover any peak delivery times.

Traffic impacts associated with the offsite disposal of waste have not been assessed, as waste volumes generated during construction of the Project are not expected to be significant (see Chapter 22: Waste and Resource Management). Consequently, the number of vehicular movements to transport waste from construction laydown areas to established waste facilities is not expected to significantly increase the number of vehicles per day using the road network.

The mass haul quantities of fill and spoil have been estimated based on excavated volume of material, overlaid spatially and temporally across the Project. A minimum of 5 per cent of material excavated from each earthworks area has been allocated as spoil that cannot be reused and will need to be disposed of, to generate a conservative number of heavy vehicle trips on the road network. A detailed assessment of material movement will form part of the mass haul assessment which will be carried out in the detailed design stage of the Project to determine the need for and viability of opportunities for material reuse. Detailed assessment is in Appendix AA: Traffic Impact Assessment.

Construction staging

Construction schedules assumed for the purposes of EIS technical assessments have been based on information available at the time of assessment and are subject to change. The assumptions made regarding construction schedules are considered suitably conservative and appropriate for the purposes of EIS impact assessment and any changes unlikely to alter the outcomes and conclusions presented in the EIS.

The number of trips made by light vehicles and heavy vehicles for each construction activity was estimated based on the volume of materials required to be transported and the duration of activity.

The estimated number of traffic trips were assigned to the corresponding transport route for each construction activity, as shown in Figure 20-3. This allowed for the estimation of the peak construction traffic volume for each construction route as well as for separate component road sections of each route.

Appendix AA: Traffic Impact Assessment contains further details on the construction-related traffic generation, distribution and assignment.

Operational traffic

Rail maintenance workforce movements and the delivery of maintenance plant and materials are expected to be the most common transport tasks during Project operation, however, it is anticipated that this operational traffic will be insignificant due to low maintenance vehicle movements to and from depots, and transportation of maintenance material within the rail corridor.

20.3.3.3 Traffic, transport and access impact assessment

The traffic, transport and access impact assessment process for projects that are subject to an EIS is specified in the GTIA and is shown in Figure 20-5. This process has principally been established to guide the impact assessment process for the SCR network but can be extended to the LGR network. The process does not apply to private roads. While use of the guidelines is not mandatory for an impact assessment, the guidelines provide a basis for assessing potential impacts from the construction, operation and maintenance of the Project on the local and regional transport network. All road sections within the traffic, transport and access impact assessment follow the same assessment process.

The performance thresholds for assessment of traffic impacts are outlined in Table 20-5, developed with reference to *Austroads Guide to Traffic Management–Part 3 Traffic Studies and Analysis (2017), GTIA (2018)* and *DTMR Guidelines for Assessment of Road Impacts of Development (2017)*. The level of service (LoS) criteria are defined in the *Austroads Guide to Traffic Management: Part 3 Traffic Studies and Analysis (2017a).*

TABLE 20-5 PERFORMANCE CRITERIA

Assessment type	Performance threshold
Traffic impact assessment	An impact occurs if construction and operational traffic generated by the development exceeds five per cent of the existing AADT on the road section.
	LoS C can be considered the minimum standard on rural roads; however, LoS D may be accepted in the case of event traffic.
	LoS E should be considered the limit of acceptable traffic for urban area operation, and remedial works would be needed if LoS F would otherwise result.
Pavement impact assessment	Construction and operational traffic generated by the development equals or exceeds five per cent of the existing SAR on the road section.

The GTIA provides guidance on the criteria for determining when mitigation measures are required in response to assessed impacts. These criteria are listed in Table 20-2, and have been modified to include reference to TfNSW. The traffic, transport and access impact assessment year is the year at which the impacts of the Project are assessed for a structural or operational aspect of the road network. The impact assessment year varies depending on impact type because the effects of development can be quite different for structural and operational aspects of the road network. The impact years that have been assessed were adopted from GTIA and are summarised in Table 20-6.

TABLE 20-6 IMPACT ASSESSMENT YEARS

Impact type	Impact assessment year
Road safety	▸ Peak impact year of construction
Access and frontage	▸ Peak impact year of construction
Intersection delay	▸ Peak impact year of construction
Road link capacity	▸ Peak impact year of construction
Pavement	▸ Each year of construction
Transport infrastructure for example, load restricted bridges	▸ Peak impact year of construction ▸ Year of opening of each stage including the final stage

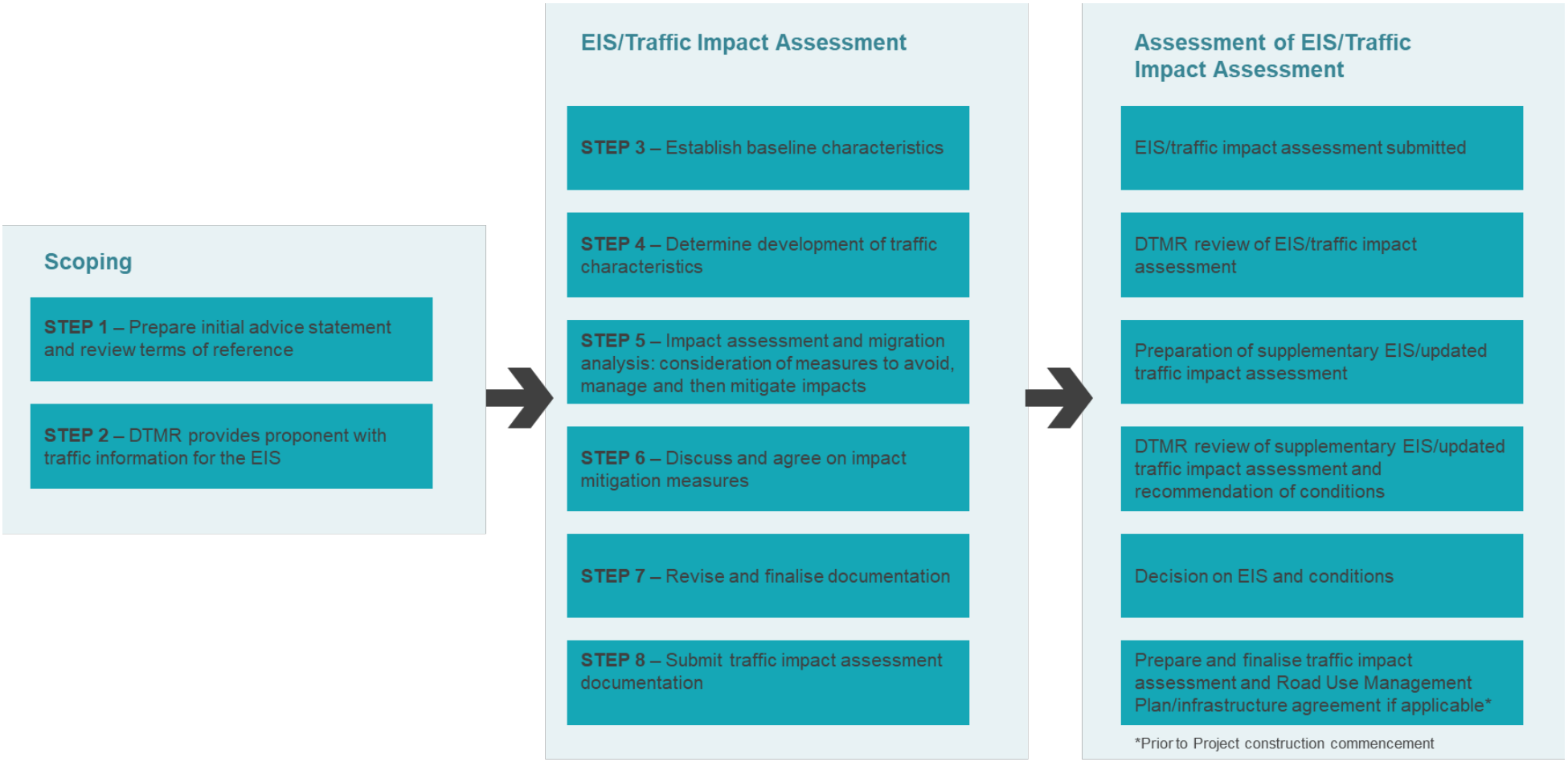


FIGURE 20-5 TRAFFIC, TRANSPORT AND ACCESS IMPACT ASSESSMENT PROCESS IN ACCORDANCE WITH THE GUIDE TO TRAFFIC IMPACT ASSESSMENT

The traffic, transport and access impact assessment and mitigation process specified in the GTIA was adopted to determine appropriate mitigation measures on identified road impacts. The mitigation framework is provided in Figure 20-6.

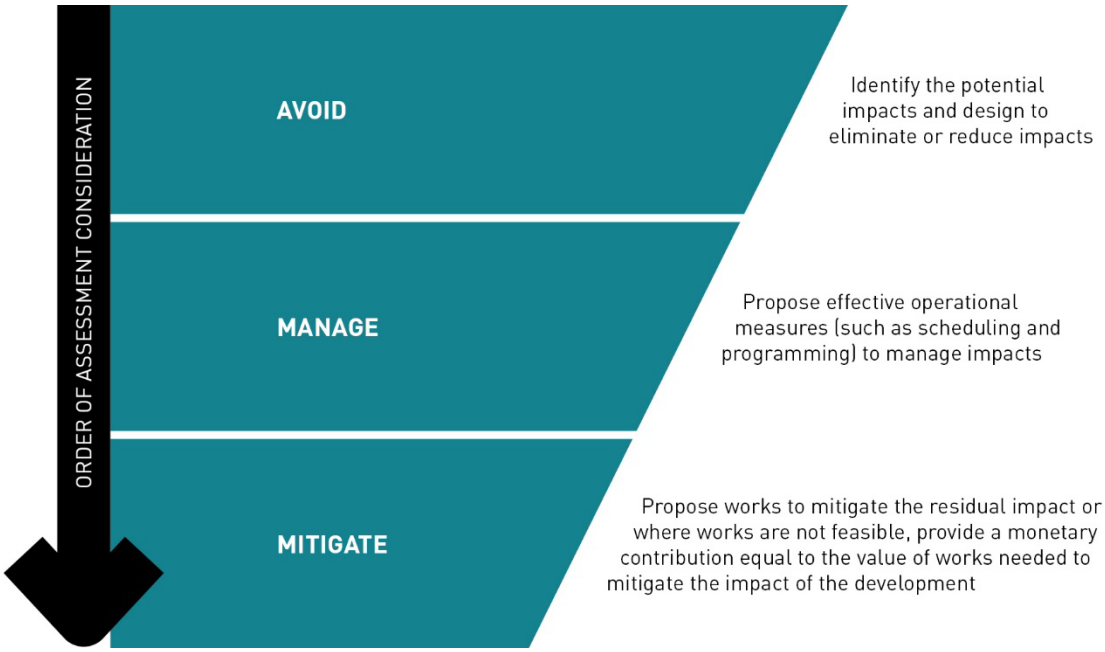


FIGURE 20-6 MITIGATION FRAMEWORK

Source: Guidelines to Traffic Impact Assessment (DTMR, 2018)

20.3.4 Rail crossing impact assessment

The rail crossing impact assessment for the Project centred on vehicle delay and queueing analysis of Project traffic at rail crossings, and at neighbouring closely spaced intersections. This analysis was undertaken for the Project at proposed new rail crossings only and was not extended to the 14 existing operational rail crossings within the road-rail impact assessment area. The rail crossing assessment is presented in Section 20.5.1.2.

A safety-based risk assessment was undertaken for the road-rail interfaces proposed for the Project, with a 'high' risk rating assigned to each level crossing location. Mitigation measures have been developed to reduce the risk associated with these crossings, with the proposed measures informed by the key actions and areas of focus of the *Queensland Level Crossing Safety Strategy 2012–2021* (Section 20.5.14).

20.3.5 Other transport services and modes

In addition to road and rail traffic impacts, the assessment documented in this chapter considered the following:

- Emergency services
- Stock routes
- Public transport services
- School bus services
- Long distance coach services
- State strategic touring routes
- Cycling and pedestrian networks
- Public parking
- Ports
- Airports.

20.3.6 Stakeholder consultation

Extensive consultation has been undertaken with key stakeholders in parallel with exhibition of the draft EIS and throughout the revised reference design and revised draft EIS process. Outcomes of these discussions have been used to inform progression of the revised reference design and to confirm assumptions adopted in this assessment.

The stakeholders consulted by ARTC in the development of the revised reference design for this Project included:

- DTMR
- TfNSW
- GRC
- TRC
- QR
- TransLink
- Queensland Fire and Emergency Services (QFES)
- Queensland Police Service (QPS)
- Queensland Department of Education, Brookstead, Yelarbon and Southbrook Central State Schools
- Toowoomba Regional Access and Disability Advisory Committee
- Queensland Regional Active and Public Transport Advisory Committee
- Toowoomba Regional Bicycle Users Group
- Community Consultative Committee
- Local communities in Brookstead, Pampas and Athol
- Inverell Shire Council
- Clarence Valley Council
- Moree Plains Shire Council (MPSC)
- GrainCorp.

The stakeholder engagement process included written correspondence in addition to formal meetings. These communications and discussions were used as an opportunity to confirm the acceptability of:

- The proposed TIA process
- List of potentially impacted assets included in the assessment
- Guidelines, manuals and policies adhered to for the assessment
- Assumptions (such as traffic growth rates and assumed base volumes)
- Proposed mitigation measures.

Full details of consultation undertaken with key stakeholders throughout the revised reference design and impact assessment process are provided in Appendix E: Consultation Report.

20.4 Existing environment

20.4.1 Rail network

Queensland Rail owns Queensland's regional freight network and operates both suburban and long-distance passenger services for the Queensland Government. QR's regional freight network comprises seven different systems in the State. One of these systems, the South Western System, interfaces with the Project. The South Western System runs over approximately 610 kilometres (km) and consists of a primary rail corridor from Toowoomba to Thallon via Warwick, with branch lines from:

- Warwick to Wallangarra
- Wyreema to Millmerran.

The South Western System connects with the West Moreton System at Toowoomba.

Within brownfield segments, the Project will require connection (turnout) onto and upgrade of QR's South Western Line and Millmerran Branch Line. Upgrade works will include the removal of existing narrow-gauge track (rail and sleepers) and the construction of new formation and dual-gauge track within the existing rail corridor.

The Project uses approximately 46.8 km of the existing rail corridor for the South Western Line and approximately 21.2 km of the existing rail corridor for the Millmerran Branch Line, both of which are components of the South Western System. Each of these lines are discussed in further detail below.

Noting design, construction and operability challenges, this Project provides significant benefits to all parties by:

- Upgrading the formation, ballast, sleepers, and rail for these sections
- Expanding track and formation design to facilitate 30 tonne axle loads
- Eliminating existing curves less than 1,200 m
- Improving vertical gradients to a maximum of 1:80
- Providing track immunity to top of formation across 1% annual exceedance probability floodplains
- Completing turnout connection into existing QR network and upgrades to dual gauge track provides greater interoperability for rail customers in Queensland.

Several level crossings have been identified on the proposed Project construction routes

Development generated construction traffic has the potential to adversely impact on these level crossings. These existing level crossings and Project-related impacts are further assessed within Appendix AA: Traffic Impact Assessment.

20.4.1.1 South Western Line

The Project interfaces with the Warwick to Goondiwindi section of the South Western Line, which is a single-track, narrow-gauge railway.

Queensland Rail have supplied ARTC all train movements on the South Western Line from January 2015 to May 2022. A representative year (2017) is shown in Table 20-7; however, the rail line haulage volumes are seasonal and vary significantly depending on the success of the yearly grain harvest season. In 2017, an average of 25 trains per month ran up and down track between Yelarbon and Inglewood on the South Western Line, with a monthly maximum of 50 train movements in June 2017 (Table 20-7).

TABLE 20-7 SOUTH WESTERN LINE MONTHLY TRAIN MOVEMENTS IN 2017, BETWEEN YELARBON AND INGLEWOOD

Direction	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Inglewood to Whetstone													
Down	20	22	23	8	23	24	13	5	2	3	3	4	12.5
Up	21	22	23	9	25	25	12	3	3	3	3	4	12.8
Whetstone to Yelarbon													
Down	20	22	23	8	23	25	12	5	2	3	3	4	12.5
Up	21	22	23	9	25	25	11	3	3	3	3	4	12.7
Average (up + down)	41.0	44.0	46.0	17.0	48.0	49.5	24.0	8.0	5.0	6.0	6.0	8.0	25.2

Structural details and operating restrictions for this section of the South Western Line are summarised in Table 20-8.

TABLE 20-8 STRUCTURAL DETAILS AND OPERATING RESTRICTIONS FOR THE WARWICK TO GOONDIWINDI SECTION OF THE SOUTH WESTERN LINE

Component/restriction	Details
Rail	A combination of continuous welded rail (47 kg/m), long welded rail (41 kg/m) and short welded rail (30 kg/m).
Sleepers	A combination of timber and steel sleepers. Steel sleepers are used at varying ratios of one steel in every two, three or four sleepers.
Crossing loops	▸ Wheatvale ▸ Thane ▸ Karara ▸ Gore ▸ Cobba-da-mana ▸ Inglewood ▸ Whetstone ▸ Yelarbon ▸ Kurumbul ▸ Carrington Cotton ▸ Goondiwindi.
Maximum allowable axle load	The maximum allowable axle load is 15.75 tonne axle load (tal).
Maximum allowable speed	The maximum allowable speed is 80 km/h. Triple-header block trains are restricted to a maximum speed of 60 km/h. A speed limit of 15 km/h applies over select bridges.
Maximum grade	The maximum grade (not compensated for horizontal alignment) that a westbound (up) train will encounter is 1 in 33 while for an eastbound (down) train the maximum grade is 1 in 44.

Table notes:
kg/m = kilogram per metre km/h = kilometres per hour

20.4.1.2 Millmerran Branch Line

The Millmerran Branch Line is a single-track railway that extends from Wyreema to Millmerran. This line is currently non-operational south of Brookstead due to flood damage sustained in the 2010/11 flood events. The Project interfaces with the Millmerran Branch Line between Yandilla and Yarranlea.

Queensland Rail have supplied ARTC all train movements on the Millmerran Line from January 2015 to May 2022. A representative year (2017) is shown in Table 20-9; however, the rail line haulage volumes are seasonal and vary significantly depending on the success of the yearly grain harvest season. In 2017, an average of three trains per month ran up and down track, between Brookstead and Wyreema on the Millmerran Branch Line, with a monthly maximum of 19 train movements in August 2017 (Table 20-9).

TABLE 20-9 MILLMERRAN BRANCH LINE MONTHLY TRAIN MOVEMENTS IN 2017, BETWEEN BROOKSTEAD AND WYREEMA

Direction	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Brookstead to Pittsworth													
Down	0	0	0	3	2	0	0	9	0	0	3	0	4.3
Up	0	1	1	3	2	0	0	9	0	0	3	0	3.2
Pittsworth to Wyreema													
Down	0	0	0	3	2	0	0	9	0	0	4	0	4.5
Up	0	1	1	3	2	0	0	10	0	0	4	0	3.5
Average (up + down)	0.0	1.0	1.0	6.0	4.0	0.0	0.0	18.5	0.0	0.0	7.0	0.0	3.1

Structural details and operating restrictions for this section of the Millmerran Branch Line are summarised in Table 20-10.

TABLE 20-10 STRUCTURAL DETAILS AND OPERATING RESTRICTIONS FOR THE MILLMERRAN BRANCH LINE

Component/restriction	Details
Rail	Short welded rail (30 kg/m).
Sleepers	Mainly timber sleepers with some steel.
Crossing loops	▸ Pittsworth ▸ Brookstead ▸ Millmerran.
Maximum allowable axle load	The maximum allowable axle load is 15.75 tonne axle load.
Maximum allowable speed	The maximum allowable speed is 50 km/h to Brookstead then 30 km/h to Millmerran (when operational).
Maximum grade	The maximum grade (not compensated for horizontal alignment) that a westbound (up) train will encounter is 1 in 50 while for an eastbound (down) train the maximum grade is 1 in 50.

20.4.1.3 Sidings and crossing loops

A siding is a low-speed section of track distinct from the main running line. A siding that connects to the main line at both ends is known as a loop.

A crossing loop is a location on a railway where trains travelling in opposite directions can pass each other. A crossing loop is double ended and connected to the main track at both ends. Crossing loops are also referred to as passing loops.

The Project will use sections of existing rail corridor that accommodate two operational QR crossing loops and three operational sidings. These loops and sidings are located as follows:

- South Western Line:
  - Kurumbul—siding and crossing loop, Chainage (Ch) 6.1 km to Ch 7.0 km
  - Yelarbon—siding and crossing loop, Ch 26.1 km to Ch 27.0 km
- Millmerran Branch Line:
  - Brookstead—siding, Ch 153.1 km.

20.4.1.4 Existing road–rail interfaces

Road–rail interfaces (RRI) are points at which the rail alignment intersects a public road. There are currently 13 existing operational level crossings along the Project alignment. Level crossings have either passive or active controls to guide road users, as follows:

- Passive—have static warning signs (e.g. stop signs) that are visible on approach. This signage is unchanging with no mechanical aspects or light devices.
- Active—flashing lights with or without boom barriers for motorists, and automated gates for pedestrians. These devices are activated prior to and during the passage of a train through the level crossing.

Each existing rail crossing of public roads that is located along the Project alignment is listed in Table 20-11, with the type of crossing provided at each location. Interface ID numbers correspond with locations shown in Appendix B1: Design Drawings.

TABLE 20-11 EXISTING RAIL CROSSINGS (PUBLIC ROADS ONLY)

Interface ID	Road name	Existing QR crossing type
SCR		
310-11-E-0	Cunningham Highway (Wondalli Street)	Active level crossing
310-40-E-2	Millmerran–Leyburn Road	Passive level crossing
310-44-E-2	Gore Highway	Active level crossing
GRC		
310-4-E-2	South Kurumbul Road	Passive level crossing
310-7-E-1	Unnamed Road	Passive level crossing
310-12-E-1	Suttons Road	Passive level crossing
310-14-E-0	Springborg Road	Passive level crossing
TRC		
310-40-E-1a	Hall Road	Passive level crossing
310-41-E-6	Gilgai Lane	Passive level crossing
310-42-E-1	Fysh Road	Passive level crossing
310-43-E-3a	Elsden Road	Passive level crossing
310-45-E-1	Longhurst Road	Passive level crossing
310-46-E-1a	Yarranlea Road	Passive level crossing

20.4.2 Road network

Several SCR and LGR are encompassed in the study area that are expected to be used as transport routes for construction of the Project. This section does not identify roads that are to be used during the Project's operation, as the origin and destination of operations stage vehicle movements cannot be foreseen. Operations stage traffic will comprise of irregular maintenance and emergency service vehicles. The existing road system is envisaged to be used by the operational traffic and account for low-volume traffic with no impact on existing operations.

20.4.2.1 State-controlled roads

Interfaces with the Project

The Project intersects seven SCR in nine locations, as summarised in Table 20-12 and shown on Figure 20-2.

TABLE 20-12 STATE-CONTROLLED ROADS INTERSECTED BY THE PROJECT

Project interface ID	Road name	Status	Revised reference design interface chainage (km)
DTMR			
310-11-E-0	Cunningham Highway (Wondalli Street)	Existing	25.6
310-24-P-2	Millmerran-Inglewood Road	Proposed	73.1
310-35-P-4	Millmerran-Inglewood Road	Proposed	115.5
310-37-P-12a	Millmerran-Inglewood Road	Proposed	127.0
310-40-E-2	Millmerran-Leyburn Road	Existing	141.4
310-44-E-2	Gore Highway	Existing	154.4
310-48-P-8	Oakey-Pittsworth Road	Proposed	172.2
310-55-P-1	Toowoomba-Cecil Plains Road	Proposed	197.4
310-56-P-2	Warrego Highway	Proposed	204.3

Table note:
Project interface IDs are shown in Figure 20-2.

Construction routes

SCR that are proposed to be used to transport materials, water, equipment, and workforce during construction of the Project are listed in Table 20-13. These routes are shown on Figure 20-3. The construction routes by activity are provided in Appendix AA: Traffic Impact Assessment.

TABLE 20-13 STATE-CONTROLLED ROADS: PRIMARY CONSTRUCTION ROUTES FOR THE PROJECT

Authority/road name	Road section	Road environment	Speed limit (km/h)	Lane configuration	Seal
DTMR					
Barwon Highway (31A)	Ch 0.0 km to Ch 0.8 km	Rural	60	2-way 2-lane	Sealed
	Ch 0.8 km to Ch 2.0 km	Rural	100	2-way 2-lane	Sealed
	Ch 2.0 km to Ch 45.9 km	Rural	100	2-way 2-lane	Sealed
	Ch 45.9 km to Ch 88.0 km	Rural	100	2-way 2-lane	Sealed
Barwon Highway (31B)	Ch 0.0 km to Ch 1.6 km	Rural	100	2-way 2-lane	Sealed
	Ch 1.6 km to Ch 66.8 km	Rural	100	2-way 2-lane	Sealed
Carnarvon Highway (24A)	Ch 40.5 km to Ch 73.5 km	Rural	100	2-way 2-lane	Sealed
Charlton Connection Road (320)	Ch 0.0 km to Ch 1.6 km	Urban	80	2-way 2-lane	Sealed
Cunningham Highway (17C)	Ch 94.4 km to Ch 96.2 km	Rural	100	2-way 2-lane	Sealed
	Ch 96.2 km to Ch 97.5 km	Rural	100	2-way 2-lane	Sealed
	Ch 97.5 km to Ch 105.7 km	Rural	100	2-way 2-lane	Sealed
	Ch 105.7 km to Ch 107.4 km	Rural	80	2-way 2-lane	Sealed
	Ch 107.4 km to Ch 107.6 km	Urban	50	2-way 2-lane	Sealed
Cunningham Highway (17D)	Ch 0.0 km to Ch 2.0 km	Urban	80	2-way 2-lane	Sealed
	Ch 2.0 km to Ch 3.9 km	Rural	100	2-way 2-lane	Sealed
	Ch 3.9 km to Ch 10.2 km	Rural	100	2-way 2-lane	Sealed
	Ch 10.2 km to Ch 13.9 km	Rural	100	2-way 2-lane	Sealed
	Ch 13.9 km to Ch 18.5 km	Rural	100	2-way 2-lane	Sealed
	Ch 18.5 km to Ch 27.1 km	Rural	100	2-way 2-lane	Sealed
	Ch 27.1 km to Ch 29.3 km	Rural	100	2-way 2-lane	Sealed
	Ch 29.3 km to Ch 34.7 km	Rural	100	2-way 2-lane	Sealed
	Ch 34.7 km to Ch 39.6 km	Rural	100	2-way 2-lane	Sealed
	Ch 39.6 km to Ch 40.3 km	Rural	100	2-way 2-lane	Sealed
	Ch 40.3 km to Ch 40.5 km	Rural	100	2-way 2-lane	Sealed
	Ch 40.5 km to Ch 43.9 km	Rural	100	2-way 2-lane	Sealed
	Ch 43.9 km to Ch 46.3 km	Rural	100	2-way 2-lane	Sealed
	Ch 46.3 km to Ch 88.0 km	Rural	80	2-way 2-lane	Sealed
	Ch 88.0 km to Ch 88.2 km	Rural	80	2-way 2-lane	Sealed
	Ch 88.2 km to Ch 90.0 km	Rural	80	2-way 2-lane	Sealed

Authority/road name	Road section	Road environment	Speed limit (km/h)	Lane configuration	Seal
Gateway Motorway (N239)	Ch 0.0 km to Ch 15.0 km	Urban	100	2-way 6-lane	Sealed
Gateway Motorway Extension (N332)	Ch 0.0 km to Ch 10.0 km	Urban	100	2-way 6-lane	Sealed
Gore Highway (28A)	Ch 0.0 km to Ch 2.2 km	Rural	110	2-way 2-lane	Sealed
	Ch 2.2 km to Ch 5.4 km	Rural	110	2-way 2-lane	Sealed
	Ch 5.4 km to Ch 6.7 km	Rural	110	2-way 2-lane	Sealed
	Ch 6.7 km to Ch 7.7 km	Rural	110	2-way 2-lane	Sealed
	Ch 7.7 km to Ch 11.2 km	Rural	110	2-way 2-lane	Sealed
	Ch 11.2 km to Ch 15.3 km	Rural	110	2-way 2-lane	Sealed
	Ch 15.3 km to Ch 17.5 km	Rural	110	2-way 2-lane	Sealed
	Ch 17.5 km to Ch 19.0 km	Rural	110	2-way 2-lane	Sealed
	Ch 19.0 km to Ch 20.3 km	Rural	110	2-way 2-lane	Sealed
	Ch 20.3 km to Ch 21.5 km	Rural	110	2-way 2-lane	Sealed
	Ch 21.5 km to Ch 23.2 km	Rural	110	2-way 2-lane	Sealed
	Ch 23.2 km to Ch 25.0 km	Rural	110	2-way 2-lane	Sealed
	Ch 25.0 km to Ch 30.1 km	Rural	110	2-way 2-lane	Sealed
	Ch 30.1 km to Ch 38.7 km	Rural	110	2-way 2-lane	Sealed
	Ch 38.7 km to Ch 41.1 km	Rural	110	2-way 2-lane	Sealed
	Ch 41.1 km to Ch 41.7 km	Rural	110	2-way 2-lane	Sealed
	Ch 41.7 km to Ch 43.2 km	Rural	110	2-way 2-lane	Sealed
	Ch 43.2 km to Ch 44.7 km	Rural	110	2-way 2-lane	Sealed
	Ch 44.7 km to Ch 47.6 km	Rural	110	2-way 2-lane	Sealed
	Ch 47.6 km to Ch 52.2 km	Rural	110	2-way 2-lane	Sealed
	Ch 52.2 km to Ch 53.3 km	Rural	110	2-way 2-lane	Sealed
	Ch 53.3 km to Ch 60.8 km	Rural	110	2-way 2-lane	Sealed
	Ch 60.8 km to Ch 63.0 km	Rural	110	2-way 2-lane	Sealed
Gore Highway (28B)	Ch 0.0 km to Ch 0.7 km	Urban	110	2-way 2-lane	Sealed
	Ch 0.7 km to Ch 0.8 km	Urban	110	2-way 2-lane	Sealed
	Ch 0.8 km to Ch 1.4 km	Urban	110	2-way 2-lane	Sealed
	Ch 1.4 km to Ch 3.0 km	Rural	110	2-way 2-lane	Sealed
	Ch 3.0 km to Ch 13.0 km	Rural	110	2-way 2-lane	Sealed
	Ch 13.0 km to Ch 121.6 km	Rural	110	2-way 2-lane	Sealed

Authority/road name	Road section	Road environment	Speed limit (km/h)	Lane configuration	Seal
Ipswich Motorway (17A)	Ch 0.0 km to Ch 3.7 km	Urban	100	2-way 6-lane	Sealed
	Ch 3.7 km to Ch 6.4 km	Urban	100	2-way 6-lane	Sealed
	Ch 6.4 km to Ch 8.3 km	Urban	100	2-way 6-lane	Sealed
Leichhardt Highway (26C)	Ch 205.2 km to Ch 220.1 km	Rural	100	2-way 2-lane	Sealed
	Ch 220.1 km to Ch 222.4 km	Urban	100	2-way 2-lane	Sealed
	Ch 222.4 km to Ch 224.1 km	Urban	100	2-way 2-lane	Sealed
Logan Motorway (210A)	Ch 0.0 km to Ch 14.5 km	Urban	100	2-way 4-lane	Sealed
Millmerran-Inglewood Road (337)	Ch 0.0 km to Ch 2.5 km	Rural	100	2-way 2-lane	Sealed
	Ch 2.5 km to Ch 3.5 km	Rural	100	2-way 2-lane	Sealed
	Ch 3.5 km to Ch 6.2 km	Rural	100	2-way 2-lane	Sealed
	Ch 6.2 km to Ch 9.0 km	Rural	100	2-way 2-lane	Sealed
	Ch 9.0 km to Ch 13.1 km	Rural	100	2-way 2-lane	Sealed
	Ch 13.1 km to Ch 14.0 km	Rural	100	2-way 2-lane	Sealed
	Ch 14.0 km to Ch 17.3 km	Rural	100	2-way 2-lane	Sealed
	Ch 17.3 km to Ch 18.1 km	Rural	100	2-way 2-lane	Sealed
	Ch 18.1 km to Ch 21.8 km	Rural	100	2-way 2-lane	Sealed
	Ch 21.8 km to Ch 28.0 km	Rural	100	2-way 2-lane	Sealed
	Ch 28.0 km to Ch 33.0 km	Rural	100	2-way 2-lane	Sealed
	Ch 33.0 km to Ch 35.6 km	Rural	100	2-way 2-lane	Sealed
	Ch 35.6 km to Ch 37.7 km	Rural	100	2-way 2-lane	Sealed
	Ch 37.7 km to Ch 39.8 km	Rural	100	2-way 2-lane	Sealed
	Ch 39.8 km to Ch 41.9 km	Rural	100	2-way 2-lane	Sealed
	Ch 41.9 km to Ch 45.9 km	Rural	100	2-way 2-lane	Sealed
	Ch 45.9 km to Ch 47.6 km	Rural	100	2-way 2-lane	Sealed
	Ch 47.6 km to Ch 53.3 km	Rural	100	2-way 2-lane	Sealed
	Ch 53.3 km to Ch 55.7 km	Rural	100	2-way 2-lane	Sealed
	Ch 55.7 km to Ch 56.6 km	Rural	100	2-way 2-lane	Sealed
	Ch 56.6 km to Ch 59.2 km	Rural	100	2-way 2-lane	Sealed
	Ch 59.2 km to Ch 61.0 km	Rural	100	2-way 2-lane	Sealed
	Ch 61.0 km to Ch 65.7 km	Rural	100	2-way 2-lane	Sealed
	Ch 65.7 km to Ch 68.7 km	Rural	100	2-way 2-lane	Sealed

Authority/road name	Road section	Road environment	Speed limit (km/h)	Lane configuration	Seal
Millmerran-Leyburn Road (335)	Ch 0.0 km to Ch 2.0 km	Rural	100	2-way 2-lane	Sealed
	Ch 2.0 km to Ch 2.2 km	Rural	100	2-way 2-lane	Sealed
Port Drive (NA24)	Ch 0.0 km to Ch 5.0 km	Urban	100	2-way 4-lane	Sealed
Port of Brisbane Motorway (U27)	Ch 0.0 km to Ch 6.0 km	Urban	100	2-way 4-lane	Sealed
Texas-Yelarbon Road (2322)	Ch 53.3 km to Ch 54.6 km	Rural	100	2-way 2-lane	Sealed
Toowoomba-Athol Road (316)	Ch 2.1 km to Ch 16.8 km	Rural	100	2-way 2-lane	Sealed
Toowoomba-Cecil Plains Road (324)	Ch 2.0 km to Ch 6.0 km	Urban	100	2-way 2-lane	Sealed
	Ch 6.0 km to Ch 6.4 km	Urban	100	2-way 2-lane	Sealed
	Ch 6.4 km to Ch 8.3 km	Urban	100	2-way 2-lane	Sealed
	Ch 8.3 km to Ch 9.2 km	Rural	100	2-way 2-lane	Sealed
	Ch 9.2 km to Ch 10.0 km	Rural	100	2-way 2-lane	Sealed
	Ch 10.0 km to Ch 10.1 km	Rural	100	2-way 2-lane	Sealed
	Ch 10.1 km to Ch 10.3 km	Rural	100	2-way 2-lane	Sealed
	Ch 10.3 km to Ch 12.1 km	Rural	100	2-way 2-lane	Sealed
	Ch 12.1 km to Ch 14.5 km	Rural	100	2-way 2-lane	Sealed
	Ch 14.5 km to Ch 16.3 km	Rural	100	2-way 2-lane	Sealed
Toowoomba Connection Road (315)	Ch 26.3 km to Ch 26.9 km	Rural	80	2-way 4-lane	Sealed
	Ch 26.9 km to Ch 27.1 km	Rural	80	2-way 4-lane	Sealed
Toowoomba Bypass (319A)	Ch 0.0 km to Ch 26.8 km	Rural	100	2-way 4-lane	Sealed
Toowoomba Bypass (319B)	Ch 0.0 km to Ch 0.6 km	Rural	100	2-way 2-lane	Sealed
	Ch 0.6 km to Ch 3.2 km	Rural	100	2-way 2-lane	Sealed
	Ch 3.2 km to Ch 4.1 km	Rural	100	2-way 2-lane	Sealed
	Ch 4.1 km to Ch 13.0 km	Rural	100	2-way 2-lane	Sealed
Toowoomba Bypass Off-ramp (319B)	Toowoomba Bypass to Warrego Highway	Urban	100	1-way 1-lane	Sealed
	Warrego Highway to Toowoomba Bypass	Urban	100	1-way 1-lane	Sealed
	Toowoomba Bypass to Toowoomba-Cecil Plains Road	Urban	100	1-way 1-lane	Sealed
	Toowoomba-Cecil Plains Road to Toowoomba Bypass	Urban	100	1-way 1-lane	Sealed
	Toowoomba Bypass to Toowoomba-Cecil Plains Road	Urban	100	1-way 1-lane	Sealed
	Toowoomba-Cecil Plains Road to Toowoomba Bypass	Urban	100	1-way 1-lane	Sealed

Authority/road name	Road section	Road environment	Speed limit (km/h)	Lane configuration	Seal
Warrego Highway (18A)	Ch 0.0 km to Ch 7.2 km	Rural	100	2-way 4-lane	Sealed
	Ch 7.2 km to Ch 15.1 km	Rural	100	2-way 4-lane	Sealed
	Ch 15.1 km to Ch 18.9 km	Rural	100	2-way 4-lane	Sealed
	Ch 18.9 km to Ch 28.9 km	Rural	100	2-way 4-lane	Sealed
	Ch 28.9 km to Ch 36.6 km	Rural	100	2-way 4-lane	Sealed
	Ch 36.6 km to Ch 55.5 km	Rural	100	2-way 4-lane	Sealed
	Ch 55.5 km to Ch 75.4 km	Rural	100	2-way 4-lane	Sealed
	Ch 75.4 km to Ch 79.6 km	Rural	100	2-way 4-lane	Sealed
Warrego Highway (18B)	Ch 0.0 km to Ch 0.4 km	Rural	100	2-way 4-lane	Sealed
	Ch 0.4 km to Ch 1.5 km	Rural	100	2-way 4-lane	Sealed
	Ch 1.5 km to Ch 2.4 km	Rural	100	2-way 4-lane	Sealed
	Ch 2.4 km to Ch 4.5 km	Rural	100	2-way 4-lane	Sealed
	Ch 4.5 km to Ch 5.0 km	Rural	100	2-way 4-lane	Sealed
	Ch 5.0 km to Ch 5.3 km	Rural	100	2-way 4-lane	Sealed
	Ch 5.3 km to Ch 6.2 km	Rural	100	2-way 4-lane	Sealed
Warrego Highway Off-ramp (18B)	Warrego Highway to Kingsthorpe Overpass	Rural	100	1-way 1-lane	Sealed
TfNSW					
Newell Highway	River Road to NSW/QLD Border	Rural	100	2-way 2-lane	Sealed

20.4.2.2 Local government roads

Interfaces with the Project

The Project includes 55 separate locations at which the revised reference design intersects an LGR. Of these interfaces, nine are existing public QR crossings. The intersection locations of LGR are summarised in Table 20-14 and shown in Figure 20-2.

TABLE 20-14 INTERFACE LOCATIONS OF PUBLIC, LOCAL GOVERNMENT ROAD ASSETS

Road ID	Road name	Existing QR crossing type	Revised reference design interface chainage (km)
GRC			
270-12-P-1	Kildonan Road	Nil	Ch 33.1 (NS2B)
270-12-P-4	Eukabilla Road	Nil	Ch 33.37 (NS2B)
310-4-E-2	South Kurumbul Road	Passive level crossing	Ch 6.08
310-5-E-2	Wondalli-Kurumbul Road	Nil	Ch 7.18
310-12-E-1	Suttons Road	Passive level crossing	Ch 30.3
310-14-E-0	Springborg Road	Passive level crossing	Ch 37.67
310-16-P-1a	Whetstone Access Road	Nil	Ch 45.59
310-17-P-7a	McDougalls Road	Nil	Ch 50.05
310-18-P-8	Cremascos Road	Nil	Ch 54.52
310-20-P-12	Bybera Road	Nil	Ch 60.55
310-21-P-9	Lovells Crossing Road	Nil	Ch 65.78
310-22-P-9	Thornton Road	Nil	Ch 68.67
310-25-P-3	Grays Road	Nil	Ch 78.42
310-26-P-2	Wongavale Yugilbar Road	Nil	Ch 80.94
310-27-P-3	Unnamed Road	Nil	Ch 84.18
310-28-P-3	Unnamed Road	Nil	Ch 91.8
TRC			
310-30-P-2	Kooroongarra Anderson Road	Nil	Ch 96.11
310-31-P-7	Kooroongarra Road	Nil	Ch 103.01
310-32-P-4	Paton Road	Nil	Ch 105.84
310-33-P-1	Nicol Creek Road	Nil	Ch 107.89
310-34-P-1	Millwood Road	Nil	Ch 112.09
310-35-P-4a	Heckendorf Road	Nil	Ch 116.41
310-36-P-1	Blackwell Road	Nil	Ch 120.37
310-36-P-8a	Commodore Peak Road	Nil	Ch 123.78
310-36-P-8b	Scragg Road	Nil	Ch 123.94
310-37-P-12	Schwarten Road	Nil	Ch 126.55
310-38-P-3b	Owens Scrub Road	Nil	Ch 129.88
310-40-E-1	Hall Road	Passive level crossing	Ch 139.63
310-41-E-6	Gilgai Lane	Passive level crossing	Ch 145.82
310-42-E-0	Harris Road	Nil	Ch 148.12
310-42-E-1	Fysh Road	Passive level crossing	Ch 148.6
310-43-E-3	Elsden Road	Passive level crossing	Ch 151.24
310-43-P-8	Mann Silo Road	Nil	Ch 153.46
310-45-E-1	Longhurst Road	Passive level crossing	Ch 159.22
310-46-E-1a	Yarranlea Road	Passive level crossing	Ch 162.57
310-46-P-3	Roche Road	Nil	Ch 164.57
310-46-P-4c	Murlaggan Road	Nil	Ch 165.41

Road ID	Road name	Existing QR crossing type	Revised reference design interface chainage (km)
310-47-P-1	Kahler Road	Nil	Ch 166.84
310-47-P-3	French Road	Nil	Ch 169.55
310-48-P-1	Tip Road	Nil	Ch 170.44
310-48-P-9	Quibet Road	Nil	Ch 172.64
310-48-P-10	Dallman Road	Nil	Ch 172.74
310-49-P-2	Lochaber Road	Nil	Ch 173.72
310-49-P-6	McEwan Lane	Nil	Ch 174.38
310-49-P-8	Paint Mine Road	Nil	Ch 175.02
310-49-P-11	Linthorpe Road	Nil	Ch 177.16
310-50-P-5	Geitz Road	Nil	Ch 179.79
310-50-P-11	Linthorpe Valley Road	Nil	Ch 182.16
310-51-P-8	Bushy Lane	Nil	Ch 184.1
310-51-P-11z	Biddeston-Southbrook Road	Nil	Ch 184.91
310-52-P-3	Purcell Road	Nil	Ch 188.48
310-53-P-1	Athol School Road	Nil	Ch 189.33
310-55-P-5	Brimblecombe Road	Nil	Ch 200.01
310-57-P-1	Chamberlain Road	Nil	Ch 205.74
310-57-P-4	Leesons Road	Nil	Ch 207.69

Table note:
NS2B = North Star to Border

Construction routes

Several LGR are proposed to be used to transport materials, water, equipment and workforce during construction of the Project. These roads are listed in Table 20-15 and are located within the jurisdiction of the following local government authorities in New South Wales and Queensland:

- Balonne Shire Council (BSC)
- GRC
- MPSC
- TRC.

