

APPENDIX

X

INLAND
RAIL 

Traffic Impact Assessment

Part 1 of 4

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

Inland Rail Border to Gowrie EIS

Appendix X – Traffic Impact
Assessment

**Australian Rail Track
Corporation**

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Contents

1	Introduction and approach	1
1.1	Project overview	1
1.2	Terms of reference requirements	1
1.3	Scope and context of report	2
1.4	Relevant legislation, policy and guidelines	3
1.5	Impact assessment area	7
1.5.1	Project rail corridor.....	7
1.5.2	Primary construction transport routes.....	7
1.5.3	Operational transport routes.....	19
1.6	Methodology	19
1.6.1	Desktop review and data collection	20
1.6.2	Impact assessment and mitigation	25
1.6.3	Cumulative impact assessment.....	31
1.6.4	Stakeholder consultation	31
2	Existing conditions.....	33
2.1	Existing land uses.....	33
2.2	Existing road network	33
2.2.1	State-controlled roads	35
2.2.2	Local government roads	38
2.2.3	Public transport networks	44
2.2.4	School bus routes.....	45
2.2.5	Long-distance services.....	55
2.2.6	Stock routes.....	56
2.2.7	State strategic touring routes.....	58
2.3	Existing rail facilities	58
2.3.1	South Western Line	58
2.3.2	Millmerran Branch Line.....	59
2.3.3	Sidings and crossing loops.....	60
2.4	Cycling and pedestrian network	61
3	Proposed works.....	62
3.1	Basis of design	62
3.2	Construction.....	63
3.3	Operation	64
3.3.1	Road-rail interface locations	65
3.3.2	Road alterations.....	69
4	Baseline operations.....	70
4.1	Existing road links.....	70
4.1.1	Level of service definition	70
4.1.2	Link analysis criteria	71
4.1.3	Baseline traffic volumes.....	72
4.1.4	Existing construction route traffic volumes	73
4.2	Existing intersection performance	86
4.3	Existing pavement load (standard axle repetitions).....	86
4.3.1	Equivalent axle load per heavy vehicle type	86
4.3.2	Existing standard axle repetitions over 20-year design life	90

4.4	Road-rail interface traffic volumes	91
4.5	Existing road safety issues (crash data)	93
4.5.1	Crash analysis – construction routes	94
4.5.2	Crash analysis – road-rail interface	102
5	Construction traffic generation and assignment	106
5.1	Construction transport modes	106
5.2	Construction staging	107
5.3	Estimated material requirements	107
5.3.1	Bulk earthworks	107
5.3.2	Borrow material	108
5.3.3	Quarry material	109
5.3.4	Precast and bulk concrete	115
5.3.5	Construction water requirements	116
5.4	Workforce	118
5.5	Hours of work	119
5.6	Construction transport routes	120
5.6.1	Delivery of water	120
5.6.2	Spoil disposal routes	121
5.6.3	Pre-cast concrete routes	122
5.6.4	Bulk concrete traffic routes	123
5.6.5	Quarry routes	123
5.6.6	Consolidated sleeper routes	123
5.6.7	Rail routes	123
5.6.8	Delivery and collection of plant, tools, materials	124
5.6.9	Laydown areas	124
5.6.10	Road network and restrictions on vehicle size	132
5.6.11	Access off/onto roads	134
5.6.12	Load restricted bridges/restricted waterway crossings	136
5.7	Traffic generation by activity	137
5.8	Construction program	160
6	Traffic impact assessment	162
6.1	Traffic analysis	162
6.1.1	Traffic growth rates	162
6.1.2	Seasonal variation	162
6.2	Construction	163
6.2.1	Five per cent traffic comparison on links	163
6.2.2	Level of service comparison on links	184
6.2.3	Level of service comparison on links with assumed base traffic volumes	200
6.3	Construction intersection analysis	207
6.3.1	Cunningham Highway/Bybera Road	215
6.3.2	Cunningham Highway/Yelarbon-Kurumbul Road	217
6.3.3	Cunningham Highway/East Sawmill Road	219
6.3.4	Cunningham Highway/Springborg Road	221
6.3.5	Cunningham Highway/Whetstone Access Road	223
6.3.6	Cunningham Highway/McDougalls Crossing Road	225
6.3.7	Cunningham Highway/Elizabeth Street	227
6.3.8	Cunningham Highway/Yelarbon-Keetah Road	229
6.3.9	Cunningham Highway/Inglewood Quarry Access Road	231
6.3.10	East Sawmill Road/Unnamed Road	233
6.3.11	Gore Highway/Athol School Road	235
6.3.12	Gore Highway/Yarranlea Road	237

6.3.13	Gore Highway/Tummaville Road	239
6.3.14	Gore Highway/Lindenmayer Road	241
6.3.15	Gore Highway/Scrubby Road	243
6.3.16	Gore Highway/Linthorpe Road	245
6.3.17	Gore Highway/Geitz Road	247
6.3.18	Gore Highway/Bushy Lane West	249
6.3.19	Gore Highway/Unnamed Road	251
6.3.20	Gore Highway/Unnamed Road	253
6.3.21	Millmerran-Inglewood Road/Paton Road	255
6.3.22	Millmerran-Inglewood Road/Millwood Road	257
6.3.23	Millmerran-Inglewood Road/Kooroongarra Road	259
6.3.24	Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road	261
6.3.25	Toowoomba-Cecil Plains Road/Brimblecombe Road	263
6.3.26	Greenwattle Street/Alderley Street	265
6.4	Operation	267
6.4.1	Workforce	267
6.4.2	Maintenance	267
6.4.3	Rail crossings	268
6.5	Other road impacts	285
6.5.1	Impacts on emergency services	285
6.5.2	Stock routes impacts	286
6.5.3	Impacts on existing rail facilities	287
6.5.4	Public transport impacts	289
6.5.5	School bus service impacts	289
6.5.6	State strategic touring routes	290
6.5.7	Access and egress	291
6.5.8	Cycling and pedestrian network	291
7	Pavement impact assessment	292
7.1	Methodology	292
7.2	Assumptions	293
7.3	Analysis and findings	294
8	Safety assessment	301
8.1	Methodology	301
8.2	Existing safety issues	301
8.3	Risk assessment	301
9	Mitigation measures	315
9.1	Mitigation through the reference design phase	315
9.2	Proposed mitigation measures	316
9.2.1	Proposed mitigation measures	316
9.2.2	Additional considerations	316
10	Impact assessment summary	323
11	Cumulative impacts	325
11.1	Approach	325
11.2	Cumulative impact assessment	326
12	Summary of findings	335
12.1	Traffic impacts – link roads	335
12.2	Traffic impacts – intersections	335
12.3	Traffic impacts – pavements	336

12.4	Traffic impacts – road-rail interface	338
12.4.1	Millmerran-Inglewood Road (310-24-P-2)	339
12.4.2	Millmerran-Leyburn Road (310-40-E-2)	339
12.4.3	Owens Scrub Road (310-38-P-3)	339
12.4.4	Lindenmayer Road (310-39-P-1)	340
12.4.5	Longhurst Road (310-45-E-1)	340
12.4.6	Kildonan Road (270-12-P-1)	340
12.4.7	McDougalls Crossing Road (310-17-P-7a)	340
12.4.8	Cremascos Road (310-18-P-8)	340
12.5	Traffic impacts – active travel	341
13	References	342

Appendices

Appendix A

Department of Transport and Main Roads traffic growth rates

Appendix B

Roads and Maritime Services traffic growth rates

Appendix C

Construction Routes - Road hierarchy

Appendix D

Existing standard axle repetitions and pavement impact analysis

Appendix E

Existing construction route crashes

Appendix F

Existing road-rail interface crashes

Appendix G

Mass haul construction traffic routes

Appendix H

Concrete – bridge construction traffic routes

Appendix I

Concrete – culverts construction traffic routes

Appendix J

Precast concrete – bridge construction traffic routes

Appendix K

Precast concrete – culverts construction traffic routes

Appendix L

Quarry construction traffic routes

Appendix M

Sleepers construction traffic routes

Appendix N

Water construction traffic routes

Appendix O

Workforce construction traffic routes

Appendix P

Multi-combination heavy vehicle routes

Appendix Q

Detailed link analysis

Appendix R

Public Transport and Principal Cycle Network Plan Maps

Appendix S

Peak construction traffic by road segment

Appendix T

Turn Warrant Intersection Graphs

Figures

Figure 1.1	Project rail alignment
Figure 1.2a-i	Project road/rail interface locations
Figure 1.3	Project primary construction transport routes
Figure 1.4	Background and project traffic volumes
Figure 1.5	Traffic impact assessment process in accordance with the GTIA
Figure 1.6	Mitigation framework
Figure 2.1	Existing land use
Figure 5.1	Potential borrow and quarry sites
Figure 5.2	Established concrete suppliers and locations for the proposed precast concrete facility and concrete batch plant
Figure 5.3	Estimated site workforce
Figure 5.4	Typical construction traffic access to laydown area adjacent to DTMR road
Figure 6.1	Turning movement definitions
Figure 6.2	Cunningham Highway/Bybera Road existing layout
Figure 6.3	Cunningham Highway/Bybera Road turning treatment assessment (2021)
Figure 6.4	Cunningham Highway/Yelarbon-Kurumbul Road existing layout
Figure 6.5	Cunningham Highway/Yelarbon-Kurumbul Road turning treatment assessment (2022)
Figure 6.6	Cunningham Highway/East Sawmill Road existing layout
Figure 6.7	Cunningham Highway/East Sawmill Road turning treatment assessment (2021)
Figure 6.8	Cunningham Highway/Springborg Road existing layout
Figure 6.9	Cunningham Highway/Springborg Road turning treatment assessment (2021)
Figure 6.10	Cunningham Highway/Whetstone Access Road existing layout
Figure 6.11	Cunningham Highway/Whetstone Access Road turning treatment assessment (2024)
Figure 6.12	Cunningham Highway/McDougalls Crossing Road existing layout
Figure 6.13	Cunningham Highway/McDougalls Crossing Road turning treatment assessment (2021)
Figure 6.14	Cunningham Highway/Elizabeth Street existing layout
Figure 6.15	Cunningham Highway/Elizabeth Street turning treatment assessment (2024)
Figure 6.16	Cunningham Highway/Yelarbon-Keetah Road existing layout
Figure 6.17	Cunningham Highway/ Yelarbon-Keetah Road turning treatment assessment (2021)
Figure 6.18	Cunningham Highway/Inglewood Quarry Access Road existing layout
Figure 6.19	Cunningham Highway/Inglewood Quarry Access Road turning treatment assessment (2022)

Figure 6.20	East Sawmill Road/Unnamed Road existing layout
Figure 6.21	East Sawmill Road/Unnamed Road turning treatment assessment (2022)
Figure 6.22	Gore Highway/Athol School Road existing layout
Figure 6.23	Gore Highway/Athol School Road turning treatment assessment (2023)
Figure 6.24	Gore Highway/Yarranlea Road existing layout
Figure 6.25	Gore Highway/Yarranlea Road turning treatment assessment (2024)
Figure 6.26	Gore Highway/Tummaville Road existing layout
Figure 6.27	Gore Highway/Tummaville Road turning treatment assessment (2022)
Figure 6.28	Gore Highway/Lindenmayer Road existing layout
Figure 6.29	Gore Highway/Lindenmayer Road turning treatment assessment (2025)
Figure 6.30	Gore Highway/Scrubby Road existing layout
Figure 6.31	Gore Highway/Scrubby Road turning treatment assessment (2022)
Figure 6.32	Gore Highway/Linthorpe Road existing layout
Figure 6.33	Gore Highway/Linthorpe Road turning treatment assessment (2022)
Figure 6.34	Gore Highway/Geitz Road existing layout
Figure 6.35	Gore Highway/Geitz Road turning treatment assessment (2022)
Figure 6.36	Gore Highway/Bushy Lane West existing layout
Figure 6.37	Gore Highway/Bushy Lane West turning treatment assessment (2024)
Figure 6.38	Gore Highway/Unnamed Road existing layout
Figure 6.39	Gore Highway/Unnamed Road turning treatment assessment (2022)
Figure 6.40	Gore Highway/Unnamed Road existing layout
Figure 6.41	Gore Highway/Unnamed Road turning treatment assessment (2022)
Figure 6.42	Millmerran-Inglewood Road/Paton Road existing layout
Figure 6.43	Millmerran-Inglewood Road/Paton Road turning treatment assessment (2025)
Figure 6.44	Millmerran-Inglewood Road/Millwood Road existing layout
Figure 6.45	Millmerran-Inglewood Road/Millwood Road turning treatment assessment (2023)
Figure 6.46	Millmerran-Inglewood Road/Kooroongarra Road existing layout
Figure 6.47	Millmerran-Inglewood Road/Kooroongarra Road turning treatment assessment (2022)
Figure 6.48	Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road existing layout
Figure 6.49	Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road turning treatment assessment (2021)
Figure 6.50	Toowoomba-Cecil Plains Road/Brimblecombe Road existing layout
Figure 6.51	Toowoomba-Cecil Plains Road/Brimblecombe Road turning treatment assessment (2024)
Figure 6.52	Greenwattle Street/Alderley Street existing layout
Figure 6.53	Greenwattle Street/Alderley Street turning treatment assessment (2023)

Tables

Table 1.1	Compliance against relevant sections of the terms of reference
Table 1.2	Summary of legislation, policies and guidelines
Table 1.3	Summary of transport impacts by mode
Table 1.4	Performance criteria
Table 1.5	Trigger criteria for the application of mitigation measures
Table 1.6	Impact assessment years
Table 1.7	Likelihood criteria
Table 1.8	Consequence criteria
Table 1.9	Risk matrix
Table 1.10	Consulted stakeholders
Table 2.1	State-controlled roads intersected by the Project
Table 2.2	State-controlled roads: project primary construction routes
Table 2.3	Intersection locations of public, local government road assets
Table 2.4	Local government roads: project primary construction routes
Table 2.5	Public transport (bus) routes with potential to interface with Project activities
Table 2.6	School bus routes with potential to interface with Project activities
Table 2.7	Long-distance coach services with potential to interface with Project activities

Table 2.8	Stock routes within the impact assessment area
Table 2.9	Strategic touring routes that are proposed to be used for construction traffic
Table 2.10	South Western Line monthly train movements in 2017, between Yelarbon and Inglewood
Table 2.11	Structural details and operating restrictions for the Warwick to Goondiwindi section of the South Western Line
Table 2.12	Millmerran Branch Line monthly train movements in 2017, between Brookstead and Wyreema
Table 2.13	Structural details and operating restrictions for the Millmerran Branch Line
Table 2.14	Cycleways with potential to interface with Project activities
Table 3.1	Performance specifications for Inland Rail and the Project
Table 3.2	Public road intersections included in the reference design for the Project
Table 3.3	Existing public road-rail intersections and proposed design treatments
Table 3.4	Proposed public road-rail interface and design treatments
Table 3.5	Proposed road realignments, diversions and closures
Table 4.1	LOS categories and colour scheme
Table 4.2	Saturation flow rate – uninterrupted two-lane two-way rural roads (vehicles per day)
Table 4.3	Saturation flow rate – uninterrupted two-lane-two-way rural roads (pc/h/ln)
Table 4.4	Saturation flow rate – Multi-lane highways (pc/h)
Table 4.5	Traffic data sources
Table 4.6	Existing baseline construction route traffic volumes
Table 4.7	Level of service definitions based on vehicle delay in seconds
Table 4.8	Standard axle repetitions/heavy vehicle on primary construction routes along state-controlled roads
Table 4.9	Standard axle repetitions/heavy vehicle on representative weigh in motion sites across New South Wales
Table 4.10	Existing traffic volumes at proposed road-rail interface locations
Table 4.11	Definition for Coding Accidents code group descriptions
Table 4.12	Construction traffic route crash data summary
Table 4.13	Crash analysis – proposed public road-rail interface (within 200 m radius)
Table 5.1	Construction activities contributing to traffic generation and transport mode
Table 5.2	Summary of bulk earthworks for rail and road components
Table 5.3	Potential borrow sites
Table 5.4	Quarry materials
Table 5.5	Precast concrete facility and concrete batch plant locations
Table 5.6	Construction water requirements for earthworks activities
Table 5.7	Estimated water usage for on-site concrete production
Table 5.8	Construction water requirements for track work activities
Table 5.9	Non-resident workforce accommodation locations
Table 5.10	Available accommodation
Table 5.11	Spoil management hierarchy
Table 5.12	Laydown areas and utilisation
Table 5.13	Potential construction traffic restrictions
Table 5.14	Estimated buffers
Table 5.15	Total construction vehicle movements by activity, per year
Table 5.16	Total trips by road section per year over the construction period
Table 5.17	Peak daily number of construction traffic movements over the construction period per road section
Table 6.1	Harvest periods for broadacre crops
Table 6.2	Percentage impact parameter
Table 6.3	Five per cent comparison summary (gazettal/northbound/eastbound directions)
Table 6.4	Five per cent comparison summary (anti-gazettal/southbound/westbound directions)
Table 6.5	Number of roads exceeding five per cent base AADT by road authority
Table 6.6	Primary construction routes level of service results gazettal direction/northbound/eastbound
Table 6.7	Primary construction routes level of service results anti-gazettal direction/southbound/westbound

Table 6.8	Primary construction routes level of service results gazettal direction/northbound/eastbound – assumed base traffic volumes
Table 6.9	Primary construction routes level of service results anti-gazettal direction/southbound/westbound – assumed base traffic volumes
Table 6.10	Intersection with construction traffic turn movements
Table 6.11	Calculation of the major road traffic volume (Q_M)
Table 6.12	Intersections with potential turn warrant requirements (development turning volume of more than 5 veh/h)
Table 6.13	Intersections requiring turn warrant treatments
Table 6.14	Cunningham Highway/Bybera Road right turning treatment volumes
Table 6.15	Cunningham Highway/Yelarbon-Kurumbul Road left turning treatment volumes
Table 6.16	Cunningham Highway/Yelarbon-Kurumbul Road right turning treatment volumes
Table 6.17	Cunningham Highway/East Sawmill Road left turning treatment volumes
Table 6.18	Cunningham Highway/East Sawmill Road right turning treatment volumes
Table 6.19	Cunningham Highway/Springborg Road left turning treatment volumes
Table 6.20	Cunningham Highway/Springborg Road right turning treatment volumes
Table 6.21	Cunningham Highway/ Whetstone Access Road left turning treatment volumes
Table 6.22	Cunningham Highway/Whetstone Access Road right turning treatment volumes
Table 6.23	Cunningham Highway/McDougalls Crossing Road right turning treatment volumes
Table 6.24	Cunningham Highway/Elizabeth Street left turning treatment volumes
Table 6.25	Cunningham Highway/ Elizabeth Street right turning treatment volumes
Table 6.26	Cunningham Highway/Yelarbon-Keetah Road left turning treatment volumes
Table 6.27	Cunningham Highway/Inglewood Quarry Access Road left turning treatment volumes
Table 6.28	Cunningham Highway/ Inglewood Quarry Access Road right turning treatment volumes
Table 6.29	East Sawmill Road/Unnamed Road left turning treatment volumes
Table 6.30	Gore Highway/Athol School Road left turning treatment volumes
Table 6.31	Gore Highway/Athol School Road right turning treatment volumes
Table 6.32	Gore Highway/Yarranlea Road left turning treatment volumes
Table 6.33	Gore Highway/Yarranlea Road right turning treatment volumes
Table 6.34	Gore Highway/Tummaville Road left turning treatment volumes
Table 6.35	Gore Highway/Tummaville Road right turning treatment volumes
Table 6.36	Gore Highway/Lindenmayer Road left turning treatment volumes
Table 6.37	Gore Highway/Lindenmayer Road right turning treatment volumes
Table 6.38	Gore Highway/Scrubby Road left turning treatment volumes
Table 6.39	Gore Highway/Scrubby Road right turning treatment volumes
Table 6.40	Gore Highway/Linthorpe Road left turning treatment volumes
Table 6.41	Gore Highway/Linthorpe Road right turning treatment volumes
Table 6.42	Gore Highway/Geitz Road left turning treatment volumes
Table 6.43	Gore Highway/Geitz Road right turning treatment volumes
Table 6.44	Gore Highway/Bushy Lane West left turning treatment volumes
Table 6.45	Gore Highway/Bushy Lane West right turning treatment volumes
Table 6.46	Gore Highway/Unnamed Road left turning treatment volumes
Table 6.47	Gore Highway/Unnamed Road right turning treatment volumes
Table 6.48	Millmerran-Inglewood Road/Paton Road left turning treatment volumes
Table 6.49	Millmerran-Inglewood Road/Millwood Road left turning treatment volumes
Table 6.50	Millmerran-Inglewood Road/Millwood Road right turning treatment volumes
Table 6.51	Millmerran-Inglewood Road/Kooroongarra Road right turning treatment volumes
Table 6.52	Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road right turning treatment volumes
Table 6.53	Toowoomba-Cecil Plains Road/Brimblecombe Road right turning treatment volumes
Table 6.54	Greenwattle Street/Alderley Street right turning treatment volumes
Table 6.55	Proposed road alterations and associated impacts
Table 6.56	Active/passive level crossing sites (public and formed roads only)
Table 6.57	Vehicle wait times
Table 6.58	Proposed level rail crossings – analysis results
Table 6.59	Potential impacts to stock routes within the Project footprint