TABLE 20-15 LOCAL GOVERNMENT ROADS: PRIMARY CONSTRUCTION ROUTES FOR THE PROJECT

Authority/Road name	Road section	Road environment	Speed limit (km/h)	Lane configuration	Seal
BSC					
Noondoo Thallon Road	GrainCorp Thallon to Carnarvon Highway	Rural	50	2-way 2-lane	Sealed
GRC					
Boodle Street	Holcim Concrete Goondiwindi to Hunt Street	Urban	50	2-way 2-lane	Sealed
Bybera Road	Cunningham Highway to B2G-LDN060.4	Rural	100	2-way 2-lane	Sealed
	B2G-LDN060.4 to Earthworks Area 2A	Rural	100	2-way 2-lane	Sealed
Cemetery Road	Access Track to Mooroobie Lane	Rural	50	2-way 2-lane	Unsealed
	Cunningham Highway to GrainCorp Goondiwindi	Rural	50	2-way 2-lane	Sealed
Coolmunda Dam Access	Inglewood Legacy Bore/Coolmunda Dam to Coolmunda Dam Access	Rural	80	2-way 2-lane	Sealed
	Coolmunda Dam Access to Cunningham Highway	Rural	80	2-way 2-lane	Sealed
Cremascos Road	B2G-LDN052.8 to B2G-LDN055.4	Rural	100	2-way 2-lane	Sealed
	B2G-LDN055.4 to B2G-LDN054.2	Rural	100	2-way 2-lane	Sealed
	Cunningham Highway to B2G-LDN052.8	Rural	100	2-way 2-lane	Sealed
East Sawmill Road	Cunningham Highway to B2G-LDN030.0	Rural	100	2-way 2-lane	Unsealed
Elizabeth Street	Cunningham Highway to B2G-LDN065.8	Urban	50	2-way 2-lane	Unsealed
Eukabilla Road	Kildonan Road to NS2B-LDN033.2	Rural	100	2-way 2-lane	Unsealed
	NS2B-LDN033.2 to NS2B-LDN035.6	Rural	100	2-way 2-lane	Unsealed
Fosters Road	Cunningham Highway to Borrow Site #9 (Fosters Road)	Rural	100	2-way 2-lane	Sealed
Georges Lane	B2G-LDN000.9 to Yelarbon Kurumbul Road	Rural	100	2-way 2-lane	Unsealed
Grays Road	Millmerran-Inglewood Road to Mosquito Creek Road	Rural	100	2-way 2-lane	Sealed
Hunt Street	Leichhardt Highway to Boodle Street	Urban	60	2-way 2-lane	Sealed
Kildonan Road	Eukabilla Road to NS2B-LDN031.0	Rural	100	2-way 2-lane	Sealed
	NS2B-LDN031.0 to South Kurumbul Road	Rural	100	2-way 2-lane	Sealed
	South Kurumbul Road to Cunningham Highway	Rural	100	2-way 2-lane	Sealed
	Cunningham Highway to Eukabilla Road	Rural	100	2-way 2-lane	Sealed
McDougalls Road	B2G-LDN049.8 to McDougalls Road	Rural	100	2-way 2-lane	Unsealed
	McDougalls Road to Cunningham Highway	Rural	100	2-way 2-lane	Unsealed
Mooroobie Lane	Cemetery Road to Borrow Site #2 (Mooroobie Lane)	Rural	100	2-way 2-lane	Unsealed
	Borrow Site #2 (Mooroobie Lane) to Mooroobie Lane	Rural	100	2-way 2-lane	Unsealed
	Mooroobie Lane to Wondalli Kurumbul Road	Rural	100	2-way 2-lane	Unsealed
Mosquito Creek Road	Borrow Site #10 (Mosquito Road) to Grays Road	Rural	100	2-way 2-lane	Unsealed
Queen Street South	Yelarbon Kurumbul Road to B2G-LDN016.0	Rural	100	2-way 2-lane	Unsealed
Silo Street	Barwon Highway to GrainCorp Talwood	Rural	50	2-way 2-lane	Sealed

Authority/Road name	Road section	Road environment	Speed limit (km/h)	Lane configuration	Seal
South Kurumbul Road	Kildonan Road to Yelarbon Kurumbul Road	Rural	100	2-way 2-lane	Sealed
South Toobeah Road	GrainCorp Toobeah to Barwon Highway	Rural	100	2-way 2-lane	Sealed
Springborg Road	Cunningham Highway to B2G-LDN037.6	Rural	100	2-way 2-lane	Unsealed
Suttons Road	B2G-LDN030.0 to Access Track (Off Suttons Road)	Rural	80	2-way 2-lane	Unsealed
Thornton Road	B2G-LDN069.0 to B2G-LDN067.6	Rural	100	2-way 2-lane	Unsealed
	B2G-LDN067.6 to Millmerran-Inglewood Road	Rural	100	2-way 2-lane	Unsealed
Town Common Road	Boral Concrete Goondiwindi to Barwon Highway	Urban	50	2-way 2-lane	Sealed
Whetstone Access	B2G-LDN044.5 to Cunningham Highway	Rural	100	2-way 2-lane	Unsealed
Wondalli Kurumbul Road	Yelarbon Kurumbul Road to Mooroobie Lane	Rural	100	2-way 2-lane	Unsealed
Wongavale Yugilbar Road	Millmerran-Inglewood Road to B2G-LDN081.0	Rural	100	2-way 2-lane	Unsealed
Woodcocks Road	Cunningham Highway to Borrow Site #4 (Woodcocks Road)	Rural	100	2-way 2-lane	Unsealed
Yelarbon Kurumbul Road	South Kurumbul Road to B2G-LDN006.3	Rural	100	2-way 2-lane	Sealed
	B2G-LDN006.3 to Wondalli Kurumbul Road	Rural	100	2-way 2-lane	Sealed
	Wondalli Kurumbul Road to Yelarbon Kurumbul Road	Rural	100	2-way 2-lane	Unsealed
	Yelarbon Kurumbul Road to B2G-LDN020.3	Rural	100	2-way 2-lane	Unsealed
	B2G-LDN020.3 to B2G-LDN025.9	Rural	100	2-way 2-lane	Unsealed
	B2G-LDN025.9 to Cunningham Highway	Rural	100	2-way 2-lane	Sealed
MPSC					
Boggabilla Weir Access	River Road to Boggabilla Weir	Rural	50	2-way 2-lane	Unsealed
River Road	Newell Highway to Boggabilla Weir Access	Rural	50	2-way 2-lane	Sealed
TRC					
Alderley Street	Greenwattle Street to Toowoomba Workforce Origin 2	Urban	60	2-way 2-lane	Sealed
	Toowoomba Workforce Origin B to Toowoomba-Athol Road	Urban	60	2-way 2-lane	Sealed
	Toowoomba-Athol Road to Boral/Wagner Concrete Facilities	Urban	60	2-way 2-lane	Sealed
Athol School Road	B2G-LDN187.8 to B2G-LDN188.2	Rural	100	2-way 2-lane	Sealed
	B2G-LDN188.2 to Gore Highway	Rural	100	2-way 2-lane	Sealed
Biddeston Southbrook Road	Gore Highway to B2G-LDN183.8	Rural	100	2-way 2-lane	Sealed
Blackwell Road	Gore Highway to Millmerran Quarry	Rural	100	2-way 2-lane	Unsealed
	Millmerran Quarry to B2G-LDN120.2	Rural	100	2-way 2-lane	Unsealed
	B2G-LDN120.2 to Millmerran-Inglewood Road	Rural	100	2-way 2-lane	Unsealed
Bligh Street	Six Mile Road to Boral Concrete Millmerran	Rural	100	2-way 2-lane	Sealed
Brimblecombe Road	Toowoomba-Cecil Plains Road to Brimblecombe Road	Rural	100	2-way 2-lane	Sealed
	Brimblecombe Road to WL 194467R	Rural	100	2-way 2-lane	Sealed

Authority/Road name	Road section	Road environment	Speed limit (km/h)	Lane configuration	Seal
Bushy Lane	B2G-LDN183.0 to Gore Highway	Rural	100	2-way 2-lane	Unsealed
Campbell Street	Millmerran-Inglewood Road to Saleyards Road	Urban	60	2-way 2-lane	Sealed
	Saleyards Road to Gore Highway	Urban	60	2-way 2-lane	Sealed
Chamberlain Road	Warrego Highway to B2G-LDN204.2	Rural	100	2-way 2-lane	Unsealed
Commodore Peak Road	Scragg Road to Millmerran-Inglewood Road	Rural	100	2-way 2-lane	Sealed
Desmonds Lane	Yarranlea Road to B2G-LDN163.3	Rural	100	2-way 2-lane	Unsealed
Dieckmann Road	B2G-LDN150.5 to Gore Highway	Rural	100	2-way 2-lane	Unsealed
Draper Road	Steger Road to B2G-FBW206.9	Rural	60	2-way 2-lane	Sealed
Drayton Wellcamp Road	Wellcamp Westbrook Road to Access Track	Rural	100	2-way 2-lane	Sealed
	Access Track to Greenwattle Street	Rural	100	2-way 2-lane	Sealed
Florence Street	Gore Highway to West Street	Urban	50	2-way 2-lane	Sealed
Forestry Road	Access Track to Millmerran-Inglewood Road	Rural	100	2-way 2-lane	Unsealed
	Millmerran-Inglewood Road to Earthworks Area 3B	Rural	100	2-way 2-lane	Unsealed
Fysh Road	B2G-LDN147.1 to Gore Highway	Rural	100	2-way 2-lane	Sealed
Gap Road	Gore Highway to Grevillea Street	Rural	70	2-way 2-lane	Sealed
Geitz Road	B2G-LDN179.0 to Linthorpe Valley Road	Rural	100	2-way 2-lane	Sealed
Gilgai Lane	B2G-LDN144.6 to Gore Highway	Rural	100	2-way 2-lane	Unsealed
Grevillea Street	Boral Concrete Pittsworth to Gap Road	Urban	50	2-way 2-lane	Sealed
Hall Road	B2G-LDN139.0 to Gore Highway	Rural	100	2-way 2-lane	Unsealed
Heckendorf Road	Borrow Site #14 (Heckendorf Road) to B2G-LDN116.0	Rural	100	2-way 2-lane	Sealed
	B2G-LDN116.0 to Millmerran-Inglewood Road	Rural	100	2-way 2-lane	Sealed
Holcim Australia Toowoomba Access	Drayton Wellcamp Road to Holcim Australia Toowoomba Quarry	Rural	40	2-way 2-lane	Sealed
Kahler Road	Murlaggan Road to B2G-LDN165.6	Rural	100	2-way 2-lane	Unsealed
Kingsthorpe Haden Overpass	Warrego Highway Off-ramp to Kingsthorpe Haden Road	Urban	60	2-way 2-lane	Sealed
Kingsthorpe Haden Road	Kingsthorpe Haden Overpass to Warrego Highway	Urban	60	2-way 2-lane	Sealed
Kooroongarra Road	Borrow Site #13 (Kooroongarra Road) to Millwood Road	Rural	100	2-way 2-lane	Sealed
	Millmerran-Inglewood Road to Commodore Mine	Rural	100	2-way 2-lane	Unsealed
Leesons Road	Warrego Highway to Steger Road	Rural	100	2-way 2-lane	Sealed
	Steger Road to B2G-LDN206.3	Rural	100	2-way 2-lane	Sealed
Linthorpe Road	Gore Highway to B2G-LDN175.5	Rural	100	2-way 2-lane	Sealed
Linthorpe Valley Road	Geitz Road to Gore Highway	Rural	100	2-way 2-lane	Sealed
Lochaber Road	Gore Highway to B2G-LDN172.0	Rural	100	2-way 2-lane	Sealed
	B2G-LDN172.0 to B2G-LDN172.6	Rural	100	2-way 2-lane	Sealed

Authority/Road name	Road section	Road environment	Speed limit (km/h)	Lane configuration	Seal
McDougall Street	Humes Precast Toowoomba to Toowoomba-Cecil Plains Road	Urban	60	2-way 2-lane	Sealed
Millwood Road	Millmerran-Inglewood Road to B2G-LDN112.1	Rural	100	2-way 2-lane	Sealed
	B2G-LDN112.1 to Millwood Road	Rural	100	2-way 2-lane	Sealed
	Millwood Road to Kooroongarra Road	Rural	100	2-way 2-lane	Unsealed
Moffatt Reserve Road	Millmerran-Inglewood Road to Millmerran Power Station	Rural	100	2-way 2-lane	Sealed
Murlaggan Road	B2G-LDN164.3 to Kahler Road	Rural	100	2-way 2-lane	Unsealed
	Kahler Road to Gore Highway	Rural	100	2-way 2-lane	Unsealed
Oakey-Pittsworth Road	Gore Highway to B2G-LDN171.0	Rural	100	2-way 2-lane	Sealed
O'Mara Road	Toowoomba-Cecil Plains Road to Warrego Highway	Urban	100	2-way 2-lane	Sealed
Owens Scrub Road	B2G-LDN129.5 to B2G-LDN128.2	Rural	100	2-way 2-lane	Sealed
	B2G-LDN128.2 to B2G-LDN130.0	Rural	100	2-way 2-lane	Sealed
	B2G-LDN130.0 to Millmerran-Inglewood Road	Rural	100	2-way 2-lane	Sealed
Paint Mine Road	Gore Highway to B2G-LDN173.5	Rural	100	2-way 2-lane	Unsealed
Paton Road	Millmerran-Inglewood Road to B2G-LDN104.5	Rural	100	2-way 2-lane	Unsealed
Quarry Road Access	Tummaville Road to Quarry	Rural	50	2-way 2-lane	Unsealed
Saleyards Road	Campbell Street to Gore Highway	Urban	60	2-way 2-lane	Sealed
Schwarten Road	Millmerran-Inglewood Road to B2G-LDN126.9	Rural	100	2-way 2-lane	Unsealed
Scragg Road	Commodore Peak Road to B2G-LDN123.6	Rural	100	2-way 2-lane	Unsealed
	B2G-LDN123.6 to B2G-LDN123.8	Rural	100	2-way 2-lane	Unsealed
Scrubby Road	Bland Quarry Pittsworth to Gore Highway	Rural	100	2-way 2-lane	Sealed
Steger Road	Warrego Highway to New Hope Recycled Water Pipeline	Rural	100	2-way 2-lane	Sealed
	New Hope Recycled Water Pipeline to Draper Road	Rural	100	2-way 2-lane	Sealed
	Draper Road to Leesons Road	Rural	100	2-way 2-lane	Sealed
Tummaville Road	Access Track to Gore Highway	Rural	100	2-way 2-lane	Sealed
Turallin Road	Gore Highway to the Turallin Facility	Rural	100	2-way 2-lane	Sealed
Ware Street	GrainCorp Brookstead to B2G-LDN153.1	Urban	100	2-way 2-lane	Sealed
	B2G-LDN153.1 to Gore Highway	Urban	100	2-way 2-lane	Sealed
	Gore Highway to B2G-LDN150.9	Urban	100	2-way 2-lane	Sealed
Wellcamp Westbrook Road	Drayton Wellcamp Road to Toowoomba-Cecil Plains Road	Rural	100	2-way 2-lane	Sealed
West Street	Gore Highway to Florence Street	Urban	50	2-way 2-lane	Sealed
	Florence Street to Six Mile Road	Urban	50	2-way 2-lane	Sealed
Yarranlea Road	Gore Highway to B2G-LDN161.0	Rural	100	2-way 2-lane	Sealed
	B2G-LDN161.0 to Desmonds Lane	Rural	100	2-way 2-lane	Sealed

20.4.2.3 Crash history

Road link crash summary

Road crash data is collected and maintained by road controlling authorities to provide statistics for accurate and timely analysis of road-safety programs and for the development of new, effective road-safety initiatives. A review has been undertaken of five-year crash data provided by DTMR and TfNSW to assess the relative safety of proposed construction traffic routes. The analysis has considered the following time periods:

- DTMR: 01/07/2016 to 31/06/2021
- TfNSW: 01/01/2017 to 31/12/2021.

Crash data has been summarised in Table 20-16 for all roads used by construction routes, providing a breakdown of road length, vehicle volumes, crashes by severity, percentage of fatal/serious injury crashes and crash rate as crashes per kilometre; serious crashes are those that result in fatalities or hospitalisations. The crash rate has been provided as number of crashes per kilometre travelled.

TABLE 20-16 CRASH HISTORY DATA FOR ROADS IDENTIFIED FOR USE DURING CONSTRUCTION OF THE PROJECT

Road name	Length (km)	Background volume bi-directional (AADT)[1]	Peak construction volume bi-directional (ADT)[2]	Five-year crashes					Fatal/ serious injury %	Crash rate (crashes/ km)
				Total	Fatal	Hospitalisation	Medical treatment	Minor injury		
DTMR										
Barwon Highway (31A)	87.8	665 to 1,893	56 to 65	1	0	1	0	0	100%	0.01
Barwon Highway (31B)	66.8	241	52 to 56	1	0	1	0	0	100%	0.01
Carnarvon Highway (24A)	33.0	191	52	2	0	1	0	1	50%	0.06
Charlton Connection Road (320)	1.6	4,541	4	2	0	0	2	0	0%	1.25
Cunningham Highway (17C)	13.7	1,635 to 2,178	51 to 548	6	0	1	2	3	17%	0.44
Cunningham Highway (17D)	89.6	1,358 to 3,603	27 to 384	16	1	8	7	0	56%	0.18
Gateway Motorway (N239)	15.1	95,861	117	215	2	64	125	24	31%	14.23
Gateway Motorway Extension (N332)	9.8	31,365	117	39	1	14	22	2	38%	3.97
Gore Highway (28A)	63.0	2,947 to 5,460	231 to 1,580	38	4	18	13	3	58%	0.60
Gore Highway (28B)	121.7	1782	91 to 363	29	3	19	6	1	76%	0.24
Ipswich Motorway (17A)	7.9	96,351 to 111,895	117	6	0	1	4	1	17%	0.76
Leichhardt Highway (26C)	19.0	2,216	35 to 91	1	0	1	0	0	100%	0.05
Logan Motorway (210A)	14.5	31,365	117	138	1	55	60	22	41%	9.50
Millmerran-Inglewood Road (337)	72.0	336 to 688	82 to 499	3	0	1	2	0	33%	0.04
Millmerran-Leyburn Road (335)	2.2	190	61 to 76	No crashes					-	-
Port Drive (NA24)	5.2	10,860	117	4	0	3	1	0	75%	0.77
Port of Brisbane Motorway (U27)	6.2	10,860	117	7	0	4	3	0	57%	1.13
Texas-Yelarbon Road (2322)	1.3	181	40	No crashes					-	-
Toowoomba-Athol Road (316)	14.9	3,725	99	30	0	12	15	3	40%	2.01
Toowoomba-Cecil Plains Road (324)	14.3	2,124 to 5,541	13 to 279	26	0	15	10	1	58%	1.82
Toowoomba Connection Road (315)	0.7	11,423	4 to 47	3	0	1	0	2	33%	4.02
Toowoomba Bypass (319A)	26.9	3,091	117	No crashes					-	-
Toowoomba Bypass (319B)	13.1	3,091	117 to 483	No crashes					-	-
Warrego Highway (18A)	80.1	21,183 to 58,316	117	11	0	9	2	0	82%	0.14
Warrego Highway (18B)	6.8	13,274 to 13,532	47 to 339	14	0	5	8	1	36%	2.07
TfNSW										
Newell Highway	4.69	4,051	23	No crashes					-	-

Road name	Length (km)	Background volume bi-directional (AADT) [1]	Peak construction volume bi-directional (ADT)[2]	Five-year crashes					Fatal/ serious injury %	Crash rate (crashes/ km)
				Total	Fatal	Hospitalisation	Medical treatment	Minor injury		
BSC										
Noondoo Thallon Road	0.39	71	52	1	0	1	0	0	100%	2.59
GRC										
Boodle Street	0.31	20	1	No crashes					-	-
Bybera Road	3.54	73	188 to 231	No crashes					-	-
Cemetery Road	1.76	130	31 to 40	No crashes					-	-
Coolmunda Dam Access	4.19	68	51	No crashes					-	-
Cremascos Road	2.42	102	17 to 20	No crashes					-	-
East Sawmill Road	3.49	42	325	No crashes					-	-
Elizabeth Street	3.66	38	30	1	0	0.27	1	0	0%	0.27
Eukabilla Road	2.56	20	24 to 41	No crashes					-	-
Fosters Road	5.20	27	497	No crashes					-	-
Georges Lane	3.16	14	10	No crashes					-	-
Grays Road	5.09	21	69	No crashes					-	-
Hunt Street	0.50	20	1	No crashes					-	-
Kildonan Road	54.21	1,446	18 to 194	10	0	0.18	2	1	70%	0.18
McDougalls Road	2.12	8	32	No crashes					-	-
Mooroobie Lane	20.72	22	40 to 81	No crashes					-	-
Mosquito Creek Road	3.98	18	69	No crashes					-	-
Queen Street South	0.14	5	29	No crashes					-	-
Silo Street	0.18	120	4	No crashes					-	-
South Kurumbul Road	3.49	50	17	No crashes					-	-
South Toobeah Road	0.67	87	5	No crashes					-	-
Springborg Road	2.25	8	24	No crashes					-	-
Suttons Road	3.35	9	190	No crashes					-	-
Thornton Road	1.73	15	19 to 329	No crashes					-	-
Town Common Road	0.18	348	11	No crashes					-	-
Whetstone Access	1.00	20	40	No crashes					-	-
Wondalli Kurumbul Road	5.77	23	81	No crashes					-	-
Wongavale Yugilbar Road	0.13	16	50	No crashes					-	-
Woodcocks Road	3.89	20	40	No crashes					-	-
Yelarbon Kurumbul Road	19.88	54	26 to 128	No crashes					-	-

Road name	Length (km)	Background volume bi-directional (AADT) [1]	Peak construction volume bi-directional (ADT)[2]	Five-year crashes					Fatal/ serious injury %	Crash rate (crashes/ km)
				Total	Fatal	Hospitalisation	Medical treatment	Minor injury		
MPSC										
Boggabilla Weir Access	2.65	20	23	No crashes					-	-
River Road	4.08	20	23	No crashes					-	-
TRC										
Alderley Street	0.99	11,852	1 to 98	15	0	0	9	6	0%	15.20
Athol School Road	1.27	241	576 to 590	No crashes					-	-
Biddeston Southbrook Road	0.25	174	146	1	0	1	0	0	100%	3.95
Blackwell Road	9.05	11 to 39	42 to 105	No crashes					-	-
Bligh Street	0.61	28	12	No crashes					-	-
Brimblecombe Road	2.56	102	39 to 56	No crashes					-	-
Bushy Lane	0.15	94	35	No crashes					-	-
Campbell Street	1.14	939 to 1,750	116 to 132	1	0	1	0	0	100%	0.88
Chamberlain Road	1.11	20	11	1	0	1	0	0	100%	0.90
Commodore Peak Road	0.04	31	103	No crashes					-	-
Desmonds Lane	2.89	15	12	No crashes					-	-
Dieckmann Road	0.50	20	47 to 301	No crashes					-	-
Draper Road	1.09	47	14	No crashes					-	-
Drayton Wellcamp Road	7.69	2,162	1 to 80	9	0	4	4	1	44%	1.17
Florence Street	0.21	322	1	No crashes					-	-
Forestry Road	1.33	2	69	No crashes					-	-
Fysh Road	0.03	71	44	No crashes					-	-
Gap Road	2.07	1,249	7	No crashes					-	-
Geitz Road	2.11	41	28	No crashes					-	-
Gilgai Lane	0.81	26	26	No crashes					-	-
Grevillea Street	0.13	0	7	No crashes					-	-
Hall Road	2.52	3	24	No crashes					-	-
Heckendorf Road	1.57	45	292	No crashes					-	-
Holcim Australia Toowoomba Access	0.11	20	79	2	0	1	0	1	50%	18.46
Kahler Road	0.34	12	11	No crashes					-	-
Kingsthorpe Haden Overpass	0.56	2,037	277	No crashes					-	-

Road name	Length (km)	Background volume bi-directional (AADT) [1]	Peak construction volume bi-directional (ADT)[2]	Five-year crashes					Fatal/ serious injury %	Crash rate (crashes/ km)
				Total	Fatal	Hospitalisation	Medical treatment	Minor injury		
Kingsthorpe Haden Road	0.39	2,002	277	1	0	1	0	0	100%	2.56
Kooroongarra Road	2.29	4 to 74	136 to 177	No crashes					-	-
Leesons Road	2.57	77	148 to 154	2	0	0	2	0	0%	0.78
Linthorpe Road	0.38	29	453	No crashes					-	-
Linthorpe Valley Road	2.72	89	28	No crashes					-	-
Lochaber Road	0.33	344	9 to 14	No crashes					-	-
McDougall Street	0.08	6,052	15	No crashes					-	-
Millwood Road	7.42	4 to 37	136 to 158	No crashes					-	-
Moffatt Reserve Road	5.28	230	71	2	0	1	1	0	50%	0.38
Murlaggan Road	4.11	401	310 to 317	No crashes					-	-
Oakey-Pittsworth Road	0.18	1,369	13	1	0	1	0	0	100%	5.67
O'Mara Road	3.16	4,699	87	1	0	0	1	0	0%	0.32
Owens Scrub Road	2.46	467	30 to 540	No crashes					-	-
Paint Mine Road	0.06	44	12	1	0	0	1	0	0%	16.99
Paton Road	1.12	21	47	No crashes					-	-
Quarry Road Access	1.75	3	164	No crashes					-	-
Saleyards Road	2.44	246	27	No crashes					-	-
Schwarten Road	0.48	5	9	No crashes					-	-
Scragg Road	0.15	20	2 to 103	No crashes					-	-
Scrubby Road	1.98	280	1,550	No crashes					-	-
Steger Road	2.31	1543	30 to 95	No crashes					-	-
Tummaville Road	2.31	187	164	No crashes					-	-
Turallin Road	5.53	278	233	1	0	1	0	0	100%	0.18
Ware Street	1.13	110 to 240	8 to 52	No crashes					-	-
Wellcamp Westbrook Road	0.80	922	80	1	0	1	0	0	100%	1.25
West Street	1.70	28 to 101	11 to 12	No crashes					-	-
Yarranlea Road	3.49	108	12 to 1,429	1	0	0	1	0	0%	0.29

Table notes:
1. The AADT for the Logan Motorway was adopted from the Ipswich Motorway due to lack of data
2. Average daily traffic

For this analysis, crash severity is defined consistent with DTMR guidance, as follows:

- Fatal crashes–one or more persons killed or died within 30 days
- Hospitalisation–a road traffic crash that resulted in the most severe casualty outcome being a person hospitalised
- Medical treatment–a road traffic crash that resulted in a person requiring medical treatment administered by a medical officer (e.g. a doctor), but not transported to hospital, from injuries sustained in a road traffic crash
- Minor injury crashes–a road traffic crash that resulted in a person with minor injuries sustained in a road traffic crash but not requiring medical treatment
- Non-injury crashes above threshold values that may vary across jurisdiction, plus those where the property owner is not present.

The Department of Transport and Main Roads does not report non-injury (uncategorised) crashes as of 2010, therefore non-injury crashes have been removed from TfNSW dataset in this analysis.

The Toowoomba Bypass was opened in September 2019 and therefore the road does not include data from the full five-year period.

20.4.3 Private access

The Project alignment intersects the following within the bounds of private properties:

- 168 private, unformed access roads or tracks
- 74 private, formed access roads or tracks.

20.4.4 Public transport services

Existing public transport routes within the traffic, transport and access study area that may interface with Project activities have been identified using data sourced from TransLink and TfNSW. No public transport routes were identified in the New South Wales portion of traffic, transport and access study area. While there are two QR train lines in the traffic, transport and access study area (South Western Line and Millmerran Branch Line), neither of these are used for passenger rail services; therefore, the assessment of public transport services has been restricted to bus services. Table 20-17 provides a summary of public bus routes within the traffic, transport and access study area and summarises the route number, route, frequency, overlap with construction routes and intersection with road–rail interfaces (RRIs).

Additional transport routes may be run by private companies and may not be publicly available and have therefore not been captured within Table 20-17. Consultation with relevant local and public transport operators (including QR) will be undertaken following the finalisation of construction routes and prior to the construction works stage of the Project to ensure that all public transport routes that may be impacted by the Project have been accounted for.

Any impacts to bus stops and pedestrian access will require consultation and agreement from DTMR, TfNSW, the relevant local council and public transport operators prior to construction commencing.

TABLE 20-17 PUBLIC TRANSPORT (BUS) ROUTES WITH POTENTIAL TO INTERFACE WITH PROJECT ACTIVITIES

Bus service	Route	Weekday frequency	Overlap with construction routes	Conflict with RRI locations
529	Ipswich to Toogoolawah	3 inbound 3 outbound	Warrego Highway	-
534	Browns Plains–Orion Springfield Central	15 inbound 15 outbound	Logan Motorway	-
905	University Southern Queensland–Toowoomba Plaza–City	11 inbound 11 outbound	Toowoomba-Athol Road	-
P142	Brisbane City–Browns Plains	5 inbound 7 outbound	Gateway Motorway	-
P546	Park Ridge–Brisbane City	9 inbound 8 outbound	Gateway Motorway	-

20.4.5 School bus routes

Existing school bus routes that use roads within the traffic, transport and access study area were identified through a review of data sourced from TransLink, TRC, GRC and TfNSW. No school bus routes were identified within the New South Wales portion of the traffic, transport and access study area; however, a variety of school bus routes have been identified through Queensland. School bus routes that use roads within the traffic, transport and access study area that may interface with Project activities are listed in Table 20-18.

There may be additional school bus routes that are privately run and not publicly available and have therefore not been captured in Table 20-18. Further consultation with relevant local councils and stakeholders will be undertaken following the finalisation of construction routes and prior to the construction works stage of the Project to ensure that all school bus routes that may be impacted by the Project have been accounted for.

Additionally, the bus routes identified do not tend to have designated bus stops, other than the termini of the routes. Rather, either 'hail and ride' or pre-arranged pick-up locations are arranged for student pick up/drop off.

TABLE 20-18 SCHOOL BUS ROUTES WITH POTENTIAL TO INTERFACE WITH PROJECT ACTIVITIES

Services	Weekday frequency	Service type	Conflict with construction routes	Conflict with RRI locations
P124 Southbrook to Southbrook Central State School	1/AM 1/PM	Loop service	▸ Gore Highway	-
P451 Seven Mile to Inglewood State School	1/AM 1/PM	Standard service	▸ Cunningham Highway	-
P462 Stanthorpe Road to Inglewood State School	1/AM 1/PM	Standard service	▸ Cunningham Highway	-
P473 Yuraraba to Inglewood State School	1/AM 1/PM	Standard service	▸ Cunningham Highway ▸ Millmerran-Inglewood Road ▸ Coolmunda Access Road	310-24-P-2
P510 Southbrook North to Southbrook Central State School	1/AM 1/PM	Standard service	▸ Gore Highway ▸ Biddeston Southbrook Road ▸ Linthorpe Valley Road	310-50-P-11 310-51-P-11z (replacing 310-52-P-1)
P528 Minimi to St George State School	1/AM 1/PM	Standard service	▸ Carnarvon Highway	-
P610 Nindigully to Thallon State School	1/AM 1/PM	Standard service	▸ Carnarvon Highway	-
P624 Service Wilga View to Pittsworth State School	1/AM 1/PM	Loop service	▸ Gore Highway ▸ Linthorpe Road ▸ Lochaber Road	310-49-P-11a 310-49-P-2 (replacing 310-49-P-1)
P645 Gooray to Goondiwindi	1/AM 1/PM	Standard service	▸ Barwon Highway	-
P674 Yagaburne to Goondiwindi State School	1/AM 1/PM	Standard service	▸ Leichardt Highway ▸ Gore Highway ▸ Barwon Highway	-
P733 Goodar to Goondiwindi State School	1/AM 1/PM	Standard service	▸ Barwon Highway	-
P772 Tummaville to Millmerran State School	1/AM 1/PM	Standard service	▸ Gore Highway ▸ Millmerran-Leyburn Road ▸ Fysh Road	310-40-E-2 310-42-E-0a (replacing 310-42-E-1)
P787 Primary and Secondary to Millmerran State School	1/AM 1/PM	Standard service	▸ Gore Highway ▸ Florence Street	-

Services	Weekday frequency	Service type	Conflict with construction routes	Conflict with RRI locations
P809 Kincora to Pittsworth State School	1/AM 1/PM	Loop service	▸ Gore Highway ▸ Scrubby Road ▸ Gap Road	-
P819 Irongate to Pittsworth State School	1/AM 1/PM	Loop service	▸ Gore Highway ▸ Lochaber Road	310-49-P-2 (replacing 310-49-P-1)
P957 Ivanhoe to Millmerran State School	1/AM 1/PM	Standard service	▸ Gore Highway ▸ Millmerran–Inglewood Road ▸ Campbell Street ▸ Owens Scrub Road	310-38-P-3b (replacing 310-38-P-3a)
P1070 Lemon Tree to Millmerran State School	1/AM 1/PM	Loop service	▸ Gore Highway ▸ West Street ▸ Saleyards Road ▸ Turallin Road	-
P1072 Billa to Goondiwindi State School	1/AM 1/PM	Standard service	▸ Leichardt Highway ▸ Barwon Highway	-
P1082 Koarlo to Goondiwindi State School	1/AM 1/PM	Standard service	▸ Kildonan Road ▸ South Kurumbul Road	270-12-P-1
P1165 Toobeah to Bungunya State School	1/AM 1/PM	Standard service	▸ Barwon Highway ▸ South Toobeah Road	-
P1651 Mungindi to Talwood State School	1/AM 1/PM	Standard service	▸ Barwon Highway ▸ Silo Street	-
P1883 Athol to Bunker's Hill State School	1/AM 1/PM	Loop service	▸ Gore Highway ▸ Toowoomba-Athol Road ▸ Athol School Road	310-53-P-1a (new)
S108 Pittsworth State High School to Mount Tyson	1/AM 1/PM	Standard service	▸ Gore Highway ▸ Oakey Pittsworth Road ▸ Lochaber Road	310-49-P-2 (replacing 310-49-P-1) 310-48-P-8
S118 Pittsworth to Brookstead Area	1/AM 1/PM	Standard service	▸ Gore Highway ▸ Ware Street ▸ Yarranlea Road ▸ Gap Road	310-44-E-2 310-46-E-1 (replacing 310-46-E-1a)
S178 Kingsthorpe Secondary to Harristown State High School	1/AM 1/PM	Loop service	▸ Warrego Highway ▸ Toowoomba Connection Road ▸ Charlton Connection Road ▸ Toowoomba-Cecil Plains Road ▸ Warrego Highway Off-Ramp ▸ Kingsthorpe Haden Overpass ▸ Kingsthorpe Haden Road	310-56-P-2
S577 Kingsthorpe/Wellcamp to Harristown State High School	1/AM 1/PM	Standard service	▸ Warrego Highway ▸ Kingsthorpe Haden Road ▸ O'Mara Road ▸ Wellcamp Westbrook Road ▸ Drayton Wellcamp Road ▸ Euston Road	310-56-P-2

Services	Weekday frequency	Service type	Conflict with construction routes	Conflict with RRI locations
S740 AM and PM Service Millmerran Years 11 and 12 to Pittsworth State High School	1/AM 1/PM	Standard service	▸ Gore Highway ▸ Saleyards Road ▸ West Street ▸ Campbell Street ▸ Gap Road	310-44-E-2
S863 Millmerran Downs Year 11 and 12 to Pittsworth State High School	1/AM 1/PM	Standard service	▸ Gore Highway	-
YEL5 Yelarbon to Goondiwindi State High School	1/AM 1/PM	Standard service	▸ Cunningham Highway	
GLE11 Glenoak Road to Goondiwindi State High School, connecting with P451	1/AM 1/PM	Standard service	▸ Cunningham Highway	

20.4.6 Long-distance coach services

Existing privately operated long-distance coach services that use roads within the Project impact assessment were identified using data sourced from Greyhound, Murrays and Crisps Coaches. Table 20-19 summarises these long-distance coach services and their conflicts with proposed construction routes and RRI locations as well as the operator and frequency.

TABLE 20-19 LONG-DISTANCE COACH SERVICES WITH POTENTIAL TO INTERFACE WITH PROJECT ACTIVITIES

Services	Operator	Frequency	Conflict with construction routes	Conflict with RRI locations
Brisbane to Toowoomba (via Gatton)	Greyhound	2/day	▸ Ipswich Motorway ▸ Warrego Highway	-
Brisbane to Dalby (via Toowoomba)	Greyhound	2/day	▸ Ipswich Motorway ▸ Warrego Highway ▸ Toowoomba Connection Road	310-56-P-2
Brisbane to Miles (via Toowoomba)	Greyhound	2/day	▸ Ipswich Motorway ▸ Warrego Highway ▸ Toowoomba Connection Road	310-56-P-2
Brisbane to Chinchilla	Greyhound	2/day	▸ Ipswich Motorway ▸ Warrego Highway ▸ Toowoomba Bypass	310-56-P-2
Brisbane to Charleville	Greyhound	2/day	▸ Ipswich Motorway ▸ Warrego Highway ▸ Toowoomba Bypass	310-56-P-2
Brisbane to Mount Isa	Greyhound	1/day	▸ Ipswich Motorway ▸ Warrego Highway ▸ Toowoomba Bypass	310-56-P-2
Toowoomba to Rockhampton	Greyhound	1/day	▸ Toowoomba Connection Road ▸ Warrego Highway	310-56-P-2
Toowoomba to Moree (via Cunningham Highway)	Crisps Coaches	1/day	▸ Cunningham Highway ▸ Newell Highway	310-11-E-1
Brisbane to St George (via Toowoomba) (via Moonie Highway)	Murrays	1/day	▸ Ipswich Motorway ▸ Warrego Highway ▸ Toowoomba-Cecil Plains Road	310-55-P-1
Brisbane to St George (via Toowoomba) (via Gore Highway)	Murrays	1/day	▸ Ipswich Motorway ▸ Warrego Highway ▸ Toowoomba-Athol Road ▸ Gore Highway ▸ Leichhardt Highway ▸ Barwon Highway	310-44-E-2

Services	Operator	Frequency	Conflict with construction routes	Conflict with RRI locations
Brisbane to Cunnamulla (via Toowoomba) (via Moonie Highway)	Murrays	1/day	▸ Ipswich Motorway ▸ Warrego Highway ▸ Toowoomba-Cecil Plains Road	310-55-P-1
Brisbane to Lightning Ridge (via Gore Highway)	Murrays	1/day	▸ Ipswich Motorway ▸ Warrego Highway ▸ Toowoomba-Cecil Plains Road ▸ Gore Highway ▸ Leichardt Highway ▸ Barwon Highway	310-44-E-2
Brisbane to Moree (via Cunningham Highway)	Crisps Coaches	1/day	▸ Ipswich Motorway ▸ Cunningham Highway ▸ Newell Highway	310-11-E-1

20.4.7 Stock routes

The Queensland stock route network provides pastoralists with a means of moving stock around Queensland's main pastoral districts as an alternative to motorised transport. Stock routes comprise pathways for moving stock on roads, reserves, unallocated State land and pastoral leases, and have no separate title or tenure information. The stock route network is administered under the *Stock Route Management Act 2002* (Qld), *Land Act 1994* (Qld) and the *Transport Infrastructure Act 1994* (Qld). The State stock route network is primarily used by the pastoral industry as:

- An alternative to transporting stock by rail or road
- Pasture for emergency agistment
- Long-term grazing.

Table 20-20 identifies the locations where stock routes fall within the Project traffic, transport and access study area. Further details on the interface locations, potential impacts and proposed design solutions for each stock route interface are provided in Chapter 8: Land Use and Tenure.

TABLE 20-20 STOCK ROUTES WITHIN THE TRAFFIC IMPACT ASSESSMENT AREA

Stock route	Conflict with construction routes
ID: 005BALO Type: Road Status: Open Class: Primary	▸ Carnarvon Highway ▸ Barwon Highway
ID: 006BALO Type: Road Status: Open Class: Primary	▸ Carnarvon Highway
ID: 005GWND Type: Road Status: Open Class: Primary	▸ Cunningham Highway ▸ Barwon Highway ▸ Kildonan Road ▸ Silo Street ▸ Eukabilla Road
ID: 081GWND Type: Road Status: Open Class: Secondary	▸ Wondalli Kurumbul Road ▸ Yelarbon Kurumbul Road ▸ South Kurumbul Road ▸ Queen Street South ▸ Mooroobie Lane ▸ Kildonan Road
ID: 083GWND Type: Road Status: Open Class: Secondary	▸ Mooroobie Lane

Stock route	Conflict with construction routes
ID: 084GWND Type: Road Status: Open Class: Secondary	▸ Barwon Highway ▸ South Toobeah Road
ID: 086GWND Type: Road Status: Open Class: Secondary	▸ Cunningham Highway
ID: 799GWND Type: Road Status: Open Class: Tertiary	▸ Barwon Highway
ID: 806GWND Type: Road Status: Open Class: Tertiary	▸ Gore Highway ▸ Leichhardt Highway
ID: 807GWND Type: Road Status: Open Class: Tertiary	▸ Gore Highway
ID: 811GWND Type: Road Status: Open Class: Tertiary	▸ Cunningham Highway ▸ Yelarbon Kurumbul Road ▸ Kildonan Road
ID: 813GWND Type: Road Status: Open Class: Tertiary	▸ Cunningham Highway ▸ Lovells Crossing Road ▸ Elizabeth Street
ID: 820GWND Type: Road Status: Open Class: Tertiary	▸ Millmerran-Inglewood Road ▸ Lovells Crossing Road ▸ Thornton Road ▸ Elizabeth Street ▸ Grays Road
ID: 830GWND Type: Road Status: Open Class: Tertiary	▸ Texas-Yelarbon Road
ID: 820TOOW Type: Road Status: Open Class: Tertiary	▸ Millmerran-Inglewood Road ▸ Forestry Road ▸ Millwood Road ▸ Moffatt Reserve Road ▸ Kooroongarra Road ▸ Schwarten Road ▸ Blackwell Road ▸ Six Mile Road ▸ West Street ▸ Paton Road ▸ Bligh Street ▸ Saleyards Road ▸ Campbell Street ▸ Heckendorf Road
ID: 856TOOW Type: Road Status: Open Class: Tertiary	▸ Forestry Road

Stock route	Conflict with construction routes
ID: 869TOOW Type: Road Status: Open Class: Tertiary	▸ Millwood Road ▸ Kooroongarra Road ▸ Moffatt Reserve Road
ID: RAINBOW RESERVE Type: Reserve Status: Open Class: Primary	▸ Eukabilla Road
ID: RESERVE Type: Reserve Status: Open Class: Primary	▸ Cunningham Highway ▸ East Sawmill Road ▸ Suttons Road
ID: No ID–Unused Type: Road Status: Open Class: Tertiary	▸ Warrego Highway ▸ Toowoomba Bypass ▸ Toowoomba Connection Road ▸ Charlton Connection Road ▸ O'Mara Road ▸ Steger Road ▸ Scrubby Road ▸ Kingsthorpe Haden Road ▸ Kingsthorpe Overpass ▸ Chamberlain Road ▸ Leesons Road ▸ Scrubby Road

20.4.8 Strategic touring routes

State strategic touring routes are routes of strategic importance to the driving tourism market in Queensland. They are the primary routes that tourists use to travel around Queensland, providing the main connections between tourist destinations and generally supporting high volumes of tourist traffic. State strategic touring routes are recognised nationally through the National Tourism Signage Reference Group and at State level by DTMR and tourism agencies.

State strategic touring routes within the traffic, transport and access study area are listed in Table 20-21.

TABLE 20-21 STRATEGIC TOURING ROUTES THAT ARE PROPOSED TO BE USED FOR CONSTRUCTION TRAFFIC

Strategic touring route	Conflict with construction routes
Adventure Way	Warrego Highway between Haigslea–Amberley Road and Ipswich Motorway
	Warrego Highway, between Ipswich Motorway and Toowoomba Bypass
	Toowoomba Connection Road, between Toowoomba-Cecil Plains Road and Warrego Highway
Leichhardt Way	Cunningham Highway, between Leichhardt Highway and Kildonan Road
	Leichhardt Highway, between Cunningham Highway Gore Highway
	Newell Highway, between Kildonan Road and River Road
Pacific Coast Way	Gateway Motorway, between Pacific Motorway and Port of Brisbane Motorway
Warrego Way	Ipswich Motorway, between Logan Motorway and Warrego Highway
	Warrego Highway, between Ipswich Motorway and Toowoomba Bypass
	Toowoomba Connection Road, between Toowoomba-Cecil Plains Road and Warrego Highway

20.4.9 Cycling

On-road cycleways that use roads within the traffic, transport and access study area were identified through a review of data sourced from the Queensland Principal Cycle Network Plans (PCNP). The PCNP is a guide for future cycleway planning and presents the core routes that are required to increase cycling among the population. There are several PCNP routes have been identified within the traffic, transport and access study area. These cycleways are summarised in Table 20-22.

TABLE 20-22 PRINCIPAL CYCLE NETWORK PLAN WITHIN TRAFFIC IMPACT ASSESSMENT AREA

Authority	Cycleway
Queensland	
DTMR	Charlton Connection Road, between Toowoomba Connection Road and Toowoomba-Cecil Plains Road
	Gateway Motorway, between Logan Motorway and Compton Road
	Gateway Motorway, between Logan Road and Port of Brisbane Motorway
	Ipswich Motorway, between Logan Motorway and Warrego Highway
	Logan Motorway, between Ipswich Motorway and Gateway Motorway
	Toowoomba-Athol Road, between Harrow Street and Ferguson Road
	Toowoomba Bypass, between Toowoomba-Cecil Plains Road and Mort Street
	Toowoomba-Cecil Plains Road, between Hanrahan Road and McDougall Street
	Toowoomba Connection Road, between Charlton Connection Road and Toowoomba Bypass
	Warrego Highway, between Mount Crosby Road and Wulkuraka Connection Road
	Warrego Highway, between Toowoomba Bypass and Kingsthorpe-Haden Road (Charlton/Gowrie Mountain)
TRC	Drayton-Wellcamp Road, between Deuble Road and Euston Road
	Gap Road, between Grevillea Street and 250 metres (m) west of Wattle Street
	Kingsthorpe Haden Road, between Warrego Highway and Kingsthorpe Overpass
	McDougall Street, between Toowoomba-Cecil Plains Road and Hursley Road
	Omara Road, between Toowoomba-Athol Road and Warrego Highway

The Project alignment only interfaces with the PCNP cycle network in one location along the Warrego Highway west of Toowoomba (between Toowoomba Bypass and Kingsthorpe-Haden Road). This location (310-56-P-2) does not have existing cycle facilities and is noted as Priority D (lowest priority classification) in the PCNP.

In addition to the PCNP, the TRC local cycle network includes an overlap with construction routes on Alderley Street, between the Gore Highway and the Boral/Wagner Concrete Facilities.

20.4.10 Walking

A number of the proposed construction routes currently traverse through areas of moderate to high pedestrian activity through Toowoomba, Millmerran, Inglewood, and Yelarbon. The roads in these areas already currently facilitate a high proportion of heavy vehicle movements.

The pathway network for the Goondiwindi region has been provided by GRC for the purpose of the Project. This pathway network is adjacent to roads used by construction routes through Yelarbon and Inglewood, in the following locations:

- Gore Highway through Yelarbon, between Wyemo Street and Wondalli Street
- Gore Highway through Inglewood, between Macintyre Brook and Inglewood Multipurpose Health Service
- Elizabeth Street through Inglewood, between Gore Highway and Great Road Street.

Bushland trails data from TRC has been noted as not interfacing with the Project traffic, transport and access study area. No existing pathway networks cross the proposed rail alignment. Pedestrian paths are currently provided at some active and passive level crossing locations on the alignment, which have been considered in the design treatments proposed at these locations.

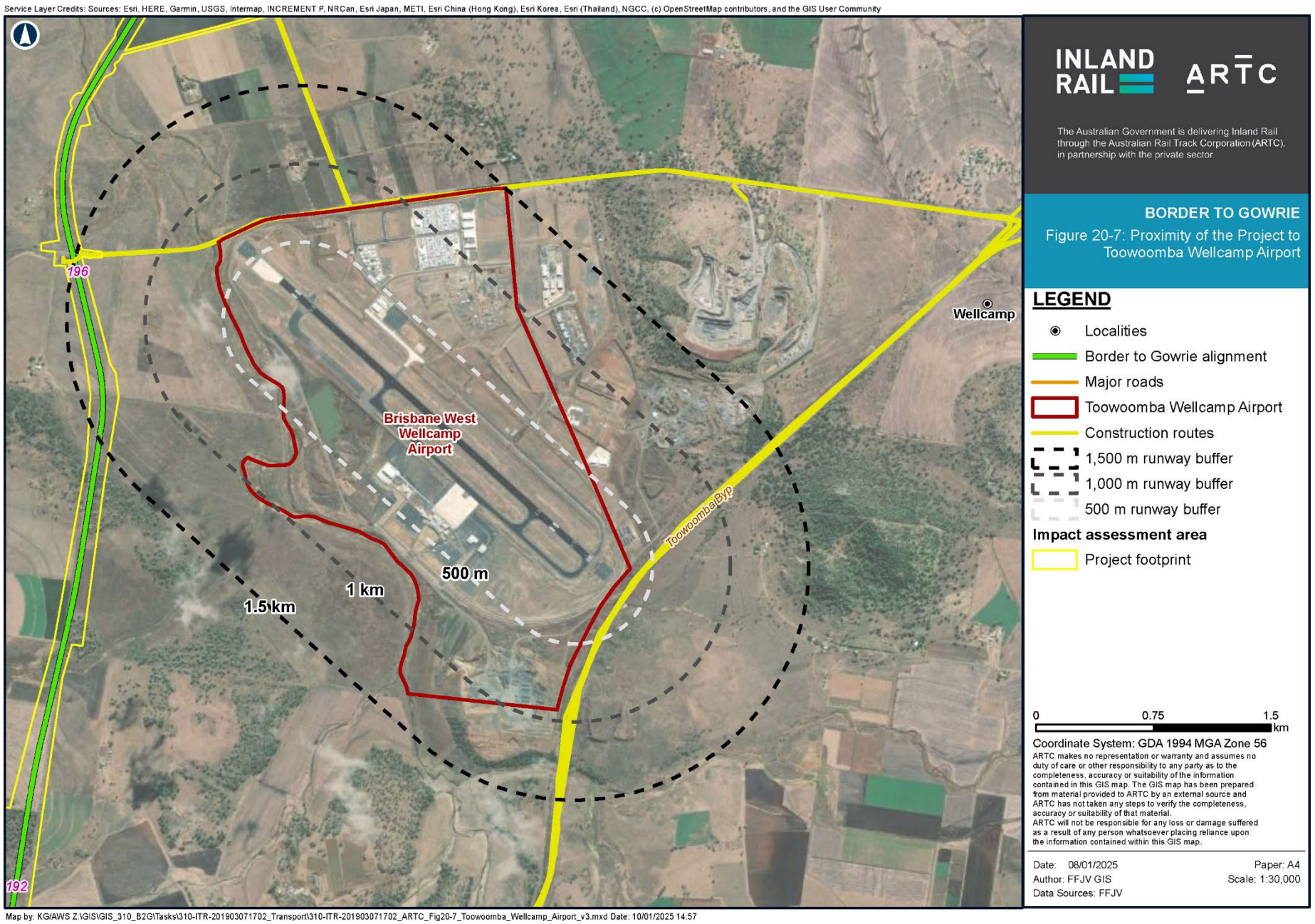
20.4.11 Airports

During the construction works and operations stages, the expected impact from the Project on airports is not considered to be significant as the transport of materials, workforce and equipment is expected to primarily utilise the existing road and rail transport networks.

The closest strategic airport is the Toowoomba Wellcamp Airport. At its closest point, the northern limit of the runway for Toowoomba Wellcamp Airport is approximately 865 m from the Project footprint and 1 km from the Project alignment. At its closest point, the Project alignment, at Ch 208.48 km, encroaches into the 470 m of Obstacle Limitation Surface (OLS) contour that extends from north-western end of the runway. Through consultation with the operator of Toowoomba Wellcamp Airport, the Project has been aligned to ensure that a double-stacked train on the rail alignment will not extend vertically into the OLS.

The locations of airports and airfields in relation to the Project alignment are shown in Figure 20-2. The location of the Project alignment relative to the Toowoomba Wellcamp Airport is shown in greater detail in Figure 20-7.

The Project will not directly impact on the operation or throughputs at any airports; therefore, airport facilities are not considered further in the traffic, transport and access impact assessment.


Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
196
192
Brisbane West Wellcamp Airport
Wellcamp
Toowoomba Byp
500 m
1 km
1.5 km
INLAND RAIL
ARTC
The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.
BORDER TO GOWRIE
Figure 20-7: Proximity of the Project to Toowoomba Wellcamp Airport
LEGEND
Localities
Border to Gowrie alignment
Major roads
Toowoomba Wellcamp Airport
Construction routes
1,500 m runway buffer
1,000 m runway buffer
500 m runway buffer
Impact assessment area
Project footprint
0
0.75
1.5
km
Coordinate System: GDA 1994 MGA Zone 56
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20.4.12 Ports

The Port of Brisbane is proposed to receive the accommodation facility cabins with construction routes linking the Port of Brisbane to the three accommodation facilities during pre-construction works. In addition, routes are proposed for transporting crops from a variety of locations to the port via road during track closures. The existing Port of Brisbane twenty-foot equivalent unit (TEU[1]) data reported an average of 118,9888 TEU/month from October 2018 to October 2022, with an all-time high of 149,416 TEU in August 2022, and a record low of 87,880 TEU in March 2020 (Global Economic Data, Indicators, Charts Forecasts (CEIC) Data, 2022).

During the construction of non-resident workforce accommodation facility, it is anticipated that 450 TEUs will be required over a period of two months. The number of TEUs compared with the monthly operating volumes indicates that there will be sufficient capacity to receive these items to the Port of Brisbane.

The export of crops aligns with current volumes and movements through the port; however, it is anticipated that these crops will be transported via road rather than via rail. This will impact the usual operations of the port with alterations required to allow for the increase in heavy vehicle movements rather than train movements.

The Project is expected to increase the operational throughputs of freight through the Port of Brisbane, however, the consideration of impacts at ports (freight containers) is not in the scope of traffic, transport and access impact assessment and therefore has not been assessed. Once the Contractor has further details, consultation will be undertaken with the Port of Brisbane.

20.4.13 Parking

An initial assessment of workforce demand and safe commutable distances has identified a potential need for three non-resident workforce accommodation facilities in the vicinity of Yelarbon, Inglewood and Millmerran. While parking at these facilities will be completely contained within the site, there are possibilities of workforce travelling to town outside of work hours for personal uses including shopping, medical or other activities. This may have an impact on local parking availability in the towns of Yelarbon, Inglewood and Millmerran, particularly nearby to restaurants, taverns, and shopping. These facilities generally have parking availability either on their properties or along local roads, which should be sufficient to accommodate off-duty workers accessing these locations.

20.4.14 Pavement

A preliminary desktop PIA has been undertaken based on the existing background traffic data available for road links impacted by proposed construction traffic. Pavement Impact Assessment is based on Standard Axle Repetition for heavy vehicles using the road network and considers pavement type, background traffic and development loading. The full PIA can be found in Appendix AA: Traffic Impact Assessment.

20.4.15 Emergency services

Emergency services within the vicinity of the Project study area have been identified and summarised in Table 20-23. This includes a summary of stations for the QPS, Queensland Ambulance Services (QAS) and QFES, including the address and contact details for each station based on publicly available information for the relevant service's website.

TABLE 20-23 EMERGENCY SERVICE LOCATIONS

Authority/ Emergency Services	Township	Address	Contact details
BSC			
Police stations	Thallon	Pine Street, Thallon, 4497	(07) 4622 9725
Fire stations	St George	37 Henry Street, St George, 4487	(07) 4625 3070
GRC			
Police stations	North Talwood	22 Main Street, North Talwood, 4496	(07) 4622 9720
	Goondiwindi	Herbert Street, Goondiwindi, 4390	(07) 4671 7777
	Yelarbon	Burrell Street and Wyemo Street, Yelarbon, 4388	(07) 4667 6828
	Inglewood	31 Albert Street, Inglewood, 4387	(07) 4667 6800
Ambulance stations	Goondiwindi	183 Marshall Street, Goondiwindi QLD 4390	(07) 4698 5916
	Inglewood	32 Albert Street, Inglewood QLD 4387	(07) 4698 5916
Fire stations	Goondiwindi	173 Marshall Street, Goondiwindi 4390	(07) 4676 6002
	Yelarbon	32 Taloom Street, Yelarbon 4388	(07) 4675 1220
	Inglewood	32 Albert Street, Inglewood 4387	(07) 4652 1265

[1] The TEU is an inexact unit of cargo capacity, often used for container ships and container ports.

Authority/ Emergency Services	Township	Address	Contact details
TRC			
Police stations	Millmerran	26 Walpole Street, Millmerran, 4357	(07) 4671 7888
	Pittsworth	Yandilla Street, Pittsworth, 4356	(07) 4631 6929
	Drayton	35 Brisbane Street, Drayton, 4350	(07) 4631 6977
	Toowoomba	161 Hume Street, Toowoomba City, 4350	(07) 4631 6333
Ambulance stations	Millmerran	2 Gillespie Street, Millmerran QLD 4357	(07) 4616 1521
	Pittsworth	37 Helens Street, Pittsworth QLD 4356	(07) 4698 5916
	Toowoomba	168 Herries Street, Toowoomba City QLD 4350	(07) 4616 1550
Fire stations	Millmerran	2 Attleigh Street, Millmerran 4357	(07) 4695 1141
	Pittsworth	5 Krinke Street, Pittsworth 4356	(07) 4693 2985
	South Toowoomba	201 Anzac Avenue, Toowoomba 4350	(07) 4698 5000
	Charlton	17 Steger Road, Charlton 4350	(07) 4592 5399
	Toowoomba	11 Kitchener Street, Toowoomba 4350	(07) 4698 5830

20.4.16 Transport infrastructure

20.4.16.1 Load restricted bridges/restricted waterway crossings

Table 20-24 lists identified potential construction traffic access restrictions, based on a desktop study. This does not consider the culverts and bridges used on the SCR network as these are located along heavy vehicle routes, with higher tolerances.