Table 6.60	Potential impacts to school bus services due to upgraded or new road-rail intersection
Table 7.1	Vehicle types by construction activity
Table 7.2	Project traffic SAR parameters (SAR per heavy vehicle)
Table 7.3	Five per cent standard axle repetitions comparison
Table 8.1	Consequence classification – based on five-year reported crash data
Table 8.2	Risk likelihood description
Table 8.3	Risk rating
Table 8.4	Safety risk assessment: project primary construction routes (without and with Project)
Table 8.5	Safety risk assessment: project primary construction routes (with Project and with mitigation measures)
Table 8.6	Safety risk assessment: road-rail interface (without and with Project)
Table 8.7	Safety risk assessment: road-rail interface (with Project and with mitigation measures)
Table 9.1	Initial mitigation measures of relevance to traffic
Table 9.2	Additional mitigation measures proposed for future phases of Project delivery
Table 10.1	Risk assessment summary for traffic and transport
Table 11.1	Relevance factor
Table 11.2	Impact significance
Table 11.3	Projects initially considered for cumulative impact assessment
Table 11.4	Qualitative cumulative impact assessment for traffic

Glossary

Abbreviation	Definition
AADT	Annual Average Daily Traffic
ADT	Average Daily Traffic
ALCAM	Australian Level Crossing Assessment Model
ARTC	Australian Rail Track Corporation
AUL	Auxiliary Left Turn
AUL(S)	Auxiliary Left Turn (short)
B2G	Border to Gowrie Project
BAL	Basic left turn
BAR	Basic right turn
CEMP	Construction environmental management plan
Ch	Chainage along the Project (in kilometres)
CHR	Channelised Right Turn
CHR(S)	Channelised Right Turn (short)
COAG	Council of Australian Governments
CVC	Clarence Valley Council (New South Wales)
DAF	Department of Agriculture and Fisheries (Queensland)
DCA	Definition for Coding Accidents
DIDO	Drive-in-drive-out
DTMR	Department of Transport Main Roads (Queensland)
EIS	Environmental Impact Statement
FFJV	Future Freight Joint Venture
FIFO	Fly-in-fly-out
GRC	Goondiwindi Regional Council
GSC	Gwydir Shire Council (New South Wales)
GTIA	Guidelines to Traffic Impact Assessment
GVM	Gross vehicle mass
HV	Heavy Vehicle
ISC	Inverell Shire Council (New South Wales)
km	Kilometre
LCIP	New South Wales Level Crossing Improvement Program
LGA	Local Government Area
LGR	Local Government Roads
LOS	Level of Service
m	Metre
MPSC	Moree Plains Shire Council (New South Wales)
MUTCD	Manual of Uniform Traffic Control Devices
NHVR	National Heavy Vehicle Regulator
NS2B	North Star to NSW/QLD Border Project
NSW	New South Wales
NTC	National Transport Commission
OSOM	Oversize, over-mass vehicles

Abbreviation	Definition
ONRSR	Office of the National Rail Safety Regulator
PCNP	Queensland Principal Cycle Network Plans
The Project	Border to Gowrie section of the Inland Rail Program
QLCSS	Queensland Level Crossing Safety Strategy
QLD	Queensland
QPS	Queensland Police Service
QR	Queensland Rail
RAV	Restricted access vehicles
RFI	Requests for Information
RMAR	Rail maintenance access roads
RMS	Roads and Maritime Services (New South Wales)
RSNL	Rail Safety National Law
RSRP	Rail Safety Regulators Panel
RTA	Roads and Traffic Authority
RUMPs	Road Use Management Plans
SAR	Standard Axle Repetitions
SCR	New South Wales State roads and Queensland State-controlled roads
SDAP	Queensland state development assessment provisions
SEARs	NSW Secretary's Environmental Assessment Requirements
SEIS	Supplementary EIS
SiD	Safety in Design
SIDRA	Signalised & Un-signalised Intersection Design and Research Aid
SFAIRP	So Far As Is Reasonably Practicable
TCPs	Traffic Control Plans
TDM	Travel demand management
TfNSW	Transport for New South Wales
TIA	Traffic Impact Assessment
TI Act	<i>Transport Infrastructure Act 1994 (QLD)</i>
TMSs	Traffic Management Strategies
TP&C Act	<i>Transport Planning and Coordination Act 1994</i>
TRC	Toowoomba Regional Council
TSR	Travelling Stock Reserves
VMS	Variable Message Signs
WiM	Weigh-in-Motion

1 Introduction and approach

1.1 Project overview

The Australian Rail Track Corporation (ARTC) proposes to construct and operate the Border to Gowrie Project ("the Project"), a 216.2 km section of the Inland Rail Program, connecting metropolitan Melbourne to Brisbane. It comprises approximately 145.0 km of new track, within new rail corridor (greenfield), and 71.2 km of upgraded track within existing rail corridor (brownfield).

The Project is located in South East Queensland, starting at the New South Wales (NSW) and Queensland border at Kurumbul, approximately 18 km southeast of Goondiwindi. The Project runs northeast via Yelarbon, Inglewood, Millmerran, Pampas, Brookstead, Pittsworth, Southbrook and the Toowoomba Wellcamp Airport to Gowrie Junction, north west of Toowoomba in Queensland. It crosses the two Local Government Areas (LGA) of Goondiwindi and Toowoomba.

1.2 Terms of reference requirements

The traffic impact assessment (TIA) has been prepared to support the Border to Gowrie Environmental Impact Statement (EIS), specifically Chapter 18: Traffic, transport and access.

In doing so, this report addresses Sections 11.107 to 11.116 of the *Terms of reference for and environmental impact statement: Inland Rail – Border to Gowrie project (November 2018)* (DSDMIP, 2018). A compliance check of this chapter against each of the relevant components of the terms of reference (ToR) is presented in in Table 1.1.

Table 1.1 Compliance against relevant sections of the terms of reference

Traffic, transport and access terms of reference requirements		Report section
Existing Environment		
11.107	Describe and map the existing and planned transport infrastructure and corridors. Provide data on existing road, active transport and rail traffic in the Project area.	Section 2.2, Section 2.3 and Section 2.4 Figure 1.1 and Figure 2.1
11.108	Describe how the Project complies with the Queensland Level Crossing Safety Strategy 2012-2021 (refer Appendix 1) on new road-rail interfaces and the impacts on existing public road-rail interfaces.	Section 1.4, Section 1.6.2.2 and Section 3.3.1
Impact Assessment		
11.109	Assess the impacts of the Project on individual road-rail crossings and any cumulative impacts on the wider transport network.	Section 2.2.1.1, Section 2.2.2.1, Section 3.3.1, Section 4.2, Section 4.4 and Section 6.4.3
11.110	Assess the construction impacts of the Project on public railway level crossings through the Australian Level Crossing Assessment Model (ALCAM) and assess the wider construction impacts on the road and active transport network.	Section 3.3.1 and Section 9.1
11.111	The EIS should include a clear summary of the total transport task for the Project, including workforce, haulage routes, inputs and outputs during the construction and operational phases.	Section 3 and Section 5
11.112	Present the transport assessment in separate sections for each project-affected mode (road, active transport and rail) as appropriate for each phase of the Project.	Section 2 and Section 6
11.113	Provide sufficient information to allow an independent assessment of how existing and proposed transport infrastructure will be affected by project transport at the local and regional level (for example, local roads and state-controlled roads). Discussion should also refer to emergency service access.	Section 6, Section 7 and Section 8

Traffic, transport and access terms of reference requirements		Report section
11.114	Include details of the adopted assessment methodology for impacts on roads within the road impact assessment report in accordance with the Department of Transport and Main Roads Guide to Traffic Impact Assessment and the Department of Environment and Science EIS information guideline – Transport (refer to Appendix 1).	Section 1.4 Section 1.6.1, Section 1.6.2, Section 6 and Section 7
Mitigation Measures		
11.115	Measures to mitigate impacts on railway level crossings should be in accordance with the Queensland Level Crossing Safety Strategy 2012-2021.	Section 9
11.116	Discuss and recommend how identified impacts will be mitigated. Mitigation strategies are to be prepared in close consultation with relevant transport authorities (including relevant local governments).	Section 9

1.3 Scope and context of report

This report assesses the traffic and transport impacts of the construction and operation of the Project on the surrounding transport infrastructure based on the reference design for the Project. The report also summarises the potential road impacts from the movement of materials, workforce and equipment during construction and operation of the Project on the surrounding road network. The assessments were undertaken for public NSW State roads and Queensland (QLD) State-controlled roads (together referred to as SCR) and Local Government Roads (LGR).

The transport of materials, workforce and equipment during construction is expected to primarily utilise the existing road and rail transport networks. While some materials may be sourced internationally, the expected impact from the Project on the throughput of ports and airports is not considered to be significant during either construction or operation (refer Table 1.3). Therefore, impacts from the Project on the operation and throughputs at ports and airports has not been assessed in this report.

A construction methodology has been developed to demonstrate the feasibility of delivering the Project. The TIA has assessed the construction transport task associated with this preliminary construction methodology. This methodology has assumed a supplier for all key materials required for the Project, which has established the spatial parameters for the TIA. Generally, suppliers local to the Project within QLD have been assumed. However, due to specific Project requirements, the provision of dual-gauge sleepers were assumed to be provided from a facility in Grafton, NSW, resulting in the inclusion of NSW impacts within this TIA.

The construction routes assumed as a part of this TIA are routes which the Principal Contractor may use to transport materials from the assumed suppliers to designated Project laydown areas. However, the determination of the final construction and heavy vehicle (HV) routes will be subject to consultation between the Department of Transport and Main Roads (DTMR), Councils, ARTC and the Principal Contractor during the next phase of the Project. This is consistent with Section 7.5 of DTMR's Guidelines to Traffic Impact Assessment (GTIA) which states that the TIA *"may be finalised when project contractors are appointed, and final traffic generation is clearer."* Consistent with this, Registered Professional Engineer of Queensland (RPEQ) certification of the Project TIA will be undertaken as per the requirement of the GTIA at a time when a Principal Contractor is engaged and final traffic volumes, turning movements, routes and vehicle types are known and, if required, DTMR have completed its final review of such information. Until that time, the TIA is not to be relied on for construction purposes.

The TIA focuses on the Project's impact on the existing road and rail transport infrastructure by providing the following:

- An overview of existing transport network conditions, including traffic volume
- A description of the proposed 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 resultant traffic forecast
- A summary of rail operational traffic and maintenance processes
- A summary of the TIA associated with intersections, road links, road-rail interface locations, pavements, road safety and access
- Mitigation measures relevant to traffic, transport and access issues.

1.4 Relevant legislation, policy and guidelines

Table 1.2 identifies the relevant policies, standards and guidelines that apply to the assessment of traffic and transport for the Project. Legislation that applies to the Project is discussed in Chapter 3: Legislation and project approvals process of the Border to Gowrie EIS.

Although the Project is solely located in Queensland, construction traffic is generated in New South Wales as well as Queensland. For this reason, New South Wales legislation has been included in Table 1.2.

Table 1.2 Summary of legislation, policies and guidelines

Legislation, policy/standard or guideline	Relevance to the Project
Legislation	
<i>Transport Planning and Coordination Act 1994</i> (QLD) (TP&C Act)	The objectives of the TP&C Act are to improve the economic, trade and regional development performance of Queensland and the quality of life of Queenslanders by achieving overall transport effectiveness and efficiency through strategic planning and management of transport resources.
<i>Transport Infrastructure Act 1994</i> (QLD) (TI Act)	The overall objective of the <i>Transport Infrastructure Act 1994</i> is to provide a regime that allows for and encourages effective integrated planning and efficient management of a system of transport infrastructure. This is consistent with the objectives of the TP&C Act. Any crossings of existing rail lines or works within existing rail corridor will trigger s255- <i>Interfering with railway</i> and will require the approval of the railway manager. Any works within SCRs or access to SCRs (during construction) will trigger s50- <i>Ancillary works and encroachments & s33-Prohibition on roadworks etc. on State-controlled roads & s62-Management of access between individual properties and State-controlled roads section 66-Road access works within state-controlled road</i> .
<i>Land Act 1994</i> (QLD) (Land Act)	The Land Act prescribes the framework for the allocation of non-freehold land tenure and its subsequent management. Under Chapter 4, Part 4 of the Land Act, permits are required for the occupation of unallocated state land, a reserve or a road. A permit to occupy will also be required for any underground infrastructure that is proposed beneath land governed by State held tenure. Chapter 3, Part 2, Division 2 of the Land Act contains the provisions relating to the temporary or permanent closure of a road, including SCR and LGRs, and declared stock routes.
<i>Rail Safety National Law (Queensland) Act 2017</i> (RSNL Act)	The purpose of the RSNL Act is to provide for safe railway operations in Australia. One objective of the RSNL Act is to establish the Office of the National Rail Safety Regulator (ONRSR) as the rail safety regulator in QLD. The RSNL Act was created following an agreement of the Council of Australian Governments (COAG) to deliver a consistent approach to rail safety policy and regulations (and to remove the inconsistencies) between the previous state and territory rail safety regimes. The RSNL Act governs the safe operation of the rail system in QLD. The ongoing operation of the Project will need to comply with all areas of the RSNL Act, covering rail industry work practices and protocols for safe working in rail corridors and associated accreditation, signalling and control, the ongoing management of structures and civil works, interfaces with public roads and highways and other activities impacting on rail safety.
<i>Local Government Act 2009</i> (QLD) (Local Government Act)	The Local Government Act sets out the responsibilities of local government authorities with regard to the construction, improvement, control and management of traffic on local roads (excluding SCRs). A local government authority may temporarily or permanently close a local road to traffic in accordance with the Local Government Act. An adjoining landowner must apply under the Land Act to temporarily or permanently close a local road.

Legislation, policy/ standard or guideline	Relevance to the Project
<i>Stock Route Management Act 2002</i> (QLD)	The QLD stock route network is a network of stock routes and reserves for travelling stock in the State. The <i>Stock Route Management Act 2002</i> (QLD) provides for managing the stock route network, recognising that the network has multiple uses with the primary purpose being for travelling stock (refer Section 98 (2) (a)). All stock routes are classified as roads under the Land Act.
<i>Transport Administration Act 1988</i> (NSW)	The objectives of the <i>Transport Administration Act 1988</i> (NSW) relate to administering the transport services provided to the people of NSW and include: ■ Providing an efficient and accountable framework for the governance of the delivery of transport services ■ Promoting the integration of the transport system ■ Enabling effective planning and delivery of transport infrastructure and services ■ Facilitating the mobilisation and prioritisation of key resources across the transport sector ■ Coordinating the activities of those engaged in the delivery of transport services ■ Maintaining independent regulatory arrangements for securing the safety of transport services. This Act is relevant to the movement of construction materials on NSW roads within the Project.
<i>Road Transport Act of 2013</i> (NSW)	The elements of the <i>Road Transport Act of 2013</i> (NSW) relevant to the Project are to govern the application of traffic control devices, electrical equipment or other facilities on roads or road shoulders, footpaths, structures under or over the Project and control of vehicles (other than vehicles used on the railway itself) and animals along construction routes within NSW.
Plans and strategies	
<i>Transport Coordination Plan (QLD) 2017-2027</i>	The Transport Coordination Plan provides a framework for the coordinated planning and management of transport in Queensland over the next decade. The plan is consistent with – and seeks to provide a transport-specific response to – the Queensland Government's overall strategic planning for Queensland, including the government's objectives for the community and the State Infrastructure Plan. The overall objective of is to encourage effective integrated planning and efficient management of transport infrastructure.
Toowoomba City Centre Master Plan: Master Plan Report (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 in order to achieve the aims of the master plan and also consists of an implementation plan which comprises of a series of action plans which support the overall Master Plan vision in the short, medium and long term. The Project passes through the LGA of TRC. In accordance with Schedule 6, Part 5, Section 26(2) of the <i>Planning Regulation 2017</i>, provisions of this local government planning schemes do not apply to the Project. Notwithstanding this, the zoning intent for these areas as determined by the planning schemes have been taken into consideration when determining impacts of the Project on future land uses in the area.
Toowoomba Region Sustainable Transport Strategy (TRC, 2014)	The purpose of the Toowoomba Region '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 aims to set out the TRC's 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 LGA of TRC, the Project should 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, 2017a)	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 numbers have been a point of reference when validating the data inputs to the traffic modelling for the Project.
TRC Charges Resolution No.2 (TRC, 2016)	The purpose of the TRC Charges Resolution is to assist with the implementation of the local planning scheme. It contains the adopted charges by development types, the method of calculation for the charge to be levied, as well as the method of calculation for the cost of infrastructure for offset of refund.

Legislation, policy/standard or guideline	Relevance to the Project
Goondiwindi Local Government Infrastructure Plan (GRC, 2018)	The Goondiwindi 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 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 numbers have been a point of reference when validating the data inputs to the traffic modelling for the Project.
Guidelines	
Office of National Rail Safety Regulator (ONRSR) Guideline: Major Projects (ONRSR, 2016a)	The 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. This guideline describes the minimum processes to be followed, from the onset of a major project, in order 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; and ■ Explain the ONRSR's minimum expectations when reviewing the processes and associated evidence used to demonstrate that safe outcomes are being planned and, ultimately, 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 party/parties; ■ Demonstration of effective management and control: to ensure the safe management of change across all entities involved with the major project; and ■ 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, Inland Rail and 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 - SFARIP (ONRSR, 2016b)	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'; and ■ If it is not reasonably practicable to eliminate risks to safety, to minimise those risks 'so far as is reasonably practicable'. The document provides guidance on the interpretation and application of the term 'so far as is reasonably practicable' (SFARIP) 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; and ■ The degree of harm that might result from the hazard or the risk; and ■ What the person concerned knows, or ought reasonably to know, about the hazard or risk, and ways of eliminating or minimising the risk; and ■ The availability and suitability of ways to eliminate or minimise the risk; and ■ 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 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 SFARIP.