TABLE 20-24 POTENTIAL CONSTRUCTION TRAFFIC RESTRICTIONS

Authority/name	Restriction	Comment
GRC		
Mooroobie Lane	Creek crossing/potential floodway	Mooroobie Lane is used to access Cemetery Road Borrow Site and Mooroobie Lane Borrow Site
McDougalls Crossing	Creek crossing/potential load limited crossing structure	Crossing structure over Macintyre Brook potentially unsuitable for construction traffic
Cremascos Road	Creek crossing/potential load limited crossing structure	Crossing structure over Macintyre Brook potentially unsuitable for construction traffic
Bybera Road	Creek crossing/potential load limited crossing structure	Crossing structure over Macintyre Brook potentially unsuitable for construction traffic
Lovell's Crossing	Creek crossing/potential load limited crossing structure	Crossing structure over Macintyre Brook potentially unsuitable for construction traffic
Grays Road	Creek crossing/potential load limited crossing structure	Crossing structure over Canning Creek potentially unsuitable for construction traffic Grays Road is proposed to be used to access Mosquito Road Borrow Site

20.4.16.2 Heavy vehicle routes and restrictions

Heavy vehicle route restrictions have been considered in the development of construction routes, to prioritise use of roads which are designed to a higher standard and are better suited to accommodate larger construction vehicles. This considered, often the first and last mile to material providers or laydown areas occur on LGR with limited design for heavy or oversize overmass (OSOM) vehicles. Where use of roads deviates from defined routes allowing the design vehicle, consultation and agreement will be undertaken with the road authority. Appendix AA: Traffic Impact Assessment provides a full summary of heavy vehicle routes and restrictions along the proposed construction routes.

20.5 Potential impacts

This section provides discussion of potential impacts to existing transport infrastructure, as described in Section 20.4, that may arise due to the Project. Where appropriate, potential impacts have been presented separately for the construction and operation of the Project.

As stated in Section 20.3.3.2, the main construction transportation activities for the Project that have been accounted for in the traffic, transport and access impact assessment include the delivery of materials to the Project footprint, the movement of workforce, the delivery of water and the transportation/collection of plant, tools and other materials.

The proposed hours of work for the Project are detailed in Chapter 5: Project Description in accordance with the DTMR's *Transport Noise Management Code of Practice: Volume 2–Construction Noise and Vibration* (DTMR, 2023). The proposed hours of work include standard construction hours of Monday to Friday 7.00 am to 6.00 pm and Saturday 8.00 am to 1.00 pm, with additional non-standard hours spanning the remaining hours of the week.

For the purpose of a conservative assessment, the TIA assumes a 12-hour work day across 22 working days/month. Construction-related traffic is assumed to be linearly distributed across the above work hours.

Peak hour traffic volumes were derived from peak daily volumes using the following key assumptions:

- Material delivery movements will be evenly distributed across the standard daily 12 hours of construction
- Two shifts will occur per day with 50 per cent of total staff working each shift.

Furthermore, where works are required within active railway corridors, such as upgrading level crossings, it is often necessary to undertake works under track possessions, when the Contractor has control over an operating railway. These works are often required to proceed during the evening and night-time to minimise the disruption to rail services. Track possession of QR assets will generally be allocated over weekend periods, with extended track possession occurring over holiday periods.

There may be circumstances where work outside the standard hours will be required, due to activities such as material delivery or at locations where road traffic volumes do not permit works during the day without excessive delay. Work outside standard hours, including night works, will only be undertaken where consultation with the local community is undertaken.

It is anticipated that the ongoing operation and maintenance of the Project will require a workforce of approximately 10 to 15 full time equivalent workers. The operational workforce will be based at provisioning centres outside the immediate vicinity of the Project and will drive to locations along the Project alignment, as required, to undertake maintenance tasks.

20.5.1 Rail network

20.5.1.1 Construction

Rail infrastructure

The Project uses approximately 46.8 km of the existing rail corridor for the South Western Line and approximately 21.2 km of the existing rail corridor for the Millmerran Branch Line.

The South Western Line is a critical link in agricultural export supply chains (particularly grain), supporting the movement of significant volumes of commodities to the Port of Brisbane. Planning of exports to international markets involves significant lead times to coordinate landside logistics, shipping schedules and client demand. Supply chain stakeholders will need sufficient time to develop contingencies to mitigate potential disruption.

Online construction of the new railway, being a direct replacement of the existing rail infrastructure, is the preferred construction approach for sections of the Project within existing rail corridor. This approach will require agreement with QR, in the form of an interface agreement, and require possession of the rail corridor to enable construction. This online construction approach would result in the existing railway being non-operational to rail movements for the duration of the possession. Consequently, alternative means of transportation will be required during these periods for freight that would otherwise be transported via rail. The rail movement data received from QR (see Section 20.4.1) has been used to understand the impact closing the rail line during construction will have on the road network. The rail freight quantities have been converted to trips on road to understand what the road capacity, safety, and pavement impacts will be. Once impacts have been calculated, mitigation measures have then been applied where required, as summarised in Section 20.7.

Offline construction is the alternative method within existing rail corridors. This approach would involve the new railway being constructed immediately adjacent to the existing rail infrastructure. The benefit of this approach being that the existing railway could remain operational during the construction period; however, this construction approach would introduce safety and logistical challenges and increase property or land requirements that would be preferable to avoid.

The staging of the works within existing rail corridors, and their associated impacts, will be the subject of an interface agreement between ARTC and QR. The timing of works within existing rail corridors will be determined in consultation with QR and key supply chain stakeholders in order to identify periods of minimum disruption.

In accordance with Section 255 of the *Transport Infrastructure Act 1994* (Qld), works cannot commence within the existing rail corridor without QR's written approval. If the construction of Project components within the existing rail corridor is completed during a temporary possession of the rail corridor, works will be completed in accordance with the conditions of the temporary possession and/or wayleave agreement granted to ARTC by QR.

ARTC will continue to consult with QR as the Project progresses through detailed design and construction planning regarding the identification of an acceptable construction method within existing rail corridor.

Existing sidings and loops

The Project will provide for continued connectivity to existing sidings and loops. As a result, impacts to these features is expected to be confined to the construction works stage of the Project while the adjoining rail network is replaced and upgraded. The impacts of temporary access restrictions to crossing loops and sidings is expected to be limited as the adjoining main line will be non-operational while under the temporary possession of ARTC for construction purposes. Alternative means of transportation will be required during these periods for freight that would otherwise be loaded or unloaded at sidings along the Project alignment, such as grain at the sidings in Yelarbon and Brookstead.

Rail deliveries

Approximately 41,150 tonnes of rail are required for the Project. It is assumed that rail will be delivered by the existing QR and ARTC rail network to ARTC's Whetstone Material Distribution Centre along the Project alignment. As a conservative allowance, 10 per cent of all rail deliveries have been assumed to be transported to four laydown areas along the alignment to account for any required use of the road network.

In 2017, the South Western Line had a maximum of 50 monthly train movements (June 2017) and a minimum of five monthly train movements (September 2017). In the same year, the Millmerran Branch Line had a maximum of 19 train movements (August 2017) and a minimum of zero train movements (6 of the 12 months). Based on the total numbers and monthly variance of train movements on both of these existing rail lines (see Section 20.4.1.1 and Section 20.4.1.2), it is anticipated that if rail deliveries to Whetstone Material Distribution Centre are via existing rail network, that the additional rail movements would be within the operational capacity of the networks used and would not result in network impacts.

The delivery of the rail in full lengths via the QR network will require further investigation and consultation with QR during the construction planning process (detailed design stage). The objective of this consultation will be to agree on routes to be used, size and frequency of locomotives and the scheduling of deliveries with consideration for monthly variances in background network usage.

20.5.1.2 Operation

Road–rail interfaces

The Project alignment crosses several SCR and LGR. A summary of the number of interfaces with each public road type is presented in Table 20-25.

TABLE 20-25 PUBLIC ROAD INTERFACES INCLUDED IN THE REVISED REFERENCE DESIGN FOR THE PROJECT

Road type	Number of interactions[1]
SCR: TMR	9
LGR: GRC	16
LGR: TRC	25

Table note:
1. Only includes locations where a crossing solution is provided. Excludes interface locations where no crossing is provided in the revised reference design

Each interface between rail and road requires a design treatment. Design treatments for public road–rail interfaces that are included in the revised reference design have been categorised as:

- Grade separated crossings—road and rail cross each other at different heights so that traffic flow is not affected. Grade separations are either road-over-rail, or rail-over-road.
- Level crossings—road and rail cross each other at the same level. Level crossings have either passive or active controls to guide road users (see Section 20.4.1.4).
- Crossing consolidation, relocation, diversion or realignment—existing road–rail interfaces may be closed, consolidated into fewer crossing points, relocated or diverted. Roads will only be closed where the impact of diversions or consolidations is considered acceptable, or the existing location is not considered safe and cannot reasonably be made safe. Approval for closures, where required, will be progressed in accordance with the requirements of the relevant legislation.

The appropriate design treatment for each road–rail interface has been assessed on a case-by-case basis, with consideration given to current and future usage of the existing road asset, its location relative to other crossings of the rail corridor and the road and rail geometry at the crossing location. The key principles guiding the decision-making process for determining treatments at public road–rail interfaces include:

- Grade separated crossings: road and rail cross each other at different heights so that traffic flow is not affected (grade separations are either road-over-rail, or rail-over-road)
- Using a risk-based decision-making process focused on minimising risk 'so far as is reasonably practicable' (SFAIRP)
- Consistency in the determination of road–rail interface treatments across all projects of the Inland Rail Program
- Applying a consistent methodology to determine if the cost of the potential available treatment is grossly disproportionate to the level of risk to safety and the projected benefits
- Working with stakeholders to minimise the number of level crossings across the Inland Rail Program
- Ensuring the feasibility of the Inland Rail Program by proposing cost-effective solutions.

Where a road-rail interface is required, ARTC will apply a consistent safety-based risk approach to determine crossing treatments.

The approach uses the Australian Level Crossing Assessment Model (ALCAM) as one of the main inputs into the decision process. ALCAM is an assessment tool used to identify key potential risks at level crossings and to assist in the prioritisation of crossings for upgrades. The risk model is used to support a decision-making process for both road and pedestrian level crossings and to help determine the most cost-effective treatments. The ALCAM model considers factors such as future road traffic numbers, vehicle types, train numbers, speeds and sighting distances to create a unique risk score for each road-rail interface, if it were to be a level crossing. The road-rail intersection risk assessment and treatment decision process has also considered other factors that are not included in the ALCAM model, such as:

- Collision and near-collision history
- Engineering experience, for road and rail
- Local knowledge of driver and pedestrian behaviour
- Social and economic function of an intersection location.

In the development of the proposed treatments, ARTC have also taken into consideration State and national guidelines and strategies, specifically the following:

- *ONRSR Policy: Level Crossings* (ONRSR, 2019b)
- *ONRSR Guideline: Meaning of duty to ensure safety so far as is reasonably practicable* (ONRSR, 2016b)
- *Queensland Level Crossing Safety Strategy 2012–2021* (DTMR, 2012a).

ARTC confirm the ALCAM assessment is applied to existing and new level crossings and have actioned the requested updates as follows:

- Appendix AA (Appendix BT Public Level Crossing Treatment Methodology) has been updated to include:
  - the ALCAM assessment review process
  - the updates to the Inland Rail Level Crossing Risk tool which have been used in the ALCAM assessments
  - a section on the recent ONRSR audit of Queensland crossings and methodology, and relevant findings
  - a section noting that from a futureproofing perspective, 2040 road and rail traffic volumes are used in determining crossing treatments
  - response to comments received from the OCG
- Appendix AA (Appendix BV ALCAM Inputs) provides the input data used in the ALCAM assessments.

Both the ONRSR Policy (2019b) and *Queensland Level Crossing Safety Strategy 2012–2021*(DTMR, 2012a) focus on avoiding, where possible, the installation of new level crossings. The ONRSR Policy acknowledges that for lower risk level crossings, operators may be able to demonstrate that alternative controls minimise the risk to safety SFAIRP, as defined in ONRSR guidelines (ONRSR, 2016b). The revised reference design has been developed to limit the number of new level crossings; however, there are instances where the road–rail interface treatment assessment has concluded that the risk to safety 'so far as is reasonably practicable' can be achieved through the provision of level crossings in lower risk locations.

In June 2020, ONRSR finalised an audit of the *Inland Rail Road-Rail Crossing Strategy* (ONRSR, 2020. The audit recognised a consistent, systematic and comprehensive process for the assessment of level crossings is applied to determine adequate treatments, noting that the approach ensures level crossing safety risks are eliminated or minimised, 'so far as is reasonably practicable'. There were no findings or recommendations identified by the audit requiring action by ARTC.

In January 2023 ONRSR undertook an audit of the *Inland Rail Road-Rail Crossing Strategy* (ONRSR, 2023) in Queensland, specifically focussing on the public level crossings in the Border to Gowrie (B2G) section. The key findings included that ARTC Inland Rail demonstrated that a consistent, systematic, and comprehensive process for the assessment of level crossings is applied to determine adequate conforming treatments, and that the stakeholder engagement process has fed into the updated designs.

For public crossings, ARTC is undertaking, and will continue to undertake, the necessary consultation with DTMR, QR and local councils in relation to the preferred road–rail interface treatments for each location. Part of this process is to work with the relevant road manager to understand the local environment and gather information on future development plans, which can be used to inform the design. This will ensure that the future assessment process for assessing the appropriate level of treatment takes into consideration changes in road and rail traffic at each crossing, consistent with the selection methodology outlined in Table 20-26. Details of consultation with relevant stakeholders is outlined in Appendix E: Consultation Report.

TABLE 20-26 EXISTING PUBLIC ROAD–RAIL INTERFACES AND PROPOSED DESIGN TREATMENTS

Authority/ Interface ID [1]	Road name	Existing QR crossing type	Proposed treatment in the revised reference design
DTMR			
310-11-E-1	Cunningham Highway (Wondalli Street)	Active level crossing	No road crossing provided at this location. Active pedestrian crossing provided. Road traffic relocated to 310-11-E-0 (grade separation)
310-40-E-2	Millmerran-Leyburn Road	Passive level crossing	Active level crossing
310-44-E-2	Gore Highway	Active level crossing	Grade separation: road-over-rail
GRC			
310-4-E-2	South Kurumbul Road	Passive level crossing	Active level crossing
310-5-E-2	Wondalli Kurumbul Road	No crossing infrastructure	No crossing provided at this location–consolidated to 310-4-E-2 (active level crossing)
310-7-E-1	Unnamed Road	Passive level crossing	Passive level crossing
310-8-E-1	Unnamed Road	Passive level crossing	No crossing provided at this location–relocated to 310-7-E-1 (passive level crossing)
310-12-E-1	Suttons Road	Passive level crossing	Passive level crossing
310-14-E-1	Springborg Road	Passive level crossing	Passive level crossing–minor road realignment to 310-14-E-0
TRC			
310-40-E-1	Hall Road	Passive level crossing	No crossing provided at this location–consolidated
310-41-E-6	Gilgai Lane	Passive level crossing	Grade separation: rail-over-road
310-42-E-1	Fysh Road	Passive level crossing	No crossing provided at this location–road realignment to Harris Road 310-42-E-0a (active level crossing)
310-43-E-3a	Elsden Road	Passive level crossing	No crossing provided at this location–minor road realignment to 310-43-E-3 (active level crossing)
310-45-E-1	Longhurst Road	Passive level crossing	Active level crossing
310-46-E-1a	Yarranlea Road	Passive level crossing	Grade separation–minor road realignment to 310-46-E-1

Table note:
1. Interface IDs are shown on Figure 20-2.

The proposed public road–rail interface locations and road closures associated with the Project are listed in Table 20-27. The proposed road-rail interface locations are shown on Figure 20-2.

TABLE 20-27 PROPOSED PUBLIC ROAD–RAIL INTERFACE AND DESIGN TREATMENTS

Authority/ Interface ID[1]	Road name	Proposed treatment in the revised reference design
DTMR		
310-11-E-0	Cunningham Highway (Wondalli Street)	Grade separation: road-over-rail
310-24-P-2	Millmerran–Inglewood Road	Active level crossing
310-35-P-4	Millmerran–Inglewood Road	Grade separation: rail-over-road (bridge)
310-37-P-12a	Millmerran–Inglewood Road	Grade separation: rail-over-road (bridge)
310-48-P-8	Oakey–Pittsworth Road	Grade separation: rail-over-road (bridge)
310-55-P-1	Toowoomba–Cecil Plains Road	Grade separation: rail-over-road (bridge)
310-56-P-2	Warrego Highway	Grade separation: rail-over-road (bridge)
GRC		
270-11-P-9a	Stock Reserve	No crossing provided at this location–relocated
270-12-P-1	Kildonan Road	Active level crossing (incorporates stock route crossing)
270-12-P-2	Kildonan Road—Stock Reserve	No crossing provided at this location–relocated
270-12-P-4	Eukabilla Road	No crossing provided at this location–road diverted/ re-aligned
270-12-P-6a	Eukabilla Road	No crossing provided at this location–road diverted/ re-aligned
310-10-P-1	Access Track	Passive level crossing
310-11-E-1	Yelarbon (adjacent to the Cunningham Highway)	Active pedestrian level crossing
310-14-E-0	Springborg Road	Passive level crossing
310-16-P-1a	Whetstone Access Road	Active level crossing
310-17-P-7a	McDougalls Road	No crossing provided at this location—consolidated
310-18-P-8	Cremascos Road	Active level crossing
310-20-P-12	Bybera Road	Grade separation: rail-over-road (bridge)
310-21-P-9	Lovells Crossing Road	Active level crossing
310-22-P-9	Thornton Road	Active level crossing
310-25-P-3	Grays Road	Passive level crossing
310-26-P-2	Wongavale–Yugilbar Road	Passive level crossing
310-27-P-3	Unnamed Road (Stock Route–minor and unused)	Grade separation: rail-over-road (culverts)
310-28-P-3	Access Track	Active level crossing
TRC		
310-30-P-2	Kooroongarra Anderson Road (Stock Route–minor and unused)	Passive level crossing
310-31-P-7	Kooroongarra Road	Active level crossing
310-32-P-4	Paton Road	Active level crossing
310-33-P-1	Nicol Creek Road	Active level crossing
310-34-P-1	Millwood Road	Active level crossing
310-35-P-4b	Heckendorf Road	Grade separation: road-over-rail
310-36-P-1	Blackwell Road	Active level crossing
310-36-P-8a	Scragg Road	No crossing provided at this location–relocated
310-36-P-8b	Commodore Peak Road/Scragg Road	Grade separation: rail-over-road
310-37-P-12	Schwarten Road	No crossing provided at this location–consolidated
310-38-P-3b	Owens Scrub Road	Grade separation: road-over-rail
310-39-P-1g	Lindenmayer Road	No crossing provided
310-40-E-1a	Hall Road	No crossing provided at this location–consolidated
310-42-E-0a	Harris Road	Active level crossing
310-43-E-3	Elsden Road	Active level crossing
310-43-P-8a	Mann Silo Road	Active level crossing

Authority/ Interface ID[1]	Road name	Proposed treatment in the revised reference design
310-46-E-1	Yarranlea Road	Grade separation: rail-over-road (bridge)
310-46-P-4c	Murlaggan Road	No crossing provided at this location–relocated
310-47-P-1	Kahler Road	No crossing provided at this location–consolidated
310-47-P-3	French Road	No crossing provided at this location–road diverted/ re-aligned
310-48-P-1	Tip Road	Active level crossing
310-48-P-9	Quibet Road	No crossing provided at this location–road diverted/ re-aligned
310-48-P-10	Dallman Road	No crossing provided at this location–road diverted/ re-aligned
310-49-P-2	Lochaber Road	Grade separation: rail-over-road (bridge)
310-49-P-6	McEwan Lane	No crossing provided at this location–consolidated
310-49-P-8	Paint Mine Road	No crossing provided at this location–road diverted/ re-aligned
310-49-P-11	Linthorpe Road	Grade separation: road-over-rail
310-50-P-11	Linthorpe Valley Road	Active level crossing
310-51-P-8	Bushy Lane	No crossing provided at this location–road diverted/ re-aligned
310-51-P-11z	Biddeston-Southbrook Road	Grade separation: rail-over-road (bridge)
310-52-P-3	Purcell Road	No crossing provided at this location–road diverted/ re-aligned
310-53-P-1a	Athol School Road	Grade separation: rail-over-road
310-55-P-5	Brimblecombe Road	Grade separation: rail-over-road (bridge)
310-57-P-1	Chamberlain Road	Grade separation: rail-over-road (bridge)
310-57-P-4	Leesons Road	Active level crossing
Queensland State		
310-24-P-3	Unnamed Road (Stock Route)	No crossing provided–stock route realignment
310-25-P-1	Unnamed Road (Stock Route)	No crossing provided–stock route realignment

Table note:
1. Interface IDs shown on Figure 20-2.

Road traffic will be required to stop and wait at level crossings to enable the pass-by of trains. Where there is an existing road crossing of the QR rail network, wait times with the Project may differ from those experienced at present due to a change in rail operating conditions. Where level crossings are newly established for the Project, wait times for road vehicles will be a new inconvenience.

The anticipated vehicle wait times at level crossings during a train pass-by have been calculated and are presented in Table 20-28. These wait times have been calculated based on an 1,800 m train moving at 115 km/h, and the table also includes the rail wait time sensitivity test, which assumes a train speed of 60 km/h. A full list of analysis assumptions is presented in Appendix AA: Traffic Impact Assessment.

TABLE 20-28 VEHICLE WAIT TIMES AT PROPOSED LEVEL CROSSING LOCATIONS

Interface ID	Road name	Total wait time per closure (min)– 115 km/h train speed	Total wait time per closure (min)– 60 km/h train speed
DTMR			
310-24-P-2	Millmerran-Inglewood Road	1.69	2.55
310-40-E-2	Millmerran-Leyburn Road	1.69	2.55
GRC			
270-12-P-1	Kildonan Road	1.69	2.55
310-4-E-2	South Kurumbul Road	1.69	2.55
310-7-E-1	Unnamed Road	2.22	2.65
310-10-P-1	Access Track	1.30	2.50
310-12-E-1	Suttons Road	1.30	2.50

Interface ID	Road name	Total wait time per closure (min)– 115 km/h train speed	Total wait time per closure (min)– 60 km/h train speed
310-14-E-0	Springborg Road	1.30	2.50
310-16-P-1a	Whetstone Access Road	1.74	2.55
310-18-P-8	Cremascos Road	2.22	2.55
310-21-P-9	Lovells Crossing Road	1.69	2.55
310-22-P-9	Thornton Road	1.69	2.55
310-25-P-3	Grays Road	1.30	2.50
310-26-P-2	Wongavale Yugilbar Road	1.30	2.50
310-28-P-3	Unnamed Road	3.02	3.02
TRC			
310-30-P-2	Kooroongarra Anderson Road	1.35	2.50
310-31-P-7	Kooroongarra Road	1.69	2.55
310-32-P-4	Paton Road	1.69	2.55
310-33-P-1	Nicol Creek Road	1.69	2.55
310-34-P-1	Millwood Road	1.69	2.55
310-36-P-1	Blackwell Road	1.69	2.55
310-42-E-0a	Harris Road	1.69	2.55
310-43-E-3	Elsden Road	1.69	2.55
310-43-P-8a	Mann Silo Road	1.69	2.55
310-45-E-1	Longhurst Road	1.69	2.55
310-48-P-1	Tip Road	1.69	2.55
310-50-P-11	Linthorpe Valley Road	1.84	2.55
310-57-P-4	Leesons Road	1.69	2.55

Table note:
1. As shown on Figure 20-2.

The number of train pass-bys per day will also increase as a result of the Project, thereby increasing the frequency that road traffic needs to stop at these level crossings. The South Western Line currently has an average of 25 train movements per month (Table 20-7) and the Millmerran Branch Line currently has an average of three train movements per month (Table 20-9). It is estimated that once operational, the Project will involve an annual average of about 14 train services per day in 2028. This is likely to increase to an average of 20 trains per day in 2040, and up to 25 per day during peak operational periods. The potential social impacts of train pass-by are discussed in Chapter 17: Social.

Queue analysis was undertaken for all proposed active and passive level crossings to confirm the available storage between the level crossings and adjacent road network is adequate for the estimated queue length and associated design vehicles. The queue analysis was based on estimated vehicle 'wait times' outlined in Table 20-28, and estimated traffic demands during two future year scenarios including 2028 (day one rail operations) and 2040 (peak Project operation). For each year, both AM and PM peak-hour analyses were conducted based on the estimated number of train movements, forecast background traffic and any diversions to the surrounding road network as a result of the Project. This approach is consistent with the requirements of AS 1742.7:2016 *Manual of uniform traffic control devices: Part 7* (Standards Australia, 2016) and the *Manual of Uniform Traffic Control Devices Part 7: Railway Crossings* (DTMR, 2019d public road–rail interface).

The estimated queue length and journey delays for each level crossing across the two future year scenarios are presented in Table 20-29 and have been calculated in reference to an 1,800 m train travelling at 115 km/h.

Further discussion on the implication of queue lengths for the design of each crossing, particularly in regard to short-stacking issues, is presented in Appendix AA: Traffic Impact Assessment.

TABLE 20-29 PROPOSED LEVEL RAIL CROSSINGS—QUEUE ANALYSIS RESULTS

Authority/ Interface ID	Road name	Total wait time per closure (min)	Maximum expected vehicles queued per closure				Available storage		Largest vehicle accommodated within available storage
			2028 G/NB/EB	2028 AG/SB/WB	2040 G/NB/EB	2040 AG/SB/WB	G/NB/EB	AG/SB/WB	
DTMR									
310-24-P-2	Millmerran-Inglewood Road	1.69	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-40-E-2	Millmerran-Leyburn Road	1.69	1	1	1	1	200 m +	200 m +	PBS2B (30 m)
GRC									
270-12-P-1	Kildonan Road	1.69	3	3	4	4	200 m +	200 m +	PBS3B (42 m)
310-4-E-2	South Kurumbul Road	1.69	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-7-E-1	Unnamed Road	2.22	1	1	1	1	200 m+*	40 m	PBS3A (36.5 m)
310-10-P-1	Unnamed Road (Stock Route–minor and unused)	1.30	1	1	1	1	200 m+*	24 m	PBS1 (19 m)
310-12-E-1	Suttons Road	1.30	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-14-E-0	Springborg Road	1.30	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-16-P-1a	Whetstone Access Road	1.74	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-18-P-8	Cremascos Road	2.22	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-21-P-9	Lovells Crossing Road	1.69	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-22-P-9	Thornton Road	1.69	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-25-P-3	Grays Road	1.30	1	1	1	1	55 m	200 m +	PBS3B (42 m)
310-26-P-2	Wongavale Yugilbar Road	1.30	1	1	1	1	56 m	200 m +	PBS3B (42 m)
310-28-P-3	Unnamed Road	3.02	1	1	1	1	48 m	200 m +	PBS3B (42 m)
TRC									
310-30-P-2	Kooroongarra Anderson Road	1.35	1	1	1	1	48 m	200 m +	PBS3B (42 m)
310-31-P-7	Kooroongarra Road	1.69	1	1	1	1	62 m	200 m +	PBS3B (42 m)
310-32-P-4	Paton Road	1.69	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-33-P-1	Nicol Creek Road	1.69	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-34-P-1	Millwood Road	1.69	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-36-P-1	Blackwell Road	1.69	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-42-E-0a	Harris Road	1.69	1	1	1	1	160 m	200 m +	PBS3B (42 m)
310-43-E-3	Elsden Road	1.69	1	1	1	1	49 m	200 m +	PBS3B (42 m)
310-43-P-8a	Mann Silo Road	1.69	1	1	1	1	200 m +	120 m	PBS3B (42 m)
310-45-E-1	Longhurst Road	1.69	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-48-P-1	Tip Road	1.69	1	1	1	2	200 m +	200 m +	PBS3B (42 m)
310-50-P-11	Linthorpe Valley Road	1.84	1	1	1	1	200 m +	200 m +	PBS3B (42 m)
310-57-P-4	Leesons Road	1.69	1	1	1	1	200 m +	200 m +	PBS3B (42 m)

Table notes:
G = Gazettal AG = Anti-Gazettal NB = Northbound EB = Eastbound SB = Southbound WB = Westbound PBS2B = Performance Based Standards level 2B

Road-rail interface crash summary

Crash data has been summarised in Table 20-30 for all proposed public road-rail interfaces. The crash summary has determined any crashes which have occurred within 200 m of the public RRI locations to determine whether existing risks are present. The source and time period used for the crash summary matches that of the road links and is summarised above in Section 20.4.2.3.

TABLE 20-30 PROPOSED ROAD-RAIL INTERFACE CRASH SUMMARY

Authority/ Interface ID	Road name	Existing QR crossing type	Recorded crashes (200 m buffer)	Crash severity
DTMR				
310-11-E-0	Cunningham Highway (Wondalli Street)	Grade Separation - Road-over-rail	No crashes	-
310-24-P-2	Millmerran-Inglewood Road	Active Level Crossing	No crashes	-
310-35-P-4	Millmerran-Inglewood Road	Grade Separation - Rail-over-road	No crashes	-
310-37-P-12a	Millmerran-Inglewood Road	Grade Separation - Rail-over-road	No crashes	-
310-40-E-2	Millmerran-Leyburn Road	Active Level Crossing	No crashes	-
310-44-E-2	Gore Highway	Grade Separation–Road-over-rail	No crashes	-
310-48-P-8	Oakey-Pittsworth Road	Grade Separation–Rail-over-road	2	Hospitalisation
				Minor injury
310-55-P-1	Toowoomba-Cecil Plains Road	Grade Separation–Rail-over-road	1	Hospitalisation
310-56-P-2	Warrego Highway	Grade Separation–Rail-over-road	1	Medical treatment
GRC				
270-12-P-1	Kildonan Road	Active Level Crossing	No crashes	-
310-4-E-2	South Kurumbul Road	Active Level Crossing	No crashes	-
310-7-E-1	Unnamed Road	Passive Level Crossing	No crashes	-
310-10-P-1	Unnamed Road	Passive Level Crossing	No crashes	-
310-12-E-1	Suttons Road	Passive Level Crossing	No crashes	-
310-14-E-0	Springborg Road	Passive Level Crossing	No crashes	-
310-16-P-1a	Whetstone Access Road	Active Level Crossing	No crashes	-
310-18-P-8	Cremascos Road	Active Level Crossing	No crashes	-
310-20-P-12	Bybera Road	Grade Separation–Rail-over-road	No crashes	-
310-21-P-9	Lovells Crossing Road	Active Level Crossing	No crashes	-
310-22-P-9	Thornton Road	Active Level Crossing	No crashes	-
310-25-P-3	Grays Road	Passive Level Crossing	No crashes	-
310-26-P-2	Wongavale–Yugilbar Road	Passive Level Crossing	No crashes	-
310-27-P-3	Unnamed Road	Grade Separation–Rail-over-road	No crashes	-
310-28-P-3	Unnamed Road	Active Level Crossing	No crashes	-
TRC				
310-30-P-2	Kooroongarra Anderson Road	Passive Level Crossing	No crashes	-
310-31-P-7	Kooroongarra Road	Active Level Crossing	No crashes	-
310-32-P-4	Paton Road	Active Level Crossing	No crashes	-
310-33-P-1	Nicol Creek Road	Active Level Crossing	No crashes	-
310-34-P-1	Millwood Road	Active Level Crossing	No crashes	-

Authority/ Interface ID	Road name	Existing QR crossing type	Recorded crashes (200 m buffer)	Crash severity
310-35-P-4b	Heckendorf Road	Grade Separation–Road-over-rail	No crashes	-
310-36-P-1	Blackwell Road	Active Level Crossing	No crashes	-
310-36-P-8b	Commodore Peak Road/ Scragg Road	Grade Separation–Rail-over-road	No crashes	-
310-38-P-3b	Owens Scrub Road	Grade Separation–Rail-over-road	No crashes	-
310-41-E-6	Gilgai Lane	Grade Separation–Rail-over-road	No crashes	-
310-42-E-0a	Harris Road	Active Level Crossing	No crashes	-
310-43-E-3	Elsden Road	Active Level Crossing	No crashes	-
310-43-P-8a	Mann Silo Access Road	Active Level Crossing	No crashes	-
310-45-E-1	Longhurst Road	Active Level Crossing	No crashes	-
310-46-E-1	Yarranlea Road	Grade Separation–Rail-over-road	No crashes	-
310-46-P-3	Roche Road	Grade Separation–Rail-over-road	No crashes	-
310-48-P-1	Tip Road	Active Level Crossing	No crashes	-
310-49-P-2	Lochaber Road	Grade Separation–Rail-over-road	No crashes	-
310-49-P-11	Linthorpe Road	Grade Separation–Road-over-rail	No crashes	-
310-50-P-11	Linthorpe Valley Road	Active Level Crossing	No crashes	-
310-51-P-11z	Biddeston Southbrook Road	Grade Separation–Rail-over-road	1	Medical treatment
310-53-P-1a	Athol School Road	Grade Separation–Rail-over-road	No crashes	-
310-55-P-5	Brimblecombe Road	Grade Separation–Rail-over-road	No crashes	-
310-57-P-1	Chamberlain Road	Grade Separation–Rail-over-road	No crashes	-
310-57-P-4	Leesons Road	Active Level Crossing	1	Medical treatment

The detailed crash summary in Table 20-31 outlines the crash date, time, and description for each of the RRI locations.

TABLE 20-31 DETAILED CRASH SUMMARY FOR THE PROPOSED ROAD-RAIL INTERFACES

Authority/ Interface ID	Road name	Recorded crashes (200 m buffer)	Crash severity	Date and time	Crash description
DTMR					
310-48-P-8	Oakey-Pittsworth Road	2	Hospitalisation	Friday 2.00 pm February 2019	Multi-Vehicle–intersection from adjacent approaches
			Minor injury	Thursday 9.00 am February 2020	Multi-Vehicle–intersection from adjacent approaches
310-55-P-1	Toowoomba-Cecil Plains Road	1	Hospitalisation	Friday 6.00 pm April 2021	Single-Vehicle–off-carriageway crash on straight
310-56-P-2	Warrego Highway	1	Medical treatment	Friday 6.00 pm June 2018	Multi-Vehicle–vehicle leaving driveway
TRC					
310-51-P-11z	Biddeston Southbrook Road	1	Medical treatment	Monday 2.00 pm June 2021	Multi-Vehicle–intersection from adjacent approaches
310-57-P-4	Leesons Road	1	Medical treatment	Sunday 1.00 pm February 2021	Single-Vehicle–out of control on curve

No fatalities were recorded at any of the proposed road-rail interface locations. Grade separated crossings are proposed at all of the locations in Table 20-31 except for location 310-57-P-4, where an active level-crossing is proposed.

Road diversions

A road diversion assessment has been undertaken at a number of locations where the rail alignment and RRI crossing type has led to a requirement for redirection of traffic to an alternative route. Within the Project impact assessment area, seven diversion locations have been identified. These are summarised below:

- Athol School Road, Athol
- Biddeston Southbrook Road, Southbrook
- Lochaber Road, Pittsworth
- Oakey Pittsworth Road, Pittsworth
- Tip Road, Pittsworth
- Ware Street, Brookstead
- Fysh Road, Pampas.

At each of these diversion locations, an assessment has been undertaken to summarise the:

- Existing situation, including the road network and active and public transport provisions
- Required site distance length
- Traffic information and rerouting assumptions
- Capacity (Sidra) and turn warrants assessment 'with development' and 'without development'
- Proposed treatments.

For these intersections that have been analysed, all intersections are found to be performing at a satisfactory level post-diversion. The impact on public transport and active modes are also expected to be negligible, if any. The detailed road diversion assessment is provided in Appendix AA: Traffic Impact Assessment.

Short stacking

The revised reference design has been developed to prevent short stacking issues with the Project alignment. Short stacking occurs when a long vehicle does not have enough space to completely clear a rail crossing and stops while part of the vehicle is still within the rail corridor. Short stacking issues have been avoided through development of the revised reference design by maintaining a minimum separation distance between the outer rail of the Project alignment and the centreline of the nearest parallel road, in accordance with Section 5.4 of AS 1742.7:2016 and with the *Manual of Uniform Traffic Control Devices Part 7: Railway Crossings* (DTMR, 2019d). Section 5.4 states that the minimum offset distance for short stacking needs to be long enough to accommodate the design vehicle plus a factor of safety of 5 m at the intersection.

The design vehicle for the level crossings is a PBS3B 42 m Road Train except at the following locations:

- 310-40-E-2 (Millmerran–Layburn Road): PBS2B 30 m Road Train (current access vehicle PBS1 (20 m)–general access)
- 310-7-E-1 (Unnamed Road): PBS3A 36.5 m Road Train (constrained brownfield site/rural access)
- 310-10-P-1 (Unnamed Road): PBS1 19 m Semi Trailer (unused stock route).

Short stacking will continue to be assessed during detailed design development. Where short stacking is not considered sufficient, the design will be revisited during the detailed design stage. Design drawings showing available clearances will be provided to all road managers to demonstrate compliance with relevant standards, at the appropriate design review milestone.

The Project temporary footprint has been widened around most road-rail interfaces to accommodate side-tracks and other feasible constructability solutions. Impacts during construction will be managed via the Traffic Management Plan (TMP), supported by appropriate assessments and stakeholder engagement. This may involve the use of alternative routes and/or localised sidetracks. Most of the existing road reserves across the road network will be widened to provide enough land to build the permanent solution and manage side-tracking. Due to site specific constraints, ARTC and the Contractor will investigate suitable detours, where practicable, for approval by the road manager during detailed design and construction.

Further consultation with DTMR, GRC, TRC and the local community will confirm the location and preferred treatment for each road–rail interface. The consultation strategy for the Project is described in Appendix E: Consultation Report.

Signalling and communications

A Direct Traffic Control signalling system is currently used on the existing South Western Line and Millmerran Branch Line. Train movements on these lines are controlled and communicated via Queensland Rail's Control Centre in Brisbane.

The Project, during operations, will be controlled by ARTC using Centralised Train Control (CTC), which is a method of managing the risks associated with the movement of rail traffic. The CTC system is comprised of the Human Machine Interfaces at the centralised operational control centre and within the vehicles under their control, and the integrated systems that connect them together. The Human Machine Interface within the rail vehicle can be either via lineside signals, or via the use of in-cab signalling following the fitment of appropriate levels of the European Train Control System (ETCS).

The Project interfaces with QR's South Western System, on the South Western Line and Millmerran Branch Line, which operates under Direct Train Control (DTC), a verbal authority-based system similar to ARTC's Train Order Working (TOW). While mainline junctions will be controlled by ARTC under CTC, a CTC to DTC interface will be required at the QR interfaces. This signalling system interface and associated operational procedures are subject to ongoing discussions, development and definition between ARTC and QR and will continue during the Project's detailed design stage.

Earthworks requirements for signalling infrastructure, including signalling hut and solar charging panels, have been included in the design of crossing loops and maintenance sidings. A single signalling hut is able to service multiple turnouts where the turnouts are no more than 150 m from the proposed hut site. Signal hut locations associated with turnouts at passing loops and maintenance sidings are shown in the general arrangement drawings included in Appendix B1: Design Drawings.

20.5.2 Traffic impact assessment

This section provides discussion on the potential impacts of the construction and operation of the Project on the background traffic and road conditions within the study area.

Generally, the following impacts may arise because of the increased number of vehicle movements on the existing road network during construction:

- Increased journey times on road linkages used by construction traffic
- Reduced LoS on road links used by construction traffic
- Increased waiting time at intersections used by construction traffic
- Accelerated degradation of road pavements due to increased volume of traffic and greater axle load.

In addition, road users may experience temporarily altered driving conditions near construction areas, such as reduced speed limits, mobile traffic lights and lane reconfigurations. Altered driving conditions will result in increased travel times through sections of the road network where such controls are implemented.

As is discussed in Section 20.5.2.1, the potential traffic impacts as a consequence of vehicle movements in support of operation and maintenance of the Project are expected to be negligible. The potential for traffic delays at road-rail intersections has been assessed in Section 20.5.1.2.

20.5.2.1 Traffic volumes

SCR and LGR that are proposed to be used for construction routes have been identified in Section 20.4.2.1 and Section 20.4.2.2.

The existing traffic volumes for all road links have been determined based on available data of background traffic volumes, growth rates, seasonal variation factors and peak hour factors. The methodology to determine the existing traffic volumes and future traffic volumes is explained in Section 20.3.3. The traffic growth rate and peak hour factors for all road links are provided in Appendix AA: Traffic Impact Assessment.

Table 20-32 provides a summary of average daily traffic (ADT) and heavy vehicle percentage by direction in the year indicated. For DTMR roads, the data is provided in the Gazettal direction (G) (i.e. the direction of the declared road from start point to end point) or Anti-gazettal direction (AG). For all other roads, data is provided as northbound (NB), southbound (SB), westbound (WB) or eastbound (EB) as per the orientation of the road. The table also provides details relating to the source of the background traffic data. Background traffic volumes for links were obtained from a variety of sources, including road controlling authorities, intersection counts and link counts across various years.

TABLE 20-32 EXISTING TRAFFIC VOLUMES FOR ROADS PROPOSED TO BE USED FOR CONSTRUCTION ROUTES

Road name	Road section	Data source	Site ID	Traffic volume base year	G/NB/EB		AG/SB/WB	
					ADT	HV%	ADT	HV%
DTMR								
Barwon Highway (31A)	Ch 0.0 km to Ch 0.8 km	A	55427	2019	988	25%	905	20%
	Ch 0.8 km to Ch 2.0 km	A	55427	2019	988	25%	905	20%
	Ch 2.0 km to Ch 45.9 km	A	50010	2019	333	26%	332	26%
	Ch 45.9 km to Ch 88.0 km	A	50010	2019	333	26%	332	26%
Barwon Highway (31B)	Ch 0.0 km to Ch 1.6 km	A	50329	2019	121	23%	120	28%
	Ch 1.6 km to Ch 66.8 km	A	50329	2019	121	23%	120	28%
Carnarvon Highway (24A)	Ch 40.5 km to Ch 73.5 km	A	51406	2019	99	33%	92	33%
Charlton Connection Road (320)	Ch 0.0 km to Ch 1.6 km	A	32074	2018	2134	29%	2407	28%
Cunningham Highway (17C)	Ch 94.4 km to Ch 96.2 km	A	50005	2019	791	43%	844	47%
	Ch 96.2 km to Ch 97.5 km	A	50005	2019	791	43%	844	47%
	Ch 97.5 km to Ch 105.7 km	A	50005	2019	791	43%	844	47%
	Ch 105.7 km to Ch 107.4 km	A	50005	2019	791	43%	844	47%
	Ch 107.4 km to Ch 107.6 km	A	51840	2019	1073	61%	1105	43%
Cunningham Highway (17D)	Ch 0.0 km to Ch 2.0 km	A	50023	2019	656	49%	702	48%
	Ch 2.0 km to Ch 3.9 km	A	50023	2019	656	49%	702	48%
	Ch 3.9 km to Ch 10.2 km	A	50023	2019	656	49%	702	48%
	Ch 10.2 km to Ch 13.9 km	A	50023	2019	656	49%	702	48%
	Ch 13.9 km to Ch 18.5 km	A	50023	2019	656	49%	702	48%
	Ch 18.5 km to Ch 27.1 km	A	50023	2019	656	49%	702	48%
	Ch 27.1 km to Ch 29.3 km	A	50023	2019	656	49%	702	48%
	Ch 29.3 km to Ch 34.7 km	A	50023	2019	656	49%	702	48%
	Ch 34.7 km to Ch 39.6 km	A	50023	2019	656	49%	702	48%
	Ch 39.6 km to Ch 40.3 km	A	50023	2019	656	49%	702	48%
	Ch 40.3 km to Ch 40.5 km	A	50023	2019	656	49%	702	48%
	Ch 40.5 km to Ch 43.9 km	A	50023	2019	656	49%	702	48%
	Ch 43.9 km to Ch 46.3 km	A	50023	2019	656	49%	702	48%

Road name	Road section	Data source	Site ID	Traffic volume base year	G/NB/EB		AG/SB/WB	
					ADT	HV%	ADT	HV%
Cunningham Highway (17D)	Ch 46.3 km to Ch 88.0 km	A	50023	2019	656	49%	702	48%
	Ch 88.0 km to Ch 88.2 km	A	50574	2019	1662	51%	1941	45%
	Ch 88.2 km to Ch 90.0 km	A	50574	2019	1662	51%	1941	45%
Gateway Motorway (N239)	Ch 0.0 km to Ch 15.0 km	H	TU 5	2019	47734	16%	48127	21%
Gateway Motorway Extension (N332)	Ch 0.0 km to Ch 10.0 km	H	TU 4	2019	15981	5%	15384	2%
Gore Highway (28A)	Ch 0.0 km to Ch 2.2 km	A	30042	2019	2744	22%	2716	22%
	Ch 2.2 km to Ch 5.4 km	A	30042	2019	2744	22%	2716	22%
	Ch 5.4 km to Ch 6.7 km	A	30042	2019	2744	22%	2716	22%
	Ch 6.7 km to Ch 7.7 km	A	30042	2019	2744	22%	2716	22%
	Ch 7.7 km to Ch 11.2 km	A	30042	2019	2744	22%	2716	22%
	Ch 11.2 km to Ch 15.3 km	A	30042	2019	2744	22%	2716	22%
	Ch 15.3 km to Ch 17.5 km	A	30042	2019	2744	22%	2716	22%
	Ch 17.5 km to Ch 19.0 km	A	30042	2019	2744	22%	2716	22%
	Ch 19.0 km to Ch 20.3 km	A	30042	2019	2744	22%	2716	22%
	Ch 20.3 km to Ch 21.5 km	A	30024	2019	1468	30%	1479	28%
	Ch 21.5 km to Ch 23.2 km	A	30024	2019	1468	30%	1479	28%
	Ch 23.2 km to Ch 25.0 km	A	30024	2019	1468	30%	1479	28%
	Ch 25.0 km to Ch 30.1 km	A	30024	2019	1468	30%	1479	28%
	Ch 30.1 km to Ch 38.7 km	A	30024	2019	1468	30%	1479	28%
	Ch 38.7 km to Ch 41.1 km	A	30024	2019	1468	30%	1479	28%
	Ch 41.1 km to Ch 41.7 km	A	30024	2019	1468	30%	1479	28%
	Ch 41.7 km to Ch 43.2 km	A	30024	2019	1468	30%	1479	28%
	Ch 43.2 km to Ch 44.7 km	A	30024	2019	1468	30%	1479	28%
	Ch 44.7 km to Ch 47.6 km	A	30024	2019	1468	30%	1479	28%
	Ch 47.6 km to Ch 52.2 km	A	30024	2019	1468	30%	1479	28%
	Ch 52.2 km to Ch 53.3 km	A	30024	2019	1468	30%	1479	28%
	Ch 53.3 km to Ch 60.8 km	A	30024	2019	1468	30%	1479	28%
	Ch 60.8 km to Ch 63.0 km	A	30024	2019	1468	30%	1479	28%

Road name	Road section	Data source	Site ID	Traffic volume base year	G/NB/EB		AG/SB/WB	
					ADT	HV%	ADT	HV%
Gore Highway (28B)	Ch 0.0 km to Ch 0.7 km	A	30027	2019	881	38%	901	39%
	Ch 0.7 km to Ch 0.8 km	A	30027	2019	881	38%	901	39%
	Ch 0.8 km to Ch 1.4 km	A	30027	2019	881	38%	901	39%
	Ch 1.4 km to Ch 3.0 km	A	30027	2019	881	38%	901	39%
	Ch 3.0 km to Ch 13.0 km	A	30027	2019	881	38%	901	39%
	Ch 13.0 km to Ch 121.6 km	A	30027	2019	881	38%	901	39%
Ipswich Motorway (17A)	Ch 0.0 km to Ch 3.7 km	A	140035	2019	55729	11%	56166	9%
	Ch 3.7 km to Ch 6.4 km	A	140027	2019	47583	11%	48768	9%
	Ch 6.4 km to Ch 8.3 km	A	136081	2018	52457	11%	50420	9%
Leichhardt Highway (26C)	Ch 205.2 km to Ch 220.1 km	A	50019	2019	1111	38%	1105	36%
	Ch 220.1 km to Ch 222.4 km	A	50019	2019	1111	38%	1105	36%
	Ch 222.4 km to Ch 224.1 km	A	50019	2019	1111	38%	1105	36%
Logan Motorway (210A)	Ch 0.0 km to Ch 14.5 km	H	TU 3	2019	15981	5%	15384	2%
Millmerran-Inglewood Road (337)	Ch 0.0 km to Ch 2.5 km	A	32644	2019	315	27%	305	37%
	Ch 2.5 km to Ch 3.5 km	A	32644	2019	315	27%	305	37%
	Ch 3.5 km to Ch 6.2 km	A	32562	2019	347	26%	341	26%
	Ch 6.2 km to Ch 9.0 km	A	32562	2019	347	26%	341	26%
	Ch 9.0 km to Ch 13.1 km	A	32562	2019	347	26%	341	26%
	Ch 13.1 km to Ch 14.0 km	A	32562	2019	347	26%	341	26%
	Ch 14.0 km to Ch 17.3 km	A	32562	2019	347	26%	341	26%
	Ch 17.3 km to Ch 18.1 km	A	32562	2019	347	26%	341	26%
	Ch 18.1 km to Ch 21.8 km	A	32562	2019	347	26%	341	26%
	Ch 21.8 km to Ch 28.0 km	A	32562	2019	347	26%	341	26%
	Ch 28.0 km to Ch 33.0 km	A	32562	2019	347	26%	341	26%
	Ch 33.0 km to Ch 35.6 km	A	32562	2019	347	26%	341	26%
	Ch 35.6 km to Ch 37.7 km	A	32562	2019	347	26%	341	26%
	Ch 37.7 km to Ch 39.8 km	A	32562	2019	347	26%	341	26%
	Ch 39.8 km to Ch 41.9 km	A	50024	2019	169	35%	167	31%

Road name	Road section	Data source	Site ID	Traffic volume base year	G/NB/EB		AG/SB/WB	
					ADT	HV%	ADT	HV%
	Ch 41.9 km to Ch 45.9 km	A	50024	2019	169	35%	167	31%
	Ch 45.9 km to Ch 47.6 km	A	50024	2019	169	35%	167	31%
	Ch 47.6 km to Ch 53.3 km	A	50024	2019	169	35%	167	31%
	Ch 53.3 km to Ch 55.7 km	A	50024	2019	169	35%	167	31%
	Ch 55.7 km to Ch 56.6 km	A	50024	2019	169	35%	167	31%
	Ch 56.6 km to Ch 59.2 km	A	50024	2019	169	35%	167	31%
	Ch 59.2 km to Ch 61.0 km	A	50024	2019	169	35%	167	31%
	Ch 61.0 km to Ch 65.7 km	A	50024	2019	169	35%	167	31%
	Ch 65.7 km to Ch 68.7 km	A	50024	2019	169	35%	167	31%
Millmerran-Leyburn Road (335)	Ch 0.0 km to Ch 2.0 km	A	32032	2018	94	20%	95	26%
	Ch 2.0 km to Ch 2.2 km	A	32032	2018	94	20%	95	26%
Port Drive (NA24)	Ch 0.0 km to Ch 5.0 km	A	136238	2016	5141	42%	5719	42%
Port of Brisbane Motorway (U27)	Ch 0.0 km to Ch 6.0 km	A	136238	2016	5141	42%	5719	42%
Texas-Yelarbon Road (2322)	Ch 53.3 km to Ch 54.6 km	A	51254	2019	90	23%	91	24%
Toowoomba-Athol Road (316)	Ch 2.1 km to Ch 16.8 km	A	38584	2019	1836	11%	1889	13%
Toowoomba-Cecil Plains Road (324)	Ch 2.0 km to Ch 6.0 km	A	32014	2018	2972	32%	2569	31%
	Ch 6.0 km to Ch 6.4 km	A	38585	2019	1684	14%	1693	25%
	Ch 6.4 km to Ch 8.3 km	A	38585	2019	1684	14%	1693	25%
	Ch 8.3 km to Ch 9.2 km	A	38585	2019	1684	14%	1693	25%
	Ch 9.2 km to Ch 10.0 km	A	32664	2019	1702	15%	1698	19%
	Ch 10.0 km to Ch 10.1 km	A	32664	2019	1702	15%	1698	19%
	Ch 10.1 km to Ch 10.3 km	A	32664	2019	1702	15%	1698	19%
	Ch 10.3 km to Ch 12.1 km	A	32664	2019	1702	15%	1698	19%
	Ch 12.1 km to Ch 14.5 km	A	32664	2019	1702	15%	1698	19%
	Ch 14.5 km to Ch 16.3 km	A	32062	2018	1041	20%	1083	18%
Toowoomba Connection Road (315)	Ch 26.3 km to Ch 26.9 km	A	38586	2019	5844	19%	5579	15%
	Ch 26.9 km to Ch 27.1 km	A	38586	2019	5844	19%	5579	15%

Road name	Road section	Data source	Site ID	Traffic volume base year	G/NB/EB		AG/SB/WB	
					ADT	HV%	ADT	HV%
Toowoomba Bypass (319A)	Ch 0.0 km to Ch 26.8 km	H	TU 2	2019	1978	49%	1113	72%
Toowoomba Bypass (319B)	Ch 0.0 km to Ch 0.6 km	H	TU 1	2019	1978	49%	1113	72%
	Ch 0.6 km to Ch 3.2 km	H	TU 1	2019	1978	49%	1113	72%
	Ch 3.2 km to Ch 4.1 km	H	TU 1	2019	1978	49%	1113	72%
	Ch 4.1 km to Ch 13.0 km	H	TU 1	2019	1978	49%	1113	72%
Toowoomba Bypass Off-ramp (319B)	Toowoomba Bypass to Warrego Highway	F	IC141 - Off-ramp	2022	-	-	542	19%
Toowoomba Bypass On-ramp (319B)	Warrego Highway to Toowoomba Bypass	F	IC143 - On-ramp	2022	583	19%	-	-
Toowoomba Bypass Off-ramp (319B)	Toowoomba Bypass to Toowoomba-Cecil Plains Road	F	IC144 - Off-ramp	2022	512	20%	-	-
Toowoomba Bypass On-ramp (319B)	Toowoomba-Cecil Plains Road to Toowoomba Bypass	F	IC76 - On-ramp	2022	-	-	497	19%
Toowoomba Bypass Off-ramp (319B)	Toowoomba Bypass to Toowoomba-Cecil Plains Road	F	IC76 - Off-ramp	2022	-	-	399	29%
Toowoomba Bypass On-ramp (319B)	Toowoomba-Cecil Plains Road to Toowoomba Bypass	F	IC144 - On-ramp	2022	429	30%	-	-
Warrego Highway (18A)	Ch 0.0 km to Ch 7.2 km	A	135546	2018	28724	13%	29592	12%
	Ch 7.2 km to Ch 15.1 km	A	135546	2018	28724	13%	29592	12%
	Ch 15.1 km to Ch 18.9 km	A	135964	2019	16026	19%	15355	15%
	Ch 18.9 km to Ch 28.9 km	A	10021	2019	14658	19%	14835	16%
	Ch 28.9 km to Ch 36.6 km	A	160004	2020	10701	25%	10482	29%
	Ch 36.6 km to Ch 55.5 km	A	30066	2019	11844	19%	11735	21%
	Ch 55.5 km to Ch 75.4 km	A	30066	2019	11844	19%	11735	21%
	Ch 75.4 km to Ch 79.6 km	A	30070	2019	11338	19%	10327	19%
Warrego Highway (18B)	Ch 0.0 km to Ch 0.4 km	A	38587	2019	6842	19%	6690	18%
	Ch 0.4 km to Ch 1.5 km	A	38587	2019	6842	19%	6690	18%
	Ch 1.5 km to Ch 2.4 km	A	38587	2019	6842	19%	6690	18%
	Ch 2.4 km to Ch 4.5 km	A	30025	2019	6520	20%	6754	19%
	Ch 4.5 km to Ch 5.0 km	A	30025	2019	6520	20%	6754	19%

Road name	Road section	Data source	Site ID	Traffic volume base year	G/NB/EB		AG/SB/WB	
					ADT	HV%	ADT	HV%
Warrego Highway (18B)	Ch 5.0 km to Ch 5.3 km	A	30025	2019	6520	20%	6754	19%
	Ch 5.3 km to Ch 6.2 km	A	30025	2019	6520	20%	6754	19%
Warrego Highway Off-ramp (18B)	Warrego Highway to Kingsthorpe Overpass	F	IC 86	2022	97	19%	1905	7%
TfNSW								
Newell Highway	River Road to NSW/QLD Border	B		2017	2048	32%	2003	33%
BSC								
Noondoo Thallon Road	GrainCorp Thallon to Carnarvon Highway	A	55459	2019	38	34%	33	24%
GRC								
Boodle Street	Holcim Concrete Goondiwindi to Hunt Street	G		2022	10	20%	10	20%
Bybera Road	Cunningham Highway to B2G-LDN060.4	F	IC 4	2022	36	8%	36	7%
	B2G-LDN060.4 to Earthworks Area 2A	F	IC 4	2022	36	8%	36	7%
Cemetery Road	Access Track to Mooroobie Lane	C		2007	65	15%	65	15%
	Cunningham Highway to GrainCorp Goondiwindi	C		2007	65	15%	65	15%
Coolmunda Dam Access	Inglewood Legacy Bore/Coolmunda Dam to Coolmunda Dam Access	C		2015	34	25%	34	25%
	Coolmunda Dam Access to Cunningham Highway	C		2015	34	25%	34	25%
Cremascos Road	B2G-LDN052.8 to B2G-LDN055.4	F		2018	51	34%	51	34%
	B2G-LDN055.4 to B2G-LDN054.2	F		2018	51	34%	51	34%
	Cunningham Highway to B2G-LDN052.8	F		2018	51	34%	51	34%
East Sawmill Road	Cunningham Highway to B2G-LDN030.0	F	IC 7	2022	20	10%	22	13%
Elizabeth Street	Cunningham Highway to B2G-LDN065.8	E	TC 1	2022	19	15%	19	22%
Eukabilla Road	Kildonan Road to NS2B-LDN033.2	C		2021	10	26%	10	26%
	NS2B-LDN033.2 to NS2B-LDN035.6	C		2021	10	26%	10	26%
Fosters Road	Cunningham Highway to Borrow Site #9 (Fosters Road)	F	IC 9	2022	14	6%	13	6%
Georges Lane	B2G-LDN000.9 to Yelarbon Kurumbul Road	G		2021	7	43%	7	43%
Grays Road	Millmerran-Inglewood Road to Mosquito Creek Road	F		2018	10	5%	11	11%
Hunt Street	Leichhardt Highway to Boodle Street	G		2022	10	20%	10	20%

Road name	Road section	Data source	Site ID	Traffic volume base year	G/NB/EB		AG/SB/WB	
					ADT	HV%	ADT	HV%
Kildonan Road	Eukabilla Road to NS2B-LDN031.0	F	IC 12	2022	746	10%	700	10%
	NS2B-LDN031.0 to South Kurumbul Road	F	IC 12	2022	746	10%	700	10%
	South Kurumbul Road to Cunningham Highway	F	IC 12	2022	746	10%	700	10%
	Cunningham Highway to Eukabilla Road	F	IC 12	2022	746	10%	700	10%
McDougalls Road	B2G-LDN049.8 to McDougalls Road	F	IC 108	2022	4	20%	4	25%
	McDougalls Road to Cunningham Highway	F	IC 108	2022	4	20%	4	25%
Mooroobie Lane	Cemetery Road to Borrow Site #2 (Mooroobie Lane)	C		2009	11	17%	11	17%
	Borrow Site #2 (Mooroobie Lane) to Mooroobie Lane	C		2009	11	17%	11	17%
	Mooroobie Lane to Wondalli Kurumbul Road	C		2009	11	17%	11	17%
Mosquito Creek Road	Borrow Site #10 (Mosquito Road) to Grays Road	C		2010	9	13%	9	13%
Queen Street South	Yelarbon Kurumbul to B2G-LDN016.0	G		2021	2	25%	2	25%
Silo Street	Barwon Highway to GrainCorp Talwood	C		2013	60	28%	60	22%
South Kurumbul Road	Kildonan Road to Yelarbon Kurumbul Road	F		2018	25	39%	25	37%
South Toobeah Road	GrainCorp Toobeah to Barwon Highway	C		2006	44	32%	43	26%
Springborg Road	Cunningham highway to B2G-LDN037.6	F		2018	4	25%	4	12%
Suttons Road	B2G-LDN030.0 to Access Track (Off Suttons Road)	F		2018	4	59%	5	74%
Thornton Road	B2G-LDN069.0 to B2G-LDN067.6	F	IC 65	2022	8	5%	8	5%
	B2G-LDN067.6 to Millmerran-Inglewood Road	F	IC 65	2022	8	5%	8	5%
Town Common Road	Boral Concrete Goondiwindi to Barwon Highway	C		2006	174	29%	174	29%
Whetstone Access	B2G-LDN044.5 to Cunningham Highway	F		2018	10	16%	10	39%
Wondalli Kurumbul Road	Yelarbon Kurumbul Road to Mooroobie Lane	E	VC 6	2022	12	11%	11	7%
Wongavale Yugilbar Road	Millmerran-Inglewood Road to B2G-LDN081.0	G		2020	8	20%	8	20%
Woodcocks Road	Cunningham Highway to Borrow Site #4 (Woodcocks Road)	G		2022	10	20%	10	20%
Yelarbon Kurumbul Road	South Kurumbul Road to B2G-LDN006.3	F	IC 21	2022	26	15%	28	14%
	B2G-LDN006.3 to Wondalli Kurumbul Road	F	IC 21	2022	26	15%	28	14%
	Wondalli Kurumbul Road to Yelarbon Kurumbul Road	F	IC 21	2022	26	15%	28	14%
	Yelarbon Kurumbul Road to B2G-LDN020.3	F	IC 21	2022	26	15%	28	14%
	B2G-LDN020.3 to B2G-LDN025.9	F	IC 21	2022	26	15%	28	14%
	B2G-LDN025.9 to Cunningham Highway	F	IC 21	2022	26	15%	28	14%

Road name	Road section	Data source	Site ID	Traffic volume base year	G/NB/EB		AG/SB/WB	
					ADT	HV%	ADT	HV%
MPSC								
Boggabilla Weir Access	River Road to Boggabilla Weir	B		2022	10	20%	10	20%
River Road	Newell Highway to Boggabilla Weir Access	B		2022	10	20%	10	20%
TRC								
Alderley Street	Greenwattle Street to Toowoomba Workforce Origin 2	D		2014	3117	11%	3117	11%
	Toowoomba Workforce Origin B to Toowoomba-Athol Road	D		2014	3117	11%	3117	11%
	Toowoomba-Athol Road to Boral/Wagner Concrete Facilities	E	TC 9	2022	5608	17%	6244	29%
Athol School Road	B2G-LDN187.8 to B2G-LDN188.2	F	IC 23	2022	124	14%	117	11%
	B2G-LDN188.2 to Gore Highway	F	IC 23	2022	124	14%	117	11%
Biddeston Southbrook Road	Gore Highway to B2G-LDN183.8	F	IC e	2022	85	8%	89	10%
Blackwell Road	Gore Highway to Millmerran Quarry	F	IC 25	2022	18	2%	20	3%
	Millmerran Quarry to B2G-LDN120.2	F	IC 25	2022	18	2%	20	3%
	B2G-LDN120.2 to Millmerran-Inglewood Road	F	IC 54	2022	5	8%	5	4%
Bligh Street	Six Mile Road to Boral Concrete Millmerran	D		2017	14	16%	14	16%
Brimblecombe Road	Toowoomba-Cecil Plains Road to Brimblecombe Road	F		2020	50	34%	52	20%
	Brimblecombe Road to WL 194467R	F		2020	50	34%	52	20%
Bushy Lane	B2G-LDN183.0 to Gore Highway	F	IC d	2022	50	4%	44	5%
Campbell Street	Millmerran-Inglewood Road to Saleyards Road	F	IC 55	2022	470	16%	469	15%
	Saleyards Road to Gore Highway	F	IC 27	2022	889	9%	860	10%
Chamberlain Road	Warrego Highway to B2G-LDN204.2	G		2022	10	20%	10	20%
Commodore Peak Road	Scragg Road to Millmerran-Inglewood Road	F	IC 56	2022	15	7%	16	10%
Desmonds Lane	Yarranlea Road to B2G-LDN163.3	E	VC 10	2022	8	3%	7	3%
Dieckmann Road	B2G-LDN150.5 to Gore Highway	G		2022	10	20%	10	20%
Draper Road	Steger Road to B2G-FBW206.9	E	TC 2	2022	23	9%	24	9%
Drayton Wellcamp Road	Wellcamp Westbrook Road to Access Track	D		2015	1081	15%	1081	15%
	Access Track to Greenwattle Street	D		2015	1081	15%	1081	15%

Road name	Road section	Data source	Site ID	Traffic volume base year	G/NB/EB		AG/SB/WB	
					ADT	HV%	ADT	HV%
Florence Street	Gore Highway to West Street	D		2017	161	4%	161	4%
Forestry Road	Access Track to Millmerran-Inglewood Road	E	VC 8	2022	1	0%	1	0%
	Millmerran-Inglewood Road to Earthworks Area 3B	E	VC 8	2022	1	0%	1	0%
Fysh Road	B2G-LDN147.1 to Gore Highway	F		2020	36	17%	35	23%
Gap Road	Gore Highway to Grevillea Street	F	IC 39	2022	605	11%	644	12%
Geitz Road	B2G-LDN179.0 to Linthorpe Valley Road	F		2020	21	10%	20	18%
Gilgai Lane	B2G-LDN144.6 to Gore Highway	F		2020	13	24%	13	44%
Grevillea Street	Boral Concrete Pittsworth to Gap Road	G		2015	208	0.27	208	0.27
Hall Road	B2G-LDN139.0 to Gore Highway	F		2020	1	50%	2	60%
Heckendorf Road	Borrow Site #14 (Heckendorf Road) to B2G-LDN116.0	F	IC 59	2022	22	27%	24	21%
	B2G-LDN116.0 to Millmerran-Inglewood Road	F	IC 59	2022	22	27%	24	21%
Holcim Australia Toowoomba Access	Drayton Wellcamp Road to Holcim Australia Toowoomba Quarry	G		2022	10	20%	10	20%
Kahler Road	Murlaggan Road to B2G-LDN165.6	F		2020	6	3%	6	3%
Kingsthorpe Haden Overpass	Warrego Highway Off-ramp to Kingsthorpe Haden Road	F	IC 86	2022	1901	7%	136	15%
Kingsthorpe Haden Road	Kingsthorpe Haden Overpass to Warrego Highway	F	IC 86	2022	97	19%	1905	7%
Kooroongarra Road	Borrow Site #13 (Kooroongarra Road) to Millwood Road	F	IC 129	2022	36	24%	38	23%
	Millmerran-Inglewood Road to Commodore Mine	F	IC 60	2022	1	25%	3	7%
Leesons Road	Warrego Highway to Steger Road	F	IC 81	2022	37	12%	40	10%
	Steger Road to B2G-LDN206.3	F	IC 81	2022	37	12%	40	10%
Linthorpe Road	Gore Highway to B2G-LDN175.5	F	IC 35	2022	10	14%	19	13%
Linthorpe Valley Road	Geitz Road to Gore Highway	F		2020	46	24%	43	29%
Lochaber Road	Gore Highway to B2G-LDN172.0	F	IC g	2022	171	6%	174	7%
	B2G-LDN172.0 to B2G-LDN172.6	F	IC g	2022	171	6%	174	7%
McDougall Street	Humes Precast Toowoomba to Toowoomba-Cecil Plains Road	D		2015	3026	20%	3026	20%

Road name	Road section	Data source	Site ID	Traffic volume base year	G/NB/EB		AG/SB/WB	
					ADT	HV%	ADT	HV%
Millwood Road	Millmerran-Inglewood Road to B2G-LDN112.1	F	IC 61	2022	18	24%	19	15%
	B2G-LDN112.1 to Millwood Road	F	IC 61	2022	18	24%	19	15%
	Millwood Road to Kooroongarra Road	F	IC 131	2022	3	6%	1	0%
Moffatt Reserve Road	Millmerran-Inglewood Road to Millmerran Power Station	D		2017	115	30%	115	30%
Murlaggan Road	B2G-LDN164.3 to Kahler Road	F	IC 39	2022	201	7%	200	6%
	Kahler Road to Gore Highway	F	IC 39	2022	201	7%	200	6%
Oakey-Pittsworth Road	Gore Highway to B2G-LDN171.0	F	IC i	2022	679	19%	690	18%
O'Mara Road	Toowoomba-Cecil Plains Road to Warrego Highway	F	IC 83	2022	2373	18%	2326	14%
Owens Scrub Road	B2G-LDN129.5 to B2G-LDN128.2	F	IC 63	2022	234	12%	233	14%
	B2G-LDN128.2 to B2G-LDN130.0	F	IC 63	2022	234	12%	233	14%
	B2G-LDN130.0 to Millmerran-Inglewood Road	F	IC 63	2022	234	12%	233	14%
Paint Mine Road	Gore Highway to B2G-LDN173.5	F		2020	22	17%	22	8%
Paton Road	Millmerran-Inglewood Road to B2G-LDN104.5	F		2018	10	75%	11	72%
Quarry Road Access	Tummaville Road to Quarry	F	IC 136	2022	2	38%	2	38%
Saleyards Road	Campbell Street to Gore Highway	D		2015	123	30%	123	30%
Schwarten Road	Millmerran-Inglewood Road to B2G-LDN126.9	F	IC 60	2022	3	0%	2	0%
Scragg Road	Commodore Peak Road to B2G-LDN123.6	G		2022	10	20%	10	20%
	B2G-LDN123.6 to B2G-LDN123.8	G		2022	10	20%	10	20%
Scrubby Road	Bland Quarry Pittsworth to Gore Highway	F	IC 43	2022	140	38%	140	40%
Steger Road	Warrego Highway to New Hope Recycled Water Pipeline	F	IC 83	2022	962	18%	581	27%
	New Hope Recycled Water Pipeline to Draper Road	F	IC 83	2022	962	18%	581	27%
	Draper Road to Leesons Road	F	IC 83	2022	962	18%	581	27%
Tummaville Road	Access Track to Gore Highway	F	IC 45	2022	91	21%	95	21%
Turallin Road	Gore Highway to the Turallin Facility	F	IC 46	2022	114	13%	165	19%

Road name	Road section	Data source	Site ID	Traffic volume base year	G/NB/EB		AG/SB/WB	
					ADT	HV%	ADT	HV%
Ware Street	GrainCorp Brookstead to B2G-LDN153.1	F		2021	121	22%	119	21%
	B2G-LDN153.1 to Gore Highway	F		2021	121	22%	119	21%
	Gore Highway to B2G-LDN150.9	F		2021	57	23%	53	21%
Wellcamp Westbrook Road	Drayton Wellcamp Road to Toowoomba-Cecil Plains Road	D		2017	461	24%	461	24%
West Street	Gore Highway to Florence Street	D		2017	50	46%	50	46%
	Florence Street to Six Mile Road	D		2017	14	16%	14	16%
Yarranlea Road	Gore Highway to B2G-LDN161.0	F	IC 45	2022	58	29%	50	22%
	B2G-LDN161.0 to Desmonds Lane	F	IC 45	2022	58	29%	50	22%

20.5.2.2 Transportation task

Project-related traffic is expected to consist of traffic generated by both construction and operational activities.

During operation of the Project, small maintenance crews may need to inspect the new track up to once a month. These inspections will likely be conducted within the rail corridor itself, using the rail maintenance access roads. These activities are likely to be infrequent and the related traffic volumes are likely to be minimal, with no envisaged impact to operational conditions of the surrounding road network. It is assumed that no new trips will be generated, as existing trips would be accounted for in traffic growth rates and the dispersed nature of these trips across the road network would have a minimal impact on road network operational performance. Therefore, the operational impacts from the Project are expected to be less than 5 per cent in addition to baseline AADT, and therefore detailed analysis of impacts on the road network is not required.

It is anticipated that traffic-related impacts would primarily be experienced during the construction works stage of the Project due to increased total and heavy vehicle movements on the existing road network. Most construction materials are expected to be delivered to laydown areas, primarily via the existing road network in conjunction with access tracks within the Project temporary footprint. Access points into the Project footprint from the public road network will be located to ensure that adequate sight distance and a safe access/egress path are available. Further investigation of access locations is required once detail around the planned construction methodology is known, which would occur during the detailed design stage.

Designated laydown areas will be used as delivery points and will have accessibility, safe manoeuvrability and off-loading provisions for transportation vehicles. Each designated laydown area will act as a temporary point of storage for materials and plant prior to being distributed to operational work fronts as the need arises. Laydown areas have been nominated for the Project that would need to be accessed directly off a SCR, including:

- Kildonan Road
- Eukabilla Road
- Georges Lane (extension)
- Yelarbon–Kurumbul Road
- Suttons Road
- Springborg Road
- McDougalls Crossing Road
- Cremascos Road
- Bybera Road
- Lovells Crossing Road
- Thornton Road
- Millmerran–Inglewood Road
- Wongavale Yugilbar Road
- Paton Road
- Millwood Road
- Heckendorf Road
- Blackwell Road
- Scragg Road
- Schwarten Road
- Owens Scrub Road
- Foxwood Road
- Hall Road
- Millmerran Leyburn Road
- Gilgai Lane
- Fysh Road
- Gore Highway
- Dieckmann Road
- Ware Street
- Madelaine Street
- Yarranlea Road
- Roche Road
- Murlaggan Road
- Kahler Road
- Oakey Pittsworth Road
- Lochaber Road
- Paint Mine Road
- Linthorpe Road
- Linthorpe Valley Road
- Bushy Lane
- Biddeston Southbrook Road
- Athol School Road
- Toowoomba-Cecil Plains Road
- Brimblecombe Road
- Warrego Highway
- Chamberlain Road
- Leesons Road
- Draper Road
- Turallin Road
- Eukabilla Road.

Each construction site, laydown area or non-resident workforce accommodation facility requiring access directly off/onto a SCR will be negotiated with and approved by DTMR.

From designated laydown areas, construction materials will be distributed to the surrounding smaller construction laydown areas and work fronts. This re-distribution of material will be via the construction access road network within the rail corridor, in the first instance. The public road network will only be used if required. Figure 20-3 illustrates the construction routes that have been identified for use by the Project.

The total number of trips required for each construction activity has been derived for each road section, from the preliminary material requirements and construction schedule established for the Project (see Chapter 5: Project Description). These total trips have been summarised in Table 20-33 by activity and year of construction for the Project.

TABLE 20-33 TOTAL CONSTRUCTION VEHICLE MOVEMENTS BY ACTIVITY, PER YEAR

Transportation task[1]	2024	2025	2026	2027	2028
Movement of workforce	1,643,622	3,231,735	3,230,876	3,211,886	802,972
Material movement: cut to fill	3,057,906	3,478,583	126,379	-	-
Material movement: cut to spoil [2]	66,032	365,241	160,629	-	-
Material movement: general fill	186,266	1,463,675	403,609	-	-
Delivery of material from quarries	114,694	34,408	186,581	781,175	27,974
Delivery of rail	-	-	-	4,008	-
Delivery of sleepers	-	-	-	28,368	-
Delivery of water	267,463	557,087	507,049	311,323	488
Delivery of precast concrete bridge components	-	1,875	28,480	9,284	-
Delivery of precast concrete culverts	20,317	190,093	59,944	-	-
Delivery of in situ concrete for culverts	4,918	53,179	14,368	-	-
Delivery of in situ concrete for bridges	-	57,987	190,264	43,652	-
Movement of plant, equipment and tools	71,722	143,443	143,443	143,443	35,861
Delivery of non-resident workforce accommodation cabins	850,281	-	-	-	-
Movement of rail-to-road diversions	633,772	1,946,954	1,946,954	1,946,954	367,268

Table notes:
1. Traffic impacts associated with the offsite disposal of waste have not been assessed, as waste volumes generated during construction of the Project are not expected to be significant (see Chapter 22: Waste and Resource Management).
2. Spoil is indicative of material that is expected to be unusable for use in the rail formation without treatment. Opportunities for reuse of this material within the Project footprint will be investigated prior to offsite disposal.

The total number of trips for each transportation task over the construction period have been assigned to construction routes that are proposed to be used for each task. This has enabled the estimated average number of daily construction movements on each road section to be determined across the whole construction period. The peak period of use by construction traffic has also been identified for each road section. This analysis is presented in Table 20-34.

TABLE 20-34 PEAK DAILY NUMBER OF CONSTRUCTION TRAFFIC MOVEMENTS OVER THE CONSTRUCTION PERIOD PER ROAD SECTION

Authority/road name	Road section	Light vehicle trips in year of construction					Heavy vehicle trips in year of construction					Peak construction months
		2024	2025	2026	2027	2028	2024	2025	2026	2027	2028	
DTMR												
Barwon Highway (31A)	Ch 0.0 km to Ch 0.8 km	0	0	0	0	0	49	64	65	61	40	May 2026 to May 2026
	Ch 0.8 km to Ch 2.0 km	0	0	0	0	0	49	64	65	61	40	May 2026 to May 2026
	Ch 2.0 km to Ch 45.9 km	0	0	0	0	0	49	61	61	61	40	May 2025 to Jul 2025
	Ch 45.9 km to Ch 88.0 km	0	0	0	0	0	45	56	56	56	37	May 2025 to Jul 2025
Barwon Highway (31B)	Ch 0.0 km to Ch 1.6 km	0	0	0	0	0	45	56	56	56	37	May 2025 to Jul 2025
	Ch 1.6 km to Ch 66.8 km	0	0	0	0	0	42	52	52	52	35	May 2025 to Jul 2025
Carnarvon Highway (24A)	Ch 40.5 km to Ch 73.5 km	0	0	0	0	0	42	52	52	52	35	May 2025 to Jul 2025
Charlton Connection Road (320)	Ch 0.0 km to Ch 1.6 km	0	0	0	0	0	0	2	4	4	0	Nov 2026 to May 2027
Cunningham Highway (17C)	Ch 94.4 km to Ch 96.2 km	0	0	0	0	0	51	51	11	9	0	Sep 2024 to Feb 2025
	Ch 96.2 km to Ch 97.5 km	0	0	0	0	0	77	77	85	233	0	Apr 2027 to Apr 2027
	Ch 97.5 km to Ch 105.7 km	0	0	0	0	0	574	124	85	233	0	Nov 2024 to Nov 2024
	Ch 105.7 km to Ch 107.4 km	91	163	114	114	114	382	165	85	153	2	Nov 2024 to Nov 2024
	Ch 107.4 km to Ch 107.6 km	77	149	100	100	100	382	166	84	136	2	Nov 2024 to Nov 2024
Cunningham Highway (17D)	Ch 0.0 km to Ch 2.0 km	77	149	100	100	100	382	166	84	136	2	Nov 2024 to Nov 2024
	Ch 2.0 km to Ch 3.9 km	77	149	100	100	100	382	163	87	136	2	Nov 2024 to Nov 2024
	Ch 3.9 km to Ch 10.2 km	70	142	93	93	93	158	158	82	93	2	Mar 2025 to Mar 2025
	Ch 10.2 km to Ch 13.9 km	56	127	79	79	79	157	158	77	92	2	Mar 2025 to Mar 2025
	Ch 13.9 km to Ch 18.5 km	48	120	72	72	72	182	160	80	75	2	Mar 2025 to Mar 2025
	Ch 18.5 km to Ch 27.1 km	7	7	7	7	7	182	183	83	51	2	Feb 2025 to Feb 2025
	Ch 27.1 km to Ch 29.3 km	14	14	14	14	14	197	183	70	47	2	Sep 2024 to Sep 2024
	Ch 29.3 km to Ch 34.7 km	14	14	14	14	14	177	133	71	48	2	Aug 2024 to Sep 2024
	Ch 34.7 km to Ch 39.6 km	14	14	14	14	14	177	133	71	48	2	Aug 2024 to Sep 2024
	Ch 39.6 km to Ch 40.3 km	21	21	21	21	21	199	197	63	44	2	Sep 2024 to Sep 2024
	Ch 40.3 km to Ch 40.5 km	21	21	21	21	21	49	46	63	43	2	May 2026 to Jun 2026
	Ch 40.5 km to Ch 43.9 km	63	63	63	63	63	3	44	7	1	1	Sep 2025 to Nov 2025
	Ch 43.9 km to Ch 46.3 km	21	21	21	21	21	3	44	7	1	1	Sep 2025 to Nov 2025
Cunningham Highway (17D)	Ch 46.3 km to Ch 88.0 km	21	21	21	21	21	3	7	7	1	1	Dec 2025 to Mar 2026
	Ch 88.0 km to Ch 88.2 km	21	21	21	21	21	26	33	36	31	21	May 2026 to May 2026
	Ch 88.2 km to Ch 90.0 km	21	21	21	21	21	1	6	6	1	1	Nov 2025 to Jan 2026

Authority/road name	Road section	Light vehicle trips in year of construction					Heavy vehicle trips in year of construction					Peak construction months
		2024	2025	2026	2027	2028	2024	2025	2026	2027	2028	
Gateway Motorway (N239)	Ch 0.0 km to Ch 15.0 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
Gateway Motorway Extension (N332)	Ch 0.0 km to Ch 10.0 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
Gore Highway (28A)	Ch 0.0 km to Ch 2.2 km	92	92	92	92	92	350	490	150	155	86	May 2025 to May 2025
	Ch 2.2 km to Ch 5.4 km	78	78	78	78	78	918	732	146	144	85	Nov 2024 to Nov 2024
	Ch 5.4 km to Ch 6.7 km	63	63	63	63	63	918	732	145	143	84	Nov 2024 to Nov 2024
	Ch 6.7 km to Ch 7.7 km	56	56	56	56	56	918	732	246	143	84	Nov 2024 to Nov 2024
	Ch 7.7 km to Ch 11.2 km	42	42	42	42	42	914	711	242	140	85	Nov 2024 to Nov 2024
	Ch 11.2 km to Ch 15.3 km	35	35	35	35	35	914	711	242	150	86	Nov 2024 to Nov 2024
	Ch 15.3 km to Ch 17.5 km	28	28	28	28	28	649	430	293	139	86	Nov 2024 to Nov 2024
	Ch 17.5 km to Ch 19.0 km	21	21	21	21	21	649	430	293	140	87	Nov 2024 to Nov 2024
	Ch 19.0 km to Ch 20.3 km	14	14	14	14	14	649	430	293	147	88	Nov 2024 to Nov 2024
	Ch 20.3 km to Ch 21.5 km	7	7	7	7	7	649	430	293	147	88	Nov 2024 to Nov 2024
	Ch 21.5 km to Ch 23.2 km	0	0	0	0	0	645	409	287	154	88	Nov 2024 to Nov 2024
	Ch 23.2 km to Ch 25.0 km	21	21	21	21	21	349	292	287	167	90	Nov 2024 to Nov 2024
	Ch 25.0 km to Ch 30.1 km	21	21	21	21	21	349	1496	1558	131	83	Jan 2026 to Jan 2026
	Ch 30.1 km to Ch 38.7 km	35	35	35	35	35	346	131	144	152	86	Nov 2024 to Nov 2024
	Ch 38.7 km to Ch 41.1 km	49	49	49	49	49	332	104	138	126	69	Nov 2024 to Nov 2024
	Ch 41.1 km to Ch 41.7 km	49	49	49	49	49	332	104	138	124	67	Nov 2024 to Nov 2024
	Ch 41.7 km to Ch 43.2 km	63	63	63	63	63	332	371	155	125	67	Aug 2025 to Aug 2025
	Ch 43.2 km to Ch 44.7 km	78	78	78	78	78	332	365	149	125	67	Aug 2025 to Aug 2025
	Ch 44.7 km to Ch 47.6 km	92	92	92	92	92	332	364	149	109	65	Aug 2025 to Aug 2025
	Ch 47.6 km to Ch 52.2 km	106	106	106	106	106	332	364	149	98	65	Aug 2025 to Aug 2025
	Ch 52.2 km to Ch 53.3 km	120	120	120	120	120	332	360	119	98	65	Aug 2025 to Aug 2025
	Ch 53.3 km to Ch 60.8 km	127	127	127	127	127	333	368	114	112	66	Aug 2025 to Aug 2025
	Ch 60.8 km to Ch 63.0 km	127	127	127	127	127	74	93	92	104	62	Jun 2027 to Jun 2027
Gore Highway (28B)	Ch 0.0 km to Ch 0.7 km	233	233	233	233	233	74	93	102	104	62	Jun 2027 to Jun 2027
	Ch 0.7 km to Ch 0.8 km	233	233	233	233	233	74	91	91	104	62	Jun 2027 to Jun 2027
	Ch 0.8 km to Ch 1.4 km	233	233	233	233	233	74	92	92	104	62	Jun 2027 to Jun 2027
	Ch 1.4 km to Ch 3.0 km	233	233	233	233	233	74	91	91	131	65	Jun 2027 to Jun 2027
	Ch 3.0 km to Ch 13.0 km	0	0	0	0	0	74	91	91	131	65	Jun 2027 to Jun 2027
	Ch 13.0 km to Ch 121.6 km	0	0	0	0	0	74	91	91	91	60	May 2025 to Jul 2025

Authority/road name	Road section	Light vehicle trips in year of construction					Heavy vehicle trips in year of construction					Peak construction months
		2024	2025	2026	2027	2028	2024	2025	2026	2027	2028	
Ipswich Motorway (17A)	Ch 0.0 km to Ch 3.7 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
	Ch 3.7 km to Ch 6.4 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
	Ch 6.4 km to Ch 8.3 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
Leichhardt Highway (26C)	Ch 205.2 km to Ch 220.1 km	0	0	0	0	0	74	91	91	91	60	May 2025 to Jul 2025
	Ch 220.1 km to Ch 222.4 km	0	0	0	0	0	25	34	35	31	20	May 2026 to May 2026
	Ch 222.4 km to Ch 224.1 km	0	0	0	0	0	25	34	35	31	20	May 2026 to May 2026
Logan Motorway (210A)	Ch 0.0 km to Ch 14.5 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
Millmerran-Inglewood Road (337)	Ch 0.0 km to Ch 2.5 km	0	0	0	0	0	285	305	30	10	5	Nov 2025 to Nov 2025
	Ch 2.5 km to Ch 3.5 km	14	14	14	14	14	260	326	50	38	8	Nov 2025 to Nov 2025
	Ch 3.5 km to Ch 6.2 km	92	92	92	92	92	260	332	60	18	5	Nov 2025 to Nov 2025
	Ch 6.2 km to Ch 9.0 km	85	85	85	85	85	260	331	234	18	4	Nov 2025 to Nov 2025
	Ch 9.0 km to Ch 13.1 km	70	70	70	70	70	260	330	145	18	4	Nov 2025 to Nov 2025
	Ch 13.1 km to Ch 14.0 km	70	70	70	70	70	261	326	132	21	4	Aug 2025 to Aug 2025
	Ch 14.0 km to Ch 17.3 km	56	56	56	56	56	258	309	115	94	13	Aug 2025 to Aug 2025
	Ch 17.3 km to Ch 18.1 km	56	56	56	56	56	258	273	407	93	12	Jan 2026 to Jan 2026
	Ch 18.1 km to Ch 21.8 km	49	49	49	49	49	258	272	406	93	12	Jan 2026 to Jan 2026
	Ch 21.8 km to Ch 28.0 km	35	35	35	35	35	256	271	307	90	10	Jan 2026 to Jan 2026
	Ch 28.0 km to Ch 33.0 km	21	21	21	21	21	256	270	307	87	7	Jan 2026 to Jan 2026
	Ch 33.0 km to Ch 35.6 km	7	7	7	7	7	256	270	302	87	7	Jan 2026 to Jan 2026
	Ch 35.6 km to Ch 37.7 km	0	0	0	0	0	254	254	10	86	7	Feb 2025 to Mar 2025
	Ch 37.7 km to Ch 39.8 km	0	0	0	0	0	254	294	10	86	7	Mar 2025 to Mar 2025
	Ch 39.8 km to Ch 41.9 km	14	14	14	14	14	253	293	8	86	7	Mar 2025 to Mar 2025
Millmerran-Inglewood Road (337)	Ch 41.9 km to Ch 45.9 km	21	21	21	21	21	8	61	9	8	3	Mar 2025 to Mar 2025
	Ch 45.9 km to Ch 47.6 km	28	28	28	28	28	8	60	9	8	3	Mar 2025 to Mar 2025
	Ch 47.6 km to Ch 53.3 km	28	28	28	28	28	8	90	9	8	3	Jun 2025 to Jul 2025
	Ch 53.3 km to Ch 55.7 km	35	35	35	35	35	10	100	11	50	3	Jun 2025 to Jul 2025
	Ch 55.7 km to Ch 56.6 km	35	35	35	35	35	10	31	11	50	3	Apr 2027 to Apr 2027
	Ch 56.6 km to Ch 59.2 km	112	184	135	135	135	10	31	11	50	3	Mar 2025 to Mar 2025
	Ch 59.2 km to Ch 61.0 km	112	184	135	135	135	11	31	11	80	3	Mar 2025 to Mar 2025
	Ch 61.0 km to Ch 65.7 km	98	170	121	121	121	138	158	11	80	3	Mar 2025 to Mar 2025
	Ch 65.7 km to Ch 68.7 km	91	163	114	114	114	456	160	13	91	2	Nov 2024 to Nov 2024

Authority/road name	Road section	Light vehicle trips in year of construction					Heavy vehicle trips in year of construction					Peak construction months
		2024	2025	2026	2027	2028	2024	2025	2026	2027	2028	
Millmerran-Leyburn Road (335)	Ch 0.0 km to Ch 2.0 km	14	14	14	14	14	0	61	62	0	0	Feb 2026 to Mar 2026
	Ch 2.0 km to Ch 2.2 km	0	0	0	0	0	0	60	61	0	0	Feb 2026 to Mar 2026
Port Drive (NA24)	Ch 0.0 km to Ch 5.0 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
Port of Brisbane Motorway (U27)	Ch 0.0 km to Ch 6.0 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
Texas-Yelarbon Road (2322)	Ch 53.3 km to Ch 54.6 km	0	0	0	0	0	0	40	0	0	0	Sep 2025 to Nov 2025
Toowoomba-Athol Road (316)	Ch 2.1 km to Ch 16.8 km	92	92	92	92	92	7	7	7	7	7	May 2025 to Jul 2026
Toowoomba-Cecil Plains Road (324)	Ch 2.0 km to Ch 6.0 km	0	0	0	0	0	4	15	10	4	0	Nov 2025 to Nov 2025
	Ch 6.0 km to Ch 6.4 km	0	0	0	0	0	4	13	10	0	0	Nov 2025 to Nov 2025
	Ch 6.4 km to Ch 8.3 km	0	0	0	0	0	7	31	14	4	0	Nov 2025 to Nov 2025
	Ch 8.3 km to Ch 9.2 km	0	0	0	0	0	9	32	15	85	3	Jun 2027 to Jun 2027
	Ch 9.2 km to Ch 10.0 km	0	0	0	0	0	16	77	23	27	1	Nov 2025 to Nov 2025
	Ch 10.0 km to Ch 10.1 km	21	21	21	21	21	16	77	23	27	1	Nov 2025 to Nov 2025
	Ch 10.1 km to Ch 10.3 km	21	21	21	21	21	16	138	22	27	2	Nov 2025 to Nov 2025
	Ch 10.3 km to Ch 12.1 km	21	21	21	21	21	1	139	6	15	2	Nov 2025 to Nov 2025
	Ch 12.1 km to Ch 14.5 km	21	21	21	21	21	1	233	233	13	3	Dec 2025 to Jan 2026
	Ch 14.5 km to Ch 16.3 km	7	7	7	7	7	10	271	271	23	3	Dec 2025 to Jan 2026
Toowoomba Connection Road (315)	Ch 26.3 km to Ch 26.9 km	0	0	0	0	0	0	2	4	4	0	Nov 2026 to May 2027
	Ch 26.9 km to Ch 27.1 km	42	42	42	42	42	0	2	4	4	0	Nov 2026 to May 2027
Toowoomba Bypass (319A)	Ch 0.0 km to Ch 26.8 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
Toowoomba Bypass (319B)	Ch 0.0 km to Ch 0.6 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
	Ch 0.6 km to Ch 3.2 km	0	0	0	0	0	330	412	126	126	78	May 2025 to May 2025
	Ch 3.2 km to Ch 4.1 km	0	0	0	0	0	330	412	126	126	78	May 2025 to May 2025
	Ch 4.1 km to Ch 13.0 km	0	0	0	0	0	343	483	143	148	80	May 2025 to May 2025
Toowoomba Bypass Off-ramp (319B)	Toowoomba Bypass to Warrego Highway	0	0	0	0	0	268	295	20	8	0	Feb 2025 to Sep 2025
	Warrego Highway to Toowoomba Bypass	0	0	0	0	0	268	295	20	8	0	Feb 2025 to Sep 2025
	Toowoomba Bypass to Toowoomba-Cecil Plains Road	0	0	0	0	0	0	133	0	0	0	Nov 2025 to Nov 2025
	Toowoomba-Cecil Plains Road to Toowoomba Bypass	0	0	0	0	0	0	133	0	0	0	Nov 2025 to Nov 2025

Authority/road name	Road section	Light vehicle trips in year of construction					Heavy vehicle trips in year of construction					Peak construction months
		2024	2025	2026	2027	2028	2024	2025	2026	2027	2028	
	Toowoomba Bypass to Toowoomba-Cecil Plains Road	0	0	0	0	0	15	70	18	27	2	Nov 2025 to Nov 2025
	Toowoomba-Cecil Plains Road to Toowoomba Bypass	0	0	0	0	0	15	72	20	28	2	Nov 2025 to Nov 2025
Warrego Highway (18A)	Ch 0.0 km to Ch 7.2 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
	Ch 7.2 km to Ch 15.1 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
	Ch 15.1 km to Ch 18.9 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
	Ch 18.9 km to Ch 28.9 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
	Ch 28.9 km to Ch 36.6 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
	Ch 36.6 km to Ch 55.5 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
	Ch 55.5 km to Ch 75.4 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
	Ch 75.4 km to Ch 79.6 km	0	0	0	0	0	95	117	117	117	78	May 2025 to Jul 2025
Warrego Highway (18B)	Ch 0.0 km to Ch 0.4 km	42	42	42	42	42	268	297	20	13	0	Nov 2026 to May 2027
	Ch 0.4 km to Ch 1.5 km	42	42	42	42	42	268	297	20	13	0	Jun 2025 to Sep 2025
	Ch 1.5 km to Ch 2.4 km	28	28	28	28	28	262	264	11	81	2	Jun 2025 to Sep 2025
	Ch 2.4 km to Ch 4.5 km	14	14	14	14	14	262	263	11	7	0	Jun 2025 to Sep 2025
	Ch 4.5 km to Ch 5.0 km	14	14	14	14	14	269	270	18	14	7	Jun 2025 to Sep 2025
	Ch 5.0 km to Ch 5.3 km	7	7	7	7	7	269	270	38	14	7	Jun 2025 to Sep 2025
	Ch 5.3 km to Ch 6.2 km	7	7	7	7	7	269	270	38	14	7	Jun 2025 to Sep 2025
Warrego Highway Off-ramp (18B)	Warrego Highway to Kingsthorpe Overpass	7	7	7	7	7	269	270	38	14	7	Jun 2025 to Sep 2025
TfNSW												
Newell Highway	River Road to NSW/QLD Border	0	0	0	0	0	23	13	5	2	0	Sep 2024 to Sep 2024
BSC												
Noondoo Thallon Road	GrainCorp Thallon to Carnarvon Highway	0	0	0	0	0	42	52	52	52	35	May 2025 to Jul 2025
GRC												
Boodle Street	Holcim Concrete Goondiwindi to Hunt Street	0	0	0	0	0	0	1	1	0	0	Feb 2025 to Jan 2026
Bybera Road	Cunningham Highway to B2G-LDN060.4	7	7	7	7	7	224	36	6	44	0	Nov 2024 to Nov 2024
	B2G-LDN060.4 to Earthworks Area 2A	0	0	0	0	0	188	0	0	0	0	Nov 2024 to Nov 2024

Authority/road name	Road section	Light vehicle trips in year of construction					Heavy vehicle trips in year of construction					Peak construction months
		2024	2025	2026	2027	2028	2024	2025	2026	2027	2028	
Cemetery Road	Access Track to Mooroobie Lane	0	0	0	0	0	0	40	0	0	0	Sep 2025 to Nov 2025
	Cunningham Highway to GrainCorp Goondiwindi	0	0	0	0	0	25	31	31	31	20	May 2025 to Jul 2025
Coolmunda Dam Access	Inglewood Legacy Bore/Coolmunda Dam to Coolmunda Dam Access	0	0	0	0	0	51	51	11	9	0	Sep 2024 to Feb 2025
	Coolmunda Dam Access to Cunningham Highway	0	0	0	0	0	51	51	11	9	0	Sep 2024 to Feb 2025
Cremascos Road	B2G-LDN052.8 to B2G-LDN055.4	14	14	14	14	14	1	3	4	0	0	Jul 2026 to Aug 2026
	B2G-LDN055.4 to B2G-LDN054.2	14	14	14	14	14	0	2	0	0	0	Nov 2025 to Dec 2025
	Cunningham Highway to B2G-LDN052.8	14	14	14	14	14	1	4	6	1	0	Feb 2026 to May 2026
East Sawmill Road	Cunningham Highway to B2G-LDN030.0	7	7	7	7	7	277	318	8	5	0	Feb 2025 to Apr 2025
Elizabeth Street	Cunningham Highway to B2G-LDN065.8	14	14	14	14	14	0	0	2	16	0	Mar 2027 to Apr 2027
Eukabilla Road	Kildonan Road to NS2B-LDN033.2	21	21	21	21	21	11	12	13	20	1	Jun 2027 to Jun 2027
	NS2B-LDN033.2 to NS2B-LDN035.6	7	7	7	7	7	5	5	12	17	0	Jun 2027 to Jun 2027
Fosters Road	Cunningham Highway to Borrow Site #9 (Fosters Road)	0	0	0	0	0	497	95	0	0	0	Nov 2024 to Nov 2024
Georges Lane	B2G-LDN000.9 to Yelarbon Kurumbul Road	7	7	7	7	7	2	0	2	3	0	Oct 2027 to Nov 2027
Grays Road	Millmerran-Inglewood Road to Mosquito Creek Road	0	0	0	0	0	0	69	0	0	0	Jun 2025 to Jul 2025
Hunt Street	Leichhardt Highway to Boodle Street	0	0	0	0	0	0	1	1	0	0	Feb 2025 to Jan 2026
Kildonan Road	Eukabilla Road to NS2B-LDN031.0	0	0	0	0	0	13	5	12	18	0	Jun 2027 to Jun 2027
	NS2B-LDN031.0 to South Kurumbul Road	0	0	0	0	0	163	194	12	18	0	Feb 2025 to Apr 2025
	South Kurumbul Road to Cunningham Highway	0	0	0	0	0	150	191	1	1	0	Feb 2025 to Apr 2025
	Cunningham Highway to Eukabilla Road	21	21	21	21	21	24	15	10	3	1	Sep 2024 to Sep 2024
McDougalls Road	B2G-LDN049.8 to McDougalls Road	7	7	7	7	7	25	25	3	23	0	Nov 2024 to Feb 2025
	McDougalls Road to Cunningham Highway	7	7	7	7	7	25	25	3	23	0	Nov 2024 to Feb 2025

Authority/road name	Road section	Light vehicle trips in year of construction					Heavy vehicle trips in year of construction					Peak construction months
		2024	2025	2026	2027	2028	2024	2025	2026	2027	2028	
Mooroobie Lane	Cemetery Road to Borrow Site #2 (Mooroobie Lane)	0	0	0	0	0	0	40	0	0	0	Sep 2025 to Nov 2025
	Borrow Site #2 (Mooroobie Lane) to Mooroobie Lane	0	0	0	0	0	0	81	0	0	0	Sep 2025 to Nov 2025
	Mooroobie Lane to Wondalli Kurumbul Road	0	0	0	0	0	0	81	0	0	0	Sep 2025 to Nov 2025
Mosquito Creek Road	Borrow Site #10 (Mosquito Road) to Grays Road	0	0	0	0	0	0	69	0	0	0	Jun 2025 to Jul 2025
Queen Street South	Yelarbon Kurumbul to B2G-LDN016.0	7	7	7	7	7	22	1	19	9	0	Aug 2024 to Sep 2024
Silo Street	Barwon Highway to GrainCorp Talwood	0	0	0	0	0	3	4	4	4	2	May 2025 to Jul 2025
South Kurumbul Road	Kildonan Road to Yelarbon Kurumbul Road	0	0	0	0	0	13	3	12	17	0	Jun 2027 to Jun 2027
South Toobeah Road	GrainCorp Toobeah to Barwon Highway	0	0	0	0	0	4	5	5	5	3	May 2025 to Jul 2025
Springborg Road	Cunningham Highway to B2G-LDN037.6	7	7	7	7	7	17	2	14	10	0	Aug 2024 to Sep 2024
Suttons Road	B2G-LDN030.0 to Access Track (Off Suttons Road)	0	0	0	0	0	150	190	0	0	0	Feb 2025 to Apr 2025
Thornton Road	B2G-LDN069.0 to B2G-LDN067.6	7	7	7	7	7	12	12	4	12	0	Nov 2024 to Feb 2025
	B2G-LDN067.6 to Millmerran-Inglewood Road	7	7	7	7	7	322	97	6	12	0	Nov 2024 to Nov 2024
Town Common Road	Boral Concrete Goondiwindi to Barwon Highway	0	0	0	0	0	2	11	11	0	0	Dec 2025 to Mar 2026
Whetstone Access	B2G-LDN044.5 to Cunningham Highway	56	127	79	79	79	54	30	4	33	0	Mar 2025 to Mar 2025
Wondalli Kurumbul Road	Yelarbon Kurumbul Road to Mooroobie Lane	0	0	0	0	0	0	81	0	0	0	Sep 2025 to Nov 2025
Wongavale Yugilbar Road	Millmerran-Inglewood Road to B2G-LDN081.0	7	7	7	7	7	4	13	2	43	0	Apr 2027 to Apr 2027
Woodcocks Road	Cunningham Highway to Borrow Site #4 (Woodcocks Road)	0	0	0	0	0	0	40	0	0	0	Sep 2025 to Nov 2025