Legislation, policy/standard or guideline	Relevance to the Project
ONRSR Policy: Level Crossings (ONRSR, 2019)	This policy 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.
Queensland Level Crossing Safety Strategy 2012-2021 (DTMR, 2012)	The Queensland Level Crossing Safety Strategy (QLCSS) complements the National Railway Level Crossing Safety Strategy 2017-2020, which was released by the Australian Transport Council in 2009 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 assessment, the QLCSS has been used, with its associated key performance indicators, in order 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.
Guideline to Traffic Impact Assessment, December 2018 (GTIA) (DTMR, 2018)	The GTIA has been used as a point of reference 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. While it is not mandatory, 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 the State-controlled roads, local government 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 State-controlled roads of less than five per cent over existing levels, either measured in terms of annual average daily traffic (AADT) or standard axle repetitions (SARs). 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. An updated version of the GTIA was released in December 2018, after the ToR for the Project were released. This assessment has been undertaken consistent with the 2017 GTIA, consistent with the ToR, which is also generally in accordance with the 2018 GTIA (and with no material implications to assessment outcomes).
Manual of Uniform Traffic Control Devices Part 7: Railway Crossings (DTMR, 2019b)	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. This Part 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 <i>Guide to Development in a Transport Environment: Rail</i> (the guide) 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.
Guide to Traffic Management Part 12: Traffic Impact Assessments (Austroads, 2016)	This Guide 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 which runs on separate alignments or are grade separated such as elevated bus rapid transit metro rail are not directly considered.

Legislation, policy/standard or guideline	Relevance to the Project
Guide to Traffic Management Part 3: Traffic Studies and Analysis (Austroads, 2017)	In the context of the Guide, 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.
Cycling Aspects of Austroads Guides (Austroads, 2017c)	This guideline 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.

1.5 Impact assessment area

The impact assessment area sets the spatial limits for establishing the existing traffic and transport network conditions and assessing potential impacts associated with the Project. The impact assessment area for the TIA has been established to comprise:

- The extent of the proposed rail corridor for the Project, including public roads intersecting the rail corridor (road-rail interface locations)
- The road network anticipated to be used for the transport of workforce, materials and equipment during the construction and operation phases of the Project

The TIA does not include assessment of non-road based transport matters, e.g. ports and airports. Assessment of these matters is provided in Chapter 18: Traffic, transport and access of the Border to Gowrie Project EIS.

The TIA does not include the consideration of impacts to private roads. Any impacts to private roads are addressed directly with the impacted landowners as part of the Project's wider consultation process. The use of any private roads during construction would require a specific agreement between the Principal Contractor with the private road owner. Further discussions regarding land use and social considerations can be found in Chapter 7: Land Use and Tenure and Chapter 15: Social of the Border to Gowrie Project EIS.

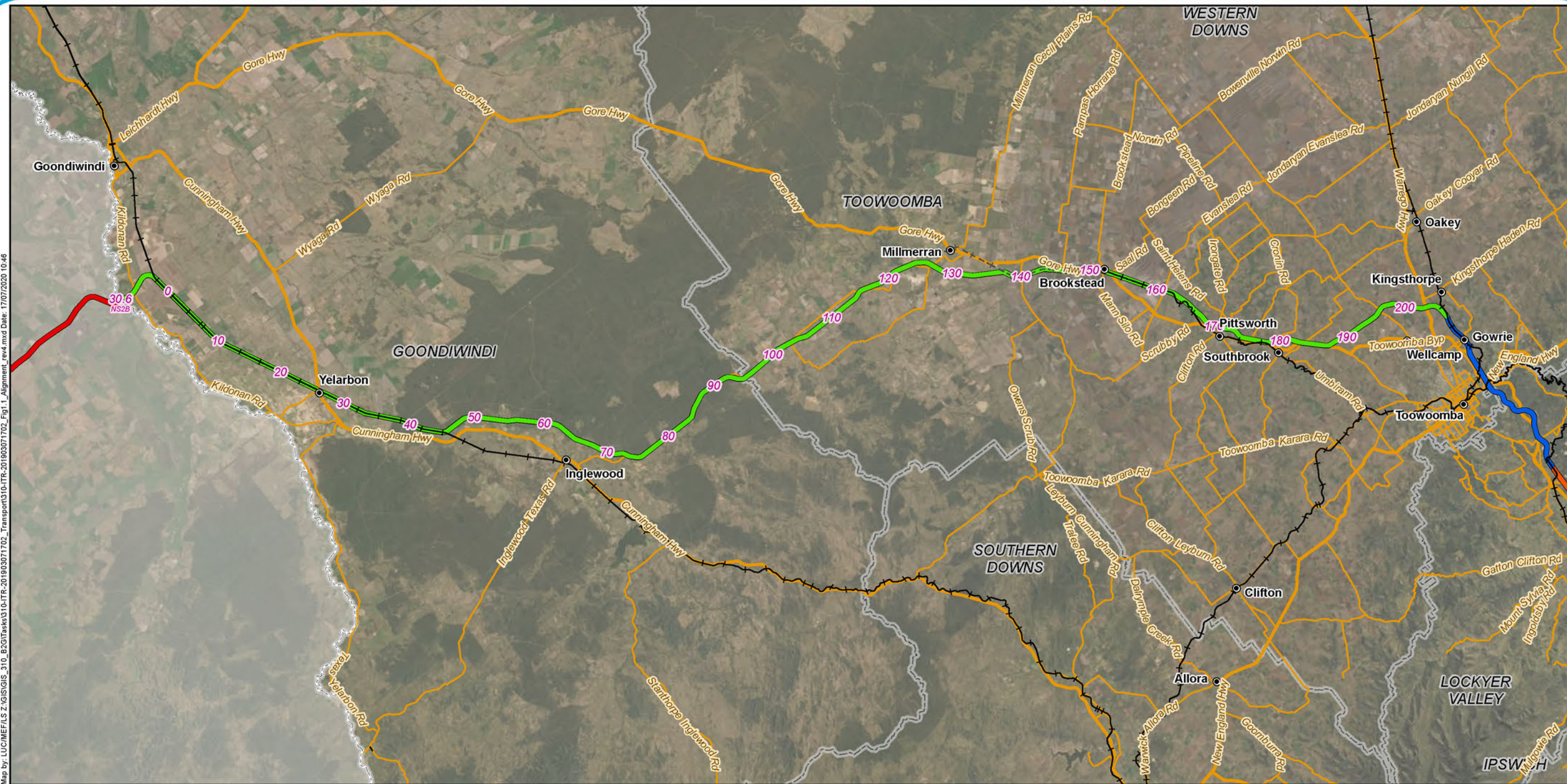
1.5.1 Project rail corridor

The Project commences at chainage Ch 30.60 km (NS2B) at the NSW/QLD border, the median point of the Macintyre River, approximately 18 km southeast of Goondiwindi. The Project runs northeast via Yelarbon, Inglewood, Millmerran, Pampas, Brookstead, Pittsworth, Southbrook and the Toowoomba Wellcamp Airport to chainage Ch. 206.95 km at Gowrie Junction, north west of Toowoomba in Queensland. The proposed Project rail corridor and alignment is illustrated in Figure 1.1.

The proposed road-rail interface locations that form part of the impact assessment area are shown in Figure 1.2. These road-rail interface locations consist of public formed roads only. The road-rail interface locations are described in more detail within Section 2.2.

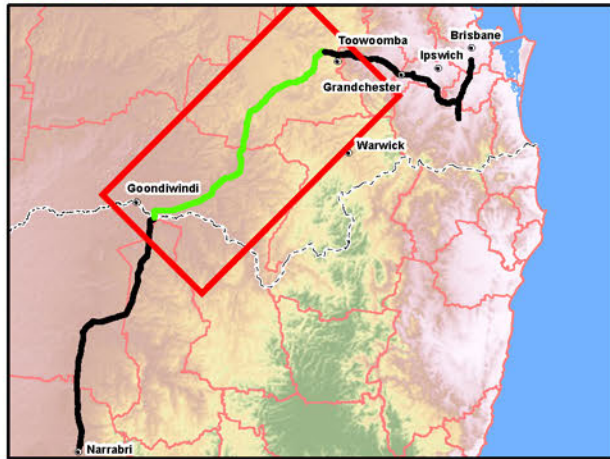
1.5.2 Primary construction transport routes

The proposed primary construction transport routes that form part of the impact assessment area are provided in Figure 1.3, with specific material transport routes provided in Appendix G to Appendix O of this TIA. The construction transport routes proposed as a part of this assessment are routes which the Principal Contractor may use. However, ultimately the determination of the final construction and HV routes will be subject to consultation between DTMR, the relevant Councils, ARTC and the Principal Contractor.



Legend

- | | |
|--|---------------------------------------|
| 5 Chainage (km) | — Existing rail (operational) |
| ● Localities | - - - Existing rail (non-operational) |
| — North Star to NSW/QLD border alignment | — Major roads |
| — Border to Gowrie alignment | — Minor roads |
| — Gowrie to Helidon alignment | --- NSW/QLD border |
| — Helidon to Calvert alignment | □ Local Government Areas |



A3 scale: 1:600,000
0 5 10 15 20 25 km



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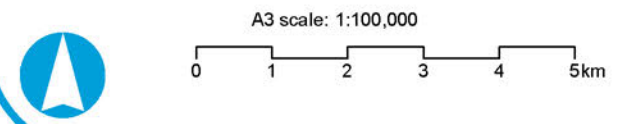
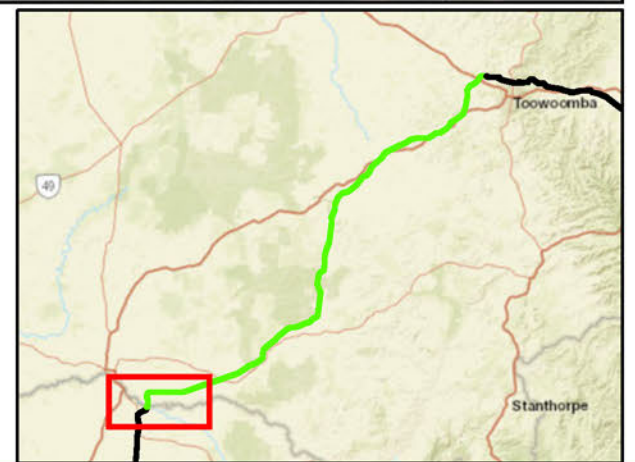
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Coordinate System: GDA 1994 MGA Zone 56

Border to Gowrie
Figure 1.1: Project rail alignment



Legend

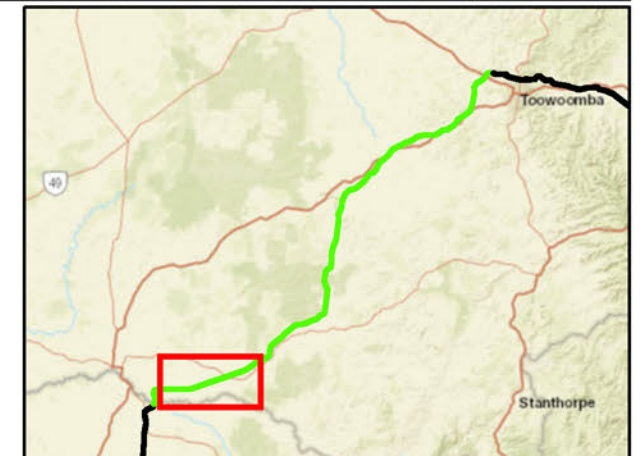
- | | |
|--------------------------------|--|
| 5 Chainage (km) | — North Star to NSW/QLD border alignment |
| ● Localities | — Border to Gowrie alignment |
| ● Grade separation - Rail over | — Existing rail (operational) |
| ● Active level crossing | — NSW/QLD border |
| ● Passive level crossing | — Minor roads |
| E Existing road rail interface | |
| P Proposed road rail interface | |





Legend

- | | |
|--------------------------------|-----------------------------|
| 5 Chainage (km) | Border to Gowrie alignment |
| ● Localities | Existing rail (operational) |
| ● Grade separation - Road over | NSW/QLD border |
| ● Active level crossing | Major roads |
| ● Passive level crossing | Minor roads |
| ⊗ No crossing provided | |
| E Existing road rail interface | |
| P Proposed road rail interface | |

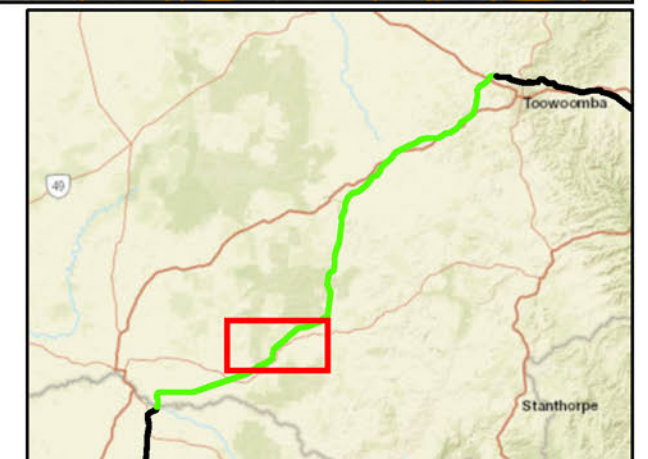


A3 scale: 1:100,000
 0 1 2 3 4 5km



Legend

- | | |
|--------------------------------|-----------------------------|
| 5 Chainage (km) | Border to Gowrie alignment |
| ● Localities | Existing rail (operational) |
| ● Active level crossing | Major roads |
| ● Passive level crossing | Minor roads |
| ⊗ No crossing provided | |
| E Existing road rail interface | |
| P Proposed road rail interface | |



A3 scale: 1:100,000
 0 1 2 3 4 5km

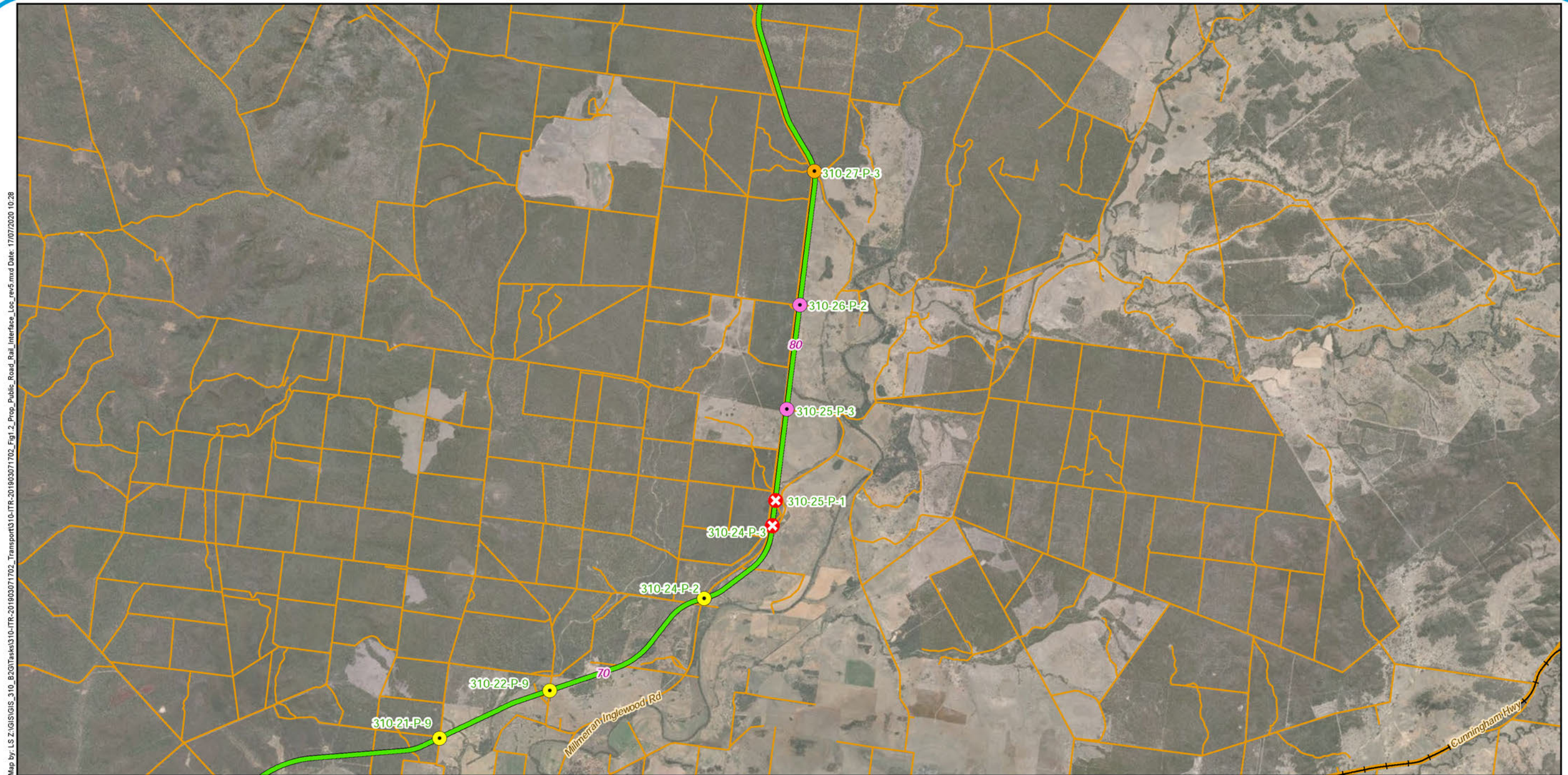


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 Coordinate System: GDA 1994 MGA Zone 56

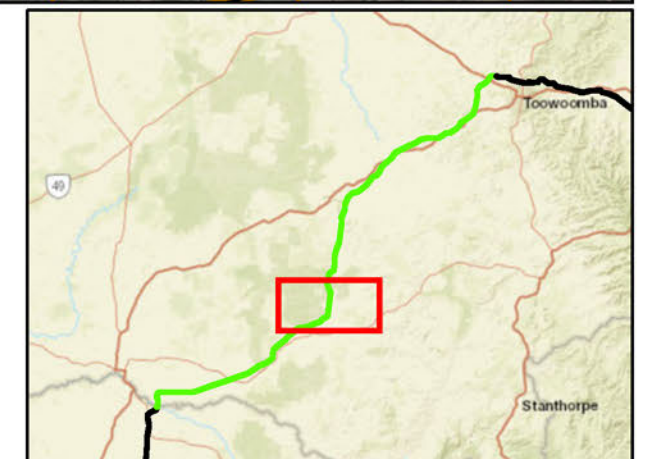
Border to Gowrie

Figure 1.2c: Project road/rail interface locations



Legend

- | | |
|--|-----------------------------|
| 5 Chainage (km) | Border to Gowrie alignment |
| Orange circle Grade separation - Rail over | Existing rail (operational) |
| Yellow circle Active level crossing | Major roads |
| Pink circle Passive level crossing | Minor roads |
| Red cross No crossing provided | |
| Blue E Existing road rail interface | |
| P Proposed road rail interface | |