Authority/road name	Road section	Light vehicle trips in year of construction					Heavy vehicle trips in year of construction					Peak construction months
		2024	2025	2026	2027	2028	2024	2025	2026	2027	2028	
Yelarbon Kurumbul Road	South Kurumbul Road to B2G-LDN006.3	7	7	7	7	7	11	3	11	19	0	Jun 2027 to Jun 2027
	B2G-LDN006.3 to Wondalli Kurumbul Road	14	14	14	14	14	0	81	12	23	0	Sep 2025 to Nov 2025
	Wondalli Kurumbul Road to Yelarbon Kurumbul Road	14	14	14	14	14	0	0	12	23	0	Jun 2027 to Jun 2027
	Yelarbon Kurumbul Road to B2G-LDN020.3	21	21	21	21	21	23	2	30	30	1	Apr 2026 to Jun 2026
	B2G-LDN020.3 to B2G-LDN025.9	28	28	28	28	28	23	2	50	33	1	Apr 2026 to Jun 2026
	B2G-LDN025.9 to Cunningham Highway	42	42	42	42	42	48	86	62	42	1	Sep 2025 to Nov 2025
MPSC												
Boggabilla Weir Access	River Road to Boggabilla Weir	0	0	0	0	0	23	13	5	2	0	Sep 2024 to Sep 2024
River Road	Newell Highway to Boggabilla Weir Access	0	0	0	0	0	23	13	5	2	0	Sep 2024 to Sep 2024
TRC												
Alderley Street	Greenwattle Street to Toowoomba Workforce Origin 2	0	0	0	0	0	1	1	1	1	1	Jul 2024 to Mar 2028
	Toowoomba Workforce Origin B to Toowoomba-Athol Road	92	92	92	92	92	7	7	7	7	7	Jul 2024 to Mar 2028
	Toowoomba-Athol Road to Boral/Wagner Concrete Facilities	0	0	0	0	0	0	1	1	0	0	May 2025 to Jul 2026
Athol School Road	B2G-LDN187.8 to B2G-LDN188.2	0	0	0	0	0	576	310	15	4	0	Sep 2024 to Nov 2024
	B2G-LDN188.2 to Gore Highway	14	14	14	14	14	576	311	15	14	1	Sep 2024 to Nov 2024
Biddeston Southbrook Road	Gore Highway to B2G-LDN183.8	7	7	7	7	7	0	139	139	3	0	Dec 2025 to Jan 2026
Blackwell Road	Gore Highway to Millmerran Quarry	0	0	0	0	0	0	0	0	42	4	Jun 2027 to Jul 2027
	Millmerran Quarry to B2G-LDN120.2	0	0	0	0	0	0	0	0	87	11	Apr 2027 to Apr 2027
	B2G-LDN120.2 to Millmerran-Inglewood Road	14	14	14	14	14	3	17	17	91	9	Apr 2027 to Apr 2027
Bligh Street	Six Mile Road to Boral Concrete Millmerran	0	0	0	0	0	0	11	12	7	0	Jan 2026 to Jan 2026

Authority/road name	Road section	Light vehicle trips in year of construction					Heavy vehicle trips in year of construction					Peak construction months
		2024	2025	2026	2027	2028	2024	2025	2026	2027	2028	
Brimblecombe Road	Toowoomba-Cecil Plains Road to Brimblecombe Road	14	14	14	14	14	10	40	41	11	0	Mar 2026 to Mar 2026
	Brimblecombe Road to WL 194467R	0	0	0	0	0	10	39	39	10	0	Jan 2025 to Mar 2026
Bushy Lane	B2G-LDN183.0 to Gore Highway	14	14	14	14	14	4	21	6	17	1	Mar 2025 to Nov 2025
Campbell Street	Millmerran-Inglewood Road to Saleyards Road	106	106	106	106	106	0	10	11	27	3	Jun 2027 to Jul 2027
	Saleyards Road to Gore Highway	106	106	106	106	106	0	9	10	7	0	Jan 2026 to Jan 2026
Chamberlain Road	Warrego Highway to B2G-LDN204.2	7	7	7	7	7	0	1	3	4	0	Apr 2027 to May 2027
Commodore Peak Road	Scragg Road to Millmerran-Inglewood Road	14	14	14	14	14	0	2	88	1	0	Jan 2026 to Feb 2026
Desmonds Lane	Yarranlea Road to B2G-LDN163.3	7	7	7	7	7	0	0	5	1	0	May 2026 to May 2026
Dieckmann Road	B2G-LDN150.5 to Gore Highway	14	14	14	14	14	1	287	49	23	0	Nov 2025 to Nov 2025
Draper Road	Steger Road to B2G-FBW206.9	14	14	14	14	14	0	0	0	0	0	Jul 2024 to Mar 2028
Drayton Wellcamp Road	Wellcamp Westbrook Road to Access Track	0	0	0	0	0	1	1	1	80	3	Jun 2027 to Jun 2027
	Access Track to Greenwattle Street	0	0	0	0	0	1	1	1	1	1	Jul 2024 to Mar 2028
Florence Street	Gore Highway to West Street	0	0	0	0	0	0	1	1	0	0	Feb 2025 to Jul 2026
Forestry Road	Access Track to Millmerran-Inglewood Road	0	0	0	0	0	0	69	0	0	0	Jun 2025 to Jul 2025
	Millmerran-Inglewood Road to Earthworks Area 3B	0	0	0	0	0	0	69	0	0	0	Jun 2025 to Jul 2025
Fysh Road	B2G-LDN147.1 to Gore Highway	14	14	14	14	14	0	0	0	30	2	Jun 2027 to Jul 2027
Gap Road	Gore Highway to Grevillea Street	0	0	0	0	0	0	1	7	2	0	Jun 2026 to Jun 2026
Geitz Road	B2G-LDN179.0 to Linthorpe Valley Road	7	7	7	7	7	0	0	0	21	1	Mar 2027 to Apr 2027
Gilgai Lane	B2G-LDN144.6 to Gore Highway	14	14	14	14	14	0	0	10	12	0	Mar 2027 to May 2027
Grevillea Street	Boral Concrete Pittsworth to Gap Road	0	0	0	0	0	0	1	7	2	0	Jun 2026 to Jun 2026
Hall Road	B2G-LDN139.0 to Gore Highway	7	7	7	7	7	1	14	14	17	1	Jun 2027 to Jul 2027
Heckendorf Road	Borrow Site #14 (Heckendorf Road) to B2G-LDN116.0	0	0	0	0	0	0	136	292	0	0	Jan 2026 to Feb 2026
	B2G-LDN116.0 to Millmerran-Inglewood Road	0	0	0	0	0	0	136	292	12	1	Jan 2026 to Feb 2026

Authority/road name	Road section	Light vehicle trips in year of construction					Heavy vehicle trips in year of construction					Peak construction months
		2024	2025	2026	2027	2028	2024	2025	2026	2027	2028	
Holcim Australia Toowoomba Access	Drayton Wellcamp Road to Holcim Australia Toowoomba Quarry	0	0	0	0	0	0	0	0	79	2	Jun 2027 to Jun 2027
Kahler Road	Murlaggan Road to B2G-LDN165.6	7	7	7	7	7	0	0	0	4	1	Mar 2027 to Apr 2027
Kingsthorpe Haden Overpass	Warrego Highway Off-ramp to Kingsthorpe Haden Road	7	7	7	7	7	269	270	38	14	7	Jun 2025 to Sep 2025
Kingsthorpe Haden Road	Kingsthorpe Haden Overpass to Warrego Highway	7	7	7	7	7	269	270	38	14	7	Jun 2025 to Sep 2025
Kooroongarra Road	Borrow Site #13 (Kooroongarra Road) to Millwood Road	0	0	0	0	0	0	136	0	0	0	Aug 2025 to Nov 2025
	Millmerran-Inglewood Road to Commodore Mine	0	0	0	0	0	0	0	177	0	0	Jan 2026 to Feb 2026
Leesons Road	Warrego Highway to Steger Road	14	14	14	14	14	0	134	0	79	2	Nov 2025 to Nov 2025
	Steger Road to B2G-LDN206.3	14	14	14	14	14	6	140	30	85	2	Nov 2025 to Nov 2025
Linthorpe Road	Gore Highway to B2G-LDN175.5	7	7	7	7	7	264	446	59	24	1	Aug 2025 to Sep 2025
Linthorpe Valley Road	Geitz Road to Gore Highway	7	7	7	7	7	0	0	0	21	1	Mar 2027 to Apr 2027
Lochaber Road	Gore Highway to B2G-LDN172.0	7	7	7	7	7	0	0	3	7	1	Mar 2027 to Apr 2027
	B2G-LDN172.0 to B2G-LDN172.6	7	7	7	7	7	0	0	2	0	0	Aug 2026 to Aug 2026
McDougall Street	Humes Precast Toowoomba to Toowoomba-Cecil Plains Road	0	0	0	0	0	4	15	10	4	0	Nov 2025 to Nov 2025
Millwood Road	Millmerran-Inglewood Road to B2G-LDN112.1	14	14	14	14	14	1	144	99	23	2	Aug 2025 to Nov 2025
	B2G-LDN112.1 to Millwood Road	0	0	0	0	0	0	136	0	0	0	Aug 2025 to Nov 2025
	Millwood Road to Kooroongarra Road	0	0	0	0	0	0	136	0	0	0	Aug 2025 to Nov 2025
Moffatt Reserve Road	Millmerran-Inglewood Road to Millmerran Power Station	0	0	0	0	0	11	71	69	15	0	Jul 2025 to Aug 2025
Murlaggan Road	B2G-LDN164.3 to Kahler Road	14	14	14	14	14	296	296	0	9	1	Mar 2025 to Apr 2025
	Kahler Road to Gore Highway	21	21	21	21	21	296	296	0	13	1	Mar 2025 to Apr 2025
Oakey-Pittsworth Road	Gore Highway to B2G-LDN171.0	7	7	7	7	7	0	0	6	0	0	Jun 2026 to Jun 2026
O'Mara Road	Toowoomba-Cecil Plains Road to Warrego Highway	0	0	0	0	0	8	46	12	87	2	Jun 2027 to Jun 2027
Owens Scrub Road	B2G-LDN129.5 to B2G-LDN128.2	0	0	0	0	0	3	20	20	30	3	Jun 2027 to Jul 2027
	B2G-LDN128.2 to B2G-LDN130.0	0	0	0	0	0	279	20	20	30	3	Sep 2024 to Nov 2024
	B2G-LDN130.0 to Millmerran-Inglewood Road	14	14	14	14	14	526	250	22	30	3	Oct 2024 to Nov 2024

Authority/road name	Road section	Light vehicle trips in year of construction					Heavy vehicle trips in year of construction					Peak construction months
		2024	2025	2026	2027	2028	2024	2025	2026	2027	2028	
Paint Mine Road	Gore Highway to B2G-LDN173.5	7	7	7	7	7	0	1	1	5	1	Oct 2027 to Nov 2027
Paton Road	Millmerran-Inglewood Road to B2G-LDN104.5	14	14	14	14	14	0	0	1	33	3	Jun 2027 to Jul 2027
Quarry Road Access	Tummaville Road to Quarry	0	0	0	0	0	0	164	0	38	5	Aug 2025 to Nov 2025
Saleyards Road	Campbell Street to Gore Highway	0	0	0	0	0	0	1	1	27	3	Jun 2027 to Jul 2027
Schwarten Road	Millmerran-Inglewood Road to B2G-LDN126.9	7	7	7	7	7	0	2	2	0	0	Dec 2025 to Mar 2026
Scragg Road	Commodore Peak Road to B2G-LDN123.6	14	14	14	14	14	0	2	88	1	0	Jan 2026 to Feb 2026
	B2G-LDN123.6 to B2G-LDN123.8	0	0	0	0	0	0	2	0	0	0	Dec 2025 to Dec 2025
Scrubby Road	Bland Quarry Pittsworth to Gore Highway	0	0	0	0	0	0	1550	1550	73	6	Dec 2025 to Jan 2026
Steger Road	Warrego Highway to New Hope Recycled Water Pipeline	14	14	14	14	14	16	81	38	32	0	Nov 2025 to Nov 2025
	New Hope Recycled Water Pipeline to Draper Road	14	14	14	14	14	6	30	30	7	0	Dec 2025 to Oct 2026
	Draper Road to Leesons Road	0	0	0	0	0	6	30	30	7	0	Dec 2025 to Oct 2026
Tummaville Road	Access Track to Gore Highway	0	0	0	0	0	0	164	0	38	5	Aug 2025 to Nov 2025
Turallin Road	Gore Highway to the Turallin Facility	233	233	233	233	233	0	0	0	0	0	Jul 2024 to Mar 2028
Ware Street	GrainCorp Brookstead to B2G-LDN153.1	0	0	0	0	0	21	26	26	26	17	May 2025 to Jul 2025
	B2G-LDN153.1 to Gore Highway	14	14	14	14	14	21	27	38	26	18	May 2026 to May 2026
	Gore Highway to B2G-LDN150.9	0	0	0	0	0	0	0	0	8	2	Mar 2027 to Apr 2027
Wellcamp Westbrook Road	Drayton Wellcamp Road to Toowoomba-Cecil Plains Road	0	0	0	0	0	1	1	1	80	3	Jun 2027 to Jun 2027
West Street	Gore Highway to Florence Street	0	0	0	0	0	0	10	11	7	0	Jan 2026 to Jan 2026
	Florence Street to Six Mile Road	0	0	0	0	0	0	11	12	7	0	Jan 2026 to Jan 2026
Yarranlea Road	Gore Highway to B2G-LDN161.0	14	14	14	14	14	4	1415	1415	32	2	Dec 2025 to Jan 2026
	B2G-LDN161.0 to Desmonds Lane	7	7	7	7	7	0	0	5	1	0	May 2026 to May 2026

20.5.2.3 Traffic growth rate and peak hour factor

As discussed in Section 20.3.3.1, the traffic growth rate and peak hour factor for all road links are determined based on the closest DTMR AADT site to the road link. The growth rates for assessment have been determined based on the following order of hierarchy:

1. 10-year growth rate
2. 5-year growth rate
3. 1-year growth rate
4. 3 per cent per annum (DTMR, 2018c) states 'in the absence of site-specific data, an annual growth rate of 3 per cent per annum should be adopted').

The growth rate was adopted from the closest DTMR AADT sites for all road links as many LGR had no historical counts to determine growth in the area. In the absence of available historical count data or forecast models, it was determined that the nearest DTMR AADT site could be adopted as a representative of growth in the area. This assumption is considered reasonable for the revised reference design; however, further consideration may be required in detailed design to adopt growth rates based on local council preferences.

Similar to growth rate, the peak hour factor was also adopted from the nearest DTMR AADT site, using the DTMR hourly summary data available through the Queensland Government Open Data Portal. This approach was adopted as many intersection and link counts had very low traffic volumes. It was determined using the intersection counts to determine peak hour factors would be inappropriate due to significant fluctuation between days of the week. An analysis was undertaken of the intersection and link counts with higher traffic volumes across the study area and the peak hour factor was compared with that of the closest DTMR AADT site. Adopted background traffic growth rate and peak hour factor for each road section are presented in Appendix AA: Traffic Impact Assessment.

Based on the dominant agricultural land uses of the impact assessment area, traffic volumes on the road network are likely to increase during periods of harvest. Harvest periods for broadacre crops in southern Queensland are shown in Table 20-35.

During harvest, heavy vehicle usage on the local and State roads in the impact assessment increases as trucks transport grain, and tractors and harvesters move between properties. Farming machinery is generally much larger and slower than other vehicles using the roads and may result in localised delays. The impact of seasonal variation was considered as part of the analyses, especially at road-rail interface locations, through the following:

- The 95th percentile output results from Sidra modelling results were adopted instead of the industry standard 85th percentile outputs. By doing so, the reported Sidra analysis results are considered to be conservative as they account for additional vehicle queue and delay, which might be induced through higher traffic volumes and slower moving vehicles.
- The LoS thresholds and associated K-values used within the analysis per road type are derived from the *Cost-benefit Analysis Manual, Part 4: Technical guide* (DTMR, 2011). This provides for upper LoS threshold limits, which accounts for micro fluctuations and peaks in traffic throughout the year.

TABLE 20-35 HARVEST PERIODS FOR BROADACRE CROPS

Broadacre crops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Barley										■	■	
Chickpea											■	■
Cotton			■	■	■	■						
Maize	■	■	■	■								■
Millet	■	■	■	■	■							
Mungbean	■	■	■	■								■
Navy beans			■	■	■	■						
Peanuts			■	■	■	■						
Sorghum	■	■	■	■								
Soybeans		■	■	■	■							
Sunflower	■	■	■	■	■							
Wheat										■	■	

Source: Agriculture in Southern Queensland, Southern Queensland Agriculture Industry Development Group (2018)

20.5.2.4 Traffic comparison on road links

An assessment of the impacts of construction traffic movements for the Project on the existing road links was undertaken by comparing projected traffic volumes without (background) and with the Project. Table 20-36 outlines the anticipated per cent increase for all road links, with numbers in dark red where the per cent increase is equal to or larger than the 5 per cent threshold specified within the GTIA. It is worth noting that, in some instances, low background traffic volumes have contributed to elevated percentage differences with the addition of Project construction traffic.

A full traffic comparison analysis is presented in Appendix AA: Traffic Impact Assessment.

TABLE 20-36 ANTICIPATED TRAFFIC INCREASES ON ROAD LINKS

Authority/road names	Road section	Road link percentage increase				
		2024	2025	2026	2027	2028
DTMR						
Barwon Highway (31A)	Ch 0.0 km to Ch 0.8 km	4.50%	5.80%	5.90%	5.50%	3.70%
	Ch 0.8 km to Ch 2.0 km	4.50%	5.80%	5.90%	5.50%	3.70%
	Ch 2.0 km to Ch 45.9 km	14.70%	18.20%	18.20%	18.20%	12.10%
	Ch 45.9 km to Ch 88.0 km	13.60%	16.80%	16.80%	16.80%	11.10%
Barwon Highway (31B)	Ch 0.0 km to Ch 1.6 km	37.40%	46.20%	46.20%	46.20%	30.60%
	Ch 1.6 km to Ch 66.8 km	34.90%	43.10%	43.10%	43.10%	28.60%
Carnarvon Highway (24A)	Ch 40.5 km to Ch 73.5 km	42.70%	52.70%	52.70%	52.70%	34.90%
Charlton Connection Road (320)	Ch 0.0 km to Ch 1.6 km	0.00%	0.10%	0.20%	0.20%	0.00%
Cunningham Highway (17C)	Ch 94.4 km to Ch 96.2 km	6.10%	6.00%	1.30%	1.00%	0.00%
	Ch 96.2 km to Ch 97.5 km	9.50%	9.40%	10.00%	27.10%	0.00%
	Ch 97.5 km to Ch 105.7 km	69.20%	14.80%	10.00%	27.10%	0.00%
	Ch 105.7 km to Ch 107.4 km	60.30%	37.70%	23.70%	31.30%	13.60%
	Ch 107.4 km to Ch 107.6 km	42.60%	26.20%	15.80%	20.00%	8.70%
Cunningham Highway (17D)	Ch 0.0 km to Ch 2.0 km	71.60%	44.20%	26.90%	34.20%	14.80%
	Ch 2.0 km to Ch 3.9 km	71.60%	43.80%	27.30%	34.20%	14.80%
	Ch 3.9 km to Ch 10.2 km	37.70%	37.50%	25.60%	26.90%	13.80%
	Ch 10.2 km to Ch 13.9 km	35.60%	35.40%	22.80%	24.90%	11.80%
	Ch 13.9 km to Ch 18.5 km	38.20%	38.00%	22.20%	21.40%	10.80%
	Ch 18.5 km to Ch 27.1 km	27.80%	27.60%	13.00%	8.30%	1.30%
	Ch 27.1 km to Ch 29.3 km	31.00%	28.80%	12.20%	8.80%	2.30%
	Ch 29.3 km to Ch 34.7 km	28.00%	21.40%	12.30%	8.90%	2.30%
	Ch 34.7 km to Ch 39.6 km	28.00%	21.40%	12.30%	8.90%	2.30%
	Ch 39.6 km to Ch 40.3 km	32.30%	31.70%	12.20%	9.40%	3.30%
	Ch 40.3 km to Ch 40.5 km	10.30%	9.80%	12.20%	9.20%	3.30%
	Ch 40.5 km to Ch 43.9 km	9.80%	15.60%	10.20%	9.20%	9.10%
	Ch 43.9 km to Ch 46.3 km	3.60%	9.40%	4.10%	3.20%	3.10%
	Ch 46.3 km to Ch 88.0 km	3.60%	4.20%	4.10%	3.20%	3.10%
	Ch 88.0 km to Ch 88.2 km	2.80%	3.20%	3.40%	3.10%	2.50%
	Ch 88.2 km to Ch 90.0 km	1.30%	1.60%	1.60%	1.30%	1.30%

Authority/road names	Road section	Road link percentage increase				
		2024	2025	2026	2027	2028
Gateway Motorway (N239)	Ch 0.0 km to Ch 15.0 km	0.20%	0.20%	0.20%	0.20%	0.10%
Gateway Motorway Extension (N332)	Ch 0.0 km to Ch 10.0 km	0.50%	0.60%	0.60%	0.50%	0.30%
Gore Highway (28A)	Ch 0.0 km to Ch 2.2 km	13.50%	17.20%	6.90%	6.80%	4.70%
	Ch 2.2 km to Ch 5.4 km	30.50%	24.00%	6.40%	6.10%	4.30%
	Ch 5.4 km to Ch 6.7 km	30.10%	23.50%	6.00%	5.70%	3.90%
	Ch 6.7 km to Ch 7.7 km	29.90%	23.30%	8.60%	5.50%	3.80%
	Ch 7.7 km to Ch 11.2 km	29.30%	22.30%	8.10%	5.00%	3.40%
	Ch 11.2 km to Ch 15.3 km	29.10%	22.10%	7.90%	5.10%	3.20%
	Ch 15.3 km to Ch 17.5 km	20.80%	13.60%	9.20%	4.60%	3.10%
	Ch 17.5 km to Ch 19.0 km	20.60%	13.40%	9.00%	4.50%	2.90%
	Ch 19.0 km to Ch 20.3 km	20.30%	13.20%	8.80%	4.50%	2.70%
	Ch 20.3 km to Ch 21.5 km	38.30%	24.70%	16.40%	8.20%	4.90%
	Ch 21.5 km to Ch 23.2 km	37.60%	23.10%	15.70%	8.20%	4.60%
	Ch 23.2 km to Ch 25.0 km	21.60%	17.70%	16.90%	10.00%	5.70%
	Ch 25.0 km to Ch 30.1 km	21.60%	85.70%	86.50%	8.10%	5.40%
	Ch 30.1 km to Ch 38.7 km	22.20%	9.40%	9.80%	9.90%	6.30%
	Ch 38.7 km to Ch 41.1 km	22.20%	8.70%	10.30%	9.30%	6.10%
	Ch 41.1 km to Ch 41.7 km	22.20%	8.70%	10.30%	9.20%	6.00%
	Ch 41.7 km to Ch 43.2 km	23.10%	24.50%	12.00%	10.00%	6.70%
	Ch 43.2 km to Ch 44.7 km	23.90%	25.00%	12.40%	10.80%	7.40%
	Ch 44.7 km to Ch 47.6 km	24.70%	25.80%	13.20%	10.70%	8.10%
	Ch 47.6 km to Ch 52.2 km	25.50%	26.60%	13.90%	10.80%	8.80%
	Ch 52.2 km to Ch 53.3 km	26.30%	27.10%	13.10%	11.60%	9.50%
	Ch 53.3 km to Ch 60.8 km	26.80%	28.00%	13.20%	12.70%	9.90%
	Ch 60.8 km to Ch 63.0 km	11.70%	12.40%	12.00%	12.20%	9.70%
Gore Highway (28B)	Ch 0.0 km to Ch 0.7 km	29.30%	31.00%	31.60%	31.60%	27.50%
	Ch 0.7 km to Ch 0.8 km	29.30%	30.80%	30.60%	31.60%	27.50%
	Ch 0.8 km to Ch 1.4 km	29.30%	30.90%	30.70%	31.60%	27.50%
	Ch 1.4 km to Ch 3.0 km	29.30%	30.80%	30.60%	34.10%	27.80%
	Ch 3.0 km to Ch 13.0 km	7.10%	8.70%	8.60%	12.30%	6.10%
	Ch 13.0 km to Ch 121.6 km	7.10%	8.70%	8.60%	8.60%	5.70%

Authority/road names	Road section	Road link percentage increase				
		2024	2025	2026	2027	2028
Ipswich Motorway (17A)	Ch 0.0 km to Ch 3.7 km	0.20%	0.20%	0.20%	0.20%	0.10%
	Ch 3.7 km to Ch 6.4 km	0.20%	0.20%	0.20%	0.20%	0.10%
	Ch 6.4 km to Ch 8.3 km	0.10%	0.20%	0.20%	0.10%	0.10%
Leichhardt Highway (26C)	Ch 205.2 km to Ch 220.1 km	5.80%	7.10%	7.10%	7.10%	4.70%
	Ch 220.1 km to Ch 222.4 km	1.90%	2.60%	2.70%	2.40%	1.60%
	Ch 222.4 km to Ch 224.1 km	1.90%	2.70%	2.70%	2.40%	1.60%
Logan Motorway (210A)	Ch 0.0 km to Ch 14.5 km	0.50%	0.60%	0.60%	0.50%	0.30%
Millmerran-Inglewood Road (337)	Ch 0.0 km to Ch 2.5 km	64.00%	65.70%	6.30%	2.10%	0.90%
	Ch 2.5 km to Ch 3.5 km	61.60%	73.40%	13.30%	10.40%	4.20%
	Ch 3.5 km to Ch 6.2 km	88.10%	105.90%	37.80%	27.40%	24.10%
	Ch 6.2 km to Ch 9.0 km	86.20%	104.00%	79.60%	25.60%	22.20%
	Ch 9.0 km to Ch 13.1 km	82.70%	100.20%	53.90%	22.10%	18.70%
	Ch 13.1 km to Ch 14.0 km	82.80%	99.20%	50.70%	23.00%	18.70%
	Ch 14.0 km to Ch 17.3 km	78.60%	91.40%	43.00%	37.70%	17.40%
	Ch 17.3 km to Ch 18.1 km	78.60%	82.30%	115.80%	37.40%	17.20%
	Ch 18.1 km to Ch 21.8 km	76.80%	80.50%	114.00%	35.50%	15.30%
	Ch 21.8 km to Ch 28.0 km	72.90%	76.50%	85.70%	31.30%	11.40%
	Ch 28.0 km to Ch 33.0 km	69.30%	72.90%	82.10%	27.00%	7.10%
	Ch 33.0 km to Ch 35.6 km	65.70%	69.30%	77.40%	23.40%	3.60%
	Ch 35.6 km to Ch 37.7 km	63.40%	63.60%	2.60%	21.50%	1.80%
	Ch 37.7 km to Ch 39.8 km	63.40%	73.50%	2.60%	21.50%	1.80%
	Ch 39.8 km to Ch 41.9 km	135.90%	151.60%	10.30%	46.40%	9.40%
	Ch 41.9 km to Ch 45.9 km	15.10%	40.30%	14.50%	13.50%	10.90%
	Ch 45.9 km to Ch 47.6 km	18.60%	43.70%	17.80%	16.60%	14.00%
	Ch 47.6 km to Ch 53.3 km	18.60%	58.10%	17.80%	16.60%	14.00%
	Ch 53.3 km to Ch 55.7 km	23.20%	66.80%	22.10%	39.70%	17.10%
	Ch 55.7 km to Ch 56.6 km	23.20%	32.80%	22.10%	39.70%	17.10%
	Ch 56.6 km to Ch 59.2 km	76.20%	84.20%	70.90%	87.00%	63.10%
	Ch 59.2 km to Ch 61.0 km	76.30%	84.30%	70.90%	100.80%	63.10%
	Ch 61.0 km to Ch 65.7 km	133.70%	140.00%	64.00%	94.10%	56.60%
	Ch 65.7 km to Ch 68.7 km	292.20%	137.10%	62.00%	96.20%	53.30%

Authority/road names	Road section	Road link percentage increase				
		2024	2025	2026	2027	2028
Millmerran-Leyburn Road (335)	Ch 0.0 km to Ch 2.0 km	10.70%	52.60%	50.50%	9.00%	8.40%
	Ch 2.0 km to Ch 2.2 km	0.00%	42.10%	40.70%	0.00%	0.00%
Port Drive (NA24)	Ch 0.0 km to Ch 5.0 km	1.50%	1.70%	1.70%	1.60%	1.10%
Port of Brisbane Motorway (U27)	Ch 0.0 km to Ch 6.0 km	1.50%	1.70%	1.70%	1.60%	1.10%
Texas-Yelarbon Road (2322)	Ch 53.3 km to Ch 54.6 km	0.00%	30.80%	0.00%	0.00%	0.00%
Toowoomba-Athol Road (316)	Ch 2.1 km to Ch 16.8 km	5.40%	5.40%	5.40%	5.40%	5.40%
Toowoomba-Cecil Plains Road (324)	Ch 2.0 km to Ch 6.0 km	0.10%	0.50%	0.30%	0.10%	0.00%
	Ch 6.0 km to Ch 6.4 km	0.20%	0.80%	0.60%	0.00%	0.00%
	Ch 6.4 km to Ch 8.3 km	0.40%	1.80%	0.80%	0.30%	0.00%
	Ch 8.3 km to Ch 9.2 km	0.50%	1.90%	0.90%	5.00%	0.20%
	Ch 9.2 km to Ch 10.0 km	0.70%	3.20%	0.90%	1.00%	0.00%
	Ch 10.0 km to Ch 10.1 km	1.60%	4.10%	1.80%	1.80%	0.80%
	Ch 10.1 km to Ch 10.3 km	1.00%	6.70%	1.10%	0.80%	0.80%
	Ch 10.3 km to Ch 12.1 km	1.00%	6.70%	1.10%	1.40%	0.80%
	Ch 12.1 km to Ch 14.5 km	1.00%	10.60%	10.00%	1.30%	0.90%
	Ch 14.5 km to Ch 16.3 km	1.40%	22.70%	22.10%	2.30%	0.70%
Toowoomba Connection Road (315)	Ch 26.3 km to Ch 26.9 km	0.00%	0.00%	0.10%	0.10%	0.00%
	Ch 26.9 km to Ch 27.1 km	0.60%	0.60%	0.60%	0.60%	0.60%
Toowoomba Bypass (319A)	Ch 0.0 km to Ch 26.8 km	4.50%	5.40%	5.40%	5.30%	3.50%
Toowoomba Bypass (319B)	Ch 0.0 km to Ch 0.6 km	4.50%	5.40%	5.40%	5.30%	3.50%
	Ch 0.6 km to Ch 3.2 km	15.50%	19.10%	5.80%	5.70%	3.50%
	Ch 3.2 km to Ch 4.1 km	15.50%	19.10%	5.80%	5.70%	3.50%
	Ch 4.1 km to Ch 13.0 km	16.10%	22.40%	6.50%	6.70%	3.50%
Toowoomba Bypass Off-ramp (319B)	Toowoomba Bypass to Warrego Highway	12.60%	13.70%	0.90%	0.40%	0.00%
	Warrego Highway to Toowoomba Bypass	0.00%	6.10%	0.00%	0.00%	0.00%
	Toowoomba Bypass to Toowoomba-Cecil Plains Road	0.70%	3.30%	0.90%	1.30%	0.10%
	Toowoomba-Cecil Plains Road to Toowoomba Bypass	0.30%	0.30%	0.30%	0.30%	0.20%
	Toowoomba Bypass to Toowoomba-Cecil Plains Road	0.30%	0.30%	0.30%	0.30%	0.20%
	Toowoomba-Cecil Plains Road to Toowoomba Bypass	0.50%	0.60%	0.60%	0.60%	0.40%

Authority/road names	Road section	Road link percentage increase				
		2024	2025	2026	2027	2028
Warrego Highway (18A)	Ch 0.0 km to Ch 7.2 km	0.60%	0.70%	0.70%	0.70%	0.40%
	Ch 7.2 km to Ch 15.1 km	0.90%	1.10%	1.10%	1.10%	0.70%
	Ch 15.1 km to Ch 18.9 km	0.70%	0.80%	0.80%	0.80%	0.50%
	Ch 18.9 km to Ch 28.9 km	0.70%	0.80%	0.80%	0.80%	0.50%
	Ch 28.9 km to Ch 36.6 km	0.80%	0.90%	0.90%	0.90%	0.60%
	Ch 36.6 km to Ch 55.5 km	0.40%	0.30%	0.30%	0.30%	0.20%
	Ch 55.5 km to 75.4 km	2.70%	2.70%	0.40%	0.40%	0.20%
	Ch 75.4 km to Ch 79.6 km	2.50%	2.30%	0.30%	0.70%	0.20%
Warrego Highway (18B)	Ch 0.0 km to Ch 0.4 km	4.00%	4.00%	0.40%	0.30%	0.20%
	Ch 0.4 km to Ch 1.5 km	4.00%	4.00%	0.40%	0.30%	0.20%
	Ch 1.5 km to Ch 2.4 km	4.00%	4.00%	0.40%	0.30%	0.20%
	Ch 2.4 km to Ch 4.5 km	4.00%	4.00%	0.60%	0.30%	0.20%
Warrego Highway Off-ramp (18B)	Ch 4.5 km to Ch 5.0 km	278.10%	275.90%	43.80%	20.60%	13.80%
TfNSW						
Newell Highway	River Road to NSW/QLD Border	0.90%	0.50%	0.20%	0.10%	0.00%
BSC						
Noondoo Thallon Road	GrainCorp Thallon to Carnarvon Highway	106.50%	130.40%	129.30%	128.20%	84.20%
GRC						
Boodle Street	Holcim Concrete Goondiwindi to Hunt Street	0.00%	5.20%	5.20%	0.00%	0.00%
Bybera Road	Cunningham Highway to B2G-LDN060.4	545.80%	101.90%	30.30%	117.50%	16.20%
	B2G-LDN060.4 to Earthworks Area 2A	443.20%	0.00%	0.00%	0.00%	0.00%
Cemetery Road	Access Track to Mooroobie Lane	0.00%	34.90%	0.00%	0.00%	0.00%
	Cunningham Highway to GrainCorp Goondiwindi	36.40%	44.80%	44.70%	44.60%	29.50%
Coolmunda Dam Access	Inglewood Legacy Bore/Coolmunda Dam to Coolmunda Dam Access	136.30%	134.90%	29.70%	22.20%	0.20%
	Coolmunda Dam Access to Cunningham Highway	136.30%	134.90%	29.70%	22.20%	0.20%
Cremascos Road	B2G-LDN052.8 to B2G-LDN055.4	24.40%	27.80%	30.50%	23.40%	23.20%
	B2G-LDN055.4 to B2G-LDN054.2	23.90%	27.30%	23.60%	22.90%	22.80%
	Cunningham Highway to B2G-LDN052.8	24.40%	29.50%	32.20%	25.10%	23.20%
East Sawmill Road	Cunningham Highway to B2G-LDN030.0	1207.90%	1370.30%	60.90%	50.40%	29.00%

Authority/road names	Road section	Road link percentage increase				
		2024	2025	2026	2027	2028
Elizabeth Street	Cunningham Highway to B2G-LDN065.8	64.30%	63.50%	68.90%	130.10%	59.60%
Eukabilla Road	Kildonan Road to NS2B-LDN033.2	287.90%	288.20%	291.60%	335.30%	175.20%
	NS2B-LDN033.2 to NS2B-LDN035.6	110.80%	109.50%	161.30%	200.80%	58.40%
Fosters Road	Cunningham Highway to Borrow Site #9 (Fosters Road)	3109.10%	588.70%	0.00%	0.00%	0.00%
Georges Lane	B2G-LDN000.9 to Yelarbon Kurumbul Road	122.50%	91.20%	107.70%	123.40%	81.80%
Grays Road	Millmerran-Inglewood Road to Mosquito Creek Road	0.00%	514.50%	0.00%	0.00%	0.00%
Hunt Street	Leichhardt Highway to Boodle Street	0.00%	5.20%	5.20%	0.00%	0.00%
Kildonan Road	Eukabilla Road to NS2B-LDN031.0	1.40%	0.50%	1.20%	1.80%	0.00%
	NS2B-LDN031.0 to South Kurumbul Road	17.70%	20.40%	1.20%	1.80%	0.00%
	South Kurumbul Road to Cunningham Highway	16.20%	20.10%	0.10%	0.10%	0.00%
	Cunningham Highway to Eukabilla Road	5.10%	4.10%	3.50%	2.70%	2.40%
McDougalls Road	B2G-LDN049.8 to McDougalls Road	689.00%	683.80%	213.30%	624.90%	146.50%
	McDougalls Road to Cunningham Highway	689.00%	683.80%	213.30%	624.90%	146.50%
Mooroobie Lane	Cemetery Road to Borrow Site #2 (Mooroobie Lane)	0.00%	219.90%	0.00%	0.00%	0.00%
	Borrow Site #2 (Mooroobie Lane) to Mooroobie Lane	0.00%	439.90%	0.00%	0.00%	0.00%
	Mooroobie Lane to Wondalli Kurumbul Road	0.00%	439.90%	0.00%	0.00%	0.00%
Mosquito Creek Road	Borrow Site #10 (Mosquito Road) to Grays Road	0.00%	484.40%	0.00%	0.00%	0.00%
Queen Street South	Yelarbon Kurumbul to B2G-LDN016.0	1135.10%	319.00%	932.40%	575.40%	250.80%
Silo Street	Barwon Highway to GrainCorp Talwood	5.00%	6.10%	6.10%	6.10%	4.10%
South Kurumbul Road	Kildonan Road to Yelarbon Kurumbul Road	40.40%	9.90%	33.40%	47.60%	0.10%
South Toobeah Road	GrainCorp Toobeah to Barwon Highway	8.90%	11.00%	11.00%	11.00%	7.30%
Springborg Road	Cunningham Highway to B2G-LDN037.6	536.80%	192.60%	466.50%	380.50%	159.30%
Suttons Road	B2G-LDN030.0 to Access Track (Off Suttons Road)	3346.80%	4224.30%	0.00%	0.00%	0.00%
Thornton Road	B2G-LDN069.0 to B2G-LDN067.6	209.10%	202.90%	114.10%	185.20%	67.30%
	B2G-LDN067.6 to Millmerran-Inglewood Road	3540.40%	1086.30%	133.20%	187.90%	70.00%
Town Common Road	Boral Concrete Goondiwindi to Barwon Highway	1.40%	6.10%	6.10%	0.00%	0.00%
Whetstone Access	B2G-LDN044.5 to Cunningham Highway	1178.80%	1169.90%	711.00%	946.30%	666.10%
Wondalli Kurumbul Road	Yelarbon Kurumbul Road to Mooroobie Lane	0.00%	527.00%	0.00%	0.00%	0.00%
Wongavale Yugilbar Road	Millmerran-Inglewood Road to B2G-LDN081.0	118.30%	201.90%	89.60%	480.20%	66.20%

Authority/road names	Road section	Road link percentage increase				
		2024	2025	2026	2027	2028
Woodcocks Road	Cunningham Highway to Borrow Site #4 (Woodcocks Road)	0.00%	394.60%	0.00%	0.00%	0.00%
Yelarbon Kurumbul Road	South Kurumbul Road to B2G-LDN006.3	55.20%	30.70%	53.50%	72.90%	19.20%
	B2G-LDN006.3 to Wondalli Kurumbul Road	44.60%	284.60%	74.40%	104.40%	39.00%
	Wondalli Kurumbul Road to Yelarbon Kurumbul Road	44.60%	43.20%	74.40%	104.40%	39.00%
	Yelarbon Kurumbul Road to B2G-LDN020.3	134.70%	68.60%	148.60%	142.70%	59.00%
	B2G-LDN020.3 to B2G-LDN025.9	164.30%	96.50%	249.10%	192.70%	90.50%
	B2G-LDN025.9 to Cunningham Highway	294.10%	411.80%	332.30%	268.40%	135.70%
MPSC						
Boggabilla Weir Access	River Road to Boggabilla Weir	214.70%	119.00%	41.10%	16.80%	0.20%
River Road	Newell Highway to Boggabilla Weir Access	214.70%	119.00%	41.10%	16.80%	0.20%
TRC						
Alderley Street	Greenwattle Street to Toowoomba Workforce Origin 2	0.00%	0.00%	0.00%	0.00%	0.00%
	Toowoomba Workforce Origin B to Toowoomba-Athol Road	3.00%	3.00%	3.00%	3.00%	3.00%
	Toowoomba-Athol Road to Boral/Wagner Concrete Facilities	0.00%	0.00%	0.00%	0.00%	0.00%
Athol School Road	B2G-LDN187.8 to B2G-LDN188.2	407.40%	212.20%	9.60%	2.30%	0.00%
	B2G-LDN188.2 to Gore Highway	417.60%	222.10%	19.50%	18.10%	9.50%
Biddeston Southbrook Road	Gore Highway to B2G-LDN183.8	7.30%	145.40%	140.40%	8.90%	6.30%
Blackwell Road	Gore Highway to Millmerran Quarry	0.00%	0.00%	0.00%	193.80%	20.20%
	Millmerran Quarry to B2G-LDN120.2	0.00%	0.00%	0.00%	397.40%	49.80%
	B2G-LDN120.2 to Millmerran-Inglewood Road	280.60%	515.70%	515.70%	1755.60%	387.70%
Bligh Street	Six Mile Road to Boral Concrete Millmerran	0.90%	76.10%	82.50%	45.00%	0.00%
Brimblecombe Road	Toowoomba-Cecil Plains Road to Brimblecombe Road	42.10%	91.20%	92.00%	39.80%	22.70%
	Brimblecombe Road to WL 194467R	16.60%	63.70%	61.70%	15.60%	0.00%
Bushy Lane	B2G-LDN183.0 to Gore Highway	31.50%	58.80%	32.90%	49.40%	23.10%
Campbell Street	Millmerran-Inglewood Road to Saleyards Road	18.10%	18.90%	18.30%	20.00%	15.80%
	Saleyards Road to Gore Highway	9.50%	9.90%	9.60%	8.90%	8.10%
Chamberlain Road	Warrego Highway to B2G-LDN204.2	68.80%	78.20%	98.00%	102.50%	65.60%
Commodore Peak Road	Scragg Road to Millmerran-Inglewood Road	81.60%	90.50%	593.60%	87.20%	81.60%
Desmonds Lane	Yarranlea Road to B2G-LDN163.3	78.00%	75.60%	129.50%	81.60%	68.80%

Authority/road names	Road section	Road link percentage increase				
		2024	2025	2026	2027	2028
Dieckmann Road	B2G-LDN150.5 to Gore Highway	138.80%	2745.20%	555.60%	320.60%	117.10%
Draper Road	Steger Road to B2G-FBW206.9	56.40%	55.70%	55.10%	54.40%	53.80%
Drayton Wellcamp Road	Wellcamp Westbrook Road to Access Track	0.10%	0.10%	0.10%	3.50%	0.10%
	Access Track to Greenwattle Street	0.10%	0.10%	0.10%	0.00%	0.00%
Florence Street	Gore Highway to West Street	0.00%	0.60%	0.60%	0.00%	0.00%
Forestry Road	Access Track to Millmerran-Inglewood Road	0.00%	5969.10%	0.00%	0.00%	0.00%
	Millmerran-Inglewood Road to Earthworks Area 3B	0.00%	5969.10%	0.00%	0.00%	0.00%
Fysh Road	B2G-LDN147.1 to Gore Highway	33.70%	32.90%	31.90%	94.50%	32.20%
Gap Road	Gore Highway to Grevillea Street	0.00%	0.20%	1.00%	0.30%	0.00%
Geitz Road	B2G-LDN179.0 to Linthorpe Valley Road	29.30%	29.60%	28.60%	103.50%	29.20%
Gilgai Lane	B2G-LDN144.6 to Gore Highway	91.40%	91.40%	148.40%	155.30%	80.70%
Grevillea Street	Boral Concrete Pittsworth to Gap Road	0.00%	0.40%	2.50%	0.60%	0.00%
Hall Road	B2G-LDN139.0 to Gore Highway	707.70%	1735.30%	1682.10%	1846.60%	623.90%
Heckendorf Road	Borrow Site #14 (Heckendorf Road) to B2G-LDN116.0	0.00%	545.10%	1173.10%	0.00%	0.00%
	B2G-LDN116.0 to Millmerran-Inglewood Road	0.00%	547.70%	1175.70%	49.40%	4.40%
Holcim Australia Toowoomba Access	Drayton Wellcamp Road to Holcim Australia Toowoomba Quarry	0.00%	0.00%	0.00%	596.00%	13.40%
Kahler Road	Murlaggan Road to B2G-LDN165.6	99.00%	96.00%	93.00%	137.60%	96.10%
Kingsthorpe Haden Overpass	Warrego Highway Off-ramp to Kingsthorpe Haden Road	13.40%	13.30%	2.10%	1.00%	0.70%
Kooroongarra Road	Borrow Site #13 (Kooroongarra Road) to Millwood Road	0.00%	325.30%	0.00%	0.00%	0.00%
	Millmerran-Inglewood Road to Commodore Mine	0.00%	0.00%	19199.7%	0.00%	0.00%
Leesons Road	Warrego Highway to Steger Road	35.60%	361.10%	34.70%	223.40%	38.30%
	Steger Road to B2G-LDN206.3	50.40%	375.80%	107.60%	237.70%	38.40%
Linthorpe Road	Gore Highway to B2G-LDN175.5	2339.80%	3770.10%	534.50%	241.30%	60.70%
Linthorpe Valley Road	Geitz Road to Gore Highway	12.70%	12.90%	12.40%	45.00%	12.70%
Lochaber Road	Gore Highway to B2G-LDN172.0	3.60%	3.60%	4.60%	6.40%	3.40%
	B2G-LDN172.0 to B2G-LDN172.6	3.60%	3.50%	4.20%	3.30%	3.20%
McDougall Street	Humes Precast Toowoomba to Toowoomba-Cecil Plains Road	0.10%	0.50%	0.30%	0.10%	0.00%
Millwood Road	Millmerran-Inglewood Road to B2G-LDN112.1	74.30%	761.60%	545.10%	176.90%	75.50%
	B2G-LDN112.1 to Millwood Road	0.00%	654.10%	0.00%	0.00%	0.00%
	Millwood Road to Kooroongarra Road	0.00%	3679.50%	0.00%	0.00%	0.00%

Authority/road names	Road section	Road link percentage increase				
		2024	2025	2026	2027	2028
Moffatt Reserve Road	Millmerran-Inglewood Road to Millmerran Power Station	9.80%	61.90%	60.00%	12.90%	0.10%
Murlaggan Road	B2G-LDN164.3 to Kahler Road	136.70%	132.50%	5.90%	9.30%	5.70%
	Kahler Road to Gore Highway	139.80%	135.50%	8.80%	13.60%	8.70%
Oakey-Pittsworth Road	Gore Highway to B2G-LDN171.0	1.00%	1.00%	1.80%	1.00%	1.00%
O'Mara Road	Toowoomba-Cecil Plains Road to Warrego Highway	0.30%	1.50%	0.40%	2.60%	0.10%
Owens Scrub Road	B2G-LDN129.5 to B2G-LDN128.2	1.20%	6.60%	6.30%	9.10%	0.90%
	B2G-LDN128.2 to B2G-LDN130.0	95.50%	6.60%	6.30%	9.10%	0.90%
	B2G-LDN130.0 to Millmerran-Inglewood Road	184.50%	86.60%	11.50%	13.30%	5.00%
Paint Mine Road	Gore Highway to B2G-LDN173.5	26.60%	27.70%	26.70%	39.40%	26.70%
Paton Road	Millmerran-Inglewood Road to B2G-LDN104.5	127.70%	128.90%	136.90%	418.10%	151.90%
Quarry Road Access	Tummaville Road to Quarry	0.00%	8815.90%	0.00%	1891.30%	238.90%
Saleyards Road	Campbell Street to Gore Highway	0.00%	0.50%	0.50%	11.80%	1.30%
Schwarten Road	Millmerran-Inglewood Road to B2G-LDN126.9	212.10%	268.10%	268.10%	212.10%	212.10%
Scragg Road	Commodore Peak Road to B2G-LDN123.6	140.90%	156.40%	1025.50%	150.70%	140.90%
	B2G-LDN123.6 to B2G-LDN123.8	0.00%	15.50%	0.00%	0.00%	0.00%
Scrubby Road	Bland Quarry Pittsworth to Gore Highway	0.00%	947.10%	918.10%	41.80%	3.50%
Steger Road	Warrego Highway to New Hope Recycled Water Pipeline	2.90%	9.00%	4.90%	4.30%	1.30%
	New Hope Recycled Water Pipeline to Draper Road	1.90%	4.20%	4.10%	1.90%	1.30%
	Draper Road to Leesons Road	0.60%	2.90%	2.80%	0.60%	0.00%
Tummaville Road	Access Track to Gore Highway	0.00%	154.60%	0.00%	33.20%	4.20%
Turallin Road	Gore Highway to the Turallin Facility	175.40%	174.40%	173.40%	172.40%	171.40%
Ware Street	GrainCorp Brookstead to B2G-LDN153.1	15.00%	18.00%	17.40%	16.90%	10.90%
	B2G-LDN153.1 to Gore Highway	25.20%	28.00%	34.80%	26.20%	19.90%
	Gore Highway to B2G-LDN150.9	0.00%	0.00%	0.00%	11.10%	2.50%
Wellcamp Westbrook Road	Drayton Wellcamp Road to Toowoomba-Cecil Plains Road	0.20%	0.20%	0.10%	9.90%	0.30%
West Street	Gore Highway to Florence Street	0.30%	19.30%	21.10%	12.50%	0.00%
	Florence Street to Six Mile Road	0.90%	76.10%	82.50%	45.00%	0.00%
Yarranlea Road	Gore Highway to B2G-LDN161.0	27.00%	2113.80%	2049.00%	64.60%	21.80%
	B2G-LDN161.0 to Desmonds Lane	10.80%	10.40%	17.90%	11.30%	9.50%

The TIA indicates that year two (2025) and year three (2026) of the construction period are likely to generate the highest construction-related traffic volumes on the surrounding road network. During these years, some routes contain sections that are exceeding 10 per cent of the background traffic.

A summary of the number of roads with construction traffic that exceeds 5 per cent and 10 per cent of base AADT has been provided for each road controlling authority in Table 20-37.

TABLE 20-37 NUMBER OF ROADS EXCEEDING 5 PER CENT BASE ANNUAL AVERAGE DAILY TRAFFIC BY ROAD AUTHORITY

Road authority	Number of roads > 5%	Number of road sections > 5%	Length of roads > 5% (km)
DTMR	18	96	583.61
TfNSW	0	0	0.00
BSC	1	1	0.39
GRC	29	46	159.42
MPSC	2	2	6.73
TRC	44	65	81.44

20.5.2.5 Level of Service comparison

By itself, percentage comparison between traffic conditions with and without the Project does not provide an accurate overview of the Project's impact on the surrounding road network. This is because it does not reflect the magnitude of the Project construction traffic volumes on the performance of the road network. Impacts on the performance of the road network are assessed through LoS analysis, which considers the change in LoS in the peak hour for each road section.

The GTIA defines LoS as a qualitative index for ranking operating conditions on roads, as well as pedestrian and cycling movement based on factors such as speed, flow rate, travel time, freedom to manoeuvre, interruptions, comfort, safety, and convenience. Further to LoS, intersection outputs, such as intersection delay, are also used for identifying their operational performance conditions.

Peak hour traffic volumes were derived from peak daily volumes using the following key assumptions:

- Material delivery movements will be evenly distributed across the standard daily 12 hours of construction
- Two shifts will occur per day with 50 per cent of total staff working each shift. Staff shift changeovers have been conservatively assumed to occur simultaneously with the background traffic peak hour.

As per the GTIA, the assessment of road link capacity is based on the incremental worsening of LoS. The LoS analysis was undertaken for the construction route sections on which the 5 per cent traffic increase threshold is predicted to be exceeded (see Table 20-37). For the purposes of comparing the expected LOS for each affected road section, the road performance with and without the Project has been assessed.

The results of the LoS comparison indicates that Project-related traffic may cause an incremental change in LoS on seven road links in the gazettal/northbound/eastbound directions and eight in the against-gazettal/southbound/westbound directions. Table 20-38 and Table 20-39 provide an overview of all road links that change in LoS between without and with Project traffic for the gazettal/northbound/eastbound directions and against-gazettal/southbound/westbound directions, respectively. The tables also provide further context regarding daily traffic volumes on each road link without and with Project traffic, as well as the LoS in each scenario where this has changed due to the Project. Apart from those road links listed below, the road network is anticipated to continue to operate with no net worsening as a result of the Project.

TABLE 20-38 SUMMARY OF ROAD LINKS WITH INCREMENTAL LEVEL OF SERVICE CHANGE GAZETTAL/ NORTHBOUND/ EASTBOUND DIRECTIONS

Road name	Road section	Peak impact year daily traffic volumes		LoS	
		Without Project	With Project	Without Project	With Project
DTMR					
Gore Highway (28A)	Ch 2.2 km to Ch 5.4 km	264	352	A	B
	Ch 5.4 km to Ch 6.7 km	264	351	A	B
	Ch 6.7 km to Ch 7.7 km	264	350	A	B
	Ch 7.7 km to Ch 11.2 km	264	349	A	B
	Ch 11.2 km to Ch 15.3 km	264	348	A	B
	Ch 15.3 km to Ch 17.5 km	264	324	A	B
	Ch 19.0 km to Ch 20.3 km	264	323	A	B

TABLE 20-39 SUMMARY OF ROAD LINKS WITH INCREMENTAL LEVEL OF SERVICE CHANGE ANTI-GAZETTAL SOUTHBOUND/ WESTBOUND DIRECTIONS

Road name	Road section	Peak impact year daily traffic volumes		LoS	
		Without Project	With Project	Without Project	With Project
DTMR					
Gore Highway (28A)	Ch 0.0 km to Ch 2.2 km	284	376	A	B
	Ch 2.2 km to Ch 5.4 km	275	397	A	B
	Ch 5.4 km to Ch 6.7 km	275	390	A	B
	Ch 6.7 km to Ch 7.7 km	275	386	A	B
	Ch 7.7 km to Ch 11.2 km	275	378	A	B
	Ch 11.2 km to Ch 15.3 km	275	375	A	B
	Ch 15.3 km to Ch 17.5 km	275	347	A	B
	Ch 19.0 km to Ch 20.3 km	275	340	A	B

Although there is a change in operational LoS for the road sections in Table 20-39, the expected operational LoS B is considered acceptable given the short duration of the construction activities. In addition, the operational performance of the road would return to base conditions after construction is complete.

Based on the LoS comparison, it is not expected that the Project would generate the need to upgrade the road network for these temporary construction activities.

Regardless, as per the earlier assessments, it is important that the routes are reviewed prior to construction commencing. This review will be undertaken as part of the construction works stage TMP and will include joint visual inspection of all routes by the Contractor, the asset owner and an accredited road safety auditor to agree on routes and any works required to make the routes suitable for the level of construction activity proposed. Full details on the LoS analysis are provided in Appendix AA: Traffic Impact Assessment.

20.5.2.6 Intersection analysis

The proposed construction routes for the Project include intersections, where construction traffic will be required to make a turning movement from one road onto another. Construction traffic routes identified for the Project are expected to use 116 intersections where turning movements would occur. These define the impact assessment area for intersection analysis. The full list of these intersections is provided in Appendix AA: Traffic Impact Assessment including relevant intersection details, including name, road authority, intersection type, existing turn treatments and existing potential visibility constraints.

Turn warrants

An assessment of base traffic flows and construction flows has been undertaken to identify intersections that are expected to require upgraded turning treatments to accommodate construction traffic flows consistent with the warrants outlined in Austroads' *Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management* (Austroads, 2020b).

Project construction traffic volumes and frequency were assessed for construction traffic routes with intersections to identify intersections at which more than five construction vehicles per hour would make a turning. The intersections that would experience a construction traffic turning volume of more than five vehicles per hour were then plotted onto turn warrant graphs from Austroads' *Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management* (Austroads, 2020b). This step in the analysis was taken to identify the intersections that may require treatment to accommodate the projected volumes of turning construction traffic.

Table 20-40 summarises the number of intersections expected to require upgrades to right turn lane provisions. Detailed discussion on the intersection analysis for each of the locations, including potential treatment options, is provided in Appendix AA: Traffic Impact Assessment.

These upgrades are required only temporarily for construction traffic; therefore, discussions will be undertaken with DTMR and local councils during the detailed design stage to determine the permanence of such upgrades. Given the short duration of construction-related traffic, traffic management strategies may be introduced as an alternative to more permanent treatments to mitigate construction-related traffic impacts at intersections.

TABLE 20-40 NUMBER OF INTERSECTIONS REQUIRING RIGHT TURN TREATMENTS

Authority	Number of intersections requiring treatment prior to the Project	Number of intersections requiring treatment due to the Project	Total number of intersections requiring turn treatments
DTMR	15	10	25
GRC	8	0	8
TRC	13	0	13
MPSC	1	0	1
Total	37	10	47

The following 10 intersections have additional right turn warrant requirements triggered as a result of the construction traffic:

- Cunningham Highway/Bybera Road
- Gore Highway/Fysh Road
- Gore Highway/Bushy Lane West (West)
- Gore Highway/Gilgai Lane
- Gore Highway/Linthorpe Road
- Gore Highway/Linthorpe Valley Road
- Gore Highway/Scrubby Road
- Gore Highway/Tummaville Road/Yarranlea Road (North)
- Toowoomba-Cecil Plains Road/Airport Quarry Wellcamp Access Road
- Toowoomba-Cecil Plains Road/Brimblecombe Road.

Thirty-seven other intersections identified currently warrant upgrades to the right turn treatments, however, these upgrades are required regardless of the addition of construction related activities.

Table 20-41 summarises the number of intersections expected to require upgrades to left turn lane provisions.

TABLE 20-41 NUMBER OF INTERSECTIONS REQUIRING LEFT TURN TREATMENTS

Authority	Number of intersections requiring treatment prior to the Project	Number of intersections requiring treatment due to the Project	Total number of intersections requiring turn treatments
DTMR	12	4	16
GRC	9	0	9
TRC	10	0	10
MPSC	1	0	1
Total	32	4	36

The following four intersections have additional left turn warrant requirements triggered as a result of the construction traffic:

- Gore Highway/Biddeston Southbrook Road
- Gore Highway/Dieckmann Road
- Gore Highway/Linthorpe Road
- Warrego Highway/Chamberlain Road.

Thirty-two other intersections identified currently warrant upgrades to the right turn treatments, however, these upgrades are required regardless of the addition of construction related activities.

Sight distance

An assessment has been conducted to determine the required safe intersection sight distance at each intersection, including required inputs relating to the road seal, major road speed limit and longitudinal grade used in the calculation of minimum safe intersection sight distance.

Further details relating to the sight distance calculation are provided in Appendix AA: Traffic Impact Assessment.

Delay

Consistent with the GTIA, each intersection used by construction traffic has undergone Sidra analysis to assess the peak period operational performance for the 'without Project' and 'with Project' scenarios. The delay-based analysis criteria adopted for the purposes of the traffic, transport and access assessment are provided in Table 20-42. The table indicates the LoS per intersection control type associated with a respective delay per vehicle measured in seconds.

TABLE 20-42 LEVEL OF SERVICE DEFINITIONS BASED ON VEHICLE DELAY IN SECONDS

Level of service	Control delay (d) per vehicle in seconds (sec)		
	Signals	Roundabout	Sign control
A	d ≤ 10	d ≤ 10	d ≤ 10
B	10 ≤ d ≤ 20	10 ≤ d ≤ 20	10 ≤ d ≤ 15
C	20 ≤ d ≤ 35	20 ≤ d ≤ 35	15 ≤ d ≤ 25
D	35 ≤ d ≤ 55	35 ≤ d ≤ 50	25 ≤ d ≤ 35
E	55 ≤ d ≤ 80	50 ≤ d ≤ 70	35 ≤ d ≤ 50
F	d < 80	d < 70	d < 50

Source: Sidra Intersection 9 User Guide

Table 20-43 and Table 20-44 detail the Project intersections that expected to experience a net increase in delay greater than 5 per cent based on the current construction routes and volumes. Detailed output tables and Sidra output summaries are included in Appendix AA: Traffic Impact Assessment.

TABLE 20-43 NUMBER OF INTERSECTIONS EXPERIENCING GREATER THAN 5 PER CENT INCREASE IN DELAY BY ROAD AUTHORITY

Authority	Number of intersections
DTMR	76
GRC	14
TRC	17
MPSC	1

TABLE 20-44 SIDRA INTERSECTION RESULTS SUMMARY (>5 PER CENT IN AGGREGATE)

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
DTMR									
Barwon Highway/ Carnarvon Highway	AM	Without Project	0.013	5	North approach Left Turn	9	A	0	51%
		With Project	0.016	6	East approach Left Turn	10	B	1	
	PM	Without Project	0.013	5	North approach Left Turn	9	A	0	55%
		With Project	0.014	6	East approach Left Turn	10	B	1	
Barwon Highway/ Leichhardt Highway	AM	Without Project	0.135	4	East approach Right Turn	8	A	5	7%
		With Project	0.146	4	East approach Right Turn	9	A	6	
	PM	Without Project	0.144	4	East approach Right Turn	8	A	5	7%
		With Project	0.156	4	East approach Right Turn	9	A	6	
Barwon Highway/ Silo Street	AM	Without Project	0.011	3	East approach Left Turn	9	A	0	19%
		With Project	0.016	2	East approach Left Turn	9	A	0	
	PM	Without Project	0.009	2	East approach Left Turn	8	A	0	22%
		With Project	0.014	2	East approach Left Turn	9	A	0	
Barwon Highway/ South Toobeah Road	AM	Without Project	0.022	2	South approach Left Turn	9	A	0	12%
		With Project	0.027	2	South approach Right Turn	9	A	0	
	PM	Without Project	0.019	2	South approach Left Turn	9	A	0	13%
		With Project	0.024	2	South approach Right Turn	9	A	0	
Barwon Highway/ Town Common Road	AM	Without Project	0.055	1	Southeast approach Left Turn	9	A	0	9%
		With Project	0.057	1	Southeast approach Left Turn	9	A	1	
	PM	Without Project	0.055	1	Southeast approach Left Turn	9	A	0	8%
		With Project	0.057	1	Southeast approach Left Turn	9	A	1	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Carnarvon Highway/ Noondoo Thallon Road	AM	Without Project	0.011	4	South approach Left Turn	6	A	0	52%
		With Project	0.016	5	West approach Right Turn	6	A	1	
	PM	Without Project	0.009	4	South approach Left Turn	6	A	0	57%
		With Project	0.015	5	South approach Left Turn	6	A	1	
Cunningham Highway/ Bybera Road	AM	Without Project	0.041	0	North approach Right Turn	8	A	0	787%
		With Project	0.068	2	North approach Left Turn	11	B	2	
	PM	Without Project	0.042	1	North approach Right Turn	8	A	0	705%
		With Project	0.071	2	North approach Left Turn	11	B	2	
Cunningham Highway/ Cemetery Road	AM	Without Project	0.093	0	East approach Right Turn	8	A	0	68%
		With Project	0.094	1	East approach Right Turn	9	A	1	
	PM	Without Project	0.101	0	East approach Right Turn	8	A	0	69%
		With Project	0.108	1	East approach Right Turn	10	A	1	
Cunningham Highway/ Coolmunda Dam Access	AM	Without Project	0.046	1	South approach Right Turn	9	A	0	154%
		With Project	0.046	1	South approach Left Turn	10	B	0	
	PM	Without Project	0.046	1	South approach Right Turn	9	A	0	154%
		With Project	0.046	1	South approach Left Turn	10	B	0	
Cunningham Highway/ Cremascos Road	AM	Without Project	0.034	1	North approach Left Turn	11	B	0	92%
		With Project	0.055	1	North approach Left Turn	12	B	0	
	PM	Without Project	0.038	1	North approach Left Turn	11	B	0	103%
		With Project	0.06	1	North approach Left Turn	11	B	0	
Cunningham Highway/ East Sawmill Road	AM	Without Project	0.041	0	North approach Right Turn	7	A	0	1935%
		With Project	0.064	2	North approach Right Turn	9	A	2	
	PM	Without Project	0.041	0	North approach Right Turn	7	A	0	1521%
		With Project	0.059	3	North approach Right Turn	8	A	2	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Cunningham Highway/ Elizabeth Street	AM	Without Project	0.067	0	Southeast approach Right Turn	6	A	0	118%
		With Project	0.11	1	Southeast approach Right Turn	6	A	1	
	PM	Without Project	0.069	0	Southeast approach Right Turn	6	A	0	123%
		With Project	0.105	1	Northeast approach Right Turn	6	A	0	
Cunningham Highway/ Fosters Road	AM	Without Project	0.038	0	North approach Left Turn	9	A	0	2790%
		With Project	0.081	4	North approach Right Turn	11	B	3	
	PM	Without Project	0.038	0	North approach Left Turn	9	A	0	2804%
		With Project	0.081	4	North approach Right Turn	11	B	3	
Cunningham Highway/ Inglewood Quarry Access Road	AM	Without Project	0.036	1	East approach Right Turn	11	B	0	448%
		With Project	0.041	3	East approach Right Turn	11	B	2	
	PM	Without Project	0.036	1	East approach Right Turn	11	B	0	601%
		With Project	0.04	3	East approach Right Turn	11	B	2	
Cunningham Highway/ Kildonan Road	AM	Without Project	0.16	8	South approach Right Turn	16	B	8	4%
		With Project	0.17	8	South approach Right Turn	17	B	8	
	PM	Without Project	0.185	8	South approach Right Turn	17	B	9	6%
		With Project	0.187	8	South approach Right Turn	17	B	9	
Cunningham Highway/ Leichhardt Highway	AM	Without Project	0.176	4	West approach Right Turn	14	B	7	7%
		With Project	0.19	4	West approach Right Turn	15	B	7	
	PM	Without Project	0.199	4	West approach Right Turn	15	B	7	6%
		With Project	0.213	4	West approach Right Turn	15	C	8	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Cunningham Highway/ McDougalls Road	AM	Without Project	0.034	0	Northwest approach Left Turn	8	A	0	358%
		With Project	0.068	1	Northwest approach Right Turn	11	B	0	
	PM	Without Project	0.037	0	Northwest approach Left Turn	8	A	0	367%
		With Project	0.072	1	Northwest approach Right Turn	11	B	0	
Cunningham Highway/ Millmerran-Inglewood Road	AM	Without Project	0.037	2	North approach Right Turn	9	A	1	320%
		With Project	0.146	5	East approach Right Turn	10	A	6	
	PM	Without Project	0.038	3	North approach Right Turn	8	A	1	272%
		With Project	0.092	5	North approach Right Turn	11	B	4	
Cunningham Highway/ Springborg Road	AM	Without Project	0.034	0	Northwest approach Left Turn	8	A	0	285%
		With Project	0.05	1	Northwest approach Right Turn	10	B	0	
	PM	Without Project	0.037	0	Northwest approach Left Turn	8	A	0	312%
		With Project	0.049	1	Southwest approach Left Turn	10	A	0	
Cunningham Highway/ Texas-Yelarbon Road	AM	Without Project	0.04	2	South approach Right Turn	9	A	0	46%
		With Project	0.041	2	South approach Left Turn	10	B	1	
	PM	Without Project	0.039	1	South approach Right Turn	9	A	0	51%
		With Project	0.044	2	South approach Left Turn	10	B	1	
Cunningham Highway/ Whetstone Access Road	AM	Without Project	0.034	0	Northwest approach Left Turn	8	A	0	1500%
		With Project	0.067	3	Northwest approach Right Turn	11	B	2	
	PM	Without Project	0.038	0	Northwest approach Left Turn	8	A	0	1511%
		With Project	0.052	3	Northeast approach Right Turn	10	A	1	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Cunningham Highway/ Woodcocks Road	AM	Without Project	0.034	0	North approach Left Turn	8	A	0	274%
		With Project	0.045	1	North approach Left Turn	10	B	0	
	PM	Without Project	0.037	0	North approach Left Turn	8	A	0	293%
		With Project	0.044	1	North approach Left Turn	10	B	1	
Cunningham Highway/ Yelarbon-Keetah Road	AM	Without Project	0.048	3	East approach Right Turn	5	A	0	17%
		With Project	0.054	3	East approach Right Turn	5	A	0	
	PM	Without Project	0.046	3	East approach Right Turn	5	A	0	24%
		With Project	0.059	4	East approach Right Turn	5	A	0	
Cunningham Highway/ Yelarbon Kurumbul Road	AM	Without Project	0.036	1	Northeast approach Right Turn	10	A	0	400%
		With Project	0.044	3	Northeast approach Left Turn	10	A	1	
	PM	Without Project	0.037	1	Northeast approach Left Turn	8	A	0	375%
		With Project	0.057	3	Southwest approach Right Turn	11	B	1	
Gore Highway/ Fysh Road	AM	Without Project	0.081	0	West approach Right Turn	6	A	0	110%
		With Project	0.112	1	East approach Left Turn	6	A	1	
	PM	Without Project	0.103	0	West approach Right Turn	6	A	0	102%
		With Project	0.11	1	West approach Right Turn	7	A	1	
Gore Highway/ Athol School Road	AM	Without Project	0.17	1	North approach Right Turn	17	C	1	760%
		With Project	0.294	4	North approach Right Turn	32	D	14	
	PM	Without Project	0.16	0	North approach Right Turn	13	B	0	1057%
		With Project	0.323	4	North approach Right Turn	36	E	15	
Gore Highway/ Biddeston Southbrook Road	AM	Without Project	0.165	0	West approach Right Turn	13	B	0	255%
		With Project	0.179	1	West approach Right Turn	20	C	2	
	PM	Without Project	0.157	0	West approach Right Turn	12	B	0	271%
		With Project	0.185	1	West approach Right Turn	20	C	2	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Gore Highway/ Blackwell Road	AM	Without Project	0.069	0	East approach Left Turn	10	A	0	313%
		With Project	0.076	1	East approach Right Turn	16	C	0	
	PM	Without Project	0.063	0	East approach Left Turn	10	A	0	243%
		With Project	0.073	1	East approach Right Turn	15	B	0	
Gore Highway/ Bushy Lane	AM	Without Project	0.135	0	West approach Right Turn	11	B	0	112%
		With Project	0.186	1	West approach Right Turn	20	C	1	
	PM	Without Project	0.145	0	East approach Right Turn	11	B	1	131%
		With Project	0.204	1	West approach Right Turn	21	C	1	
Gore Highway/ Campbell Street	AM	Without Project	0.073	4	Northeast approach Right Turn	7	A	2	63%
		With Project	0.147	5	Northeast approach Right Turn	7	A	3	
	PM	Without Project	0.032	5	Northeast approach Right Turn	7	A	1	116%
		With Project	0.072	5	Northeast approach Right Turn	7	A	2	
Gore Highway/ Dieckmann Road	AM	Without Project	0.082	0	Northwest approach Right Turn	8	A	0	2052%
		With Project	0.126	2	Northwest approach Right Turn	13	B	2	
	PM	Without Project	0.09	0	Northwest approach Right Turn	9	A	0	2074%
		With Project	0.117	2	Northwest approach Right Turn	12	B	2	
Gore Highway/ Florence Street	AM	Without Project	0.063	1	Northeast approach Left Turn	6	A	1	14%
		With Project	0.116	1	Northeast approach Right Turn	7	A	1	
	PM	Without Project	0.059	1	Northeast approach Left Turn	6	A	1	9%
		With Project	0.122	1	Northeast approach Right Turn	7	A	1	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Gore Highway/ Gilgai Lane	AM	Without Project	0.089	0	West approach Right Turn	10	A	0	251%
		With Project	0.121	1	South approach Right Turn	11	B	1	
	PM	Without Project	0.096	0	South approach Left Turn	10	A	0	213%
		With Project	0.115	1	South approach Right Turn	11	B	0	
Gore Highway/ Hall Road	AM	Without Project	0.088	0	East approach Right Turn	9	A	0	83%
		With Project	0.13	0	East approach Right Turn	10	B	1	
	PM	Without Project	0.095	0	East approach Right Turn	10	A	0	88%
		With Project	0.126	0	Southwest approach Left Turn	10	B	0	
Gore Highway/ Linthorpe Road	AM	Without Project	0.176	1	North approach Right Turn	11	B	1	452%
		With Project	0.238	2	North approach Right Turn	16	C	5	
	PM	Without Project	0.198	0	North approach Right Turn	11	B	0	699%
		With Project	0.229	2	North approach Right Turn	18	C	5	
Gore Highway/ Linthorpe Valley Road	AM	Without Project	0.169	0	North approach Left Turn	11	B	0	115%
		With Project	0.176	0	North approach Right Turn	14	B	1	
	PM	Without Project	0.166	0	North approach Left Turn	11	B	0	87%
		With Project	0.175	0	North approach Right Turn	15	B	0	
Gore Highway/ Lochaber Road	AM	Without Project	0.084	1	West approach Right Turn	8	A	1	
		With Project	0.091	1	West approach Right Turn	9	A	1	
	PM	Without Project	0.111	1	West approach Right Turn	8	A	1	
		With Project	0.122	1	West approach Right Turn	9	A	1	
Gore Highway/ Millmerran-Inglewood Road	AM	Without Project	0.058	3	Southeast approach Right Turn	13	B	1	
		With Project	0.084	4	Southeast approach Right Turn	16	C	3	
	PM	Without Project	0.078	3	Southeast approach Right Turn	12	B	1	
		With Project	0.115	4	Southeast approach Right Turn	15	C	4	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Gore Highway/ Millmerran-Leyburn Road	AM	Without Project	0.054	1	East approach Right Turn	10	B	0	
		With Project	0.077	1	East approach Right Turn	13	B	1	
	PM	Without Project	0.078	1	East approach Right Turn	9	A	0	
		With Project	0.111	1	East approach Right Turn	13	B	1	
Gore Highway/ Murlaggan Road	AM	Without Project	0.061	2	Southeast approach Right Turn	17	C	1	
		With Project	0.067	4	Southeast approach Right Turn	22	C	2	
	PM	Without Project	0.074	4	Southeast approach Right Turn	22	C	2	
		With Project	0.157	5	Southeast approach Right Turn	30	D	5	
Gore Highway/ Oakey-Pittsworth Road	AM	Without Project	0.074	2	West approach Right Turn	10	A	2	
		With Project	0.08	2	West approach Right Turn	10	B	2	
	PM	Without Project	0.099	2	West approach Right Turn	12	B	2	
		With Project	0.111	2	West approach Right Turn	13	B	2	
Gore Highway/ Paint Mine Road	AM	Without Project	0.095	0	West approach Left Turn	8	A	0	100%
		With Project	0.102	0	West approach Left Turn	9	A	0	
	PM	Without Project	0.119	0	West approach Left Turn	8	A	0	97%
		With Project	0.131	0	West approach Left Turn	9	A	0	
Gore Highway/ Saleyards Road	AM	Without Project	0.06	1	South approach Left Turn	6	A	1	34%
		With Project	0.132	1	South approach Right Turn	7	A	1	
	PM	Without Project	0.062	1	South approach Left Turn	6	A	1	37%
		With Project	0.12	1	West approach Right Turn	7	A	1	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Gore Highway/ Scrubby Road	AM	Without Project	0.079	1	Southwest approach Right Turn	11	B	0	2256%
		With Project	0.235	6	Southeast approach Right Turn	15	C	14	
	PM	Without Project	0.123	1	Southeast approach Right Turn	12	B	1	1706%
		With Project	0.288	6	Southeast approach Right Turn	18	C	16	
Gore Highway/ Tummaville Road/ Yarranlea Road	AM	Without Project	0.082	1	North approach Right Turn	12	B	0	899%
		With Project	0.141	6	North approach Right Turn	17	C	8	
	PM	Without Project	0.1	1	North approach Right Turn	13	B	0	1479%
		With Project	0.165	6	South approach Right Turn	15	B	9	
Gore Highway/ Turallin Road	AM	Without Project	0.049	1	North approach Left Turn	9	A	0	691%
		With Project	0.084	4	East approach Right Turn	8	A	3	
	PM	Without Project	0.064	1	North approach Left Turn	8	A	1	296%
		With Project	0.132	4	North approach Right Turn	9	A	5	
Gore Highway/ Ware Street (N)	AM	Without Project	0.091	1	South approach Right Turn	11	B	1	44%
		With Project	0.114	2	South approach Right Turn	19	C	2	
	PM	Without Project	0.099	1	South approach Right Turn	11	B	1	58%
		With Project	0.116	2	South approach Right Turn	20	C	1	
Gore Highway/ Ware Street (S)	AM	Without Project	0.084	0	East approach Right Turn	10	B	0	24%
		With Project	0.088	1	East approach Right Turn	11	B	0	
	PM	Without Project	0.089	0	East approach Right Turn	10	B	0	20%
		With Project	0.107	1	East approach Right Turn	11	B	0	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Gore Highway/ West Street	AM	Without Project	0.057	0	East approach Right Turn	7	A	0	53%
		With Project	0.117	0	East approach Right Turn	7	A	1	
	PM	Without Project	0.055	0	East approach Right Turn	7	A	0	26%
		With Project	0.122	0	East approach Right Turn	7	A	0	
Leichhardt Highway/ Hunt Street	AM	Without Project	0.059	0	South approach Right Turn	8	A	0	33%
		With Project	0.061	0	South approach Right Turn	10	B	0	
	PM	Without Project	0.064	0	South approach Right Turn	8	A	0	33%
		With Project	0.066	0	South approach Right Turn	10	B	0	
Millmerran-Inglewood Road/ Blackwell Road	AM	Without Project	0.021	1	Northwest approach Left Turn	8	A	0	727%
		With Project	0.035	2	Northwest approach Right Turn	11	B	1	
	PM	Without Project	0.021	1	Northwest approach Left Turn	8	A	0	582%
		With Project	0.041	2	Northwest approach Right Turn	11	B	1	
Millmerran-Inglewood Road/ Campbell Street	AM	Without Project	0.047	5	Southwest approach Left Turn	8	A	2	59%
		With Project	0.051	6	Southwest approach Left Turn	9	A	2	
	PM	Without Project	0.059	5	Southwest approach Left Turn	8	A	2	40%
		With Project	0.096	5	Southwest approach Left Turn	8	A	3	
Millmerran-Inglewood Road/ Commodore Peak Road	AM	Without Project	0.03	0	West approach Left Turn	8	A	0	754%
		With Project	0.073	2	West approach Left Turn	10	B	1	
	PM	Without Project	0.029	0	West approach Left Turn	8	A	0	784%
		With Project	0.058	2	North approach Right Turn	11	B	1	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Millmerran-Inglewood Road/ Forestry Road	AM	Without Project	0.023	0	West approach Left Turn	8	A	0	478%
		With Project	0.046	1	West approach Right Turn	11	B	0	
	PM	Without Project	0.023	1	West approach Left Turn	8	A	0	476%
		With Project	0.046	1	West approach Right Turn	11	B	0	
Millmerran-Inglewood Road/ Grays Road	AM	Without Project	0.011	1	East approach Left Turn	8	A	0	415%
		With Project	0.023	2	East approach Right Turn	10	B	0	
	PM	Without Project	0.011	1	East approach Left Turn	8	A	0	413%
		With Project	0.029	2	East approach Right Turn	10	B	0	
Millmerran-Inglewood Road/ Heckendorf Road	AM	Without Project	0.02	1	Northwest approach Left Turn	10	A	0	1994%
		With Project	0.051	5	Northwest approach Right Turn	15	C	2	
	PM	Without Project	0.021	1	Northwest approach Left Turn	10	A	0	1163%
		With Project	0.062	5	Northwest approach Right Turn	16	C	2	
Millmerran-Inglewood Road/ Kooroongarra Road	AM	Without Project	0.032	1	East approach Left Turn	8	A	0	540%
		With Project	0.061	3	East approach Left Turn	11	B	2	
	PM	Without Project	0.03	1	West approach Left Turn	8	A	0	524%
		With Project	0.076	3	East approach Left Turn	11	B	1	
Millmerran-Inglewood Road/ Millwood Road	AM	Without Project	0.009	3	East approach Left Turn	10	A	0	422%
		With Project	0.033	5	East approach Right Turn	15	B	1	
	PM	Without Project	0.018	2	East approach Left Turn	10	A	0	397%
		With Project	0.032	4	East approach Right Turn	13	B	1	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Millmerran-Inglewood Road/Moffatt Reserve Road	AM	Without Project	0.03	2	Northeast approach Left Turn	9	A	1	81%
		With Project	0.042	2	Northeast approach Right Turn	10	B	1	
	PM	Without Project	0.028	2	Northeast approach Left Turn	9	A	0	85%
		With Project	0.053	2	Northeast approach Right Turn	10	B	1	
Millmerran-Inglewood Road/Owens Scrub Road	AM	Without Project	0.022	4	East approach Left Turn	8	A	1	331%
		With Project	0.059	7	South approach Right Turn	11	B	3	
	PM	Without Project	0.034	5	South approach Left Turn	8	A	1	160%
		With Project	0.091	7	East approach Left Turn	10	A	3	
Millmerran-Inglewood Road/Paton Road	AM	Without Project	0.023	1	East approach Right Turn	11	B	0	368%
		With Project	0.034	2	East approach Right Turn	10	B	0	
	PM	Without Project	0.023	1	East approach Right Turn	11	B	0	364%
		With Project	0.03	2	North approach Left Turn	10	A	0	
Millmerran-Inglewood Road/ Thornton Road	AM	Without Project	0.009	1	Southwest approach Left Turn	9	A	0	2160%
		With Project	0.047	5	West approach Right Turn	12	B	2	
	PM	Without Project	0.016	1	Southwest approach Left Turn	9	A	0	2165%
		With Project	0.078	4	West approach Right Turn	12	B	2	
Millmerran-Inglewood Road/ Wongavale Yugilbar Road	AM	Without Project	0.012	2	South approach Left Turn	8	A	0	150%
		With Project	0.027	3	East approach Left Turn	10	B	1	
	PM	Without Project	0.012	2	South approach Left Turn	8	A	0	156%
		With Project	0.02	3	South approach Right Turn	10	A	0	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Texas-Yelarbon Road/ Access Track	AM	Without Project	0.007	1	East approach Left Turn	6	A	0	247%
		With Project	0.011	2	East approach Right Turn	7	A	0	
	PM	Without Project	0.006	1	East approach Left Turn	6	A	0	247%
		With Project	0.01	3	East approach Right Turn	7	A	0	
Toowoomba-Cecil Plains Road/ Airport Quarry Wellcamp Access Road	AM	Without Project	0.116	1	South approach Right Turn	13	B	1	174%
		With Project	0.122	2	South approach Right Turn	14	B	3	
	PM	Without Project	0.06	0	East approach Left Turn	10	B	0	411%
		With Project	0.089	2	West approach Right Turn	11	B	2	
Toowoomba-Cecil Plains Road/ Brimblecombe Road	AM	Without Project	0.095	0	North approach Left Turn	9	A	0	226%
		With Project	0.104	1	North approach Right Turn	12	B	1	
	PM	Without Project	0.135	0	East approach Right Turn	10	A	1	117%
		With Project	0.141	1	North approach Right Turn	14	B	1	
Toowoomba-Cecil Plains Road/Omara Road	AM	Without Project	0.471	7	North approach Right Turn	16	C	22	6%
		With Project	0.491	7	North approach Right Turn	16	C	24	
	PM	Without Project	0.623	8	North approach Right Turn	21	C	33	7%
		With Project	0.65	8	North approach Right Turn	22	C	36	
Toowoomba-Cecil Plains Road/ Toowoomba Bypass NB Ramps	AM	Without Project	0.27	10	South approach Right Turn	24	C	16	10%
		With Project	0.274	10	South approach Right Turn	25	C	19	
	PM	Without Project	0.194	8	South approach Right Turn	36	D	22	15%
		With Project	0.21	9	South approach Right Turn	37	D	24	
Toowoomba-Cecil Plains Road/ Toowoomba Bypass SB Ramps	AM	Without Project	0.238	10	North approach Right Turn	30	C	22	25%
		With Project	0.399	12	North approach Right Turn	25	C	24	
	PM	Without Project	0.183	9	North approach Right Turn	30	C	17	28%
		With Project	0.296	10	North approach Right Turn	25	C	17	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Toowoomba-Cecil Plains Road/ Access Track	AM	Without Project	0.051	0	South approach Right Turn	8	A	0	735%
		With Project	0.081	3	South approach Right Turn	12	B	2	
	PM	Without Project	0.091	0	South approach Right Turn	9	A	0	755%
		With Project	0.121	2	South approach Right Turn	12	B	3	
Toowoomba-Cecil Plains Road/ Wellcamp Westbrook Road	AM	Without Project	0.133	4	South approach Right Turn	11	B	3	10%
		With Project	0.144	4	West approach Right Turn	12	B	3	
	PM	Without Project	0.171	4	South approach Right Turn	12	B	4	9%
		With Project	0.183	5	West approach Right Turn	12	B	5	
Warrego Highway/ Chamberlain Road	AM	Without Project	0.168	0	North approach Left Turn	9	A	0	282%
		With Project	0.169	0	North approach Left Turn	11	B	0	
	PM	Without Project	0.18	0	North approach Left Turn	9	A	0	348%
		With Project	0.182	0	North approach Left Turn	10	A	0	
Warrego Highway/ Leesons Road	AM	Without Project	0.204	0	East approach U Turn	16	C	0	830%
		With Project	0.204	0	East approach Right Turn	17	C	2	
	PM	Without Project	0.203	0	East approach U Turn	15	C	0	496%
		With Project	0.205	0	East approach Right Turn	21	C	2	
Warrego Highway/ Toowoomba Bypass NB Ramps	AM	Without Project	0.649	11	East approach Right Turn	26	C	44	9%
		With Project	0.692	12	East approach Right Turn	26	C	48	
	PM	Without Project	0.632	11	East approach Right Turn	25	C	42	11%
		With Project	0.697	11	East approach Right Turn	25	C	49	
Warrego Highway/ Toowoomba Bypass SB Ramps	AM	Without Project	0.41	22	North approach Right Turn	40	D	70	7%
		With Project	0.431	23	North approach Right Turn	40	D	73	
	PM	Without Project	0.527	24	North approach Right Turn	40	D	92	4%
		With Project	0.527	24	North approach Right Turn	40	D	92	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
GRC									
Cemetery Road/ Access Track	AM	Without Project	0.01	8	Northwest approach Left Turn	9	A	0	42%
		With Project	0.015	9	Northwest approach Left Turn	10	A	0	
	PM	Without Project	0.01	8	Northwest approach Left Turn	9	A	0	47%
		With Project	0.015	9	Northwest approach Left Turn	10	A	0	
Coolmunda Dam Access/ Coolmunda Dam Access	AM	Without Project	0.004	3	East approach Right Turn	6	A	0	144%
		With Project	0.009	5	East approach Right Turn	6	A	0	
	PM	Without Project	0.004	3	East approach Right Turn	6	A	0	144%
		With Project	0.009	5	East approach Right Turn	6	A	0	
Hunt Street/ Boodle Street	AM	Without Project	0.001	4	South approach Left Turn	6	A	0	61%
		With Project	0.002	4	South approach Left Turn	6	A	0	
	PM	Without Project	0.001	4	South approach Left Turn	6	A	0	61%
		With Project	0.002	4	South approach Left Turn	6	A	0	
Kildonan Road/ Eukabilla Road	AM	Without Project	0.051	0	Northwest approach Left Turn	8	A	0	513%
		With Project	0.059	1	Southeast approach Right Turn	10	A	0	
	PM	Without Project	0.05	0	Northwest approach Left Turn	8	A	0	442%
		With Project	0.053	1	Southeast approach Right Turn	10	A	0	
Kildonan Road/ South Kurumbul Road	AM	Without Project	0.051	0	North approach Left Turn	10	B	0	57%
		With Project	0.052	1	North approach Left Turn	10	B	0	
	PM	Without Project	0.05	0	North approach Left Turn	10	B	0	57%
		With Project	0.051	1	North approach Left Turn	10	B	0	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
McDougalls Road/ Access Track	AM	Without Project	0.002	6	Southwest approach Left Turn	8	A	0	74%
		With Project	0.005	4	Northwest approach Through	8	A	0	
	PM	Without Project	0.002	6	Southwest approach Left Turn	8	A	0	128%
		With Project	0.007	6	Southwest approach Left Turn	8	A	0	
Mooroobie Lane/ Cemetery Road	AM	Without Project	0.009	7	Southwest approach Left Turn	8	A	0	42%
		With Project	0.013	8	Northeast approach Right Turn	10	A	0	
	PM	Without Project	0.009	7	Southwest approach Left Turn	8	A	0	50%
		With Project	0.013	8	Northeast approach Right Turn	10	A	0	
Mooroobie Lane/ Mooroobie Lane	AM	Without Project	0.001	7	Southwest approach Left Turn	10	A	0	342%
		With Project	0.007	9	Southwest approach Left Turn	10	A	0	
	PM	Without Project	0.001	7	Southwest approach Left Turn	10	A	0	342%
		With Project	0.007	9	Southwest approach Left Turn	10	A	0	
Mosquito Creek Road/ Grays Road	AM	Without Project	0.001	5	South approach Left Turn	9	A	0	432%
		With Project	0.008	9	South approach Left Turn	11	B	0	
	PM	Without Project	0.001	5	South approach Left Turn	9	A	0	432%
		With Project	0.008	9	South approach Left Turn	11	B	0	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Suttons Road/ Access Track	AM	Without Project	0.001	4	Southeast approach Left Turn	6	A	0	970%
		With Project	0.016	6	Southeast approach Left Turn	7	A	1	
	PM	Without Project	0.001	4	Southeast approach Left Turn	6	A	0	970%
		With Project	0.016	6	Southeast approach Left Turn	7	A	1	
Wondalli Kurumbul Road/ Mooroobie Lane	AM	Without Project	0.002	6	South approach Left Turn	8	A	0	195%
		With Project	0.012	8	South approach Left Turn	10	B	0	
	PM	Without Project	0.002	6	South approach Left Turn	8	A	0	195%
		With Project	0.012	8	South approach Left Turn	10	B	0	
Yelarbon Kurumbul Road/ Queen Street South	AM	Without Project	0.002	4	Northeast approach Left Turn	9	A	0	219%
		With Project	0.011	4	Northeast approach Left Turn	11	B	0	
	PM	Without Project	0.002	4	Northeast approach Left Turn	9	A	0	231%
		With Project	0.006	4	East approach Right Turn	10	A	0	
Yelarbon Kurumbul Road/ South Kurumbul Road	AM	Without Project	0.003	5	Southwest approach Left Turn	11	B	0	85%
		With Project	0.007	5	Southwest approach Left Turn	11	B	0	
	PM	Without Project	0.003	5	Southwest approach Left Turn	11	B	0	85%
		With Project	0.007	5	Southwest approach Left Turn	11	B	0	
Yelarbon Kurumbul Road/ Wondalli Kurumbul Road	AM	Without Project	0.002	3	North approach Left Turn	8	A	0	476%
		With Project	0.01	5	West approach Left Turn	10	B	0	
	PM	Without Project	0.002	3	North approach Left Turn	8	A	0	477%
		With Project	0.013	5	West approach Left Turn	10	B	0	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
MPSC									
River Road/ River Road	AM	Without Project	0.002	4	South approach Left Turn	6	A	0	103%
		With Project	0.003	5	South approach Right Turn	6	A	0	
	PM	Without Project	0.002	4	South approach Left Turn	6	A	0	103%
		With Project	0.003	5	South approach Right Turn	6	A	0	
TRC									
Campbell Street/ Saleyards Road	AM	Without Project	0.061	1	North approach Right Turn	6	A	1	24%
		With Project	0.088	1	West approach Right Turn	8	A	1	
	PM	Without Project	0.066	1	North approach Right Turn	6	A	1	26%
		With Project	0.096	1	West approach Right Turn	9	A	1	
Commodore Peak Road/ Scragg Road	AM	Without Project	0.002	4	North approach Left Turn	8	A	0	500%
		With Project	0.013	5	North approach Left Turn	10	B	1	
	PM	Without Project	0.002	4	North approach Left Turn	8	A	0	660%
		With Project	0.014	6	North approach Left Turn	9	A	1	
Drayton Wellcamp Road/ Boundary Street South	AM	Without Project	0.093	0	South approach Right Turn	14	B	0	220%
		With Project	0.094	1	North approach Right Turn	17	C	1	
	PM	Without Project	0.134	0	South approach Right Turn	16	C	0	245%
		With Project	0.135	1	North approach Right Turn	23	C	2	
Forestry Road/ Access Track	AM	Without Project	0.001	4	East approach Right Turn	6	A	0	364%
		With Project	0.007	6	East approach Right Turn	7	A	0	
	PM	Without Project	0.001	4	East approach Right Turn	6	A	0	364%
		With Project	0.007	6	East approach Right Turn	7	A	0	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Kingsthorpe Haden Road/ Kingsthorpe Overpass	AM	Without Project	0.154	7	North approach Right Turn	8	A	2	10%
		With Project	0.154	7	West approach Right Turn	9	A	4	
	PM	Without Project	0.17	6	North approach Right Turn	8	A	6	9%
		With Project	0.204	6	North approach Right Turn	8	A	7	
Kooroongarra Road/ Millwood Road	AM	Without Project	0.005	4	North approach Left Turn	9	A	0	294%
		With Project	0.019	7	South approach Left Turn	10	B	1	
	PM	Without Project	0.004	4	East approach Left Turn	8	A	0	336%
		With Project	0.019	8	South approach Left Turn	10	B	1	
Leesons Road/ Steger Road	AM	Without Project	0.047	8	East approach Left Turn	8	A	2	6%
		With Project	0.051	8	East approach Right Turn	10	A	2	
	PM	Without Project	0.058	8	East approach Left Turn	8	A	2	6%
		With Project	0.063	8	East approach Right Turn	10	A	2	
Linthorpe Valley Road/ Geitz Road	AM	Without Project	0.004	7	East approach Left Turn	8	A	0	74%
		With Project	0.008	8	South approach Right Turn	9	A	0	
	PM	Without Project	0.004	7	East approach Left Turn	8	A	0	73%
		With Project	0.008	7	East approach Left Turn	9	A	0	
Millwood Road/ Millwood Road	AM	Without Project	0.001	5	South approach Left Turn	8	A	0	814%
		With Project	0.016	9	South approach Left Turn	10	B	1	
	PM	Without Project	0.001	5	South approach Left Turn	8	A	0	814%
		With Project	0.016	9	South approach Left Turn	10	B	1	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
Murlaggan Road/ Kahler Road	AM	Without Project	0.011	2	West approach Left Turn	8	A	0	57%
		With Project	0.019	2	North approach Left Turn	9	A	0	
	PM	Without Project	0.012	2	West approach Left Turn	8	A	0	70%
		With Project	0.016	2	East approach Right Turn	9	A	0	
Six Mile Road/ Bligh Street	AM	Without Project	0.001	5	Northeast approach Left Turn	8	A	0	133%
		With Project	0.003	7	Northeast approach Left Turn	10	A	0	
	PM	Without Project	0.001	5	Northeast approach Left Turn	8	A	0	133%
		With Project	0.003	7	Northeast approach Left Turn	10	A	0	
Steger Road/ Draper Road	AM	Without Project	0.077	4	West approach Left Turn	9	A	3	8%
		With Project	0.078	4	West approach Right Turn	11	B	3	
	PM	Without Project	0.091	4	West approach Left Turn	9	A	4	6%
		With Project	0.095	4	West approach Right Turn	11	B	4	
Tummaville Road/ Quarry Road Access	AM	Without Project	0.006	2	East approach Left Turn	8	A	0	962%
		With Project	0.018	7	North approach Left Turn	10	B	1	
	PM	Without Project	0.004	2	East approach Left Turn	8	A	0	954%
		With Project	0.018	8	North approach Left Turn	10	B	1	
Wellcamp Westbrook Road/ Drayton Wellcamp Road	AM	Without Project	0.162	6	East approach Right Turn	9	A	5	6%
		With Project	0.174	7	East approach Right Turn	9	A	5	
	PM	Without Project	0.256	7	East approach Right Turn	9	A	8	5%
		With Project	0.268	7	East approach Right Turn	9	A	8	

Intersection name	Peak period	Analysis scenario	Intersection		Worst movement				Increase in vehicle minutes delay (%)
			DoS	Average delay (s)	Movement	Delay (s)	LoS	95% back of queue length (m)	
West Street/ Florence Street	AM	Without Project	0.013	5	South approach Left Turn	5	A	0	7%
		With Project	0.014	5	South approach Left Turn	5	A	0	
	PM	Without Project	0.012	5	South approach Left Turn	5	A	0	7%
		With Project	0.013	5	South approach Left Turn	5	A	0	
Yarranlea Road/ Desmonds Lane	AM	Without Project	0.003	4	South approach Left Turn	8	A	0	75%
		With Project	0.007	5	East approach Left Turn	9	A	0	
	PM	Without Project	0.003	4	South approach Left Turn	8	A	0	77%
		With Project	0.006	5	South approach Right Turn	9	A	0	

The overall vehicle minutes delay net increase for the intersection impact assessment area equates to 5.98 per cent, which is just above the GTIA definition of significantly worsening of 5 per cent. Therefore, mitigation of capacity issues causing delay is likely required to return the development to pre-development levels subject to further discussions with the road managers during detailed design.

20.5.2.7 Pavement impacts

An increase in the total vehicle and heavy vehicle movements on the existing road network has the potential to result in the accelerated degradation of the trafficable surface.

A Pavement Impact Assessment (PIA) was undertaken as part of the TIA on all potentially affected SCR based on the existing background traffic data available for the relevant road sections. The PIA is a preliminary desktop assessment, which is suitable for this stage of the Project. The GTIA specifies that an impact to road pavement has potential to occur where construction or operation traffic generated by a development equal or exceeds 5 per cent of the existing SAR on a road section (see Table 20-5).

The following approach was adopted for the PIA for affected SCR:

- The number and types of vehicles that will be generated by the Project in both construction and operation were determined, and sections of the network were identified where pavement assessment is most likely required for each year of implementation
- The Project traffic volumes were converted into SAR based on the assumed number of SAR per vehicle
- A 5 per cent impact comparison of the background SAR and Project generated SAR was conducted for each road link identified to be most likely impacted by the Project.

The PIA indicates that the majority of SCR segments would have minimal pavement impact given the duration of construction activities and pavement loading, however, it was found that the 5 per cent threshold would be exceeded for several road sections, as outlined in Table 20-45.

TABLE 20-45 NUMBER OF ROADS EXCEEDING FIVE PER CENT BASE STANDARD AXLE REPETITIONS BY ROAD AUTHORITY

Road authority	Number of roads > 5%	Number of road links > 5%	Length of roads > 5% (km)
DTMR	12	81	531.2
TfNSW	0	0	0
BSC	1	1	0.4
GRC	26	39	136.8
MPSC	2	2	6.7
TRC	42	59	76.9

Some of the percentages are relatively high due to very low background traffic volumes along the particular road sections. Detailed analysis outputs and results of these road segments are provided in Appendix AA: Traffic Impact Assessment.

Detailed pavement design life assessments will be carried out prior to the commencement of construction, in consultation with DTMR, once specific construction routes are agreed in the detailed design stage of the Project. Further detailed assessment will assist in identifying if contributions may be required towards the maintenance costs for the affected road sections as a result of additional pavement loading. This will form part of the draft Outline Environmental Management Plan (Outline EMP) and subsequent construction environmental management plans (CEMP) to be developed prior to construction. The TMP will also be developed prior to the commencement of construction by the Contractor with mitigation measures included to supplement the Outline EMP. This will assist further discussions with DTMR to identify if contributions may be required towards the maintenance costs for the affected road sections as a result of additional pavement loading.

20.5.3 Private access

ARTC has consulted with impacted landowners to obtain an understanding of property access requirements and to present potential private access solutions based on the revised reference design. Legal access to properties will be retained in all instances. Each property solution will be designed on a case-by-case basis through ongoing consultation with landowners and further design refinement. Consultation to identify potential occupational crossing solutions is described in Appendix E: Consultation Report. The final number of occupational crossings on private property will be determined during detailed design.

Where level crossings are required, ARTC will consult with landowners to determine the design that best fits their requirements. For example, in areas where landowners use large machinery, the design of the level crossing including gate widths, crossing surface and approach grades will need to accommodate this. Alternatively, where there is stock on a property, the focus will be on installing appropriate fencing and gates to keep the stock out of the rail corridor.

Where the consolidation of private accesses results in road alterations to the road network, the relevant road controlling authority, either DTMR or the local council, will be required to be consulted.

ARTC will work with each landowner to find access solutions that minimise the number of level crossings for the Project, consistent with the safety objectives of the ONRSR guidelines and policies.

Design and layout of occupational crossing solutions will be determined based on the following considerations:

- Feedback from consultation with landowners on specific property requirements
- Safety standards, including criteria for minimum sight distances for trains and vehicles
- Alternative access arrangements
- Rail design and landform
- Stock movements
- Vehicle access requirements (for example farm machinery, frequency of use).