A3 scale: 1:100,000
 0 1 2 3 4 5km



Future Freight
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Issue date: 19/05/2020 Version: 5
 Coordinate System: GDA 1994 MGA Zone 56

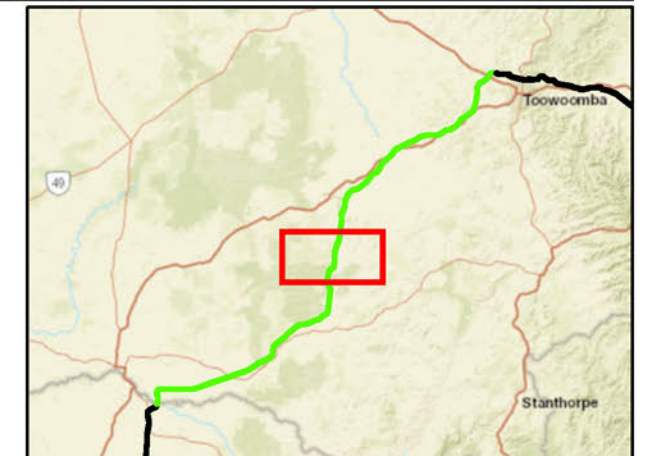
Border to Gowrie

Figure 1.2d: Project road/rail interface locations



Legend

- 5 Chainage (km)
- Localities
- Active level crossing
- Passive level crossing
- E Existing road rail interface
- P Proposed road rail interface
- Border to Gowrie alignment
- Minor roads



A3 scale: 1:100,000
 0 1 2 3 4 5km

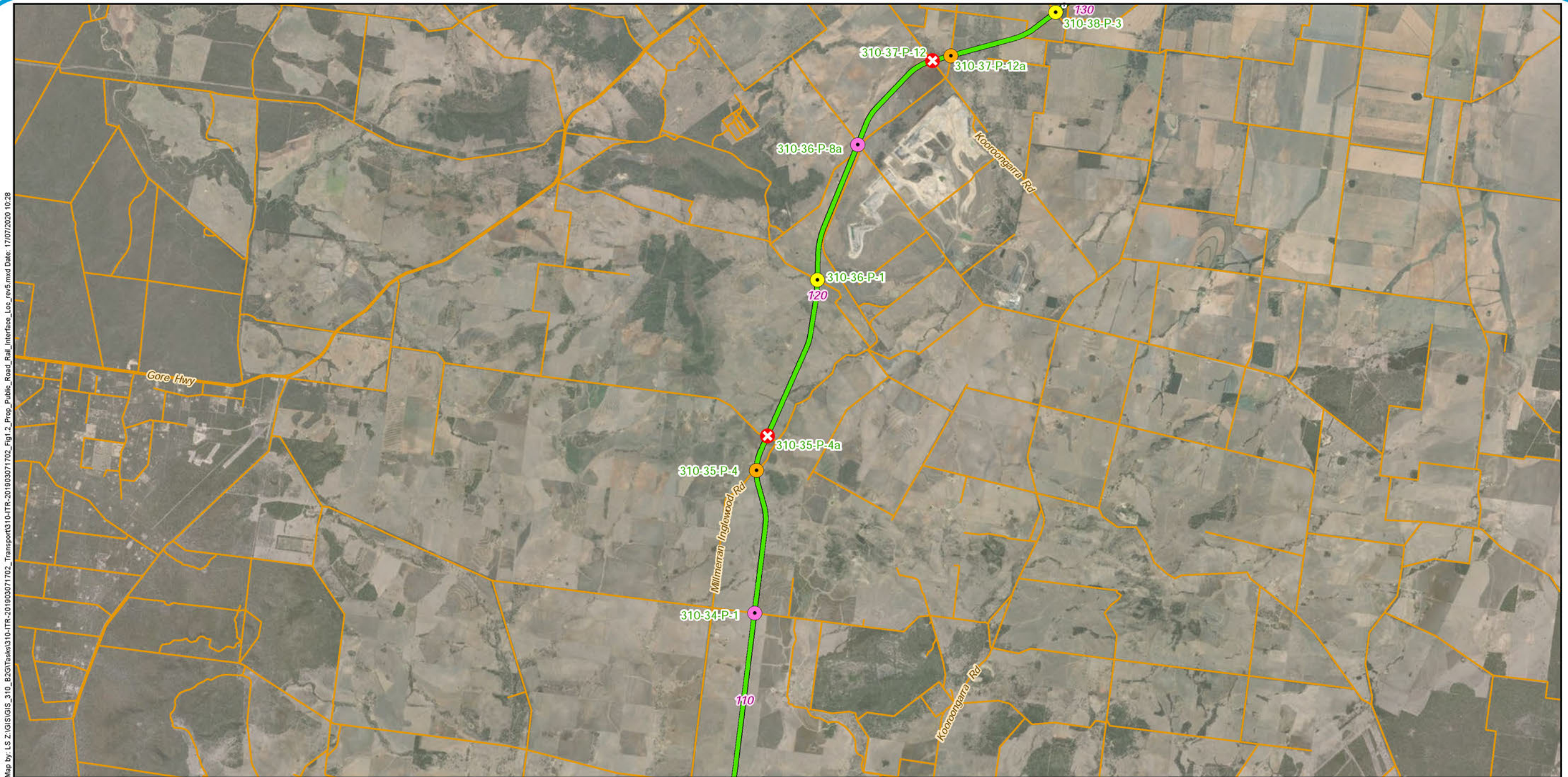


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Issue date: 19/05/2020 Version: 5
 Coordinate System: GDA 1994 MGA Zone 56

Border to Gowrie

Figure 1.2e: Project road/rail interface locations



Legend

- | | |
|------------------------------|----------------------------|
| 5 Chainage (km) | Border to Gowrie alignment |
| Grade separation - Rail over | Major roads |
| Active level crossing | Minor roads |
| Passive level crossing | |
| No crossing provided | |
| Existing road rail interface | |
| Proposed road rail interface | |

A3 scale: 1:100,000

0 1 2 3 4 5km

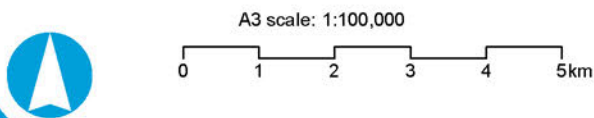
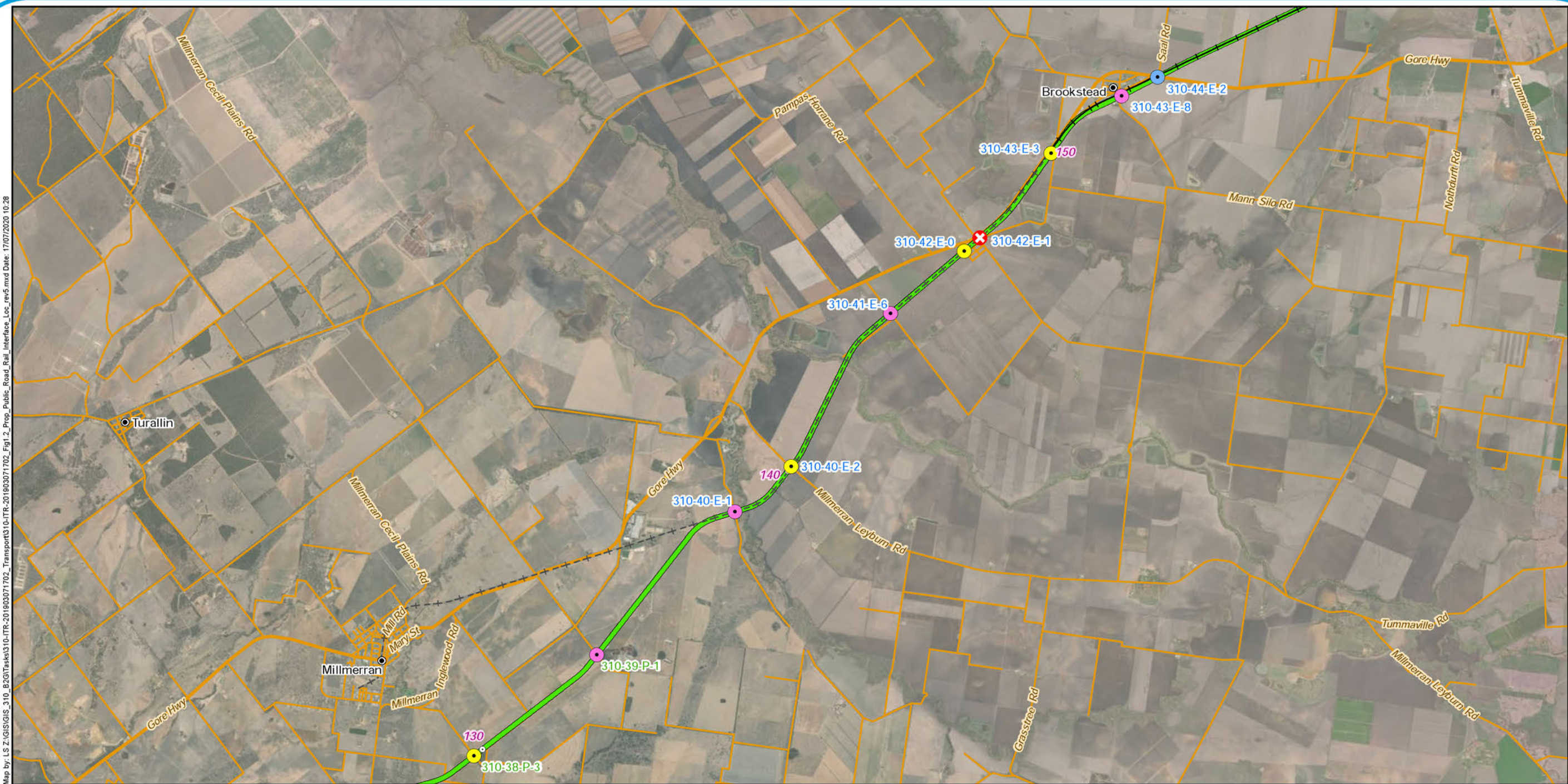


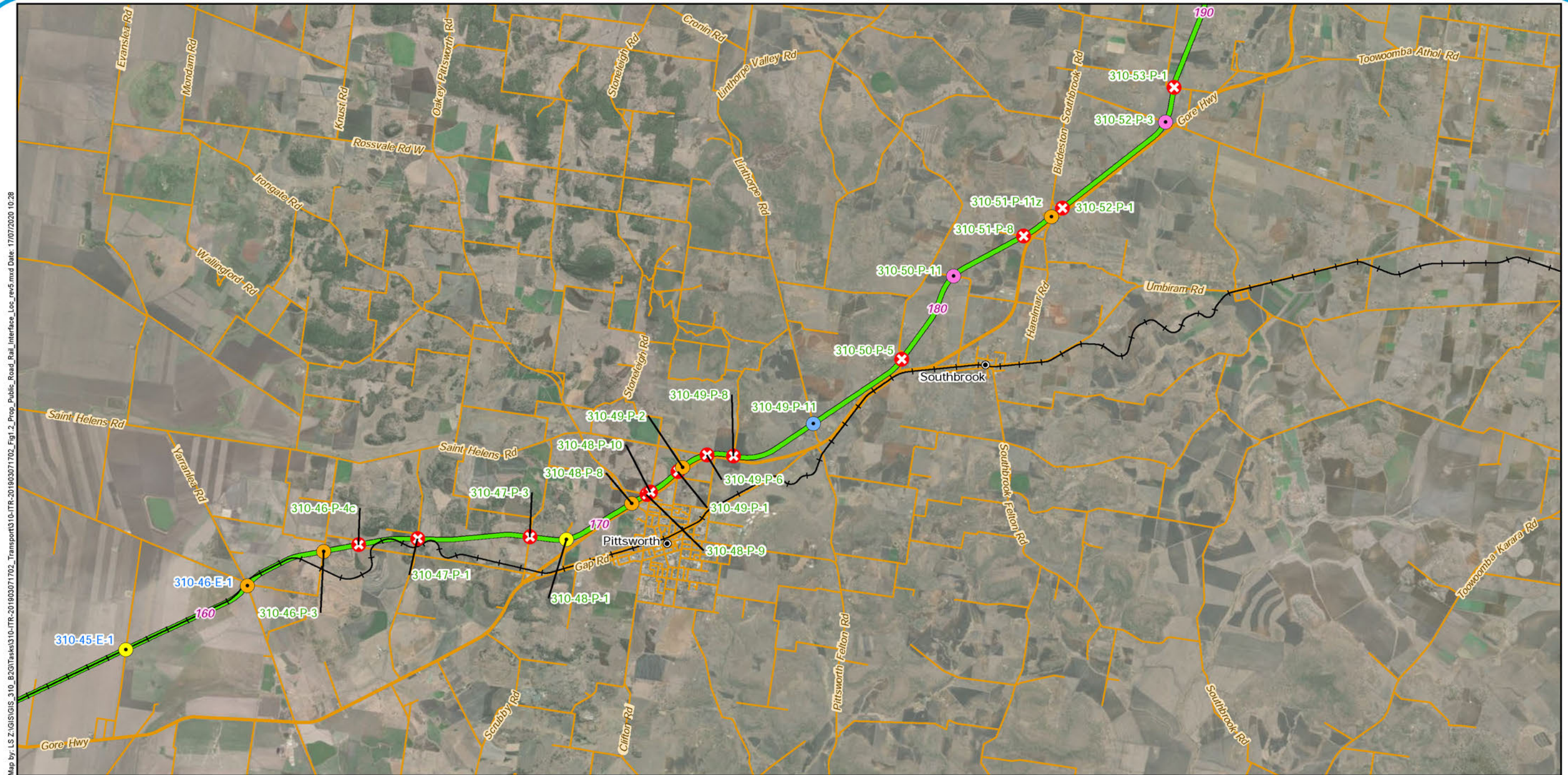
Future Freight
 Integrating Community, Environment and Engineering

Issue date: 19/05/2020 Version: 5
 Coordinate System: GDA 1994 MGA Zone 56

Border to Gowrie

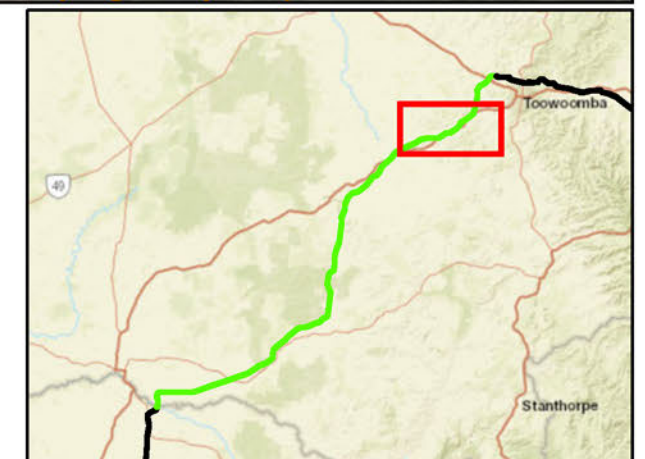
Figure 1.2f: Project road/rail interface locations





Legend

- 5 Chainage (km)
- Localities
- Grade separation - Rail over
- Grade separation - Road over
- Active level crossing
- Passive level crossing
- ✕ No crossing provided
- E Existing road rail interface
- P Proposed road rail interface
- Border to Gowrie alignment
- Existing rail (operational)
- Major roads
- Minor roads



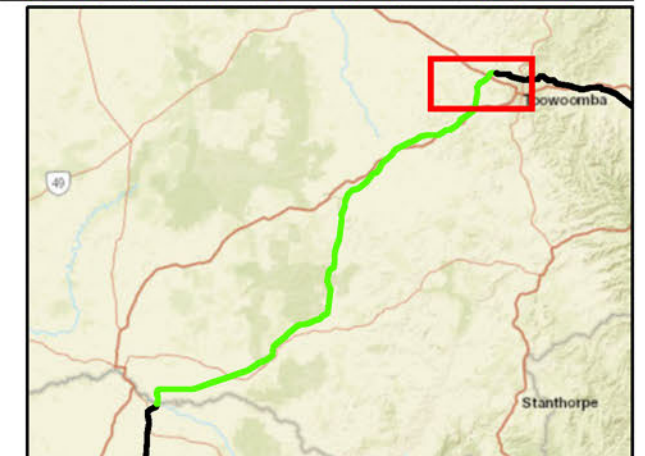
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Legend

- 5 Chainage (km)
- Localities
- Grade separation - Rail over
- Active level crossing
- E Existing road rail interface
- P Proposed road rail interface
- Border to Gowrie alignment
- Gowrie to Helidon alignment
- Existing rail (operational)
- Major roads
- Minor roads



A3 scale: 1:100,000

0 1 2 3 4 5km

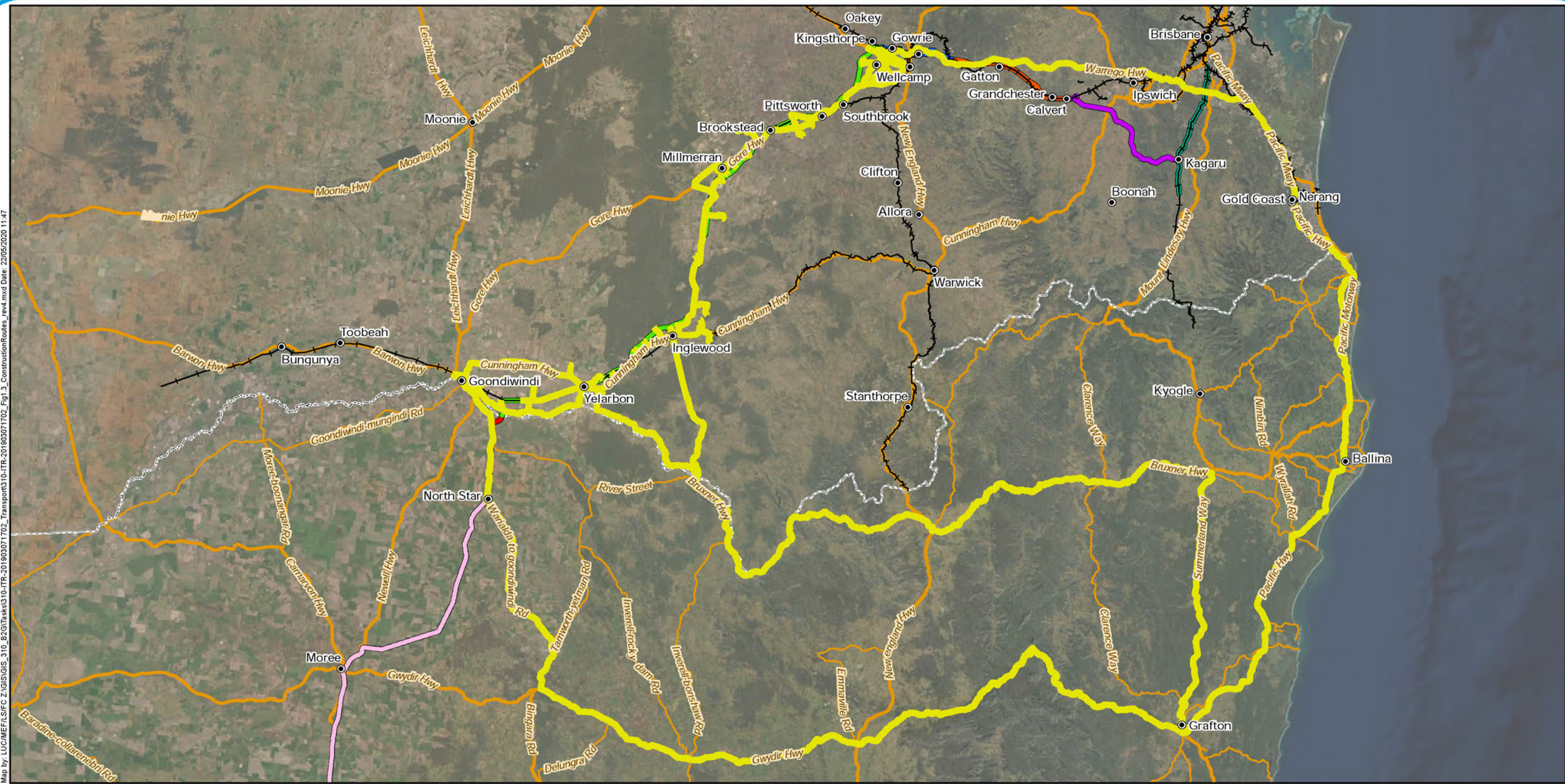


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 Coordinate System: GDA 1994 MGA Zone 56