Typical treatments include:

- Underpass for stock passage or vehicle and machinery use, subject to topography
- At grade level crossing
- Diversion to adjacent public road/public road crossing.

During construction, private access to individual properties may be temporarily disrupted and restricted where land is required temporarily for the temporary footprint.

20.5.4 Public transport services

Existing public transport services that have potential to be impacted by the Project have been identified in Section 20.4.3.

Generally, temporary traffic controls (e.g. reduced speed limits and temporary traffic lights) and/or an increase in construction traffic, particularly heavy vehicle traffic, have the potential to impact the operation of public transport services.

Five public transport services have been identified with routes that are proposed to be used, in part, by construction traffic for the Project. These routes utilise roads of high traffic volumes, including using one of the following roads:

- Warrego Highway (<5 per cent volume increase)
- Logan Motorway (<5 per cent volume increase)
- Gateway Motorway (<5 per cent volume increase)
- Toowoomba-Athol Road.

Toowoomba-Athol Road is expected to increase traffic volumes by 99 vehicles per day in the peak impact year (5.4 per cent increase to background traffic). The road continues to operate at LoS A in the road link assessment.

Based on the above, low increase in construction traffic comparatively to background traffic, it is considered unlikely that increased journey times would be experienced on these public transport services as a consequence of construction traffic for the Project.

No public transport routes intersect with the Project alignment.

TransLink and other public transport operators will be consulted as part of the detailed design and construction works stage of the Project to identify public transport service constraints on the local road network. Other service operators will be consulted, as required.

20.5.5 School bus routes

The increase in construction traffic, particularly heavy vehicle traffic, has the potential to impact the journey time and safety of school bus routes.

The potential impacts to school bus services due to the upgrade of existing, or introduction, of new road–rail intersection for the Project are discussed in Table 20-46.

TABLE 20-46 POTENTIAL IMPACTS TO SCHOOL BUS SERVICES DUE TO UPGRADED OR NEW ROAD–RAIL INTERSECTION

School bus service	Potential impact
P473 Yuraraba to Inglewood State School	The rail alignment interfaces with this bus route at 310-24-P-2 (Millmerran-Inglewood Road). This RRI is proposed as an active level crossing. A wait time of approximately 1.69 minutes is expected at this crossing during the train pass-by.
P510 Southbrook North to Southbrook Central State School	The rail alignment interfaces with the bus route at 310-50-P11z (Biddeston Southbrook Road) and 310-50-P-11 (Linthorpe Valley Road). Proposed grade separated (rail-over-road) crossing, 310-50-P11z, realigns Biddeston Southbrook Road from its previous crossing at 310-52-P-1. The route would require realignment to use the new Biddeston Southbrook Road section. This realignment is further discussed in Appendix AA: Traffic Impact Assessment. There is the opportunity to build the grade separation offline without impacting the movement of school buses during construction. The grade separation will allow buses to cross the rail alignment with no delay. 310-50-P-11 is proposed as an active level crossing with a wait time of approximately 1.68 minutes expected during train crossings.
P624 Service Wilga View to Pittsworth State School	The rail alignment interfaces with the bus route at 310-49-P-11a (Linthorpe Road) and 310-49-P-2 (Lochaber Road). The construction of the grade separation is expected to cause delay to the school bus service; however, once operational, the buses will be able to cross the rail alignment with no delay. Proposed grade separated (rail-over-road) crossing, 310-49-P-2, realigns Lochaber Road from its previous location (310-49-P-1). The route would require realignment to use the new Lochaber Road alignment. This realignment is further discussed Appendix AA: Traffic Impact Assessment. The grade separation will allow buses to cross the rail alignment with no delay.
P772 Tummaville to Millmerran State School	The rail alignment interfaces the bus route at 310-40-E-2 (Millmerran–Leyburn Road) and 310-42-E-0a. Proposed active level crossing 310-40-E-2 with a wait time of approximately 1.52 minutes is expected during train crossings. Proposed active crossing 310-42-E-0a, with an expected wait time of approximately 1.52 minutes during train closures, is located west of the current Fysh Road crossing at 310-42-E-1.

School bus service	Potential impact
P819 Irongate to Pittsworth State School	The rail alignment interfaces with the bus route at 310-49-P-2 (Lochaber Road). This RRI is a grade separated (rail-over-road) crossing to realign Lochaber Road from its previous location (310-49-P-1). The route would require realignment to use the new Lochaber Road alignment. This realignment is further discussed in Appendix AA: Traffic Impact Assessment. The grade separation will allow buses to cross the rail alignment with no delay.
P957 Ivanhoe to Millmerran State School	The rail alignment interfaces with the bus route at 310-38-P-3b (Owens Scrub Road). The crossing is proposed as a grade separated (road-over-rail) crossing. The crossing is proposed slightly east of the existing crossing. As such, there is the opportunity to build the grade separation offline without impacting the movement of school buses during construction. Once operational, the buses will be able to cross the rail alignment with no delay.
P1082 Koarlo to Goondiwindi State School	The rail alignment interfaces with the bus route at 270-12-P-1 (Kildonan Road). This location is proposed for active level crossing treatment within the revised reference design. A wait time of approximately 97 seconds is expected at this crossing during a train pass-by.
P1883 Athol to Bunker's Hill State School	The rail alignment interfaces with the bus route at 310-53-P-1a (Athol School Road). The impacts to services passing through proposed grade separation 310-53-P-1a will be confined to construction of the Project. Once operational, vehicular movements at this location are expected to be unimpeded.
S108 Pittsworth State High School to Mount Tyson	The rail alignment interfaces with the bus route at 310-48-P-8 (Oakey–Pittsworth Road) and 310-49-P-2 (Lochaber Road). Impacts to the services passing through the proposed grade separated (rail-over-road) crossing 310-48-P-8 will be confined to construction of the Project. Once operational vehicular movements at this location are expected to be unimpeded. Proposed grade separated (rail-over-road) crossing, 310-49-P-2, realigns Lochaber Road from its previous location (310-49-P-1). The route would require realignment to use the new Lochaber Road alignment. This realignment is further discussed in Appendix AA: Traffic Impact Assessment. The grade separation will allow buses to cross the rail alignment with no delay.
S118 Pittsworth to Brookstead Area	The rail alignment interfaces with the bus route at 310-44-E-2 (Gore Highway) and 310-46-E-1 (Yarranlea Road). 310-44-E-2 is proposed as a grade separated (road-over-rail) crossing. The crossing will likely cause delays during construction due to its alignment with the existing level crossing location. Once operational vehicular movements at this location are expected to be unimpeded. The Project design proposed 310-46-E-1 as a grade separated (road-over-rail) crossing south of the existing level crossing at 310-46-E-1a. The crossing will likely cause delays during construction due to its alignment with the existing level crossing location. Once operational, vehicular movements at this location are expected to be unimpeded.
S178 Kingsthorpe Secondary to Harristown State High School	The rail alignment interfaces with the bus route at 310-56-P-2 (Warrego Highway). The RRI is proposed as a grade separated (rail-over-road) crossing. The crossing will likely cause delays during construction due to its alignment with the existing road. Once operational, vehicular movements at this location are expected to be unimpeded.
S577 Kingsthorpe/ Wellcamp to Harristown State High School	The rail alignment interfaces with the bus route at 310-56-P-2 (Warrego Highway). The RRI is proposed as a grade separated (rail-over-road) crossing. The crossing will likely cause delays during construction due to its alignment with the existing road. Once operational, vehicular movements at this location are expected to be unimpeded.
S740 AM and PM Service Millmerran Years 11 and 12 to Pittsworth State High School	The rail alignment interfaces with the bus route at 310-44-E-2 (Gore Highway). The Project design proposed 310-44-E-2 as a grade separated (road-over-rail) crossing. The crossing will likely cause delays during construction due to its alignment with the existing level crossing location. Once operational vehicular movements at this location are expected to be unimpeded.
YEL5 Yelarbon to Goondiwindi State High School	This bus route interfaces with construction traffic on the Cunningham Highway. It is expected that school bus services would not be substantially impacted from an operational and service reliability perspective as a result of the Project generated traffic during the Project construction, however, the Contractor will avoid school bus services and school zones, with school zones and routes considered in the preparation of the CEMP.
GLE11 Glenoak Road to Goondiwindi State High School, connecting with P451	This bus route interfaces with construction traffic on the Cunningham Highway. It is expected that school bus services would not be substantially impacted from an operational and service reliability perspective as a result of Project generated traffic during Project construction, however, the Contractor will avoid school bus services and school zones, with school zones and routes considered in the preparation of the CEMP.

It is no longer proposed to use the Yelarbon rest area as a laydown area for Project construction activities, therefore no impacts are expected associated with student bus transfers at this location.

Given that the school bus routes in Table 20-46 do not tend to have designated bus stops, apart from the termini, prior to the construction works stage of the Project, suitable mitigation measures for all of the affected services, including the location of bus stops, will be identified in consultation with bus operators, local councils, impacted schools, Department of Education and the local community. These will be documented in the TMP to ensure school bus safety and understand any impacts to journey times, if any. These stakeholders should be consulted as part of the Project and made aware of the proposed changes to the school bus routes. The Contractor will also be made aware of the presence of school bus routes and bus stops, and their operational hours, as part of the Project induction process.

ARTC commits to maintaining existing bus stops during the Project construction. Any alterations will be agreed with the relevant service provider.

There may be additional school bus routes that are not publicly available and have therefore not been captured in this assessment. Consultation with relevant stakeholders, including local councils and Department of Education, will be undertaken prior to the construction works stage of the Project once construction routes have been finalised to ensure that all school bus routes that may be impacted by construction traffic have been accounted for.

It is expected that school bus services would not be substantially impacted from an operational and service reliability perspective as a result of the Project generated traffic during the Project construction, however, the Contractor will avoid school bus services and school zones, with school zones and routes considered in the preparation of the CEMP.

20.5.6 Long-distance coach services

Long distance coach services were identified in Section 20.4.6 to use the following sections which overlap with construction routes on the following roads:

- Ipswich Motorway
- Warrego Highway
- Toowoomba Connection Road
- Toowoomba Bypass
- Cunningham Highway
- Newell Highway
- Toowoomba-Cecil Plains Road
- Toowoomba-Athol Road
- Gore Highway
- Leichhardt Highway.

Of the listed roads overlapping construction routes, only sections of the Gore Highway and Toowoomba-Cecil Plains Road would experience a reduction in LoS due to construction related traffic. Although there is a change in operational LoS for the road sections listed above, the expected operational LoS B is within the generally preferred LoS range. Given the LoS B results include allowance for peak harvest season, it is not expected that long-distance coach route travel times along the routes will be impacted significantly by construction vehicles both during and outside of harvest season. In addition, the operational performance of the road would return to base conditions after construction is complete, however, where possible, the Contractor will avoid use of these routes where possible and consider the operations of long-distance bus routes in the preparation of the Outline EMP and TMP.

20.5.7 Stock routes

The revised reference design for the Project interfaces the stock route network in 12 locations. Details of these stock routes and the potential impacts are outlined in Table 20-47.

Connectivity of the local stock route network, ‘with’ and ‘without’ the Project, is shown in figures included in Appendix B2: Stock Routes and Appendix E: Consultation Report.

TABLE 20-47 POTENTIAL IMPACTS TO STOCK ROUTES WITHIN THE PROJECT FOOTPRINT

Location and Project interface point (approximate chainage)	Stock route ID, type, status and class	Interface type	Description	Proposed mitigation
No direct interface	ID: 005BALO Type: Road Status: Open Class: Primary	Construction routes: ▸ Carnarvon Highway ▸ Barwon Highway	This stock route follows routes proposed to be used by construction traffic.	Consultation with GRC, TRC, Department of Resources (DoR) and landowners has occurred to determine potential impacts on these stock routes and to identify potential solutions for the treatment of rail and stock route interfaces. This consultation will continue through the detailed design stage and as the construction approach is confirmed to further ensure that potential impacts are appropriately managed.
No direct interface	ID: 006BALO Type: Road Status: Open Class: Primary	Construction routes: ▸ Carnarvon Highway	This stock route follows routes proposed to be used by construction traffic.	Consultation with GRC, TRC, DoR and landowners has occurred to determine potential impacts on these stock routes and to identify potential solutions for the treatment of rail and stock route interfaces. This consultation will continue through the detailed design stage and as the construction approach is confirmed to further ensure that potential impacts are appropriately managed.
Kildonan Road Ch 33.1 km (NS2B)	ID: 005GWND Type: Road Status: Open Class: Primary	Road-rail interface: ▸ 270-12-P-1 Construction routes: ▸ Cunningham Highway ▸ Barwon Highway ▸ Kildonan Road ▸ Silo Street ▸ Eukabilla Road	This stock route follows Kildonan Road. The Project alignment crosses this stock route at Kurumbul.	▸ A dedicated stock level crossing, adjacent to Kildonan Road level crossing will be provided, allowing stock movement across the railway that avoids vehicular traffic interaction. The road level crossing will have flashing lights and boom barriers. ▸ Holding yards ▸ Funnel fencing ▸ Barrier across tracks* ▸ Communication system for controlled movement of trains and stock through level crossings.
Rainbow Reserve and Eukabilla Road Ch 33.4 km (NS2B)	ID: RAINBOW RESERVE Type: Reserve Status: Open Class: Primary	Construction routes: ▸ Eukabilla Road Project alignment: ▸ Parallel to rail corridor	This stock reserve encompasses the Rainbow Reserve camping area and Eukabilla Road. The Project alignment enters this stock reserve at Ch 33.15 km (NS2B) and crosses Eukabilla Road at Ch 33.4 km (NS2B). The Project alignment continues to run parallel to the western edge of the existing Eukabilla Road, within the stock reserve, to Ch 34.9 km (NS2B). At this point it exits the stock reserve.	Eukabilla Road will be realigned to run parallel to the western edge of the new rail corridor, allowing for uninterrupted stock movement from Kildonan Road onto Eukabilla Road. The stock reserve will be otherwise unaffected.

Location and Project interface point (approximate chainage)	Stock route ID, type, status and class	Interface type	Description	Proposed mitigation
South Kurumbul Road Ch 6.1 km Wondalli-Kurumbul Road and Yelarbon–Kurumbul Road Ch 7.2 km	ID: 081GWND Type: Road Status: Open Class: Secondary	Road-rail interface: ▸ 310-4-E-2 ▸ 310-5-E-2 Construction routes: ▸ Wondalli Kurumbul Road ▸ Yelarbon Kurumbul Road ▸ South Kurumbul Road ▸ Queen Street South ▸ Mooroobie Lane ▸ Kildonan Road	The stock route connects Wondalli-Kurumbul Road and South Kurumbul Road, running parallel and adjacent to the existing South Western Line rail corridor. This stock route is aligned along Wondalli-Kurumbul Road and parallel to Yelarbon–Kurumbul Road, which runs adjacent to the existing South Western Line rail corridor. The Project alignment crosses this stock route at the intersection of Wondalli–Kurumbul Road and Yelarbon–Kurumbul Road.	▸ A dedicated stock level crossing, adjacent to the upgraded active level crossing at South Kurumbul Road, allowing stock movement across the railway that avoids vehicular traffic interaction. ▸ Holding yards ▸ Funnel fencing ▸ Barrier across tracks* ▸ Communication system for controlled movement of trains and stock through level crossings. No crossing provided at Wondalli Kurumbul Road, noting there is no existing crossing on the QR line at this location. The stock will utilise the existing drover movements via South Kurumbul Road.
No direct interface	ID: 083GWND Type: Road Status: Open Class: Secondary	Construction routes: ▸ Mooroobie Lane	This stock route follows routes proposed to be used by construction traffic.	Consultation with GRC, TRC, DoR and landowners has occurred to determine potential impacts on these stock routes and to identify potential solutions for the treatment of rail and stock route interfaces. This consultation will continue through the detailed design stage and as the construction approach is confirmed to further ensure that potential impacts are appropriately managed.
No direct interface	ID: 084GWND Type: Road Status: Open Class: Secondary	Construction routes: ▸ Barwon Highway ▸ South Toobeah Road	This stock route follows routes proposed to be used by construction traffic.	Consultation with GRC, TRC, DoR and landowners has occurred to determine potential impacts on these stock routes and to identify potential solutions for the treatment of rail and stock route interfaces. This consultation will continue through the detailed design stage and as the construction approach is confirmed to further ensure that potential impacts are appropriately managed.
No direct interface	ID: 086GWND Type: Road Status: Open Class: Secondary	Construction routes: ▸ Cunningham Highway	This stock route follows routes proposed to be used by construction traffic.	Consultation with GRC, TRC, DoR and landowners has occurred to determine potential impacts on these stock routes and to identify potential solutions for the treatment of rail and stock route interfaces. This consultation will continue through the detailed design stage and as the construction approach is confirmed to further ensure that potential impacts are appropriately managed.

Location and Project interface point (approximate chainage)	Stock route ID, type, status and class	Interface type	Description	Proposed mitigation
No direct interface	ID: 799GWND Type: Road Status: Open Class: Tertiary	Construction routes: ▸ Barwon Highway	This stock route follows routes proposed to be used by construction traffic.	Consultation with GRC, TRC, DoR and landowners has occurred to determine potential impacts on these stock routes and to identify potential solutions for the treatment of rail and stock route interfaces. This consultation will continue through the detailed design stage and as the construction approach is confirmed to further ensure that potential impacts are appropriately managed.
No direct interface	ID: 806GWND Type: Road Status: Open Class: Tertiary	Construction routes: ▸ Gore Highway ▸ Leichhardt Highway	This stock route follows routes proposed to be used by construction traffic.	Consultation with GRC, TRC, DoR and landowners has occurred to determine potential impacts on these stock routes and to identify potential solutions for the treatment of rail and stock route interfaces. This consultation will continue through the detailed design stage and as the construction approach is confirmed to further ensure that potential impacts are appropriately managed.
No direct interface	ID: 807GWND Type: Road Status: Open Class: Tertiary	Construction routes: ▸ Gore Highway	This stock route follows routes proposed to be used by construction traffic.	Consultation with GRC, TRC, DoR and landowners has occurred to determine potential impacts on these stock routes and to identify potential solutions for the treatment of rail and stock route interfaces. This consultation will continue through the detailed design stage and as the construction approach is confirmed to further ensure that potential impacts are appropriately managed.
Yelarbon Ch 26.0 km	ID: 811GWND Type: Road Status: Open Class: Tertiary	Construction routes: ▸ Cunningham Highway ▸ Yelarbon Kurumbul Road ▸ Kildonan Road	This stock route is aligned with Merton Road, the Cunningham Highway and Yelarbon–Keetah Road. The stock route crosses the existing QR South Western Line at an active level crossing on the Cunningham Highway. The Project will require the closure of the existing active level crossing, to be replaced by a road-over-rail crossing approximately 400 m to the west of the existing crossing point. This road reconfiguration will result in the severance of the current stock route.	Realignment of the stock route to provide continued connectivity between Merton Road and Yelarbon–Keetah Road, via a passive level crossing off Yelarbon–Kurumbul Road. The new rail crossing point would be approximately 640 m west of the existing rail level crossing. ▸ Holding yards ▸ Funnel fencing ▸ Barrier across tracks* ▸ Communication system for controlled movement of trains and stock through level crossings

Location and Project interface point (approximate chainage)	Stock route ID, type, status and class	Interface type	Description	Proposed mitigation
East Sawmill Road Ch 27.0 km	ID: RESERVE Type: Reserve Status: Open Class: Primary	Project alignment: ▸ Parallel to road upgrades Construction routes: ▸ Cunningham Highway ▸ East Sawmill Road ▸ Suttons Road	This is an isolated stock reserve, with no mapped stock route linkages. The stock reserve is bound by the Cunningham Highway to the west and East Sawmill Road to the north. The Project involves curve easing on East Sawmill Road, which will encroach by up to 15 m into the northwestern corner of the stock reserve. The existing Yelarbon levee extends diagonally across this stock reserve. Modifications to the existing Yelarbon levee, will temporarily require works within the stock reserve.	The usability of this stock reserve is not expected to be impacted by the Project and therefore no treatment is proposed.
Lovells Crossing Road Ch 65.8 km	ID: 813GWND Type: Road Status: Open Class: Tertiary	Road-rail interface: ▸ 310-21-P-9 Construction routes: ▸ Cunningham Highway ▸ Lovells Crossing Road ▸ Elizabeth Street	This stock route follows Lovells Crossing Road. The Project alignment crosses this stock route approximately 3 km north of Inglewood.	A rail-over-road crossing of Lovells Crossing Road will be provided, allowing stock movement to pass under the railway at the same location. ▸ Holding yards ▸ Funnel fencing ▸ Barrier across tracks* ▸ Communication system for controlled movement of trains and stock through level crossings.
Millmerran–Inglewood Road (Inglewood) Ch 73.1 km to Ch 76.5 km and 84.2k	ID: 820GWND Type: Road Status: Open Class: Tertiary	Road-rail interface: ▸ 310-27-P-3 ▸ 310-24-P-2 Construction routes: ▸ Millmerran-Inglewood Road ▸ Lovells Crossing Road ▸ Thornton Road ▸ Elizabeth Street ▸ Grays Road	This stock route follows or runs parallel to the east of Millmerran-Inglewood Road. The Project alignment crosses this stock route twice in 10 km, once at Ch 75.0 km and again at Ch 85.0 km. The Project alignment crosses this stock route at the point of the stock route re-joining Millmerran-Inglewood Road.	This stock route would be realigned to remain on the eastern side of the rail alignment, thus avoiding the need to provide two separate stock route crossing treatments in close proximity. This treatment approach would provide continued connectivity for stock movement in parallel to Millmerran–Inglewood Road in this area. An underpass through the railway embankment will be provided to ensure continued connectivity for stock movement along Millmerran-Inglewood Road. The Department of Resources corridor requirements for new stock route corridor is 100 m wide.

Location and Project interface point (approximate chainage)	Stock route ID, type, status and class	Interface type	Description	Proposed mitigation
No direct interface	ID: 830GWND Type: Road Status: Open Class: Tertiary	Construction routes: ▸ Texas-Yelarbon Road	This stock route follows routes proposed to be used by construction traffic.	Consultation with GRC, TRC, DoR and landowners has occurred to determine potential impacts on these stock routes and to identify potential solutions for the treatment of rail and stock route interfaces. This consultation will continue through the detailed design stage and as the construction approach is confirmed to further ensure that potential impacts are appropriately managed.
Kooroongarra-Anderson Road Ch 96.1 km	ID: 856TOOW Type: Road Status: Open Class: Tertiary	Road-rail interface: ▸ 310-30-P-2 Construction routes: ▸ Forestry Road	This stock route branches off 820TOOW and provides an east-west connection to Stonehenge Road. The Project alignment crosses this stock route at the intersection of Kooroongarra-Anderson Road and Millmerran-Inglewood Road. Investigations are underway to potentially remove this interface. The Department of Resources have indicated that this stock route may not be required and will progress discussions with TRC on this matter.	▸ A passive level crossing will be provided, allowing stock movement across the railway at the same location. ▸ Funnel fencing ▸ Barrier across tracks*.
Millmerran-Inglewood Road (near Heckendorf Road) Ch 115.5 km	ID: 820TOOW Type: Road Status: Open Class: Tertiary	Road-rail interface: ▸ 310-35-P-4 Construction routes: ▸ Millmerran-Inglewood Road ▸ Forestry Road ▸ Millwood Road ▸ Moffatt Reserve Road ▸ Kooroongarra Road ▸ Schwarten Road ▸ Blackwell Road ▸ Six Mile Road ▸ West Street ▸ Paton Road ▸ Bligh Street ▸ Saleyards Road ▸ Campbell Street ▸ Heckendorf Road	This stock route follows Millmerran-Inglewood Road. The Project alignment crosses this stock route approximately 900 m south of the intersection of Heckendorf Road and Millmerran-Inglewood Road.	A rail-over-road grade separated crossing will be provided at 310-35-P-4 allowing continuation of existing stock movements along Millmerran-Inglewood Road at this location.

Location and Project interface point (approximate chainage)	Stock route ID, type, status and class	Interface type	Description	Proposed mitigation
Kooroongarra Road (Commodore Mine) Ch 127.2 km	ID: 820TOOW Type: Road Status: Open Class: Tertiary	Road-rail interface: ▸ 310-37-P-12a Construction routes: ▸ Millmerran-Inglewood Road ▸ Forestry Road ▸ Millwood Road ▸ Moffatt Reserve Road ▸ Kooroongarra Road ▸ Schwarten Road ▸ Blackwell Road ▸ Six Mile Road ▸ West Street ▸ Paton Road ▸ Bligh Street ▸ Saleyards Road ▸ Campbell Street ▸ Heckendorf Road	The stock route follows Millmerran-Kooroongarra Road and Millmerran-Inglewood Road. This Project alignment crosses this stock route approximately 550 m north of the intersection between Millmerran-Inglewood Road, Millmerran-Kooroongarra Road and Schwarten Road.	A rail-over-road grade separated crossing will be provided at 310-37-P-12a, allowing continuation of existing stock movements along Millmerran-Kooroongarra Road and Millmerran-Inglewood Road at this location.
No direct interface	ID: 869TOOW Type: Road Status: Open Class: Tertiary	Construction routes: ▸ Millwood Road ▸ Kooroongarra Road ▸ Moffatt Reserve Road		Consultation with GRC, TRC, DoR and landowners has occurred to determine potential impacts on these stock routes and to identify potential solutions for the treatment of rail and stock route interfaces. This consultation will continue through the detailed design stage and as the construction approach is confirmed to further ensure that potential impacts are appropriately managed.
Warrego Highway Ch 204.3 km	ID: No ID–Unused Type: Road Status: Open Class: Tertiary	Road-rail interface: ▸ 310-56-P-2 Construction routes: ▸ Warrego Highway ▸ Toowoomba Bypass ▸ Toowoomba Connection Road ▸ Charlton Connection Road ▸ O'Mara Road ▸ Steger Road ▸ Scrubby Road ▸ Kingsthorpe Haden Road ▸ Kingsthorpe Overpass ▸ Chamberlain Road ▸ Leesons Road ▸ Scrubby Road	This stock route follows the Warrego Highway. The Project alignment crosses this stock route approximately 700 m west of the intersection between the Warrego Highway, Chamberlain Road and Jannuschs Road.	A rail-over-road grade separated crossing will be provided, allowing continuation of existing stock movements along the Warrego Highway at this location.

Table note:

* Barrier option assessment will be conducted during detailed design in consultation with the Department of Resources to determine if there is an option that is acceptable to both road and rail managers which adequately manages their respective risks

20.5.8 State strategic touring routes

Although some State strategic touring routes use roads that have been identified for use by construction traffic, the short-term nature of the construction works stage would result in only temporary impacts to these routes, with no substantial impacts based on the road link assessment.

Details on the impacts of the Project to the visual amenity that may be available from transport routes are discussed in Chapter 10: Landscape and Visual Impact Assessment.

20.5.9 Cycling and pedestrian network

Construction of the Project has the potential to result in the following impacts to existing cycle networks within the Project traffic, transport and access study area:

- Temporary diversion of cycling routes or pedestrian access, resulting in modified routes and increased journey times
- Increased vehicle movements on cycleway network linkages that are co-located with construction traffic routes for the Project, which may result in longer journey times and increased likelihood of interactions between cyclists and vehicles.

Some of the proposed construction routes are aligned through areas of moderate to high pedestrian activity through the areas surrounding the towns of Yelarbon, Inglewood, Millmerran, Brookstead, Pittsworth and Toowoomba. Significant increases in heavy vehicle movements through these locations may adversely impact pedestrian movements, however, while increased heavy vehicle movements through these locations may adversely impact pedestrian movements, the majority of these routes currently facilitate a high proportion of heavy vehicle movements. Haulage contractors should be made aware of these areas of high pedestrian activity as a part of the TMP.

ARTC has committed to maintaining connectivity of existing on and off-road pedestrian/shared user facilities, where the need for that facility remains in a third-party agreement with relevant local councils. Consultation will continue with local councils regarding pedestrian crossing options during detailed design. Once agreed, changes to active transport networks will be communicated to active transport users through regular Project channels.

An active pedestrian level crossing has been proposed at the existing Cunningham Highway interface location (310-11-E-1) in the revised reference design to enable pedestrian connectivity to the Yelarbon township. Pedestrian and cyclist provisions at other road-rail interfaces will be confirmed and agreed with road controlling authorities and local councils on a case-by-case basis during detailed design once the alignment has been confirmed. At this stage, some road rail interfaces are likely to include integration of active transport facilities, including Crime Prevention Through Environmental Design considerations and access control.

Sections of the South Western Line and Millmerran Branch Line may become disused or non-operational with the delivery of the Project. Opportunities exist for these to be repurposed as rail trails for community use. These opportunities will be reviewed at the detailed design stage, in consultation with ARTC and QR.

Provision has been made where there is the need or future need for pedestrians and cyclist transport (e.g. Yelarbon pedestrian crossing). In all road-over-rail interfaces assessed, there is no existing desire or future need, and the provision of separate pedestrian and non-vehicular access is not economically justified in accordance with *Austroads Guide to Road Design Part 6A–Section C1.2.2*.

20.5.10 Airports

During the construction works and operations stages, the expected impact from the Project on airports is not considered to be significant as the transport of materials, workforce and equipment is expected to primarily use the existing road and rail transport networks.

The closest strategic airport is the Toowoomba Wellcamp Airport. At its closest point, the northern limit of the runway for Toowoomba Wellcamp Airport is approximately 865 m from the Project footprint and 1 km from the Project alignment. At its closest point, the Project alignment encroaches into the 470 m Obstacle Limitation Surface contour that extends from north-western end of the runway. Through consultation with the operator of Toowoomba Wellcamp Airport, the Project has been aligned to ensure that a double-stacked train on the rail alignment will not extend vertically into the OLS.

20.5.11 Ports

The Port of Brisbane is proposed to receive the accommodation facility cabins with construction routes linking the Port of Brisbane to the two non-resident accommodation facilities during pre-construction and early works. In addition, routes are proposed for transporting crops from a variety of locations to the port via road during track closures. The existing Port of Brisbane twenty-foot equivalent unit (TEU) data reported an average of 118,9888 TEU/month from October 2018 to October 2022, with an all-time high of 149,416 TEU in August 2022, and a record low of 87,880 TEU in March 2020 (CEIC Data, 2022).

During the construction of non-resident workforce accommodation facility, it is anticipated that 450 TEUs will be required over a period of two months. The number of TEUs compared with the monthly operating volumes indicates that there should be sufficient capacity to receive these items to the Port of Brisbane.

The export of crops aligns with current volumes and movements through the port; however, it is anticipated that these crops will be transported via road rather than via rail. This will impact the usual operations of the port with alterations required to allow for the increase in heavy vehicle movements rather than train movements.

The Project is expected to increase the operational throughputs of freight through the Port of Brisbane, however, the consideration of impacts at ports (freight containers) is not in the scope of this report and has not been assessed. Once the Contractor has further details, consultation will be undertaken with the Port of Brisbane.

20.5.12 Parking

An initial assessment of workforce demand and safe commutable distances has identified a potential need for three non-resident workforce accommodation facilities in the vicinity of Yelarbon, Inglewood and Millmerran. While parking at these facilities will be completely contained within the site, there is the possibility of workforce travelling to town outside of work hours for leisure. This may have an impact on local parking availability in the towns of Yelarbon, Inglewood and Millmerran, particularly at nearby to restaurants, taverns, and shopping centres. These facilities generally have parking availability either on their properties or along the local roads, which should be sufficient to accommodate off-duty workers accessing these locations.

20.5.13 Bulk transport

The Project has a significant requirement for bulk material transportation (i.e. ballast, quarry material and spoil), with over 6,000,000 m^3 of bulk materials requiring transportation as a part of the Project. Ongoing consultation between the Contractor, ARTC and the industry will be undertaken during the detailed design and construction works stage of the Project to ensure that the required transportation capacity is available to undertake the transport task and ensure that impacts to costs are mitigated.

20.5.14 Emergency services

The Project has the potential to result in the following during construction:

- Increased journey times on road linkages used by construction traffic
- Increased wait time at intersections used by construction traffic
- Temporarily altered driving conditions in proximity to construction areas, such as reduced speed limits, mobile traffic lights and lane reconfigurations
- Reduced connectivity across the Project alignment, impacting accessibility during flooding and fires.

Such impacts have the potential to result in increased response times for emergency services.

During both construction and operation, response times for emergency services may be delayed if they encounter significant roadworks or passing trains at level crossings. As part of the on-going process, ARTC is consulting and working with the relevant emergency service agencies (e.g. QFES, QAS and QPS) to develop protocols and joint working arrangements to address potential impacts on emergency services and service response times during construction and operation and ensure that access is retained as required. QAS, QPS and QFES have acknowledged the potential impact to their services during construction and operations and are supportive of the Project's approach. The QFES, QAS and QPS will all be consulted to identify suitable emergency access locations to the rail corridor in response to emergencies along the rail track.

Consultation with the community and relevant government agencies, including emergency services, will continue through the detailed design and construction planning process to ensure that safety concerns and issues are addressed.

The TMP will be developed prior to the commencement of construction to identify secondary/alternative construction routes which can be used by construction traffic in the event that a primary construction route is blocked by an accident or emergency situation. Where a suitable secondary route is not identified, the movement of construction vehicles will stop until suitable alternative routes are identified and agreed with the relevant road authority. Chapter 6: Stakeholder Engagement further details the consultation undertaken for the Project.

20.5.15 Transport infrastructure

20.5.15.1 Bridge and culvert constraints

A preliminary assessment identified a number of potential construction traffic restrictions along LGR as provided in Table 20-48. Should heavy vehicles be required to traverse these bridges or culverts, an assessment will be undertaken and further investigation and inspections will take place, the outcomes of which may lead to upgrading these bridges for construction and operational purposes.

TABLE 20-48 POTENTIAL CONSTRUCTION TRAFFIC RESTRICTIONS

Authority/ name	Restriction	Comment	Largest construction vehicle
GRC			
Mooroobie Lane	Creek crossing/potential floodway	Mooroobie Lane is used to access Cemetery Road Borrow Site and Mooroobie Lane Borrow Site.	Austroads Class 10
McDougalls Crossing	Creek crossing/potential load limited crossing structure	Crossing structure over Macintyre Brook potentially unsuitable for construction traffic.	Austroads Class 10
Cremascos Road	Creek crossing/potential load limited crossing structure	Crossing structure over Macintyre Brook potentially unsuitable for construction traffic.	OSOM
Bybera Road	Creek crossing/potential load limited crossing structure	Crossing structure over Macintyre Brook potentially unsuitable for construction traffic.	OSOM
Lovell's Crossing	Creek crossing/potential load limited crossing structure	Crossing structure over Macintyre Brook potentially unsuitable for construction traffic.	Austroads Class 10
Grays Road	Creek crossing/potential load limited crossing structure	Crossing structure over Canning Creek potentially unsuitable for construction traffic. Grays Road is proposed to be used to access Mosquito Road Borrow Site.	Austroads Class 10

At this stage, it is not expected that over-height construction vehicles will be needed in the construction of the Project, however, this is to be confirmed by the construction Contractor. Based on the site visits and desktop assessments undertaken, there have been no known height clearance issues for construction or maintenance requirements. This will also require further assessment during the next stage once construction routes are finalised.

Once a Contractor is appointed and the final construction routes are determined, all construction routes will be further assessed and ground-truthed prior to use by construction vehicles. This includes obtaining all necessary permits and ensuring roads meet appropriate performance standards, and any road upgrades that may be required are considered. Any roads or existing structures located along construction routes that may warrant upgrades to cater for the Project's construction vehicles will be required to be assessed in consultation with the asset owner, the road controlling authority, local councils, ARTC and the Contractor to determine if the upgrade is warranted as part of the Project.

20.5.15.2 Heavy vehicle movement

Where heavy vehicles routes and restrictions are defined, the Project construction vehicles comply with these requirements, with the exception of oversize overmass (OSOM) vehicles. These are generally SCRs. There are a number of roads used by construction vehicles that are not defined under the Queensland heavy vehicle routes and restrictions information. Routes unclassified for heavy vehicle use are generally LGR which usually have no requirement for B-double, higher mass limit or road train-sized vehicles. These roads may not be typically designed for such large vehicle types, the construction vehicles could impact on the pavement or road formation or be unsuitable for the road geometry.

Mitigation measures are discussed and outlined in the PIA in Section 20.6.

20.5.15.3 Oversize overmass movement

Swept path analysis has been undertaken at a total of 35 identified pinch point locations. These locations were identified through a desktop study of the proposed routes of OSOM movements. The pinch point locations and information is provided in Table 20-49. The assessment has identified a number of pinch points requiring upgrade (temporary or permanent) to accommodate the movement of OSOM vehicles.

Once the Contractor has prepared further plans and chosen their preferred design vehicle, the swept path assessments will be revisited to determine any temporary or permanent changes to the existing layout which may be required to accommodate construction traffic movements, such as road upgrades, localised lane widening, geometric improvements or removal of signage and lighting. These mitigation measures will be further discussed and agreed with the relevant road authorities and included as part of the third-party agreement.

TABLE 20-49 OVERSIZE OVERMASS PINCH POINT LOCATIONS

Pinch point ID	Street 1	Street 2	Approximate latitude	Approximate longitude	Intersection type
PP1	Warrego Highway off-ramp	Kingsthorpe Overpass	27°49'94.29"S	151°80'42.44"E	Roundabout
PP2	Kingsthorpe Overpass	Kingsthorpe Haden Road	27°49'63.96"S	151°80'75.55"E	Priority 3-way
PP3	Warrego Highway	Access Track	27°50'39.25"S	151°81'58.64"E	Priority 3-way
PP4	Warrego Highway	Chamberlain Road	27°50'65.21"S	151°82'36.47"E	Priority 3-way
PP5	Toowoomba Bypass	Warrego Highway	27°31'25.92"S	151°15'32.56"E	Signalised 4-way
PP6	Warrego Highway	Toowoomba Bypass	27°31'29.36"S	151°51'47.85"E	Signalised 4-way
PP7	Toowoomba-Cecil Plains Road	Toowoomba Bypass	27°32'49.32"S	151°50'07.01"E	Signalised 4-way
PP8	Toowoomba-Cecil Plains Road	Toowoomba Bypass	27°32'48.50"S	151°50'00.20"E	Signalised 4-way
PP9	Gore Highway	Athol School Road	27°37'14.05"S	151°46'01.16"E	Priority 3-way
PP10	Gore Highway	Biddeston Southbrook Road	27°38'41.68"S	151°43'52.32"E	Priority 3-way
PP11	Gore Highway	Linthorpe Road	27°41'42.42"S	151°40'14.98"E	Priority 3-way
PP12	Gore Highway	Lochaber Road	27°42'05.73"S	151°38'10.27"E	Priority 3-way
PP13	Gore Highway	Oakey Pittsworth Road	27°42'28.72"S	151°37'30.67"E	Priority 3-way
PP14	Gore Highway	Yarranlea Road	27°45'14.10"S	151°32'32.10"E	Priority 4-way
PP15	Yarranlea Road	Desmonds Lane	27°43'26.54"S	151°31'52.35"E	Priority 4-way
PP16	Gore Highway	Ware Street	27°75'58.77"S	151°45'58.91"E	Priority 4-way
PP17	Gore Highway	Dieckmann Road	27°76'91.95"S	151°43'30.26"E	Priority 3-way
PP18	Dieckmann Road	Access Track	27°43'26.54"S	151°31'52.35"E	Priority 3-way
PP19	Gore Highway	Access Track	27°77'96.83"S	151°42'44.44"E	Priority 3-way
PP20	Gore Highway	Gilgai Lane	27°79'90.45"S	151°38'64.97"E	Priority 3-way
PP21	Gore Highway	Millmerran-Leyburn Road	27°49'26.23"S	151°21'10.85"E	Priority 3-way
PP22	Gore Highway	Hall Road	27°49'55.68"S	151°20'48.69"E	Priority 3-way
PP23	Gore Highway	Millmerran-Inglewood Road	27°52'06.89"S	151°17'07.79"E	Priority 3-way
PP24	Owens Scrub Road	Millmerran-Inglewood Road	27°53'18.97"S	151°16'40.64"E	Priority 3-way
PP25	Millmerran-Inglewood Road	Schwarten Road	27°91'33.19"S	151°26'33.13"E	Priority 4-way
PP26	Commodore Peak Road/Scragg Road	Millmerran-Inglewood Road	27°53'18.97"S	151°16'40.64"E	Priority 3-way
PP27	Millmerran-Inglewood Road	Heckendorf Road	27°99'12.09"S	151°22'13.94"E	Priority 3-way
PP28	Millmerran-Inglewood Road	Paton Road	28°08'24.78"S	151°19'61.86"E	Priority 3-way
PP29	Thornton Road	Millmerran-Inglewood Road	28°23'07.54"S	151°06'26.78"E	Priority 3-way
PP30	Cunningham Highway	Millmerran-Inglewood Road	28°24'38.95"S	151°05'53.42"E	Priority 3-way
PP31	Cunningham Highway	Bybera Road	28°25'27.08"S	151°02'32.32"E	Priority 3-way
PP32	Cunningham Highway	Cremascos Road	28°26'51.61"S	150°59'07.83"E	Priority 3-way
PP33	Cunningham Highway	Whetstone Access Rd	28°50'43.20"S	150°93'88.39"E	Priority 3-way
PP34	Cunningham Highway	Yelarbon Kurumbul Road	28°34'17.58"S	150°44'58.56"E	Priority 3-way
PP35	Kildonan Road	Eukabilla Road	28°38'34.94"S	150°27'23.02"E	Priority 3-way

20.6 Mitigation measures

This section provides discussion of mitigation measures and controls that have been incorporated into the revised reference design (see Section 20.6.1), and measures proposed for incorporation in further delivery of the Project through the subsequent design, construction works and operations stages of the Project (see Section 20.6.2).

20.6.1 Mitigation through the revised reference design stage

Mitigation measures and controls that have been factored into the revised reference design to avoid, minimise and mitigate impacts are summarised in Table 20-50.

TABLE 20-50 INITIAL MITIGATION MEASURES: TRAFFIC, TRANSPORT AND ACCESS

Aspect	Initial mitigation measures
Traffic	▸ The Project has been aligned to be co-located with existing rail and road infrastructure, where possible, in an effort to minimise the number of new road network intersections. ▸ The revised reference design has been developed to minimise the potential for permanent alterations to the public road network or create a permanent change to existing traffic patterns, configurations and distributions. ▸ The horizontal and vertical alignment has been established to optimise the earthworks required and achieve as close to a net-balance as is possible. By minimising the material deficit for construction of the Project, the volume of material required to be imported has been reduced. Less imported material equates to fewer construction truck movements on public roads. ▸ Where practical, traffic will be contained to constructed access tracks/temporary footprint, which has been identified to provide the shortest journey time between origin and destination, thereby restricting fuel consumption and vehicular emissions. These routes have been assessed as part of the TIA. The temporary footprint for the Project has been defined to provide sufficient space for the Project, including road modifications, to be safely and efficiently constructed, with a need for temporary side-tracks to be provided. ▸ The temporary footprint for the Project has been defined to provide sufficient space for the Project, including road modifications, to be safely and efficiently constructed. ▸ The laydown areas include parking facilities, with the design also including parking facilities with sufficient capacity to meet the requirements requested by QFES.

Rail incidents as a result of development of the Project	▸ The Project alignment has been designed to minimise the likelihood of rail incidents for the types of trains projected to use the Inland Rail network. This has been achieved by adhering to the minimum design requirements of the basis of design, which are provided within Chapter 5: Project Description, and are summarised below:
	  ▸ design speed of 115 km/h
	  ▸ maximum grade of 1:80, with 1:100 the target
	  ▸ maximum curve radius of 800 m, with 1,200 m target
	  ▸ train lengths of 1,800 m.
	▸ The revised reference design includes mixed gauge turnouts at locations where the Project interfaces with existing rail networks or infrastructure, to enable QR rollingstock to join and exit the Inland Rail network.

Road-rail interfaces	▸ Grade separated crossings of existing public roads have been adopted over level crossings, where possible and feasible. The specific design treatment at each road-rail interface has been selected based on a combination of factors, which include:
	  ▸ topography
	  ▸ road classification
	  ▸ rail geometry
	  ▸ road geometry
	  ▸ community and stakeholder feedback through consultation.
	▸ Further details on the public road-rail interface treatment process can be found in Appendix AA: Traffic Impact Assessment
	▸ Where grade separation has not been feasible, the design has been developed in accordance with the ARTC Engineering Code of Practice–Level Crossings (available on the ARTC extranet). Level crossings have been subject to safe design studies and risk assessments in accordance with ALCAM to identify and reduce the potential risks associated with these crossings, so far as is reasonably practicable, in accordance with the *ONRSR Guideline* (ONRSR, 2016b). Further details are provided in Appendix AA: Traffic Impact Assessment.
	▸ Additional physical controls at level crossings such as boom gates and warning lights are provided in accordance with the *Guide to Development in a Transport Environment: Rail* (DTMR 2015), *Manual of Uniform Traffic Control Devices Part 7: Railway Crossings* (DTMR, 2019f) and ARTC Engineering Code of Practice–Level Crossings.
	▸ The revised reference design has been developed to remove any short stacking issues from the Project alignment through the diversion of the Project alignment or adjacent roads to accommodate the required design vehicle.

Aspect	Initial mitigation measures
Airport operation and infrastructure	▸ The Project alignment is approximately 1 km from the Toowoomba Wellcamp Airport. The Project has been positioned to ensure that double-stacked freight trains will not extend vertically into the OLS for this airport.
Access	▸ ARTC have consulted with TRC, GRC and QFES through the impact assessment and design development process and considered potential impacts to other stakeholders. As a result, the revised reference design for the Project has, where possible and feasible, maintained connectivity across the Project footprint for public roads.
Stock routes	▸ Where stock routes have been intersected by the Project, an allowance for the continuity of movement of stock along the same route has been made in the revised reference design. In some instances, such as Yelarbon (811GWND) and the southern end of Millmerran-Inglewood Road (820GWD), this has involved allowance for a localised realignment of the current stock route.
Bridges	▸ Maintenance access to the deck level of all new bridge structures has been incorporated into the revised reference design. ▸ Bridge clearances have been established in consultation with the owners of existing assets over which the bridge structures span including DTMR, local councils and private landowners.

20.6.2 Proposed mitigation measures and management approach

In order to manage and mitigate risks, mitigation measures have been identified to address Project-specific issues and opportunities. Table 20-51 identifies the relevant Project stage, the aspect to be managed and the proposed mitigation measure. Location-specific details of where each mitigation measure will be applied is provided in Appendix AA: Traffic Impact Assessment. The mitigation measures presented in Table 20-51 are factored into the assessment of residual risk which provides further context and the framework for implementation of these proposed mitigation and management measures.

Mitigation measures should be considered in conjunction with Chapter 24: Draft Outline Environmental Management Plan (Outline EMP) developed for the Project which:

- Provides an environmental management framework to enable the identified environmental and social outcomes to be achieved for the life of the Project, through detailed design, pre-construction and early works, construction works and operations stages
- Establishes the process for the preparation and implementation of the CEMP and the Outline EMP, including plans.

The Outline EMP will be further developed during the post-EIS stage, incorporating relevant approval and permit conditions, design refinements, and detailed construction planning, to inform the CEMP and Outline EMP.

The TMP will be developed by the Contractor to limit impact to the public and asset owners by managing construction movements and deliveries during peak hours, and minimising construction staff traffic using shuttles and public transport. The TMP will be prepared in consultation with relevant local governments, DTMR, QR and emergency service providers (e.g. QFES and Queensland Ambulance Service) and completed prior to the commencement of construction, with mitigation measures included to supplement existing management plans. The TMP will include condition assessment of the road pavement for all construction traffic routes.

The TMP will be implemented in conjunction with a Road Use Management Plan (RUMP) agreed with each of the local governments (GRC, TRC) in the Project area, prior to the commencement of construction. The effectiveness of traffic controls will be monitored in accordance with the TMP and RUMP. Implementation of traffic and transport elements of the CEMP and compliance against conditions of approval will be monitored and reported in accordance with processes specified in the Outline EMP.

TABLE 20-51 ADDITIONAL MITIGATION MEASURES PROPOSED FOR FUTURE STAGES OF PROJECT DELIVERY

Delivery stage	Aspect	Mitigation measures
Detailed design	General	▸ A Traffic Management Plan will be developed for the Project during detailed design, as a component of the CEMP. The plan will be developed in consultation with DTMR, relevant local councils, an accredited road safety auditor and, where relevant, QR. The purpose of the plan will be to limit potential impacts to the public and road asset owners by managing construction movements and deliveries during peak periods, and minimise construction staff traffic using shuttles and public transport. The Plan will, as a minimum: ▸ identify the potential impacts that construction traffic is likely to have on transport infrastructure and detail ameliorative measures required to mitigate all identified impacts of the Project ▸ include the requirement to undertake a condition assessment of the road pavement for all designated construction traffic routes. This will be required to occur before the commencement of any operations and ongoing throughout construction at intervals developed in consultation with the contractor and the asset owner. ▸ specify the contractor as responsible for all works required to mitigate the impacts of construction traffic, requiring consideration to be given to: – final construction routes – approaches to seasonality and stock routes – areas of significant pedestrian and cyclist activity – standard hours of work and deliveries – specific hours of deliveries impacted by local land uses (e.g. school zones) – bus service operators (e.g. public transport, school buses, long distance services) – emergency services – staff transport – staff parking, with the provision of on-site tool storage where practicable. ▸ specify how access, road conditions, traffic network and safety across the rail corridor will be maintained during construction, including for emergency response vehicles ▸ determine secondary alternative construction route activities, in the event that the primary route is blocked off by an emergency/accident. Secondary construction routes will facilitate the (continued) construction activities, thus managing costs and schedule. ▸ require that the plan be implemented during the construction stage and reviewed annually during construction for effectiveness, including review by relevant road authorities (i.e. local councils, DTMR) ▸ require that the plan be implemented in conjunction with a Road Use Management Plan agreed with each of the relevant local council (TRC, GRC), prior to the commencement of construction. ▸ detail the procedure for ARTC to analyse community complaints and suggested improvements to the plan, including at level crossings to capture near-miss information. ▸ Specific event Traffic Management Plans will be developed for special events (e.g. Australian Camp Oven Festival in Millmerran, regional road cycling events), in conjunction with DTMR, relevant location councils, event organisers and relevant stakeholders. The outcome of these will include bespoke plans providing safe and efficient pedestrian, cycle, public transport, and traffic flows during occasional events to minimise disruption to the community throughout construction.