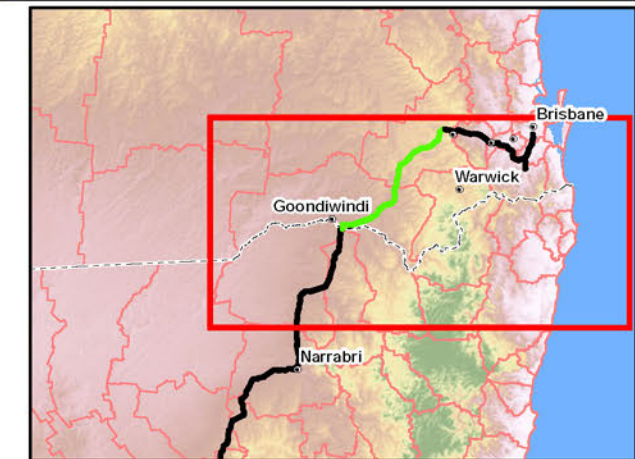
Border to Gowrie

Figure 1.2i: Project road/rail interface locations



Legend

- Localities
- Construction routes
- 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 Kagaru alignment
- Kagaru to Acacia Ridge/Bromelton alignment
- Existing rail (operational)
- Existing rail (non-operational)
- Major roads
- NSW/QLD border



A3 scale: 1:1,500,000
0 10 20 30 40 50km

The primary construction routes are within the existing rail and road network for both SCRs and LGRs and will primarily be used to transport materials, equipment and workforce for the construction of the Project.

Although other roads might also be used for the transport of construction activities, these roads would not be the primary construction routes and will have significantly less construction traffic volumes. Regardless the use of these routes will be agreed with the asset owner prior to use.

It is currently assumed that rail will be supplied by a single source and will be distributed via the existing QR rail network (Western Line, Millmerran Branch and the South Western Line) to designated laydown areas along the Project alignment. The TIA has assumed that rail will be welded into long welded rail and delivered to the point of use via material train and that there will be no public road transportation of rail.

The primary construction routes for the Project are described in more detail in Section 5.

1.5.3 Operational transport routes

The Project transport task during the operation phase of the Project is expected to be limited to rail maintenance workforce movements and the delivery of maintenance materials. It is anticipated that operational traffic will consist of low vehicle movements to/from depots and transportation of maintenance material within the rail corridor. Therefore, it is expected to be irregular and insignificant.

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 road (RMAR) incorporated into the design of the Project will be used in preference to the existing road network for project maintenance activities.

Further transport impacts may be realised with the introduction of potential intermodal freight facilities or industrial developments facilitated by Inland Rail. However, such developments are not a component of the Project and are therefore not included in the scope of this TIA. Further, the development application for such land uses will require the preparation of a separate site-specific TIA where the impacts will be considered.

Similarly, this TIA does not consider changes to the network operations resulting from modal shift, such as the improvement to highway operations resulting from the shift of freight movements from HVs to trains. Further discussion regarding this can be found in Chapter 2: Project rationale of the Border to Gowrie Project EIS.

1.6 Methodology

The ToR requires the TIA be undertaken in accordance with the DTMR GTIA 2017. Where applicable in NSW, the use of the DTMR GTIA manual has been agreed with and accepted by RMS. The methodology followed within this TIA is generally consistent with the methodology outlined in the GTIA and consists of:

- Desktop studies to establish the baseline conditions for the transport infrastructure within the TIA impact assessment area
- Determining the traffic generation related to the construction and operation of the Project
- Identifying the potential impacts on the transport infrastructure and users
- Developing measures to avoid, manage and mitigate impacts
- Undertaking a risk assessment of potential traffic impacts
- Undertaking a cumulative assessment of other committed projects of significance.

An updated version of the GTIA was released in December 2018, after the ToR for the Project were released. This updated version included requirements to provide additional clarification on the pavement impact assessment. This TIA has been undertaken consistent with the 2017 GTIA, consistent with the ToR, which is also generally in accordance with the 2018 GTIA (and with no material implications to assessment outcomes). Irrespective of the GTIA version, a detailed pavement impact assessment is not feasible at this point in the Project development and planning, as construction traffic routes remain subject to confirmation. As per the GTIA, the TIA will need to be finalised when Principal Contractor is appointed, and the final traffic generation is clearer. Future revisions to the TIA, specifically the pavement impact assessment, will be in accordance with the 2018 GTIA.

An initial high-level summary of the expected transport task by mode was undertaken for the existing road, rail, port and airport facilities to establish the assessment requirements during the construction and operation phases of the Project. Table 1.3 summarises the expected Project transport tasks by mode. As shown, the transportation of materials and equipment will typically make use of the existing road and rail network. Therefore, the majority of impacts were considered to be road and rail network based.

The construction program includes the transport of construction materials, plant and equipment, and the impacts that this transportation will have on the surrounding road network. The construction program includes the establishment of internal haul roads and laydown areas, and a nominal timeframe from contract award to the commencement of work on site for access upgrade works. The design and detailing of these required works are not yet at a level to be programmed and will need to be agreed by the Principal Contractor and the relevant road authority.

Table 1.3 Summary of transport impacts by mode

Project phase	Road	Rail	Port and airport	Active transport
Construction	Transport of construction material, plant and equipment. The transport of workforce to and from the site.	Transport of construction material (i.e. rail)	No impact expected	No impact expected
	Impact of road closures and realignments on surrounding road network and road-rail interface locations			
	Impact of rail crossings on vehicle queues and nearby intersections.			
Operation	Rail maintenance workforce movements.	Operations and maintenance	No impact expected	No impact expected
	Impact of permanent road closures and realignments on surrounding road network and road-rail interface locations			
	Rail maintenance workforce movements.			
	Impact of rail crossings on vehicle queues along adjacent state controlled and local council roads, and impacts on nearby intersections			

1.6.1 Desktop review and data collection

The assessment of traffic impact 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 1.4, 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.

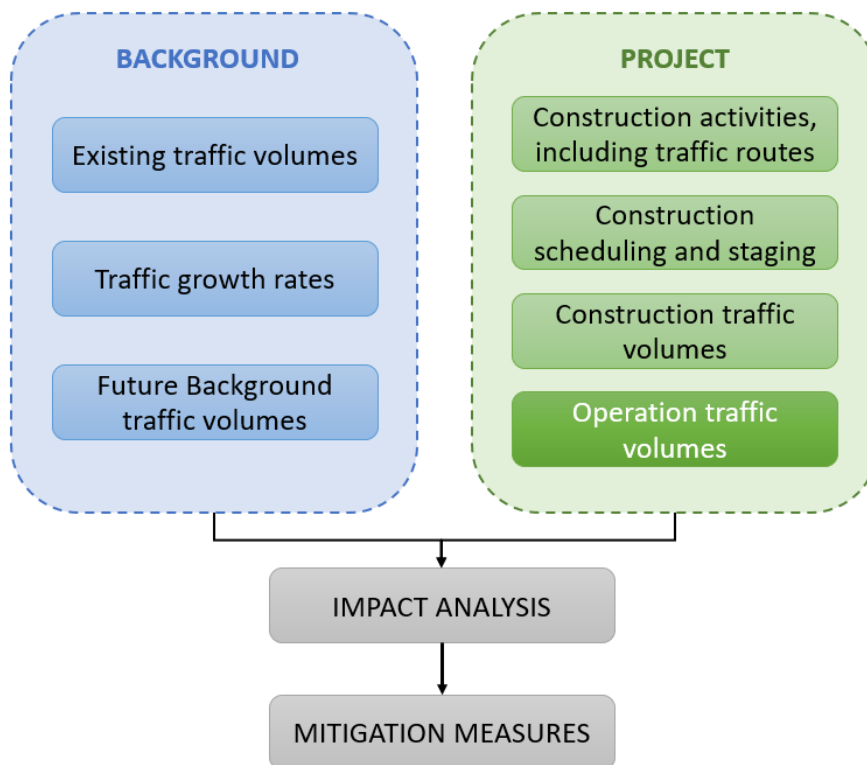


Figure 1.4 Background and project traffic volumes

The establishment of background conditions has been informed by publicly available data and information provided by the road controlling authorities, being DTMR, NSW Roads and Maritime Services (RMS) and local councils for LGAs within the impact assessment area.

The following information was requested from relevant road controlling authorities:

- Local government/state policies and strategies potentially influencing the TIA for the Project
- Road configurations and access policies (existing and proposed)
- Road network and hierarchy maps
- Road link capacity thresholds
- Road classification details, including typical cross sections
- Existing traffic data
- Traffic growth
- Programmed road works and upgrades
- Future planned road network
- Approved and future development plans
- Road use management plans
- Designated freight and seasonal traffic routes
- Dangerous goods vehicle routes
- Bus and school bus routes
- Stock routes and travelling stock reserves
- Multi-combination routes and zones
- Standard axle loads and existing pavement conditions
- Prevailing structural integrity issues (i.e. vulnerable structures)

- Structural capacity/life of structures
- Crash data.

Assumptions were made in instances where requested data was not available. These have been documented in the TIA as appropriate.

The following section describes the approach for obtaining background and Project traffic volumes used in the impact assessment.

1.6.1.1 Background traffic:

Existing traffic volumes

To enable assessment, existing traffic volumes are required for intersections and links in the network that may be used by Project traffic. In the first instance, this information was obtained from road controlling authorities. Where data was not available, these roads were assessed to determine if background traffic conditions could be reasonably derived from data available on the surrounding network. In these situations, the local government authority was consulted to verify the basis of assumptions that were applied.

In these instances, traffic volumes were assumed by adopting the following process:

- Classify each road segment within the impact assessment area based on the following classification system:
 - Urban local road
 - Urban collector road
 - Urban arterial road
 - Rural local road
 - Rural collector road
 - Rural arterial road
 - Urban motorway (*no volumes assumed for motorways*)
 - Rural motorway (*no volumes assumed for motorways*)
- Traffic flow rates were estimated based on the following principles, where the K-value represents the ratio between the 30th highest hourly peak volume and AADT:
 - Urban local road: Volumes derived by assuming level of service (LOS) A with associated AADT of 2,000 vehicles as adopted from the *Guide to Traffic Engineering Practice, Part 2: Roadway Capacity* (Austroads, 1991)
 - Urban collector road: Volumes derived by assuming LOS B with associated AADT of 3,800 as adopted from the *Guide to Traffic Engineering Practice, Part 2: Roadway Capacity* (Austroads, 1991)
 - Urban arterial road: Volumes derived by assuming LOS B with K-value of 0.12 with associated AADT of 2,000 vehicles as depicted in *Guide to Traffic Engineering Practice, Part 2: Roadway Capacity* (Austroads, 1991)
 - Rural local road: Volumes derived by assuming 400 AADT based on a review of proximate rural local roads
 - Rural collector road: Volumes derived by assuming LOS A with K-value of 0.12 with associated AADT of 2,000 vehicles as depicted in *Guide to Traffic Engineering Practice, Part 2: Roadway Capacity* (Austroads, 1991)

- Rural arterial road: Volumes derived by assuming LOS A with K-value of 0.15 with associated AADT of 1,600 vehicles as depicted in *Guide to Traffic Engineering Practice, Part 2: Roadway Capacity* (Austroads, 1991)

- Peak hour flow rates obtained from various sources and converted to average daily traffic volumes.

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.

Finally, a gap analysis of received and inferred data was undertaken to identify the need for traffic count surveys. Traffic count surveys were confined to State-controlled roads and survey locations were selected with consideration for:

- Duration of usage for construction traffic (i.e. short: <6 months; moderate: 6-12 months; long: >12 months).
- The indicative increase in traffic volumes due to the Project
- The location of turning manoeuvres for construction traffic

The use of local government roads for construction traffic is not preferred as these roads are not generally designed for regular HV use. Therefore, construction planning has, where possible, avoided the use of local government roads unless no practicable alternative route is available.

Traffic growth rates

In the first instance, traffic growth rates provided by relevant road controlling authorities were applied to existing traffic volumes to estimate the future background traffic for roads within the impact assessment area.

Where growth rates were not provided, these rates were derived through assessment of historic permanent census traffic data, where available. An evaluation of available traffic growth rates on State-controlled roads identified an overall annual average AADT growth rate of two per cent. This linear growth rate was used to establish future background traffic volumes for all roads where data was not available. This approach is considered reasonable for reference design given the observed growth on roads evaluated.

The data and evaluation are provided in Appendix A for DTMR roads and Appendix B for RMS roads.

Future background traffic

Traffic growth was applied to existing traffic volumes to estimate the future background traffic. This was done by means of a compound traffic growth estimation procedure which can be equated as:

$$AADT_x = AADT_{y1} \times (1 + GR)^{(x-y1)}$$

Where:

- $AADT_{y1}$ = AADT in the first year of evaluation
- $AADT_x$ = AADT in year x
- GR = growth rate
- y1 = first year (1)
- x = year of calculation

1.6.1.2 Project traffic

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

Construction activities

The main construction transportation activities for the Project that have been accounted for in the TIA include:

- Delivery of materials to the Project footprint, such as:
 - Ballast
 - Capping materials
 - Pre-cast concrete
 - Ready-mix concrete
 - Rail
 - Consolidated sleepers
 - Earthworks materials
- Movement of workforce
- Delivery of water
- Transportation/collection of plant, tools and other materials.

Traffic impacts associated with the off-site disposal of waste have not been assessed, as waste volumes generated during construction of the Project are not expected to be significant (refer Chapter 20: Waste management of the Border to Gowrie project EIS). 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.

Construction staging

Staging relates to start and end dates of all construction related activities within the envisaged construction period. Early works is scheduled for commencement in 2021, with construction scheduled to be completed by the beginning of 2026. Inland Rail, and the Project, are scheduled to be operational in 2026. The start and end dates of all associated construction activities have been considered in order to determine the peak construction period for the Project.

The construction schedule with anticipated road segment based peak loads/volumes are described in more detail in Section 5.

Construction related traffic

The number of trips made by light vehicles and HVs 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. 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.

Operational traffic

Rail maintenance workforce movements and the delivery of maintenance materials are expected to be the major transport tasks during Project operation. It is anticipated that operational traffic will be insignificant due to low maintenance van movements to/from depots, and transportation of maintenance material within the rail corridor.

1.6.2 Impact assessment and mitigation

1.6.2.1 Road network impact assessment

The operational performance of the road network in the impact assessment area was assessed to develop an understanding on the potential traffic impacts from the Project. The impact assessment area primarily consists of impacted roads located in QLD; however, it also extends to some parts of NSW due to the need to transport sleepers from Grafton.

The TIA process for Projects that are subject to an EIS is specified in the GTIA and is shown in Figure 1.5. 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 this TIA follow the same assessment process.

The performance criteria specified in the GTIA for assessment of traffic impacts are outlined in Table 1.4. The LOS criteria are defined in the *Guide to Traffic Management: Part 3 Traffic Studies and Analysis* (Austroads, 2017).

Table 1.4 Performance criteria

Assessment type	Performance criteria
Traffic impact assessment	An impact occurs if construction and operational traffic generated by the development equals or 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 case of event traffic.
	LOS E should be considered the limit of acceptable 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 SARs 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 1.5 and have been modified to include reference to NSW RMS.

Table 1.5 Trigger criteria for the application of mitigation measures

Impact type	Trigger criteria for the application of mitigation measures
Road safety	All intersections where the Project traffic exceeds five per cent of the base traffic for any movement in the design peak periods in the year of opening of each stage. All road links where the Project traffic exceeds five per cent of the base traffic in either direction on the link in the design peak periods in the year of opening of each stage.
Access and frontage	The State-controlled road 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 RMS network ¹ .
Intersection delay	All intersections where the Project traffic exceeds five per cent of the base traffic for any movement in the design peak periods, in the year of opening of each stage.

Impact type	Trigger criteria for the application of mitigation measures
Road link capacity	All road links where the Project traffic exceeds five 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 Project SAR exceed five 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 Project traffic exceeds five 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 RMS identifies prevailing structural integrity issues of transport infrastructure (for example, 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*

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 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 1.6.

Table 1.6 Impact assessment years

Impact type	Impact assessment years
Road safety	Each year of construction + year of opening of each stage including the final stage
Access and frontage	Each year of construction + year of opening of each stage including the final stage and 10 years after the year of opening of the final stage for access intersections (includes both new and amended accesses)
Intersection delay	Each year of construction + year of opening of each stage including the final stage
Road link capacity	Each year of construction + year of opening of each stage including the final stage
Pavement	Each year of construction + year of opening of each stage including the final stage over a 20-year design period
Transport infrastructure	Each year of construction + year of opening of each stage including the final stage

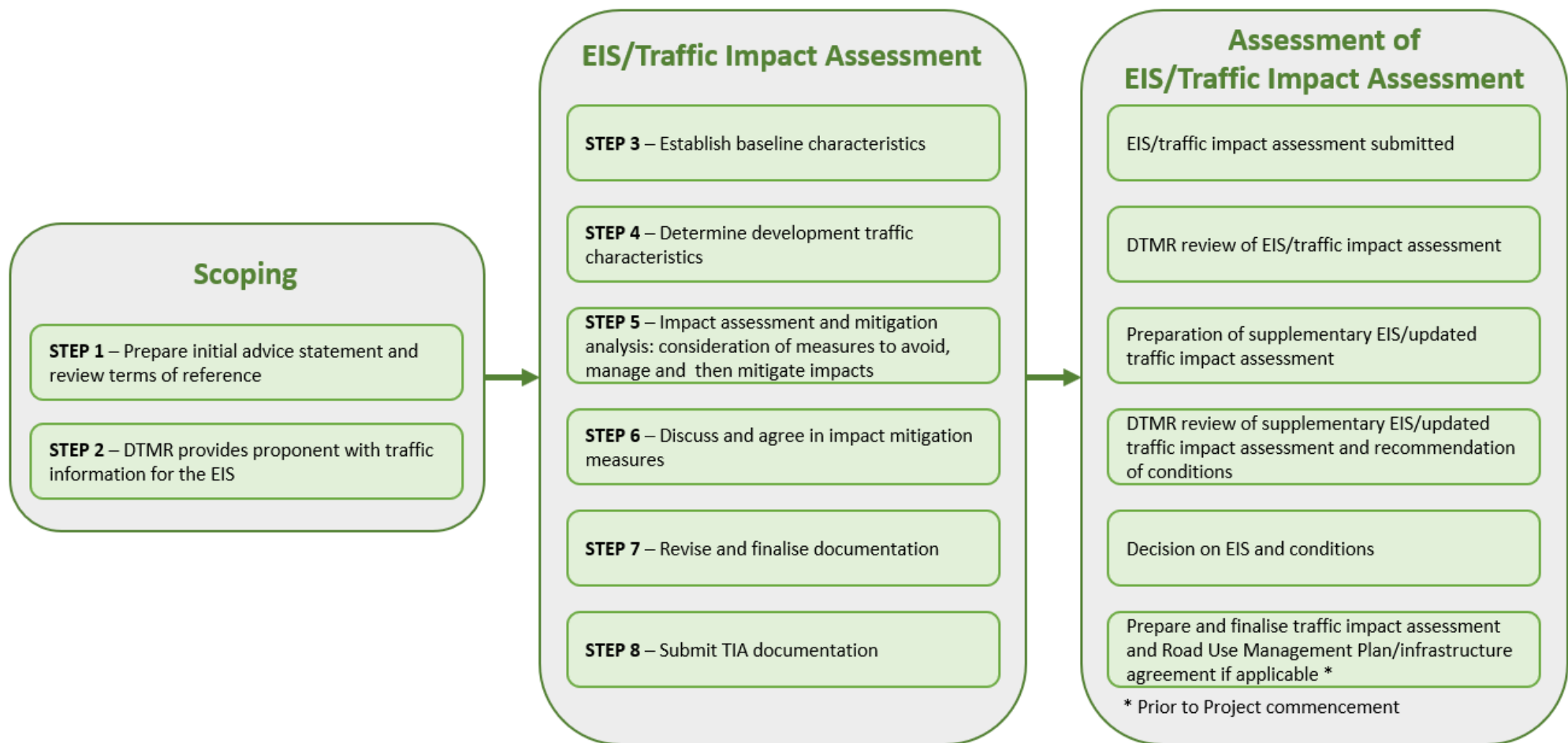


Figure 1.5 Traffic impact assessment process in accordance with the GTIA

Source: Adapted from GTIA (DTMR, 2018b)

The impact assessment and mitigation process contained in GTIA was adopted to determine appropriate mitigation measures on road impacts. The mitigation framework is provided in Figure 1.6.

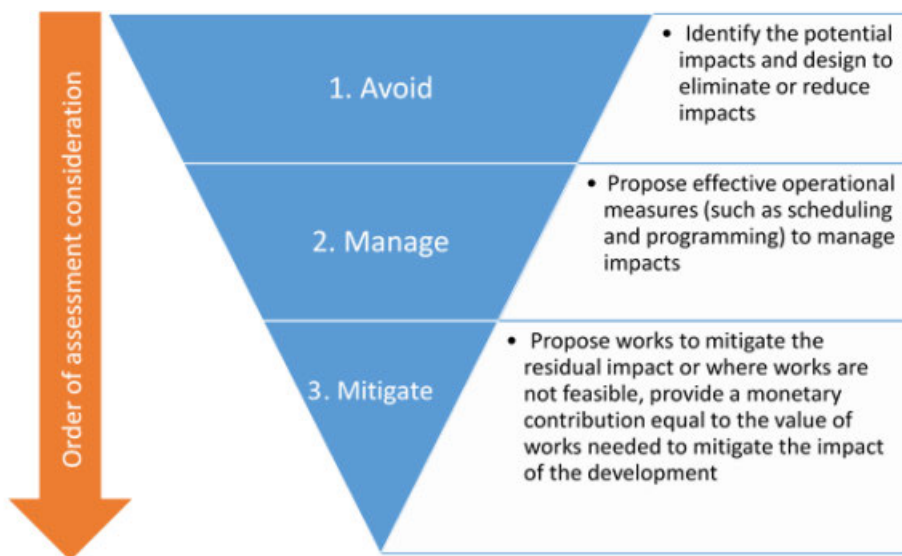


Figure 1.6 Mitigation framework

Source: GTIA (DTMR, 2018b)

1.6.2.2 Rail crossing impact assessment

The rail crossing impact assessment describes how the Project complies with the QLD Level Crossing Safety Strategy (QLCSS). The rail crossing impact assessment for the Project has 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 12 existing operational rail crossings within the impact assessment area. The assessment of the operational impacts on rail crossings is provided in section 6.4.3.

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 QLCSS.

1.6.2.3 Rail network impact assessment

The Project utilises 71.2 km of existing rail corridor for the Queensland Rail South Western Line and Millmerran Branch Line.

The staging of the works, and their associated impacts will be the subject of an interface agreement between ARTC and QR. It is currently assumed that proponents can occupy sections of existing corridor to avoid the need for constrained, short-term possession works. In accordance with Section 255 of the *Transport Infrastructure Act 1994*, 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, then works will be completed in accordance with the conditions of the temporary possession and/or wayleave agreement granted to ARTC by QR.

Further details regarding impacts to the existing rail facilities are summarised in section 6.5.3.

The operational performance of the existing rail network in the impact assessment area is not anticipated to be significantly impacted as a result of the Project construction. Due to the anticipated positive benefits including the reduction in number of freight related truck movements, no quantitative assessment regarding the shift of rail movements to the road network has been undertaken.

1.6.2.4 Port and airports impact assessment

During the construction and operation phases, the expected impact from the Project on ports and 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. Impacts from the Project on the operation and throughputs at ports (freight containers) is not in the scope of this report and has not been assessed.

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 one kilometre from the Project alignment. At its closest point, the Project alignment encroaches into the 470 m Obstacle Limitation Surface contour that extends from northwestern 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.

Assessment of the impacts of the Project on airports and other aviation facilities is provided in Chapter 18: Traffic, transport and access of the Border to Gowrie Project EIS.

1.6.2.5 Road safety impact assessment

The road safety impact assessment has been undertaken as per the framework laid out in Part C of the GTIA. This framework relies on the principle that a road's safety is not significantly worsened as a result of the Project, and that any pre-existing or Project-introduced unacceptable safety risk is addressed. This process has been utilised to determine safety risks along the Project construction traffic routes and project road-rail interface locations.

1.6.2.6 Impact assessment summary

Potential impacts associated with the Project have been summarised in Section 10. This summary of risk considers the following:

- Likelihood of impact or the probability of the impact occurring
- Magnitude of impact (or consequence) through an assessment of the traffic impact of the Project on the road sections within the Project footprint.

Likelihood and consequence criteria, and the resulting risk matrix adopted for the purpose of the summary assessment are set out in Table 1.7, Table 1.8 and Table 1.9. The criteria are consistent with *AS/NZ 31000:2009 Risk Management – Principles and Guidelines*.

Table 1.7 Likelihood criteria

Likelihood	Description	Frequency of occurrence
Almost certain	Is expected to occur in most circumstances	Once per month
Likely	Will probably occur in most circumstances	Between one a month and once a year
Possible	Might occur at some time	Between once a year and once in five years
Unlikely	Could occur at some time	Between once in five years and once in 20 years
Rare	May occur in exceptional circumstances	Once in more than 20 years

Table 1.8 Consequence criteria

Risk category		Consequence				
		Not significant	Minor	Moderate	Major	Extreme
Safety	Impact to people	No medical treatment required	Lost Time Injury or medical treatment required	Serious injury	Single fatality	Multiple but localised fatalities
Assets	Engineering impact (s) and satisfying objectives	Up to 6 hours worth of track closure	>6 hours to 24 hours of track closure	>24 to 48 hours of track closure	>48 hours to 5 days of track closure	>5 days of track closure
Financial	Total out-turn cost impact	Up to 0.05% of program budget (i.e. up to \$5 million (M) in \$10 B)	>0.05% to 0.5% of program budget (i.e. >\$5 M to \$50 M in \$10 B)	>0.5% to 1.5% of program budget (i.e. >\$50M to \$150M in \$10B)	>1.5% to 5% of program budget (i.e. >\$150M to \$500M in \$10B)	>5% of program budget (i.e. > \$500M in \$10B)
		Up to 0.1% of Project budget (i.e. up to \$100,000 (k) in \$100M)	>0.1% to 0.5% of Project budget (e.g. >\$100k to \$500k in \$100M)	>0.5% to 2.5% of Project budget (e.g. >\$500k to \$2.5M in \$100M)	>2.5% to 10% of Project budget (e.g. >\$2.5M to \$10M in \$100M)	>10% of Project budget (e.g. >\$10M in \$100M)
Environment	Environment impact, heritage, flora and fauna, archaeology and indigenous, pollution and amenity (public)	Contained environmental damage – fully recoverable, no cost or ARTC action required	Isolated environmental damage – minimal ARTC remediation required	Localised/clustered environmental damage – requiring remediation	Considerable environmental damage – requiring remediation	Widespread long-term or permanent environmental damage – remediation required
Regulatory	Regulatory/legislation exposure, non-compliance and “Licence to Operate”	Minimal or no regulatory involvement	Notice to produce information	Improvement notice or threatened action	Prohibition notice or fine (s)	Prosecution of the company and/or its office holders
Reputation	Reputational exposure, customer dissatisfaction, stakeholder support, service, quality and reliability, public image and stakeholder attitudes	Isolated event able to be resolved (up to 7 days)	Management intervention required (>7 days to 3 months)	Tactical (Business Unit/Divisional intervention required (>3 months to 18 months)	Strategic intervention required (>18 months to 3 years)	Corporate loss of shareholder and/or customer support – tangible business impact lasting > 3 years
Schedule	Time based impacts	Influences schedule up to 1% of program or approved schedule period	Influences schedule >1% to 2.5% of program approved schedule period	Influences schedule >2.5% to 5% of program approved schedule period	Influences schedule >5% to 10% of program approved schedule period	Influences schedule >10% of program approved schedule period
		Influences schedule up to 2% of Project approved schedule period	Influences schedule >2% to 5% of Project approved schedule period	Influences schedule >5% to 10% of Project approved schedule period	Influences schedule >10% to 20% of Project approved schedule period	Influences schedule >20% of Project approved schedule period

Table 1.9 Risk matrix

Likelihood	Consequence				
	Not significant	Minor	Moderate	Major	Extreme
Almost certain	Medium	Medium	High	Very high	Very high
Likely	Low	Medium	High	Very high	Very high
Possible	Low	Low	Medium	High	High
Unlikely	Low	Low	Low	Medium	Medium
Rare	Low	Low	Low	Low	Medium

1.6.3 Cumulative impact assessment

It is a requirement of the ToR for this Project that the potential for cumulative impacts be considered. Projects with spatial and/or temporal overlap can result in cumulative impacts. Cumulative impacts may:

- Differ from those of an individual project when considered in isolation
- Be positive or negative
- Differ in severity and duration depending on the spatial and temporal overlap of projects occurring in an area.

The cumulative impact assessment, including the methodology applied, is presented in Section 11.

1.6.4 Stakeholder consultation

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

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

- DTMR
- NSW RMS
- GRC
- TRC
- Inverell Shire Council (NSW)
- Clarence Valley Council (NSW)
- QR
- TransLink.

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, assumed base volumes, etc.)
- Proposed mitigation measures.

The consulted stakeholders are listed in Table 1.10.

Table 1.10 **Consulted stakeholders**

Stakeholder	Consultation methods
DTMR (QLD)	RFI, meetings, email
Roads and Maritime Services (NSW)	RFI, telephone, email
Goondiwindi Regional Council	RFI
Toowoomba Regional Council	RFI, meetings
Inverell Shire Council	RFI
Clarence Valley Council	RFI
Moree Plains Shire Council	RFI
Gwydir Shire Council	RFI

Further consultation will be required through the following stages of the Project with all relevant stakeholders.

2 Existing conditions

2.1 Existing land uses

Approximately one third of the Project length will involve upgrade, enhancement or construction of new track coincident with existing rail corridor. The balance of the project has been co-located with existing road infrastructure or will be established on land that, by and large, has been subject to previous disturbance for agricultural purposes.

Land surrounding the Project is predominantly used for livestock grazing, combined with other agricultural uses including irrigated cropping. Other land uses include production forestry, other minimal use (consisting of areas of land that are largely unused, for example, residual native cover or land reserved for stock routes) and transport and communication.

The predominantly rural nature of these surrounding land uses indicates that the local road network would generally consist of low traffic volumes.

The Project traverses through, or near to the townships of Yelarbon, Inglewood, Millmerran, Pampas, Brookstead, Pittsworth, Southbrook, Athol, Gowrie Mountain and Kingsthorpe. Traffic volumes on the road network surrounding these towns are likely to be higher.

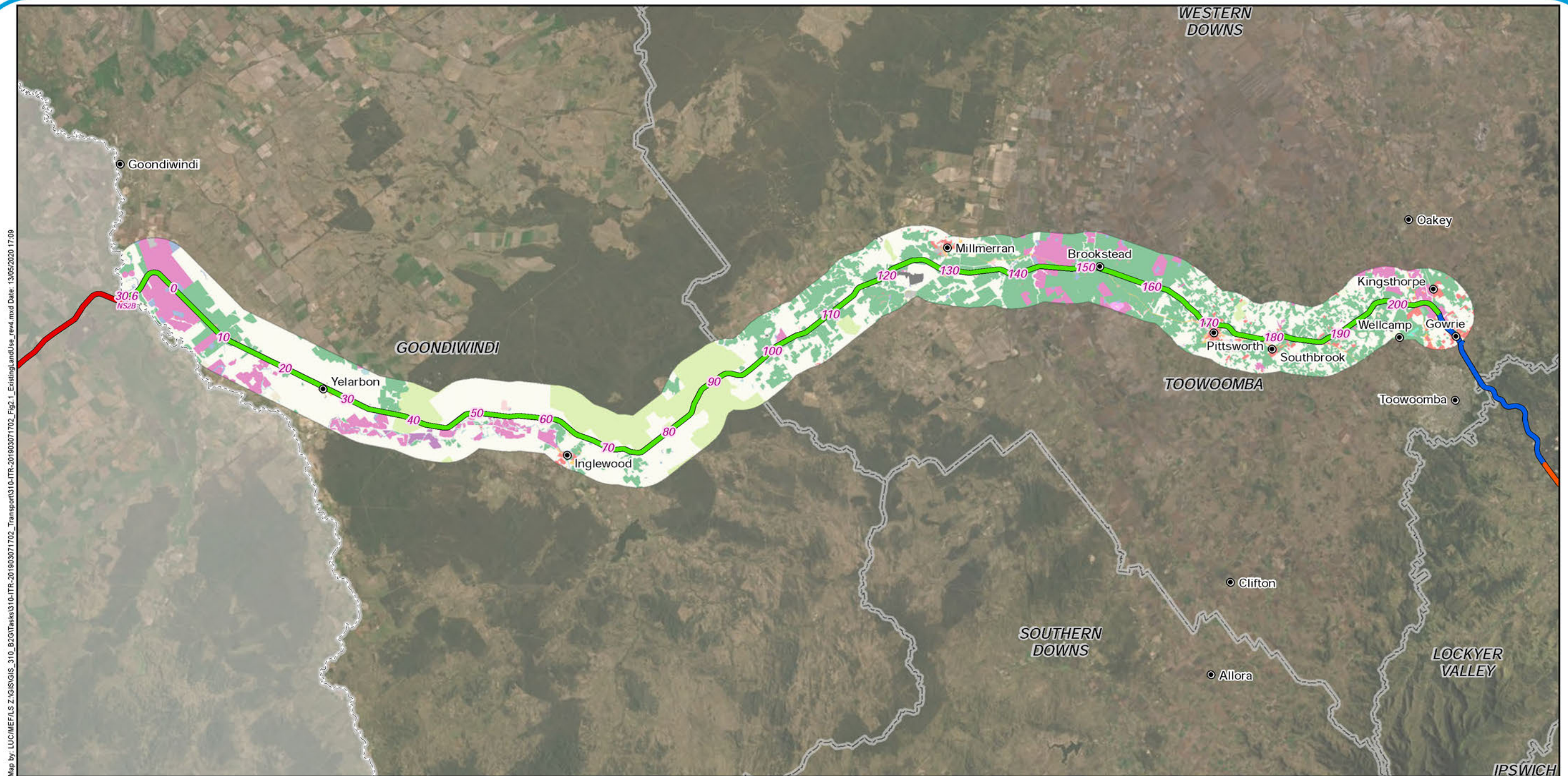
Notable land uses traversed by, or located within proximity to the Project include the Kildonan Key Resource Area (KRA 120), Whetstone State Forest, Bringalily State Forest, Commodore Mine, several intensive animal production operations including cattle feedlots, poultry farms and piggeries and, at the northeastern end, the Toowoomba Wellcamp Airport and Toowoomba Enterprise Hub.

The existing land uses which occur along the Project alignment are shown in Figure 2.1. Further land use information is provided in Chapter 7: Land use and tenure of the Border to Gowrie Project EIS.

2.2 Existing road network

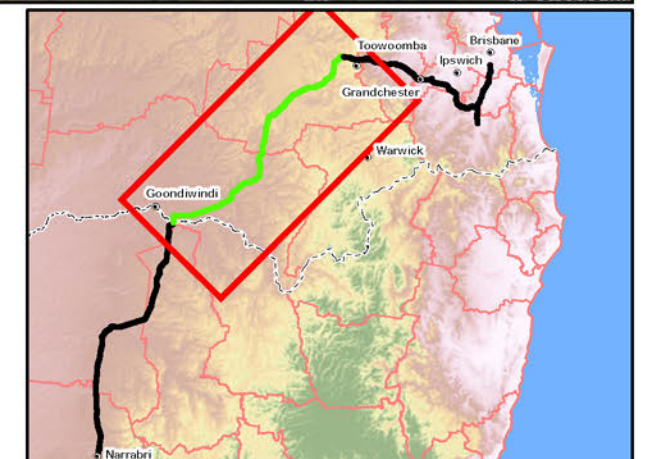
The impact assessment area encompasses several SCRs and LGRs that are expected to be used as transport routes for construction of the Project. These roads are further described in the following sections. Appendix C provides a construction route road hierarchy map based on the classification categories shown in Section 1.6.

This section does not identify roads which are to be used during the Project's operation, as the origin and destination of operation phase vehicle movements cannot be foreseen. Operation phase 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.



Legend

- | | | | |
|--|---------------------------|-------------------------------------|------------------------------|
| 5 Chainage (km) | Nature conservation | Land in transition | Utilities |
| Localities | Other minimal use | Grazing irrigated modified pastures | Transport and communication |
| North Star to NSW/QLD border alignment | Grazing native vegetation | Irrigated cropping | Mining |
| Border to Gowrie alignment | Production native forests | Irrigated perennial horticulture | Waste treatment and disposal |
| Gowrie to Helidon alignment | Plantation forests | Intensive animal production | Lake |
| NSW/QLD border | Grazing modified pastures | Manufacturing and industrial | Reservoir/dam |
| Local Government Areas | Cropping | Residential and farm infrastructure | River |
| | Perennial horticulture | Services | Marsh/wetland |



A3 scale: 1:600,000

0 4.5 9 13.5 18 22.5 km

2.2.1 State-controlled roads

2.2.1.1 Interfaces with the Project

The Project intersects seven State-controlled roads in nine locations, as detailed in Table 2.1 and shown on Figure 1.2.