Delivery stage	Aspect	Mitigation measures
Detailed design (continued)	Road safety for intersections	▸ Undertake a road safety audit during the detailed design stage where such road upgrade works are required. The audit will be undertaken by an accredited road safety auditor, in accordance with the Austroads *Guide to Road Safety Part 6A: Implementing Road Safety Audits* (Austroads, 2019c) ▸ Turn lanes will be designed and be fully compliant with the requirements and design criteria as outlined in the *Guide to Road Design Part 3 - Geometric Design* (2017) and *Guide to Road Design Part 4 –Intersections and Crossings* (2017) ▸ Requirements for turn lane treatments will be finalised during the detailed design stage and updated during the construction works stage and as per contractor required risk assessments when preparing the Traffic Management Plan, also in accordance with the *Manual of Uniform Traffic Control Devices: Part 3 –Works on Roads* and DTMR's specification *MRTS02 – Provision for traffic requirements*. This will reflect updated construction duration estimates and final peak hour volumes ▸ All conflict points impacting vehicle turn path will be relocated/removed. Further road widening works of kerb turnouts or carriageway of minor road to accommodate vehicle swept path will be reviewed during the detailed design stage. ▸ Consultation between ARTC, TMR and local councils will be undertaken regarding the provision of road impact assessments and road safety audits for all impacted local and State-controlled roads. Additionally, ARTC will deliver appropriate mitigation measures which have been agreed by the relevant road authorities, and address identified road operation and safety matters and issues. Consultation during the detailed design stage will ensure directly impacted stakeholders are involved in developing the road safety mitigation measures. ▸ Opportunities to accommodate greater separation distances between rail and neighbouring roads will be investigated, in consultation with DTMR and in accordance with *AS 1742.7-2016* and the *Road Planning and the Design Manual – Edition 2: Volume 3, Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (DTMR, 2014). ▸ Construction works will not commence within a State-controlled road corridor without written approval from DTMR, or within a local government road corridor without necessary approvals from the relevant local council. These will be required to be obtained through consultation with DTMR and the relevant local councils during the detailed design stage of the Project.
Detailed design, pre-construction and early works	Access	▸ The detailed design will be developed to ensure that legal and practical access for private properties is provided. ▸ ARTC will continue to consult with potentially impacted landowners during the detailed design stage and construction planning process on outcomes to minimise impacts to property access. This includes where property access adjoins a State-controlled road or a local government road. ▸ The provision of suitable private property access during the construction works will form a component of property-specific management agreements developed in consultation with landowners. ▸ Changes to individual property access onto and across properties may be offset by consolidating access in key locations, which may be facilitated through underpasses for stock and vehicles at appropriate locations. These solutions will be developed in consultation with affected landowners. ▸ ARTC will consult with Toowoomba and Goondiwindi Local Disaster Management Groups, as well as QPS, Queensland Ambulance Service (QAS) and QFES during the detailed design stage regarding emergency access. ▸ ARTC will ensure the contractor consults with relevant stakeholders regarding Brookstead State School, Southbrook Central State School and Yelarbon State School, including the Department of Education for works undertaken near schools, to minimise disruption and maintain safe access, as practicable. ▸ Safe corridor access and vehicle turnaround points will be provided for maintenance work to ensure sufficient setback while working adjacent to live railway. ▸ The design of the rail maintenance access roads will consider the availability for use by emergency vehicles in the event of an incident. ▸ Traffic management arrangements for construction sites, laydown areas or non-resident workforce accommodation facilities requiring access directly off/onto a State-controlled road will be negotiated with, and approved by, DTMR.

Delivery stage	Aspect	Mitigation measures
Detailed design, pre-construction and early works (continued)		▸ All construction access locations will be designed in accordance with Australian Standards and Austroads' guidance with: ▸ appropriate sighting distances in both the vertical and horizontal ▸ deceleration lanes for trucks ▸ acceleration lanes for re-entering construction traffic ▸ suitable stopping areas ▸ appropriate signage and line marking. ▸ Where possible, access will be provided from secondary roads to minimise potential disruptions to the nearby arterial road network.
	Intersection/sight distance	▸ Intersections will be assessed against requirements outlined in *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (Austroads, 2023) requirements. Where insufficient sight distance is available, ARTC will apply the following mitigation strategies: ▸ avoid – investigate alternative construction routes which have adequate sight distance. ▸ manage – sight distance issues through the implementation of the Traffic Management Plan which may temporarily reduce speeds to achieve sight distance compliance. ▸ mitigate – propose works to mitigate sight distance issues. ▸ Temporary road works, including diversion and signage, will be designed in accordance with the *Manual of Uniform Traffic Control Devices: Part 3 - Works on Roads* (DTMR, 2019g) and the *Traffic and Road Use Management Manual: Volume 7 Road Works* (DTMR 2012a).
	Intersection/turn warrant	▸ Intersections will be assessed against requirements outlined in *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (Austroads, 2023) requirements. Where adequate turn lane treatments are not available, ARTC will apply the following mitigation strategies: ▸ avoid – investigate alternative construction routes which avoid intersections with inadequate turn lane treatments. ▸ manage – turn lane treatments through the implementation of the Traffic Management Plan which may temporarily reduce speeds to achieve sight distance compliance. ▸ mitigate – propose works to upgrade the turn lane treatments. Agreement will be negotiated between ARTC and the relevant road authority on upgrade requirements and funding arrangements. Given that these are existing requirements, it is not anticipated that ARTC will fund these upgrades. ▸ Temporary road works, including diversion and signage, will be designed in accordance with the *Manual of Uniform Traffic Control Devices: Part 3 - Works on Roads* (DTMR 2019g) and the *Traffic and Road Use Management Manual: Volume 7 Road Works* (DTMR 2012a).
	Road-rail interfaces	▸ The design of road-rail interfaces will continue to be developed in accordance with the principles established in ONRSR Policy: Level Crossings (ONRSR, 2019b), and in reference to the ONRSR Guideline: Meaning of duty to ensure safety so far as is reasonably practicable –SFAIRP (ONRSR, 2016b) and the Queensland Level Crossing Safety Strategy 2012-2021 (DTMR, 2012a). ▸ Public level crossings will be designed in order to provide for safe design standards where sufficient stacking and, sight distances, lane marking, and signage prevail for a design vehicle consisting of a low loader. ▸ Level crossings will be provided with warning signage, line marking, and other relevant controls in accordance with the relevant national and ARTC standards and in accordance with all Traffic Management Plan and Road Use Management Plan procedures. ▸ Options for impact mitigation will depend on the specific activity being undertaken, and the location where it is occurring. The contractor will select and implement appropriate controls.

Delivery stage	Aspect	Mitigation measures
Detailed design, pre-construction and early works (continued)		▸ Road safety audits will be undertaken at the level crossings pre and post-construction in accordance with the Austroads guidelines. Level crossings will be reviewed to confirm the: ▸ level of protection continues to be appropriate ▸ infrastructure is appropriate for the traffic conditions. ▸ Design of appropriate exclusion fencing will be erected near roads or where trespass is likely to occur. Specific fencing requirements will be agreed through discussion with adjoining landowners and asset owners. Agreed fencing requirements will be documented in a revised fencing strategy for the Project. ▸ Ongoing consultation with, as relevant, local councils, TfNSW, DTMR, emergency services, QR and affected landholders and, where applicable, the wider community during the detailed design stage and throughout construction of the Project to inform of the Project's status and likely disruptions. ▸ Threshold and ALCAM assessments will be undertaken to determine the appropriate protection type for the proposed crossing, as required. (if required). Additionally, these assessments will be undertaken again during detailed design, including all ALCAM considerations, where applicable, as agreed upon between ARTC, the contractor, QR and the relevant LGA. ▸ ARTC to progress discussions, development and definition of the signalling system interface and associated operational procedures required to manage the interface between ARTC's CTC system and QR's Network ▸ The construction approach for the components of the Project within the existing rail corridor for the South Western Line and the Millmerran Branch Line will be confirmed through discussion with QR and other key stakeholders. This consultation will be used to inform: ▸ the programming of construction requiring track possessions ▸ effective communication strategies with QR and other stakeholders. ▸ The agreed construction approach within the existing rail corridor for the QR South Western Line and the Millmerran Branch Line will be formulated in a wayleave agreement, or similar, between ARTC and QR. ▸ Track design will incorporate trackside monitoring systems. The locations for trackside monitoring systems will be confirmed and incorporated into the detailed design.
Pre-construction and early works and construction works	Road link	▸ A travel demand management campaign will be developed to inform DTMR, emergency services, local councils and the public on Project works and its effect on network operations. ▸ Consultation with QR will be undertaken prior to use of existing level crossings. During construction, mitigation measures for existing level crossings along the construction routes may be required depending on the specific activity and the locations. The contractor will be required to consult QR to determine appropriate controls at existing level crossings. ▸ Directional signage and line marking around construction sites and the surrounding network, including using Variable Message Signs if appropriate ▸ Relevant emergency services will be notified in advance and any required approvals will be sought prior to the movement of all hazardous/dangerous or oversize construction material and equipment. ▸ Pilot vehicles and police escorts will be used to warn opposing vehicles where loads are greater than 3.5 m wide and 25 m long. Additional pilot/escort and/or police escorts will be provided as per Section 6.3 of the *Guideline for Excess Dimension Vehicles in Queensland* (DTMR, 2013) or the *Critical Areas and Roads in Queensland for Vehicles/Combinations Requiring Pilot/Escort* map, or a police permit when accompanying an oversize vehicle or combination. Travel outside of peak times, perhaps, such as the evenings or early mornings to avoid other vehicular conflict will be considered. All other safety aspects treating OSOM movements will be in accordance with the *Guideline for Excess Dimension Vehicles in Queensland* (DTMR, 2013). ▸ Physical upgrade works at critical intersections or links where mitigation measures cannot be managed by traffic or construction management.

Delivery stage	Aspect	Mitigation measures
Pre-construction and early works and construction works (continued)		▸ Secondary alternative construction route activities will be determined as part of the Traffic Management Plan, in the event that the primary route is blocked off by an emergency/accident. ▸ Construction works will not commence within a State-controlled road corridor without written approval from DTMR, or within a local government road corridor without necessary approvals from the relevant local council. These will be obtained through consultation with DTMR and the relevant local councils during the detailed design stage of the Project.
	Pavement	▸ A rock bed, shaker grids or rumble pads will be installed as appropriate at vehicle/equipment site exit points. ▸ **Unsealed roads:** ▸ A visual pavement condition assessments (either manual or vehicle mounted high speed condition survey) will be undertaken prior to and post-construction activities. ▸ The pavement assessment for unsealed local government road will be agreed with local councils before construction commences and will identify measures to avoid, reduce or mitigate effects on the pavement life of the local government road. Typical measures include: – provide a payment contribution for future pavement works – seal an unsealed pavement – provide maintenance during construction – undertake road rehabilitation. – Pre- and post-construction rutting surveys. ▸ **Sealed and asphalt roads:** ▸ A condition and dilapidation surveys and assessment (e.g. National Association of Australian State Road Authorities roughness count) will be undertaken prior to and post-construction activities, as well as at ongoing intervals during construction. These intervals will be agreed with local councils before construction commences and will identify measures to avoid, reduce or mitigate effects on the pavement life of the local government road. Typical measures include: – provide a payment contribution for future pavement works – provide extra pavement width (for example, to prevent edge degradation) – provide additional pavement thickness – provide maintenance during construction – undertake pavement rehabilitation. – Pre- and post-construction rutting surveys. ▸ ARTC will consult with relevant stakeholders during the detailed design stage on mitigation measures to maintain structural capacities are maintained and seek agreement on the minimum design life of returned works as well as agreed contribution towards the consumption of pavement design life by construction related vehicles. ▸ ARTC will consult with the local government road owner regarding arrangements to maintain the envisaged impacted road for the duration of the construction period. This may entail works such as crack sealing, pothole patching, edge repairs, resealing, and grading of gravel roads.
	Road-rail interfaces	▸ In accordance with Section 255 of the *Transport Infrastructure Act 1994* (Qld), works will not commence within the existing rail corridor without QR's written approval, unless this process is overwritten by a pre-agreement between ARTC and QR. ▸ If construction of Project components within the existing rail corridor is completed during a temporary possession of the rail corridor, works will be completed in accordance with the conditions of the temporary possession and/or wayleave agreement granted to ARTC by QR. ▸ All works carried out on QR property will be in accordance with the requirements of QR's Civil Engineering Technical Requirement: Work in or about Queensland Rail Property (CIVIL-SR-002).

Delivery stage	Aspect	Mitigation measures
Pre-construction and early works and construction works (continued)	Road safety for intersections	▸ Construction traffic on known school bus routes, or routes with significant cyclist or pedestrian activity will be restricted to only essential movements only during pick-up and set-down times on school days, or peak active transport periods. ▸ Further measures may include signage or protection on construction routes with a high proportion of cyclists or pedestrians, and employing contractor driver briefings on safe driving to avoid active transport users and community notifications. ▸ Once a contractor is appointed, construction routes and vehicle numbers are finalised, specific measures to mitigate impacts to active transport users will be developed for the construction routes on a case-by-case basis. This is to minimise construction vehicles through areas of higher pedestrian or cyclists' activity, such as schools or town centres, and in peak periods to reduce the impact and potential safety issues. ▸ Relevant emergency services (e.g. QFES, QPS, QAS) will be notified in advance of temporary and permanent changes to the road network and of construction activities that may affect journey times for emergency vehicles. ▸ Relevant emergency services will be notified prior to the movement of all hazardous/dangerous or oversize construction material and equipment. Temporary traffic management will be implemented, for example road signs stipulating reduced speed limits. ▸ Identify and provide emergency accesses and routes to minimise adverse impacts to local residents, in consultation with emergency services ▸ Provision of heavy vehicle truck turning signage in combination with possible temporary speed reduction signage through the intersections for the duration of construction. These requirements will be determined and finalised during the construction works stage, as per contractor required risk assessments within the Traffic Management Plan. ▸ Construction speed limits will apply to all unsealed routes used by construction vehicles. Applicable speed limits will be determined through consultation with the relevant local councils and documented in the Traffic Management Plan. Speed limits through construction routes of all types will ensure increased safety for local residents and construction workers. ▸ All OSOM and Restricted Access Vehicles will comply with the *Guideline for Excess Dimension Vehicles in Queensland* (DTMR, 2013) in terms of transport safety. ▸ Licensed transporters operating in compliance with the *Australian Code for the Transport of Dangerous Goods by Road & Rail* (National Transport Commission, 2024) will be used for the transportation of dangerous goods. ▸ A DTMR *Form M994* will be completed and signed by a certified Level 3 Traffic Management Operator should any Regulatory Traffic Signs/Devices associated with any State-controlled road be required. Ensuring compliance with all relevant standards and guidelines will ensure that construction vehicles operate safely on all proposed construction vehicles, with appropriate mitigation measures applied. ▸ Regular maintenance and vegetation clearance will be carried out to maintain adequate sight lines. ▸ Undertake a road safety audit following the completion of the construction stage where such road upgrade works are required. The audit will be undertaken by an accredited road safety auditor, in accordance with the Austroads *Guide to Road Safety Part 6A: Implementing Road Safety Audits* (Austroads, 2019c).
	Road safety for road links	▸ Implement the Traffic Management Plan as detailed in the 'General' category of this table, above. ▸ Requirements for road upgrades will be finalised during the detailed design stage and will be updated during the construction works stage (as per the contract-required risk assessments when preparing appropriate Traffic Management Plans) and Traffic Guidance Schemes such as the *Manual of Uniform Traffic Control Devices: Part 3 – Works on Roads* and DTMR's specification *MRTS02 – Provision for traffic requirements*. This will reflect updated construction duration estimates and final peak hour volumes. Additional Traffic Management Plan mitigation measures may include speed reductions and advisory signage. ▸ Ongoing consultation will be undertaken as required with relevant councils, TfNSW, DTMR, emergency services, QR and affected landowners and, where applicable, the wider community in the detailed design stage of the Project to inform of the Project's status and likely disruptions.

Delivery stage	Aspect	Mitigation measures
Pre-construction and early works and construction works (continued)		▸ Directional signage and line marking around construction sites and the surrounding network will be installed, including using Variable Message Signs if appropriate. Drivers and pedestrians will be directed past construction sites, and advice of potential delays, traffic diversions, speed restrictions or alternate routes will be provided. ▸ Implement a specific event Traffic Management Plan for special events, as detailed in the 'General' category of this table, above. ▸ Relevant emergency services will be notified in advance and any required approvals sought prior to the movement of all hazardous/ dangerous or oversize construction material and equipment. Discussions will identify any existing emergency response routes which may be impacted by the transport corridors as well as possible solutions to minimise any potential impacts. ▸ Physical upgrade works will be undertaken at critical intersections or links where mitigation measures cannot be managed by traffic or construction management. The infrastructure upgrades will ensure additional capacity and resilience within the network to minimise network impacts. ▸ A travel demand management campaign will be implemented to inform DTMR, emergency services, local councils and the public of Project works and its effect on network operations. This is to relieve congestion by encouraging travel outside of peaks or mode shift by the public and increase awareness of construction works. ▸ Regular maintenance and vegetation clearance will be carried out to maintain adequate sight lines and maintain clear zones.
Operations	Access	▸ The provision of suitable private property access during operations will form a component of property-specific management agreements developed in consultation with landowners.
	Road link	▸ A protocol will be developed between ARTC and emergency service providers, defining appropriate and co-ordinated responses and communication in the event of emergencies during operations (e.g. access to real time information about crossing times and access to alternate crossing points). The protocol will minimise any impact to emergency services due to potential changes to the road network and Project operation.
	Road-rail interfaces	▸ ARTC will maintain safety treatments for passive and active level crossings (including sight lines) by conducting routine inspections of crossing infrastructure in accordance with ARTC's *engineering codes of practice and* will regularly review crossing performance and incident information to identify opportunities for improved performance and further reduction in risk. ARTC will work with road controlling authorities to manage any incidents at road-rail interfaces. ▸ Road safety audits will be undertaken at the level crossings, once completed, in accordance with the Austroads guidelines. Post commissioning, the level crossing will be managed as a part of business as usual for the relevant road and rail manager under the terms of the signed interface agreement. ▸ Railway safety messages will be provided to the community through awareness activities, community engagement activities, and campaigns to increase public awareness regarding the Project. Fact sheets and guidelines will also be freely available on the ARTC website, aiming to provide guidance to the community regarding safety around level crossings. ▸ key actions outlined within the *Queensland Level Crossing Safety Strategy 2012-2021* (DTMR, 2012) will be implemented, including: – promoting level crossing safety through public awareness campaigns – maintain data collection, including near miss reporting – maintain level crossing infrastructure in accordance with Australian Standards. Appendix AA: Traffic Impact Assessment provides further details on the level crossing strategy.

20.7 Impact assessment summary

The traffic, transport and access assessment has evaluated a range of issues encompassing potential impacts of the construction works and operations stages of the Project on the surrounding transport infrastructure and its users. It also examined the potential traffic and pavement impacts from the movement of materials, workforce and equipment during construction of the Project on the surrounding road network. Potential traffic and transport impacts associated with the Project in the construction works and operations stages are outlined in Section 20.5. The key findings are summarised in the section below. Where necessary, mitigations will be agreed with the relevant road manager prior to construction.

These potential impacts have been subjected to a risk assessment as per the methodology introduced in Chapter 4: Assessment Methodology and summarised in Section 20.3.

20.7.1 Traffic impact–road safety

20.7.1.1 Intersections

The results of the road safety impact risk assessment for 116 intersections impacted by primary construction routes are presented in Appendix AA: Traffic Impact Assessment. There are two intersections that receive a risk rating of high risk in the risk assessment. These intersections, the risks and the mitigation measures are discussed below.

- Gore Highway/Gilgai Lane:
  - The Project traffic risk assessment resulted in a high risk rating due to Project traffic potentially exacerbating the existing rear end crash risk.
  - To reduce the risk rating to medium, the proposed mitigation measures include:
    - channelised right turn lane
    - heavy vehicle truck turning signage
    - temporary speed reduction signage for the duration of construction
    - the application of the standard non-infrastructure based mitigation measures as discussed in Section 20.6.
  - The specific details of the mitigation measures will be finalised during the construction works stage by the Contractor during preparation of the TMP.
- Greenwattle Street/Alderley Street:
  - The existing intersection assessment shows the intersection is currently exceeding acceptable capacity, delay, and queue lengths.
  - The construction route assessment has assumed that construction trips will travel through this intersection. This assumption will be revisited within the construction works stage of the Project. It is likely that the Project traffic will be more dispersed than this conservative intersection assessment indicates.
  - The Project traffic risk assessment resulted in a high risk rating due to Project traffic potentially exacerbating the existing capacity, delay and queueing issues, and the existing crash risk for vehicles performing right turn manoeuvres from Alderley Street.
  - To reduce the risk rating to medium, the proposed mitigation measure is to signalise the intersection, which removes the crash risk, minimises delay, and reduces queuing and applies the standard non-infrastructure based mitigation measures as discussed in Section 20.6.
  - The specific details of the mitigation measure will be finalised during the construction works stage by the Contractor during preparation of the TMP.

All other intersections received a medium risk rating, or better, and will be subject to the mitigation measures outlined in Section 20.6.

20.7.1.2 Road link

The results of the road safety impact risk assessment for intersections impacted by primary construction routes are summarised in Appendix AA: Traffic Impact Assessment. There are four road links that receive a risk rating of high which are further explained below:

- Gore Highway (28A), Southbrook, DTMR Ch 11.2 km to Ch 15.3 km:
  - The Project traffic risk assessment resulted in a high risk rating due to Project traffic potentially increase multi-vehicle head-on crash types where additional heavy vehicle volumes on the road may increase the need for overtaking.
  - To reduce the risk to medium, wide centre line treatment is proposed to be implemented along this section of road. In addition, the standard non-infrastructure based mitigation measures as discussed in Section 20.6. The specific details of the mitigation measures will be finalised during the construction works stage by the Contractor during preparation of the TMP.

- Gore Highway (28A), Millmerran, DTMR Ch 53.3 km to Ch 60.8 km:
  - The Project traffic risk assessment resulted in a high risk rating due to Project traffic (including OSOM vehicles) potentially exacerbating the existing head-on crash risk.
  - To reduce the risk rating to medium, the proposed mitigation measures include the standard mitigation measures as discussed in Section 20.6. The specific details of the mitigation measures will be finalised during the construction works stage by the Contractor during preparation of the TMP.
- Gore Highway (28B), Kindon, DTMR Ch 13.0 km to Ch 121.6 km:
  - The Project traffic risk assessment resulted in a high risk rating due to Project traffic potentially increase multi-vehicle head-on crash types where additional heavy vehicle volumes on the road may increase the need for overtaking.
  - To reduce the risk rating to medium, the proposed mitigation measures include the standard non-infrastructure based mitigation measures as discussed in Section 20.6. The specific details of the mitigation measures will be finalised during the construction works stage by the Contractor during preparation of the TMP.
- Toowoomba–Athol Road (316), Westbrook, DTMR Ch 2.1 km to Ch 16.8 km:
  - The Project traffic risk assessment resulted in a high risk rating due to Project traffic potentially exacerbating the existing multi-vehicle and rear-end crash risks.
  - To reduce the risk rating to medium, the proposed mitigation measures include the standard mitigation measures as discussed in Section 20.6.The specific details of the mitigation measures will be finalised during the construction works stage by the Contractor during preparation of the TMP.

In summary, the road link safety assessment for the four road links results in no requirements for infrastructure upgrade related mitigation measures; however, the standard mitigation measures discussed in Section 20.6 are applicable.

20.7.1.3 Construction road-rail interface

There is one road-rail interface that received a risk rating of high in the risk assessment. The risks and mitigation measures are discussed below.

- 310-12-E-1 Suttons Road, passive level crossing:
  - The Project traffic risk assessment resulted in a high risk rating at this existing passive level crossing. The Project traffic potentially exacerbates the existing crash rate due to the existing road alignment, unsealed pavement, and insufficient sight distance available to approaching vehicles.
  - The proposed upgraded treatment of the crossing will be:
    - passive control crossing with significantly improved road geometry by realigning and upgrading the road to required geometrical standards and sight distance requirements
    - the crossing will also be temporarily closed during the construction works stage
    - in addition, road safety audits will also be required to be undertaken based on the design and based on as-constructed conditions.

All other road-rail interfaces received a medium risk rating, or better, and the mitigation measures outlined in Section 20.6 will be implemented.

20.7.1.4 Operational road-rail interface

The results of the road safety impact risk assessment for road-rail interfaces impacted by operational traffic are shown in Appendix AA: Traffic Impact Assessment. All road-rail interfaces received a medium risk rating, or better, and will be subject to the mitigation measures outlined in Section 20.6.

20.7.2 Traffic impact–accesses

20.7.2.1 Turn warrants

A turn warrants impact assessment has been conducted at all access locations to laydown areas in order to identify the required turning treatments to accommodate Project traffic flows. This operational assessment has reviewed the existing turn warrant treatments against Austroads requirements to determine which intersections warrant impact mitigation.

The potential upgraded turning treatments outlined in this methodology are warranted only temporarily for construction traffic based on the current assumed traffic routes. Road use management strategies may be introduced in the RUMP and/or the TMP in order to temporarily mitigate construction related traffic impacts at laydown area accesses.

Where turning lanes are implemented (temporarily or permanently), these will be designed consistent with the requirements of *Austroads Guide to Road Design Part 4A* and accommodate sufficient storage for the largest proposed construction vehicle (currently listed as a 26.0 m B-double, but to be confirmed with the Contractor).

20.7.2.2 Sight distance

An assessment has been conducted to determine the required safe intersection sight distance at each laydown area access location, in order to consider appropriate design of these accesses in detailed design.

20.7.2.3 Local business impacts

Accesses to private properties that are impacted by the Project are subject to discussions between the impacted landowner and ARTC; this includes local businesses such as Wagners, DA Hall, GrainCorp and Vary Agricultural services. Specific discussion regarding impacts on these local businesses is outlined below.

DA Hall

The DA Hall properties are no longer impacted by access and connectivity issues due to the Millmerran Alternative Alignment described in Chapter 2: Project Rationale.

GrainCorp

- Yelarbon
  - The Yelarbon GrainCorp facility currently operates trucking movements around the silos that interface with the existing QR South Western Line corridor, with future turnout provisions for a siding. Through engagement, designs have been shared with GrainCorp, which communicated the continuation of these existing trucking movements. These movements contained legal and practical access via Railway Parade and the occasional use of the adjacent private crossing. GrainCorp have since confirmed no objections to the removal of the private crossing. The proposed access arrangement is integrated with the Cunningham Highway improvements and Yelarbon safety enhancements. The design includes a road-over-rail grade separation and realignments of local roads, eliminating the existing level crossing on the Cunningham Highway, following the guidelines outlined in the Public Level Crossing Treatment Methodology in Appendix AA: Traffic Impact Assessment (Appendix BT).
- Brookstead
  - The Brookstead GrainCorp facility 1 is located on the north-west side of the QR Millmerran Branch Line, with practical access from Ware Street. The project has no adverse impact on the facility's connectivity. Additionally, the design includes a turnout to provision for a future siding, facilitating grain transportation via Inland Rail.
  - GrainCorp maintains a backup storage location, facility 2, on the eastern side of Inland Rail, adjacent to the Gore Highway. Access to this site is via a private crossing on the QR line and an informal route from the Gore Highway. The design will aim to preserve the private crossing for vehicles since the Gore Highway is categorised as ‘limited access’, and establishing a driveway connection at the current location is not feasible. Formalising the driveway is further complicated by the proposed road-over-rail grade separation to replace the existing active level crossing.

Holdfast Timbers

Holdfast Timbers is situated on the northern side of the existing QR South Western Line in Yelarbon and adjacent to GrainCorp. It currently has two legal and practical accesses:

- Via Railway Parade
- Via a private level crossing connecting to East Sawmill Road.

The private level crossing is located on a proposed rail siding, which if developed, would mean a non-compliance with ARTC standards. The revised reference design proposes to close the private crossing and maintain access via Railway Parade. The proposed access is integrated with the Cunningham Highway improvements and Yelarbon safety enhancements. The design includes a road-over-rail grade separation and realignments of local roads, eliminating the existing level crossing on the Cunningham Highway, following the guidelines outlined in the Public Level Crossing Treatment Methodology in Appendix AA: Traffic Impact Assessment (Appendix BT).

Vary Agricultural Services

Vary Agricultural Services is located on the north-west side of the QR Millmerran Branch Line, accessible via Ware Street. The Project has no adverse impact on the facility's access or connectivity requirements. During the construction of the Gore Highway grade separation and level crossing removal, the business may experience minor travel disruptions. To mitigate this, a temporary side road will be constructed to facilitate safe and efficient vehicle movement around the site.

Wagner Corporation

Wagner Corporation own a significant portion of land in the Biddeston–Wellcamp area. The primary focus for connectivity and access, determined through consultation, is on the lots adjacent to Toowoomba—Cecil Plains Road. In this area, the design proposed is a rail-over-road grade separation, which enables unimpeded access to both sides of the alignment. This design will not physically impact driveways and private access. However, due to the Project's proximity, it is anticipated temporary traffic control measures will be needed to ensure safety during construction. It is important to note that the details of private access across the railway are part of an ongoing detail design process, and discussions are well underway to address connectivity requirements between lots. Finally, it is acknowledged further work on connectivity will be necessary as Wellcamp progress the intermodal designs.

20.7.3 Traffic impact–intersections

20.7.3.1 Turn warrants

Table 20-52 summarises the number of intersections expected to require upgrades to right turn lane provisions.

TABLE 20-52 NUMBER OF INTERSECTIONS REQUIRING RIGHT TURN TREATMENTS

Authority	Number of intersections requiring treatment prior to the Project	Number of intersections requiring treatment due to the Project	Total number of intersections requiring turn treatments
DTMR	15	10	25
GRC	8	0	8
TRC	13	0	13
MPSC	1	0	1
Total	37	10	47

The following 10 intersections have additional right turn warrant requirements triggered as a result of the construction traffic:

- Cunningham Highway/Bybera Road
- Gore Highway/Fysh Road
- Gore Highway/Bushy Lane West (West)
- Gore Highway/Gilgai Lane
- Gore Highway/Linthorpe Road
- Gore Highway/Linthorpe Valley Road
- Gore Highway/Scrubby Road
- Gore Highway/Tummaville Road/Yarranlea Road (North)
- Toowoomba-Cecil Plains Road/Airport Quarry Wellcamp Access Road
- Toowoomba-Cecil Plains Road/Brimblecombe Road.

Thirty-seven other intersections identified currently warrant upgrades to the right turn treatments, however, these are required regardless of the addition of construction related activities.

Table 20-53 summarises the number of intersections expected to require upgrades to left turn lane provisions.

TABLE 20-53 NUMBER OF INTERSECTIONS REQUIRING LEFT TURN TREATMENTS

Authority	Number of intersections requiring treatment prior to the Project	Number of intersections requiring treatment due to the Project	Total number of intersections requiring turn treatments
DTMR	12	4	16
GRC	9	0	9
TRC	10	0	10
MPSC	1	0	1
Total	32	4	36

The following four intersections have additional left turn warrant requirements triggered as a result of the construction traffic:

- Gore Highway/Biddeston Southbrook Road (signalised)
- Gore Highway/Dieckmann Road (priority controlled)
- Gore Highway/Linthorpe Road (signalised)
- Warrego Highway/Chamberlain Road (priority controlled).

Thirty-two other intersections identified currently warrant upgrades to the right turn treatments, however, these are required regardless of the addition of construction-related activities.

Mitigation measures are outlined in Section 20.6. The mitigation measures suggested may not be required once the construction routes have been finalised. Given that a number of intersection warrants are required regardless of the temporary Project traffic, mitigation measures to improve safety issues resulting from inadequate turn lane availability will be agreed with the relevant road authority.

20.7.3.2 Sight distance

An assessment has been conducted to determine the required safe intersection sight distance at each intersection, including required inputs relating to the road seal, major road speed limit and longitudinal grade used in the calculation of minimum safe intersection sight distance.

The mitigation measures proposed in Section 20.6 provide information on potential infrastructure-based mitigations proposed at these locations, including provision of additional turn lanes or upgrading the priority intersection to a signalised intersection. Specific requirements for any upgrade or improved capacity measures should be reassessed during detailed design and in conjunction with the any changes in construction traffic volumes and the proposed TMP.

20.7.3.3 Delay

Each intersection used by construction traffic has undergone Sidra analysis to assess the peak period operational performance for the 'without Project' and 'with Project' scenarios.

The overall vehicle minutes delay net increase for the impact assessment area equates to 5.98 per cent, which is just above the GTIA definition of significantly worsening of 5 per cent. Therefore, mitigation of capacity issues causing delay is required to return the intersection to pre-Project levels.

Table 20-54 shows the number of intersections expected to experience a net increase in delay greater than 5 per cent based on the current construction routes and volumes.

TABLE 20-54 NUMBER OF INTERSECTIONS EXPERIENCING GREATER THAN 5 PER CENT INCREASE IN DELAY

Authority	Number of intersections
DTMR	76
GRC	14
TRC	17
MPSC	1

Non-infrastructure and infrastructure-based mitigation measures for delay impacts are outlined in Section 20.6.

20.7.4 Traffic impact–road links

20.7.4.1 Level of service

Table 20-55 provides a summary of the number of roads, number of road sections and length of roads by road authority that exceed the prescribed 5 per cent threshold for construction traffic compared with background traffic.

TABLE 20-55 NUMBER OF ROADS EXCEEDING 5 PER CENT BASE ANNUAL AVERAGE DAILY TRAFFIC BY ROAD AUTHORITY

Road authority	Number of roads > 5%	Number of road sections > 5%	Length of roads > 5% (km)
DTMR	18	96	583.61
TfNSW	0	0	0.00
BSC	1	1	0.39
GRC	29	46	159.42
MPSC	2	2	6.73
TRC	44	65	81.44

The results of the LoS comparison indicates that the Project-related traffic may cause an incremental change in LoS on seven road links in the gazettal/northbound/eastbound directions and eight in the against-gazettal/southbound/westbound directions. Table 20-56 and Table 20-57 provide an overview of all road links that change in LoS between without and with Project traffic for the gazettal/northbound/eastbound directions and against-gazettal/southbound/ westbound directions, respectfully. Apart from those road links listed below, the road network is anticipated to continue to operate with no net worsening as a result of the Project.

TABLE 20-56 SUMMARY OF ROAD LINKS WITH INCREMENTAL LEVEL OF SERVICE CHANGE GAZETTAL/ NORTHBOUND/ EASTBOUND DIRECTIONS

Road name	Road section	Peak impact year daily traffic volumes		LoS	
		Without Project	With Project	Without Project	With Project
Gore Highway (28A)	Ch 2.2 km to Ch 5.4 km	264	352	A	B
	Ch 5.4 km to Ch 6.7 km	264	351	A	B
	Ch 6.7 km to Ch 7.7 km	264	350	A	B
	Ch 7.7 km to Ch 11.2 km	264	349	A	B
	Ch 11.2 km to Ch 15.3 km	264	348	A	B
	Ch 15.3 km to Ch 17.5 km	264	324	A	B
	Ch 19.0 km to Ch 20.3 km	264	323	A	B

TABLE 20-57 SUMMARY OF ROAD LINKS WITH INCREMENTAL LEVEL OF SERVICE CHANGE ANTI-GAZETTAL/ SOUTHBOUND/ WESTBOUND DIRECTIONS

Road name	Road section	Peak impact year daily traffic volumes		LoS	
		Without Project	With Project	Without Project	With Project
Gore Highway (28A)	Ch 0.0 km to Ch 2.2 km	284	376	A	B
	Ch 2.2 km to Ch 5.4 km	275	397	A	B
	Ch 5.4 km to Ch 6.7 km	275	390	A	B
	Ch 6.7 km to Ch 7.7 km	275	386	A	B
	Ch 7.7 km to Ch 11.2 km	275	378	A	B
	Ch 11.2 km to Ch 15.3 km	275	375	A	B
	Ch 15.3 km to Ch 17.5 km	275	347	A	B
	Ch 19.0 km to Ch 20.3 km	275	340	A	B

Although there is a change in operational LoS for the road sections previously discussed, the expected operational LoS B is considered acceptable given the short duration of the construction activities. In addition, the operational performance of the road would return to base conditions after construction is complete.

Based on the LoS comparison, it is not expected that the Project would generate the need to upgrade the road network for these temporary construction activities. Regardless, as per the earlier assessments, it is important that the routes are reviewed in the preparation of a TMP from a physical and safety perspective prior to the commencement of construction activities to ensure they are suitable. This will include joint visual inspection of all routes by the Contractor, the asset owner and an accredited road safety auditor to agree on routes and any works required to ensure the routes are suitable for the level of construction activity proposed.

20.7.5 Traffic impacts–pavements

The PIA indicates that the majority of SCR segments would have minimal pavement impact given the duration of construction activities and pavement loading, however, it was found that the 5 per cent threshold would be exceeded for several road sections, as outlined in Table 20-58.

TABLE 20-58 NUMBER OF ROADS EXCEEDING 5 PER CENT BASE STANDARD AXLE REPETITIONS BY ROAD AUTHORITY

Road authority	Number of roads > 5%	Number of road links > 5%	Length of roads > 5% (km)
DTMR	12	81	531.2
TfNSW	0	0	0
BSC	1	1	0.4
GRC	26	39	136.8
MPSC	2	2	6.7
TRC	42	59	76.9

Some of the percentages are relatively high due to very low background traffic volumes along the particular road sections. Detailed analysis outputs and results of these road segments are provided in Section 20.5.2.7.

Detailed pavement design life assessments will be carried out prior to the commencement of construction, in consultation with DTMR, once specific construction routes are agreed in the detailed design stage of the Project. Further detailed assessment will assist in identifying if contributions may be required towards the maintenance costs for the affected road sections as a result of additional pavement loading. This will form part of the Outline EMP and subsequent EMPs to be developed prior to construction. The TMP will also be developed by the Contractor prior to the commencement of construction with mitigation measures included to supplement the EMPs. This will assist further discussions with DTMR to identify if contributions may be required towards the maintenance costs for the affected road sections as a result of additional pavement loading.

The estimated contribution required based on the vehicle movements of all construction vehicles on DTMR roads, excluding cumulative impacts has been provided to DTMR. Contributions are only required on sections of the SCR where the Project vehicles exceeded the 5 per cent threshold.

20.7.6 Traffic impacts–transport infrastructure

20.7.6.1 Heavy vehicle movement

Where heavy vehicles routes and restrictions are defined, the Project construction vehicles comply with these requirements, with the exception of OSOM vehicles. These are generally SCR. There are a number of roads used by construction vehicles which are not defined under the Queensland heavy vehicle routes and restrictions information. Routes unclassified for heavy vehicle use are generally LGR which usually have no requirement for B-double, higher mass limit or road train-sized vehicles. These roads may not typically be designed for such large vehicle types, the construction vehicles could impact on the pavement or road formation or be unsuitable for the road geometry.

Mitigation measures for impacts to these roads due to the use of heavy vehicles are:

- Road safety audits to be carried out at detailed design stage and post-construction stage where such road upgrade works are required to ensure the design vehicle can be accommodated
- All conflict points impacting vehicle turn path will be relocated/removed and further road widening works of kerb turnouts, or carriageway of minor road to accommodate vehicle swept path, will be reviewed during the detailed design stage
- All OSOM and Restricted Access Vehicles will comply with the Guideline for Excess Dimension Vehicles in Queensland (DTMR, 2013) in terms of transport safety.

20.7.6.2 Oversize overmass movement

Swept path analysis has been undertaken at a total of 35 identified pinch point locations. These locations were identified through a desktop study of the proposed routes of OSOM movements. The pinch point locations and information is provided in Section 20.5.15.3. The assessment has identified a number of pinch points requiring upgrade (temporary or permanent) to accommodate the movement of OSOM vehicles. The key mitigation measures for OSOM movement identified are:

- Temporary removal of signage, fencing, guard rail and guide posts
- Removal of vegetation
- Widening of intersection pavement (either permanent, or using gravel)
- Locate, identify and flag overhead power poles
- Assessment of structural adequacy of bridges/culverts
- Use of pilot vehicles and police escorts to warn other road users
- Use of traffic control
- Travel outside of peak times (preferably evenings) to minimise vehicle conflict
- Erect temporary lighting
- Erect temporary signage as required.

Once the Contractor has prepared further plans and chosen their preferred design vehicle, these swept path assessments will be revisited to determine any temporary or permanent changes to the existing layout which may be required to accommodate construction traffic movements, such as road upgrades, localised lane widening, geometric improvements or removal of signage and lighting. ARTC commits that these mitigation measures will be further discussed and agreed with the relevant road authorities and include as part of a third-party agreement.

20.7.7 Traffic impacts–road-rail interface

20.7.7.1 Construction

During construction, it is anticipated that most existing rail crossings will be non-operational. As such, only two level crossings were identified as having impacts. The assessment findings of the public level crossings are:

- Cunningham Highway (Whetstone) active level crossing: train crossings limited to those for delivery of Project construction materials. Vehicle volumes are expected to increase from 681 vehicles/day/direction to 912 vehicles/day/direction (38.2 per cent increase) in the peak impact year.
- Coolmunda Dam Access Road (Coolmunda) passive level crossing: vehicle increase from 37 vehicles/day/direction to 88 vehicles/day/direction (136.6 per cent increase) in the peak impact year. Volumes remain low therefore limited impact is expected.

Traffic management strategies to be introduced to mitigate road-rail interface impacts include:

- Road safety audits will be undertaken at the level crossings pre- and post-construction, as well as post-opening in accordance with the Austroads guidelines
- Physical controls such as boom barrier gates and/or warning lights will be incorporated into the revised reference design at active level crossing locations in accordance with the *Guide to Development in a Transport Environment: Rail* (DTMR 2015), *Manual of Uniform Traffic Control Devices Part 7: Railway Crossings* (DTMR, 2019f) and ARTC *Engineering Code of Practice–Level Crossings*
- Railway safety messages will be provided to the community through awareness activities, community engagement activities, and campaigns to increase public awareness regarding the Project.

20.7.7.2 Operation

The operational performance of the proposed public level rail crossings in the TIA study area was assessed to provide an understanding of the impacts on performance and safety during the operations stage. The rail crossing impact assessment focuses on vehicle delay and queueing analysis, demonstrating how the Project generated traffic impacts vehicle delay and queuing at the rail crossing.

Two future year scenarios were analysed: 2028 (day one rail operations) and 2040 (peak Project operation). For each year, both AM and PM peak hour analysis was conducted based on the estimated number of train movements, forecast background traffic and any diversions to the surrounding road network as a consequence of the Project.

The results indicate a delay of 1.30 to 3.02 minutes depending on the road-rail interface location and based on a train speed of 115 km/h. All road-rail interfaces have been found to have sufficient storage based on the adopted design vehicles.

20.7.7.3 Road diversions

A road diversion assessment has been undertaken at a number of locations where the rail alignment and road-rail interface crossing type has led to a requirement for redirection of traffic to an alternative route. Within the traffic, transport and access study area, seven diversion locations have been identified as follows:

- Athol School Road, Athol
- Biddeston Southbrook Road, Southbrook
- Lochaber Road, Pittsworth
- Oakey Pittsworth Road, Pittsworth
- Tip Road, Pittsworth
- Ware Street, Brookstead
- Fysh Road, Pampas.

At each of these diversion locations, an assessment has been undertaken to summarise the:

- Existing situation, including the road network and active and public transport provisions
- Required site distance length
- Traffic information and rerouting assumptions
- Capacity (Sidra) and turn warrants assessment with and without Project
- Proposed mitigation measures.

For the intersections previously summarised in Section 20.7.7.1 that have been analysed, all intersections are found to be performing at a satisfactory level post-diversion. The impact on public transport and active modes are also expected to be negligible, if any.

20.7.8 Traffic impacts–active travel

Impacts to active travel have been described in Section 20.5.

The TMP will be an important tool for the Contractor to mitigate risk to active transport users.

ARTC has committed to maintaining connectivity of existing on and off-road pedestrian/shared user facilities, where the need for that facility remains in accordance with agreement reached with relevant local councils. Consultation will continue with local councils regarding pedestrian crossing options during detailed design. Once agreed, changes to active transport networks will be communicated to active transport users through regular Project channels.

Sections of the South Western Line and Millmerran Branch Line may become disused or non-operational with the delivery of the Project. Opportunities exist for these to be repurposed as rail trails for community use. The ongoing operational status and requirements of remaining existing rail lines connecting to the Project will be reviewed and confirmed at the detailed design stage, through consultation and agreement with ARTC and QR.

Provision has been made where there is the need or future need for pedestrians and cyclist transport (e.g. Yelarbon pedestrian crossing). In all road-over-rail interfaces assessed, there is no existing desire line or future need, and the provision of separate pedestrian and non-vehicular access is not economically justified in accordance with Austroads Guide to Road Design Part 6A–Section C1.2.2.

20.7.9 Traffic impacts–emergency services

Impacts to emergency services have been described in Section 20.5.

The TMP will identify and include secondary/alternative construction routes which can be used by construction traffic in the event that a primary construction route is blocked by an accident or emergency situation. Where a suitable secondary route is not identified, the movement of construction vehicles will stop until suitable alternative routes are identified and agreed with the relevant road authority.

20.7.10 Traffic impacts–bus routes

Impacts to bus routes have been described in Section 20.5.

During the construction works stage, it is suggested that the Contractor collaborates with Brookstead State School, as well as other key stakeholders in the area (such as DTMR and Toowoomba Regional Council), to address and mitigate any construction impacts, particularly concerning the operation and access to the school zone, including the operations of the S118 service. Specific mitigations will be further examined and determined during the detailed design and construction works stages and will be documented as part of the TMP.

It is expected that other school bus services would not be substantially impacted from an operational and service reliability perspective as a result of the Project-generated traffic during the construction works stage, however, the Contractor will work with stakeholders to avoid impacts on school bus services and school zones, during the preparation of the draft Outline EMP and TMP.

20.8 Conclusions

This chapter assesses the traffic, transport and access impacts of the construction and operation of the Project on the surrounding transport infrastructure based on the current design of the Project. This chapter addresses the transport section of the ToR inclusive of ToR items 11.107 to 11.116, of which Appendix A2: Terms of Reference Cross-reference Table provides section links from this report to the relevant ToR. This chapter also addresses the additional requests for information issued by the Office of Coordinator-General following the public notification of the EIS. In doing so, the assessment has evaluated a comprehensive range of issues encompassing potential impacts of the construction works and operations stages of the Project on the surrounding transport infrastructure and its users. This chapter has also examined the potential traffic and pavement impacts from the movement of materials, workforce and equipment during the construction works stage of the Project on the surrounding road network.

Key findings of this assessment are as follows:

- The revised reference design for the Project interfaces with seven SCR in nine locations.
- Eighteen SCR are expected to experience construction traffic that exceeds 5 per cent of the background traffic.
- Seventy-six LGR have been identified that are expected to experience construction traffic that exceeds 5 per cent of the background traffic. Twenty-nine of these roads are in the Goondiwindi LGA, and 44 of these roads are in the Toowoomba LGA, two of these roads are in MPSC LGA and a single road is in BSC. Impacts to many of these roads are expected to be minimal as the high percentage of construction traffic is a function of low existing traffic volumes.
- Based on the LoS comparison, it is not expected that the Project would generate the need to upgrade the road network for these temporary construction activities. Regardless, as per the earlier assessments, it is important that the routes are reviewed in the preparation of the TMP from a physical and safety perspective prior to the commencement of construction activities to ensure they are suitable. This will include joint visual inspection of all routes by the Contractor, the asset owner, and an accredited road safety auditor to agree on routes and any works required to ensure the routes are suitable for the level of construction activity proposed.
- Intersection analysis has identified 10 locations where the addition of construction traffic warrants right-turn treatments. The analysis also identified 37 locations currently warrant upgrades to the right turn treatments to maintain operational safety, however; these are required regardless of the addition of construction related activities.
- Intersection analysis has identified four locations where the addition of construction traffic warrants left-turn treatments. The analysis also identified 32 other locations currently warrant upgrades to the left turn treatments to maintain operational safety; however, these are required regardless of the addition of construction related activities.

- The findings of the PIA show that 12 SCR and 71 LGR are likely to cross the 5 per cent SAR threshold, with several road segments exceeding this threshold by a significant margin. Detailed pavement design life assessments will be carried out prior to the commencement of construction, in consultation with DTMR, once specific construction routes are agreed in the next stage of the Project. Further detailed assessment will assist in identifying if contributions may be required towards the maintenance costs for the affected road sections as a result of additional pavement loading.
- Sixteen cycle routes are identified in Queensland and New South Wales that might be impacted by construction traffic. Some of the proposed construction routes are aligned through areas of moderate to high pedestrian activity through the areas surrounding the towns of Yelarbon, Inglewood, Millmerran, Brookstead, Pittsworth and Toowoomba. While increased heavy vehicle movements through these locations may adversely impact pedestrian movements, the majority of these routes currently facilitate a high proportion of heavy vehicle movements.
- Five public transport services in Queensland and New South Wales have been identified with routes that are proposed to be used, in part, by construction traffic for the Project. The closest route to the Project is for the Ipswich to Toogoolawah (529) route, approximately 70 km to the east of the Project at its closest point. While roads used by the 12 identified services may be used by construction vehicles, the roads will not require temporary traffic controls. Therefore, driving conditions on roads used by public transport services will remain unchanged. Thirty existing school bus services share elements of proposed construction routes for the Project. During the construction works stage, it is suggested that the construction contractor collaborates with Brookstead State School, as well as other key stakeholders in the area (such as DTMR and TRC), to address and mitigate any construction impacts, particularly concerning the operation and access to the school zone, including the operations of the S118 service. Specific mitigations will be further examined and determined during the detailed design and construction works stage and will be documented as part of the TMP.
- It is expected that other school bus services would not be substantially impacted from an operational and service reliability perspective as a result of the Project generated traffic during the construction works stage. Given that the school bus routes do not tend to have designated bus stops, apart from the termini, prior to the construction works stage of the Project, suitable mitigation measures for all of the affected services, including the location of bus stops, will be identified in consultation with bus operators, local councils, impacted schools, Department of Education and the local community and be documented in the TMP to ensure school bus safety and understand any impacts to journey times, if any.
- Thirteen existing long-distance coach services share elements of proposed construction routes for the Project; however, the impacts on these long-distance coach services are expected to be minimal due to the low frequency of the services.
- The revised reference design for the Project interfaces with the State stock route network in a number of locations. The revised reference design for the Project has, in all instances, maintained access for stock route users. This has been provided through either:
  - the provision of a crossing point of the rail alignment in the location of the existing stock route
  - the provision of an alternative means of moving stock.
- In relation to rail operational traffic and maintenance processes, rail operational traffic volumes are likely to be negligible with no envisaged impact to operational conditions of the surrounding road networks.

The revised reference design has been refined in parallel with the revised draft EIS to enable opportunities for elimination and minimisation of transport infrastructure and traffic impacts. Where avoidance has not been possible, design development has sought to minimise the likelihood and/or consequence of these impacts, as far as possible. Responses of the revised reference design to potential traffic and transport issues have been detailed in Section 20.6.1.

Where potential impacts to traffic and transport have not been eliminated, reduced or mitigated through the revised reference design, additional mitigation measures have been nominated for implementation in future stages of the Project. These proposed mitigation measures have been detailed in Section 20.6.2.

Potential impacts to traffic and transport infrastructure will be managed through adherence to the Outline EMP (Chapter 24: Draft Outline Environmental Management Plan), including the TMP and RUMP.