Table 2.1 State-controlled roads intersected by the Project

Road name	Road section (DTMR chainages)	Project interface ID ¹
Cunningham Highway (Wondalli Street)	Ch 40.0 to 41.0 km	310-11-E-1
Millmerran-Inglewood Road	Ch 5.0 to 6.0 km Ch 18.0 to 19.0 km Ch 60.0 to 61.0 km	310-24-P-2 310-35-P-4 310-37-P-12a
Millmerran-Leyburn Road	Ch 1.0 to 2.0 km	310-40-E-2
Gore Highway	Ch 55.0 to 56.0 km	310-44-E-2
Oakey-Pittsworth Road	Ch 37.0 to 38.0 km	310-48-P-8
Toowoomba-Cecil Plains Road	Ch 17.0 to 18.0 km	310-55-P-1
Warrego Highway	Ch 16.0 to 17.0 km	310-56-P-2

Table note:

1 Project interface IDs are shown on Figure 1.2

2.2.1.2 Construction routes

The SCRs proposed to be used to transport construction materials, equipment and workforce during construction of the Project are summarised in Table 2.2 and shown on Figure 1.3.

The construction routes by activity are provided in Appendix G through to Appendix O.

Table 2.2 State-controlled roads: project primary construction routes

Road name	Road ID - road section
SCRs: DTMR	
Barwon Highway	31A - Between Leichhardt Highway and Town Common Road
Charlton Connection Road	320 - Between Toowoomba-Cecil Plains Road and Jordan Court
	320 - Between Jordan Court and Warrego Highway
Cunningham Highway	17D - Between NSW/QLD Border and Leichhardt Highway
	17D - Between Leichhardt Highway and Wyaga Road
	17D - Between Wyaga Road and Yelarbon-Keetah Road
	17D - Between Yelarbon-Keetah Road and Texas-Yelarbon Road
	17D - Between Texas-Yelarbon Road and Inglewood-Texas Road
	17C - Between Inglewood-Texas Road and Millmerran-Inglewood Road
	17C - Between Millmerran-Inglewood Road and Inglewood Quarry Access Road
	17C - Between Inglewood Quarry Access Road and Coolmunda Dam Access
Gore Highway	28A - Between Blackwell Road and Saleyards Road
	28A - Between Saleyards Road and West Street
	28A - Between West Street and Millmerran-Inglewood Road
	28A - Between Millmerran-Inglewood Road and Millmerran-Leyburn Road
	28A - Between Millmerran-Leyburn Road and Pampas-Horrane Road
	28A - Between Pampas-Horrane Road and Brookstead-Norwin Road

Road name	Road ID - road section
	28A - Between Brookstead-Norwin Road and Tummaville Road
	28A - Between Tummaville Road and Vines Street
	28A - Between Vines Street and Toowoomba Bypass
	28A - Between Toowoomba Bypass and Westbrook Road
	28A - Between Westbrook Road and Warrego Highway
Inglewood-Texas Road	231 - Between Cunningham Highway and Greenup Limevale Road
	231 - Between Greenup Limevale Road and Texas-Yelarbon Road
	231 - Between Texas-Yelarbon Road and Stanthorpe-Texas Road
	231 - Between Stanthorpe-Texas Road and Old Texas-Yelarbon Road
	231 - Between Old Texas-Yelarbon Road and NSW/QLD Border
Ipswich Motorway	17A - Between Cunningham Highway and Logan Motorway
Leichhardt Highway	26C - Between Cunningham Highway and Hunt Street
	26C - Between Hunt Street and Barwon Highway
Logan Motorway (managed by Transurban)	210A - Between Ipswich Motorway and Pacific Motorway
Millmerran-Inglewood Road	337 - Between Cunningham Highway and Thornton Road
	337 - Between Thornton Road and Council Boundary
	337 - Between Council Boundary and Kooroongarra Road
	337 - Between Kooroongarra Road and Blackwell Road
	337 - Between Blackwell Road and Campbell Street
	337 - Between Campbell Street and Gore Highway
Millmerran-Leyburn Road	335 - Between Gore Highway and Reiche Road
Oakey-Pittsworth Road	323 - Between Gore Highway and Quibet Road
Pacific Motorway	12A - Between Logan Highway and NSW/QLD border
Pampas-Horrane Road	327 - Between Gore Highway and Bostock Road
Pittsworth-Felton Road	332 - Between Golf Course Road and Short Street
Texas-Yelarbon Road	2322 - Between Cunningham Highway and Old Texas-Yelarbon Road
Toowoomba-Cecil Plains Road	324 - Between Warrego Highway and McDougall Street
	324 - Between McDougall Street and Boundary Street
	324 - Between Boundary Street and Charlton Connection Road
	324 - Between Charlton Connection Road and Hursley Road
	324 - Between Hursley Road and Hanrahans Road
	324 - Between Hanrahans Road and 2 km west of Brimblecombe Road
Toowoomba Bypass	319 - Between Gore Highway and Toowoomba-Cecil Plains Road
	319 - Between Toowoomba-Cecil Plains Road and New England Highway
	319 - Between New England Highway and Warrego Highway
Warrego Highway	18B - Between Kingsthorpe Haden Road and Toowoomba Bypass
	18B - Between Toowoomba Bypass and Charlton Connection Road
	18B - Between Charlton Connection Road and McDougall Street
	18B - Between McDougall Street and Bridge Street
	18B - Between Bridge Street and Toowoomba-Cecil Plains Road
	18B - Between Toowoomba-Cecil Plains Road and Karrool Street

Road name	Road ID - road section
	18B - Between Karrool Street and Gore Highway
	18B - Between Gore Highway and Fifth Avenue
	18A - Between Toowoomba Bypass and Gatton-Helidon Road
	18A - Between Gatton-Helidon Road and Gatton-Esk Road
	18A - Between Gatton-Esk Road and Laidley-Plainland Road
	18A - Between Laidley-Plainland Road and Tallegalla Two Tree Hill Road
	18A - Between Tallegalla Two Tree Hill Road and Haigslea Amberley Road
	18A - Between Haigslea Amberley Road and Brisbane Valley Highway
	18A - Between Brisbane Valley Road and Mount Crosby Road
	18A - Between Mount Crosby Road and Cunningham Highway
Yelarbon-Keetah Road	241 - Between Cunningham Highway and Old Warwick Road
SCRs: Roads and Maritime Services	
Bruxner Highway	Between New England Highway and Summerland Way
Gwydir Highway	Between Stephens Road and Delungra Road
	Between Delungra Road and Delungra Bypass Road
	Between Delungra Bypass Road and Copeton Dam Road
	Between Copeton Dam Road and Bannockburn Road
	Between Bannockburn Road and Campbell Street
	Between Campbell Street and Tingha Road
	Between Tingha Road and Elsmore Road
	Between Elsmore Road and Woodstock Road
	Between Woodstock Road and Waterloo Road
	Between Waterloo Road and Coronation Avenue
	Between Coronation Avenue and New England Highway
	Between New England Highway and Shannon Vale Road
	Between Shannon Vale Road and Bald Nob Road
	Between Bald Nob Road and Old Grafton Road
	Between Old Grafton Road and Coombadjha Road
	Between Coombadjha Road and Old Glen Innes Road
	Between Old Glen Innes Road and Rogan Bridge Road
	Between Rogan Bridge Road and Bent Street
New England Highway	Between Bruxner Way and Bruxner Highway
	Between Gwydir Highway and Gwydir Highway
Newell Highway	Between NSW/QLD Border and Bruxner Way
Pacific Motorway	Between NSW/QLD Border and Gwydir Highway
Summerland Way	Between Bruxner Highway and Red Lane
	Between Trenayr Road and Turf Street

2.2.2 Local government roads

2.2.2.1 Interfaces with the Project

The Project includes 66 separate locations at which the reference design intersects a public, local government road. Of these intersections, nine are existing QR crossings. The intersection locations of public, local government roads are summarised in Table 2.3 and shown on Figure 1.2. These roads fall within the jurisdiction of the following local government authorities:

- Goondiwindi Regional Council (GRC)
- Toowoomba Regional Council (TRC).

Table 2.3 Intersection locations of public, local government road assets

Project interface ID ¹	Road name	Existing Queensland Rail crossing type	Reference design interface chainage (km)
Goondiwindi Regional Council			
270-11-P-9a	Stock reserve	Nil	Ch 32.62 (NS2B)
270-12-P-1	Kildonan Road	Nil	Ch 33.10 (NS2B)
270-12-P-2	Kildonan Road - Stock reserve	Nil	Ch 33.07 (NS2B)
270-12-P-4	Eukabilla Road	Nil	Ch 33.37 (NS2B)
270-12-P-6a	Eukabilla Road	Nil	Ch 34.97 (NS2B)
310-4-E-2	South Kurumbul Road	Passive level crossing	Ch 6.08
310-5-P-1	Wondalli-Kurumbul Road	Nil	Ch 7.19
310-8-E-0	Unnamed Road	Nil	Ch 16.15
310-10-P-1	Unnamed Road	Nil	Ch 25.39
310-12-E-1	Suttons Road	Passive level crossing	Ch 30.30
310-14-E-0	Springborg Road	Passive level crossing	Ch 37.67
310-14-E-1	Springborg Road	Nil	Ch 37.70
310-16-E-1	Whetstone Access Road	Passive level crossing	Ch 45.59
310-17-P-7a	McDougalls Crossing Road	Nil	Ch 50.05
310-18-P-8	Cremascos Road	Nil	Ch 54.52
310-19-P-8	Unnamed Road	Nil	Ch 57.79
310-20-P-12	Bybera Road	Nil	Ch 60.55
310-20-P-12z	Bybera Road	Nil	Ch 60.63
310-20-P-7	Unnamed Road	Nil	Ch 59.47
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 78.43
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 91.80
Toowoomba Regional Council			
310-30-P-2	Unnamed Road	Nil	Ch 96.11
310-31-P-7	Kooroongarra Road	Nil	Ch 103.01
310-32-P-4	Paton Road	Nil	Ch 105.85
310-33-P-1	Nicol Creek Road	Nil	Ch 107.89

Project interface ID ¹	Road name	Existing Queensland Rail crossing type	Reference design interface chainage (km)
310-34-P-1	Millwood Road	Nil	Ch 112.09
310-35-P-4a	Heckendorf Road	Nil	Ch 116.40
310-36-P-1	Blackwell Road	Nil	Ch 120.36
310-36-P-8a	Scraggs Road	Nil	Ch 123.77
310-37-P-12	Schwartens Road	Nil	Ch 126.54
310-38-P-3	Owens Scrub Road	Nil	Ch 129.74
310-39-P-1	Lindenmayer Road	Nil	Ch 133.54
310-40-E-1	Hall Road	Passive level crossing	Ch 138.37
310-41-E-6	Gilgai Lane	Passive level crossing	Ch 144.53
310-42-E-0	Harris Road	Nil	Ch 146.83
310-42-E-1	Fysh Road	Active level crossing	Ch 147.31
310-43-E-3	Elsden Road	Passive level crossing	Ch 149.95
310-43-E-8	Mann Silo Road	Nil	Ch 152.174
310-45-E-1	Longhurst Road	Passive level crossing	Ch 157.94
310-46-E-1	Yarranlea Road	Nil	Ch 161.25
310-46-P-3	Roche Road	Nil	Ch 163.29
310-46-P-4c	Murlaggan Road	Nil	Ch 164.14
310-47-P-1	Kahler Road	Nil	Ch 165.56
310-47-P-3	French Road	Nil	Ch 168.26
310-48-P-1	Tip Road	Nil	Ch 169.15
310-48-P-9	Quibet Road	Nil	Ch 171.35
310-48-P-10	Dallman Road	Nil	Ch 171.46
310-49-P-1	Unnamed Road	Nil	Ch 172.29
310-49-P-2	Lochaber Road	Nil	Ch 172.44
310-49-P-6	McEwan Lane	Nil	Ch 173.09
310-49-P-8	Paint Mine Road	Nil	Ch 173.74
310-49-P-11	Linthorpe Road	Nil	Ch 175.88
310-50-P-5	Geitz Road	Nil	Ch 178.51
310-50-P-11	Linthorpe Valley Road	Nil	Ch 180.88
310-51-P-8	Bushy Lane	Nil	Ch 182.82
310-51-P-11z	Biddeston-Southbrook Road	Nil	Ch 183.63
310-52-P-1	Unnamed Road	Nil	Ch 183.96
310-52-P-3	Purcell Road	Nil	Ch 187.20
310-53-P-1	Athol School Road	Nil	Ch 188.06
310-55-P-5	Brimblecombe Road	Nil	Ch 198.73
310-57-P-1	Chamberlain Road	Nil	Ch 204.46
310-57-P-4	Leesons Road	Nil	Ch 206.41

Table note:

1 Project interface IDs are shown on Figure 1.2

2.2.2.2 Construction routes

Several local government roads are proposed to be used to transport materials, water, equipment and workforce during construction of the Project. These roads are listed in Table 2.4. and are located within the jurisdiction of the following local government authorities in NSW and Queensland:

- Clarence Valley Council (NSW)
- GRC (Queensland)
- Gwydir Shire Council (NSW)
- Inverell Shire Council (NSW)
- Moree Plains Shire Council (NSW)
- TRC (Queensland).

Table 2.4 Local government roads: project primary construction routes

Road name and section	Road section
Clarence Valley Council	
Bent Street	Between Craig Street and Gwydir Highway
Charles Street	Between Bent Street and Pacific Highway
Clarence Street	Between Oliver Street and Craig Street
Clark Road	Full extent
Craig Street	Between Villiers Street and Clarence Street
	Between Clarence Street and Bent Street
Dobie Street	Between Villers Street and Summerland Way
Fry Street	Between Mary Street and Alice Street
Mary Street	Between Fry Street and Oliver Street
Oliver Street	Between Clarence Street and Mary Street
Red Lane	Between Summerland Way and Trenayr Road
Trenayr Road	Between Red Lane and Clark Road
	Between Summerland Way and Clark Road
Villers Street	Between Craig Street and Dobie Street
Goondiwindi Regional Council	
Boodle Street	Between Boodle Street and Hunt Street
Bybera Road	Between Cunningham Highway and Private Access
	Between Private Access and Unnamed Road
Cemetery Road	Between Moorobie Lane and Unnamed Road
Coolmunda Dam Access	Full extent
Cremascos Road	Between Cunningham Highway and 400 m west of Private Access
East Sawmill Road	Between Cunningham Highway and Springborg Road
Elizabeth Street	Between Cunningham Highway and Callandoon Street
Eukabilla Road	Full extent
Fosters Road	Between Cunningham Highway and Grays Road
Grays Road	Between Millmerran-Inglewood Road and Mosquito Creek Road
Hunt Street	Between Leichhardt Highway and Boodle Street
Inglewood Quarry Access Road	Full extent
Kildonan Road	Between Yelarbon-Keetah Road and Cunningham Highway

Road name and section	Road section
Lovells Crossing Road	Between Callandoon Street and Unnamed Road
	Between Unnamed Road and Unnamed Road
McDougalls Crossings Road	Between Cunningham Highway and 800 m west of Cremascos Road
Mooroobie Lane	Between Wondalli-Kurumbul Road and Cemetery Road
Mosquito Creek Road	Between Grays Road and Cunningham Highway
Old Texas-Yelarbon Road	Between Texas-Yelarbon Road and Rocky Creek Road
	Between Rocky Creek Road and Inglewood-Texas Road
Queen Street South	Between Yelarbon-Kurumbul Road and Danes Lane
South Kurumbul Road	Between Yelarbon-Kurumbul Road and Kildonan Road
Springborg Road	Between Cunningham Highway and Railway Line
Suttons Road	Between East Sawmill Road and Unnamed Road
Thornton Road	Between Millmerran-Inglewood Road and Unnamed Road
Town Commons Road	Between Waggamba Road and Barwon Highway
Unnamed Road	Between Cunningham Highway and Private Access
Unnamed Road	Between Cemetery Road and Unnamed Road
Unnamed Road	Between Texas-Yelarbon Road and Private Land
Unnamed Road	Between Woodcocks Road and Queen Street North
Unnamed Road	Between East Sawmill Road and Suttons Road
Unnamed Road	Full extent
Whetstone Access Road	Between Cunningham Highway and 600 m west of Railway Line
Wondalli-Kurumbul Road	Between South Western System (Railway) and Bickers Road
Woodcocks Road	Between Cunningham Highway and Unnamed Road
Yelarbon-Kurumbul Road	Yelarbon-Kurumbul Road
Gwydir Shire Council	
Edwards Street	Between North Star Road and I B Bore Road
North Star Road	Between MPSC Council Boundary and Edwards Street
	Between Edward Street and Getta Getta Road
	Between Getta Getta Road and Blue Nobby Road
	Between Blue Nobby Road and Hibernia Road
	Between Hibernia Road and Yallaroi Road
	Between Yallaroi Road and Baroma Road
	Between Baroma Road and Warialda Road
Stephen Street	Between Long Street and Gwydir Highway
Warialda Road	Between North Star Road and Gournama Road
	Between Gournama Road and Oregon Road
	Between Oregon Street and Stephen Street
Inverell Shire Council	
Bruxner Way	Between Texas Bridge Road and Glenrock Road
	Between Glenrock Road and New England Highway
Campbell Street	Between Byron Street and Otho Street
Texas Bridge Road	Between NSW/QLD Border and Bruxner Highway

Road name and section	Road section
Moree Plains Shire Council	
Bruxner Way	Between Newell Highway and Tucka Tucka Road
	Between Tucka Tucka Road and North Star Road
North Star Road	Between Bruxner Way and Gwydir Shire Council boundary
River Road	Between Newell Highway and Boggabilla Weir
Toowoomba Regional Council	
Airport Quarry Wellcamp Access Road (Privately owned road)	Between Toowoomba-Cecil Plains Road and Toowoomba Wellcamp Airport
Alderley Street	Between Greenwattle Street and Gore Highway
	Between Gore Highway and Condamine Street
Athol School Road	Between Gore Highway and Trader Road
Biddeston Southbrook Road	Between Gore Highway and Stower Road
Blackwell Road	Between Millmerran-Inglewood Road and Gore Highway
Blackwell Road	Between Bunkers Hill School Road and Macaulay Road
Bligh Street	Between Six Mile Road and Concrete Millmerran
	Between Concrete Millmerran and Crosby Street
Bostock Road	Between Pampas-Horrane Road and Unnamed Road
Brimblecombe Road	Between Toowoomba-Cecil Plains Road and Gowrie Mountain School Road
Bunkers Hill School Road	Between Gore Highway and Blackwell Road
Bushy Lane West	Between Gore Highway and 650 m west of Gore Highway
Campbell Street	Between Millmerran-Inglewood Road and Commens Street
Chamberlain Road	Between Warrego Highway and Robson Road
Commodore Peak Road	Between Millmerran-Inglewood Road and Blackwell Road
Condamine Street	Full extent
Dieckmann Road	Between Gore Highway and Madelaine Street
Draper Road	Between Steger Road and Leeson's Road
Drayton Wellcamp Road	Between Wellcamp-Westbrook Road and Boundary Street South
Euston Road	Between Boundary Court and Greenwattle Street
Forestry Road	Between Millmerran-Inglewood Road and Unnamed Road
Fysh Road	Between Gore Highway and Fysh Road
Gap Road	Between Gore Highway and Cypress Street
Geitz Road	Between Gore Highway and Luck Road
Gilgal Lane	Between Gore Highway and Railway Line
Greenwattle Street	Between Euston Road and Alderley Street
Grevillea Street	Full extent
Hall Road	Between Gore Highway and Railway Line
Heckendorf Road	Between Millmerran-Inglewood Road and Bora Creek Road
Kahler Road	Between Murlaggan Road and Glen Devon Road
Kooroongara Road	Between Millmerran-Inglewood Road and Bliss Road
Kooroongarra Road	Between Millmerran-Inglewood Road and Halls Road
Kooroongarra Road	Between Millwood Road and Cunningham Highway
Leeson's Road	Full extent

Road name and section	Road section
Lindenmayer Road	Between Gore Highway and Unnamed Road
Linthorpe Road	Between Gore Highway and Loveday Road
Lochaber Road	Between McEwan Lane and Gore Highway
Macaulay Road	Between Blackwell Road and Wellcamp-Westbrook Road
McDougall Street	Between Toowoomba-Cecil Plains Road and Hursley Road
Millwood Road	Between Millmerran-Inglewood Road and Kooroongarra Road
Murlaggan Road	Between Gore Highway and Roche Road
	Between Roche Road and Yarranlea Road
Omara Road	Between Toowoomba-Cecil Plains Road and Warrego Highway
Owens Scrub Road	Between Millmerran-Inglewood Road and Foxwood Road
Paint Mine Road	Between Gore Highway and Loveday Road
Paton Road	Between Millmerran-Inglewood Road and Kooroongarra Road
Pittsworth-Felton Road	Between Cypress Street and Golf Course Road
Railway Street	Between Short Street and Vines Street
Roche Road	Between Murlaggan Road and Saint Helens Road
Saleyards Road	Between Millmerran-Inglewood Road and Gore Highway
Scrubby Road	Between Gore Highway and Jentz Road
Short Street	Between Yandilla Street and Toowoomba Road
Six Mile Road	Between Rodney Road and Bligh Street
Steger Road	Between Warrego Highway and Draper Road
Toowoomba Road	Between Vines Street and Gore Highway
Tummaville Road	Between Gore Highway and Mann Silo Road
Unnamed Road	Between Gore Highway and Millmerran Indoor Sports Centre
Unnamed Road	Between Toowoomba-Cecil Plains Road and Unnamed Road
Unnamed Road	Between Tummaville Road and Scrubby Road
Unnamed Road	Between Drayton Westbrook Road and Unnamed Road
Unnamed Road	Between Bostock Road and Unnamed Road
Unnamed Road	Between Forestry Road and Unnamed Road
Unnamed Road	Between Gore Highway and Private Access
Ware Street	Between Gore Highway and Railway Line
Wellcamp-Westbrook Road	Between Macaulay Road and Toowoomba-Cecil Plains Road
	Between Toowoomba-Cecil Plains Road and Drayton Wellcamp Road
West Street	Between Gore Highway and Rodney Road
Yarranlea Road	Between Gore Highway and Railway Line
	Between Railway Line and Saint Helens Road

2.2.3 Public transport networks

The QR South Western Line and Millmerran Branch Line are not used for passenger rail services. Therefore, the assessment of public transport services has been restricted to bus services.

Public bus routes that use roads within the impact assessment area were identified through a review of data sourced from TransLink and Transport for NSW. These existing public transport routes may use roads:

- That will be intersected by the Project alignment
- That are proposed to be used for construction traffic.

Public bus routes that use roads within the impact assessment area that may interface with Project activities are listed in Table 2.5.

There may be additional routes that are not publicly available and have therefore not been captured in Table 2.5. Consultation with relevant Councils and public transport operators will be required prior to the commencement of construction to ensure that all public transport routes that may be impacted by construction traffic have been accounted for.

Potential impacts on the public transport services are discussed in Section 6.5.4. Public Transport Maps are provided in Appendix R.

Table 2.5 Public transport (bus) routes with potential to interface with Project activities

Bus service	Route (to/from)	State	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
Queensland Public Transport Routes					
529	Ipswich to Toogoolawah	QLD	3 per day	Warrego Highway	-
New South Wales Public Transport Routes					
372	Grafton to Coffs Harbour	NSW	2 per day	Bent Street Craig Street Charles Street	-
373	Grafton to South Grafton via Fairway Drive (Loop Service)	NSW	6 per day	Bent Road Craig Street Charles Street	-
374	Grafton to South Grafton via Bimble Avenue (Loop Service)	NSW	17 per day Hourly off-peak, 30 minutes at peak	Bent Street Craig Street Charles Street	-
375C	Grafton to Westlawn via Grafton Base Hospital (Clockwise Loop)	NSW	10 per day	Oliver Street	-
376	Grafton to Dovedale via Hospital	NSW	9 per day	Oliver Street Mary Street	-
377	Grafton to Junction Hill via Hospital	NSW	4 per day	Turf Street	-
378	Cangai to Grafton via South Grafton	NSW	1 per day	Bent Street Craig Street	-
379	Copmanhurst to Grafton via South Grafton	NSW	1 per day	Bent Street Craig Street	-
380	Yamba – Grafton via Maclean	NSW	8 per day	Bent Street Craig Street Charles Street Pacific Highway (Grafton to Yamba)	-

Bus service	Route (to/from)	State	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
386	Maclean to Iluka (Loop Service)	NSW	3 per day	Pacific Highway	-

2.2.4 School bus routes

School bus routes that use roads within the impact assessment area were identified through a review of data sourced from DTMR (Queensland) and TfNSW (NSW). These existing school bus routes may use roads:

- That will be intersected by the Project alignment
- That are proposed to be used for construction traffic

School bus routes that use roads within the impact assessment area that may interface with Project activities are listed in Table 2.6.

There may be additional school bus routes that are not publicly available and have therefore not been captured in Table 2.6. Consultation with relevant Councils and school bus operators will be required prior to the commencement of construction to ensure that all school bus routes that may be impacted by construction traffic have been accounted for.

Potential impacts on school bus routes are discussed in Section 6.5.5.

Table 2.6 School bus routes with potential to interface with Project activities

Services	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
Queensland School Bus Routes			
IP1502 AM and PM Hatton Vale, Lowood, Fernvale, Ironbark Area to Ipswich Special Schools	1/AM 1/PM	Warrego Highway	-
IP1503 AM and PM Hatton Vale/Marburg Area to Ipswich Special Schools	1/AM 1/PM	Warrego Highway	-
P1070 Lemon Tree to Millmerran State School	1/AM 1/PM	Gore Highway	-
P1072 Billa Billa to Goondiwindi State School	1/AM 1/PM	Leichardt Highway	-
P1082 - Koarlo to Goondiwindi State School	1/AM 1/PM	Kildonan Road	270-12-P-1
P124 Southbrook to Southbrook Central State School	1/AM 1/PM	Gore Highway Toowoomba Road Railway Street	-
P1732 AM and PM Hatton Vale Area, Hatton Vale SS	1/AM 1/PM	Warrego Highway	-
P1751 AM and PM Iredale-Postmans Ridge to Helidon State School	1/AM 1/PM	Warrego Highway	-
P1883 AM and PM Service Athol to Bunker's Hill State School	1/AM 1/PM	Gore Highway Athol School Road	310-53-P-1
P1886 Captains Mt to Millmerran SS	1/AM 1/PM	Gore Highway Saleyards Road	-

Services	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
P1886 Year 11 and 12 Secondary Re-Run to Millmerran SS	1/AM 1/PM	Gore Highway	-
P1927 AM and PM Limevale to Texas State School Service	1/AM 1/PM	Inglewood-Texas Road	-
P450 Seven Mile to Inglewood State School	1/AM 1/PM	Cunningham Highway	-
P451 Seven Mile to Inglewood State School	1/AM 1/PM	Cunningham Highway	-
P473 Yuraraba to Inglewood State School	1/AM 1/PM	Cunningham Highway Millmerran-Inglewood Road Coolmunda Access Road	310-24-P-2
P510 Southbrook North to Southbrook Central State School	1/AM 1/PM	Gore Highway Biddeston Southbrook Road Linthorpe Valley Road	310-50-P-11 310-51-P-11z
P522 Mt Emlyn area to Millmerran State School	1/AM 1/PM	Koroongara Road Millmerran-Inglewood Road Campbell Street Gore Highway	310-37-P-12a
P540 Yelarbon to Yelarbon State School	1/AM 1/PM	Cunningham Highway Texas-Yelarbon Road	-
P623 AM and PM Summerholm Area, Hatton Vale SS	1/AM 1/PM	Warrego Highway	-
P645 Gooray to Goondiwindi	1/AM 1/PM	Barwon Highway	-
P674 Yagaburne to Goondiwindi State School	1/AM 1/PM	Leichardt Highway	-
P733 Goodar to Goondiwindi State School	1/AM 1/PM	Barwon Highway	-
P772 AM and PM Service – Tummalville to Millmerran State School	1/AM 1/PM	Gore Highway Millmerran-Leyburn Road	310-40-E-2 310-42-E-1
P787 Primary and Secondary to Millmerran SS	1/AM 1/PM	Gore Highway	-
P809 Kincora to Pittsworth SS	1/AM 1/PM	Gore Highway Railway Street Yandilla Street Scrubby Road Gap Road	-
P821 AM and PM Primary and Secondary Services – Glencoe to Gowrie State School	1/AM 1/PM	Gowrie Tilgonda Road Gowrie Lilyvale Road	-
P902 Beebo to Texas State School	1/AM 1/PM	Texas-Yelarbon Road Inglewood-Texas Road	-
P938 Service – Bringalily to Millmerran State School	1/AM 1/PM	Millmerran-Inglewood Road Gore Highway	310-35-P-4 310-37-P-12a

Services	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
P957 AM and PM Service/Ivanhoe to Millmerran State School	1/AM 1/PM	Millmerran-Inglewood Road Koorongarra Road Owens Scrub Road Gore Highway	310-37-P-12a 310-38-P-3
S118 AM and PM Service – Pittsworth to Brookstead Area	1/AM 1/PM	Gore Highway Yarranlea Road Gap Road Yandilla Street Short Street Railway Road	310-44-E-2 310-46-E-1
S178 Kingsthorpe Secondary to Harristown State High School	1/AM 1/PM	Warrego Highway Charlton Connection Road Toowoomba-Cecil Plains Road	310-56-P-2
S577 Kingsthorpe/Wellcamp to Harristown State High School	1/AM 1/PM	Warrego Highway Charlton Connection Road Toowoomba-Cecil Plains Road	310-56-P-2
S740 AM and PM Service Millmerran Years 11 and 12 to Pittsworth SHS	1/AM 1/PM	Gore Highway Saleyards Road Campbell Street Gap Road Yandilla Street Railway Street	310-44-E-2 310-46-E-1
S789 Gowrie Mtn – Charlton – Wellcamp to Harristown State High School	1/AM 1/PM	Drayton Wellcamp Road Greenwattle Street Wellcamp-Westbrook Road Toowoomba-Cecil Plains Road Omara Road	-
New South Wales School Bus Routes			
Bus 6 to Grafton Public School, Grafton High School, Grafton Infants School, Clarence Valley Anglican School – Grafton, Clarence Valley Anglican School – Clarenza, Gillwinga Public School, McAuley Catholic College - Clarenza	1/AM 1/PM	Summerland Way Oliver Street	-
Bus 8 to Grafton Public School, Grafton High School, Grafton Infants School, Clarence Valley Anglican School – Grafton, Clarence Valley Anglican School – Clarenza, Gillwinga Public School, McAuley Catholic College - Clarenza	1/AM 1/PM	Bent Street Craig Street Oliver Street	-
Bus 7 to Grafton Public School, Grafton High School, Grafton Infants School, Clarence Valley Anglican School – Clarenza, Gillwinga Public School, McAuley Catholic College - Clarenza	1/AM 1/PM	Summerland Way Oliver Street	-
Bus 2 to Grafton Public School, Grafton High School, Grafton Infants School, Clarence Valley Anglican School – Grafton, Clarence Valley Anglican School – Clarenza, Gillwinga Public School, McAuley Catholic College - Clarenza	1/AM 1/PM	Oliver Street	-

Services	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
Bus 34 to Grafton Public School, Grafton High School, Grafton Infants School, Clarence Valley Anglican School – Grafton, Gillwinga Public School, McAuley Catholic College - Clarenza	1/AM 1/PM	Bent Street	-
Bus 12 to Grafton Public School, Grafton Infants School, Clarence Valley Anglican School – Clarenza, Gillwinga Public School	1/AM 1/PM	Bent Street	-
Bus 5 to Grafton Public School, Grafton High School, Grafton Infants School, Clarence Valley Anglican School – Grafton, Gillwinga Public School, McAuley Catholic College - Clarenza	1/AM	Summerland Way	-
Bus 18 to Grafton Public School, Grafton High School, Grafton Infants School, Clarence Valley Anglican School – Grafton, McAuley Catholic College - Clarenza	1/AM 1/PM	Oliver Street	-
Bus 1 to Grafton Public School, Grafton High School, Grafton Infants School, Clarence Valley Anglican School – Grafton, Clarence Valley Anglican School – Clarenza, Gillwinga Public School, McAuley Catholic College - Clarenza	1/AM 1/PM	Summerland Way Trenayr Road	-
Bus 9 to Grafton High School	1/AM	Summerland Way Oliver Street	-
Bus 14 to Clarence Valley Anglican School – Grafton, Gillwinga Public School	1/AM	Oliver Street Mary Street	-
Bus 4 to Grafton Public School, Grafton High School, Grafton Infants School, Clarence Valley Anglican School – Grafton, Clarence Valley Anglican School – Clarenza, Gillwinga Public School	1/AM 1/PM	Oliver Street	-
Bus 10 to Grafton Public School, Grafton Infants School	1/PM	Oliver Street Fry Street Summerland Way	-
Bus 32 to Grafton Public School, Grafton High School, Grafton Infants School, Clarence Valley Anglican School - Grafton	1/PM	Oliver Street Fry Street Craig Street Bent Street	-
Bus 38 to Grafton Public School, Grafton High School, Grafton Infants School, Clarence Valley Anglican School - Grafton	1/PM	Bent Street Craig Street Charles Street Pacific Highway	-
Bus 43 to Grafton High School, Clarence Valley Anglican School - Clarenza	1/AM 1/PM	Mary Street	-
Bus 27 to McAuley Catholic College - Clarenza	1/AM	Mary Street Oliver Street Craig Street Bent Street Pacific Highway	-

Services	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
Bus 26 to McAuley Catholic College - Clarenza	1/AM	Oliver Street Craig Street Bent Street Pacific Highway	-
Bus 44 to McAuley Catholic College - Clarenza	1/AM 1/PM	Bent Street Pacific Highway	-
Bus 41 to Clarence Valley Anglican School – Clarenza	1/PM	Bent Street Craig Street Oliver Street	-
Bus 37 to Gillwinga Public School	1/AM	Oliver Street Craig Street Bent Street	-
Bus 29 to McAuley Catholic College – Clarenza	1/PM	Bent Street	-
Bus 14 to Gillwinga Public School	1/AM 1/PM	Craig Street Bent Street	-
Bus 21 to Gillwinga Public School	1/AM	Bent Street	-
Bus 5 to McAuley Catholic College – Clarenza	1/AM 1/PM	Oliver Street Craig Street Bent Street Pacific Highway	-
Bus 25 to Gillwinga Public School	1/AM	Bent Street	-
Bus 26 to Gillwinga Public School	1/PM	Bent Street	-
Bus 24 to Chatsworth Island Public School	1/AM 1/PM	Pacific Highway	-
Bus 1 to Cowper Public School	1/AM 1/PM	Pacific Highway	-
Bus 46 to Maclean High School, Maclean Public School	1/AM 1/PM	Pacific Highway	-
Bus 47 to Maclean High School, Maclean Public School	1/AM 1/PM	Pacific Highway	-
Bus 16 to McAuley Catholic College – Clarenza	1/AM	Pacific Highway	-
Bus 11 to McAuley Catholic College – Clarenza	1/AM	Pacific Highway	-
Bus 9 to McAuley Catholic College - Clarenza	1/AM	Pacific Highway	-
Bus 46 to Pacific Valley Christian School	1/AM	Pacific Highway	-
Bus 47 to Pacific Valley Christian School	1/PM	Pacific Highway	-
Bus 7 to Palmers Island Public School	1/PM	Pacific Highway	-
Bus 9 to South Grafton High School	1/AM	Pacific Highway	-
Bus 9 to South Grafton High School	1/PM	Pacific Highway	-
Bus 9 to South Grafton High School	1/PM	Pacific Highway	-

Services	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
Bus 1 to South Grafton High School	1/PM	Oliver Street Mary Street Summerland Way Trenayr Road	-
Bus 14 to South Grafton High School	1/PM	Craig Street Clarence Street Mary Street	-
Bus 34 to South Grafton High School	1/PM	Bent Street	-
Bus 2 to South Grafton High School	1/PM	Mary Street Prince Street	-
Bus 15 to South Grafton High School	1/PM	Bent Street Craig Street Oliver Street Clarence Street	-
Route 378 to South Grafton Infants School	1/AM 1/PM	Bent Street	-
Bus 33 to South Grafton Infants School	1/AM 1/PM	Bent Street	-
Bus 34 to South Grafton Infants School	1/AM 1/PM	Bent Street	-
Bus 37 to South Grafton Infants School	1/AM	Bent Street Craig Street Oliver Street	-
Bus 14 to South Grafton Infants School	1/AM 1/PM	Bent Street Clarence Street Craig Street Fry Street Mary Street Oliver Street	-
Bus 21 to South Grafton Infants School	1/AM	Bent Street	-
Bus 25 to South Grafton Infants School	1/AM	Bent Street	-
Bus 26 to South Grafton Infants School	1/PM	Bent Street	-
Bus 8 to South Grafton Infants School	1/PM	Bent Street Craig Street Oliver Street	-
Bus 4 to South Grafton Infants School	1/PM	Bent Street Craig Street Oliver Street	-
Bus 2 to South Grafton Infants School	1/PM	Fry Street Mary Street Oliver Street	-
Route 377 to South Grafton Infants School	1/AM	Fry Street Mary Street Oliver Street	-

Services	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
Bus 7 to South Grafton Infants School	1/PM	Mary Street Oliver Street	-
Bus 1 to South Grafton Infants School	1/PM	Mary Street Oliver Street Trenayr Road	-
Bus 6 to South Grafton Infants School	1/AM	Oliver Street	-
Bus 5 to South Grafton Infants School	1/AM	Oliver Street	-
Route 376 to South Grafton Infants School	1/AM	Oliver Street	-
Bus 5 to South Grafton Public School	1/AM	Oliver Street	-
Bus 33 to South Grafton Public School	1/AM 1/PM	Bent Street	-
Route 378 to South Grafton Public School	1/AM 1/PM	Bent Street	-
Bus 34 to South Grafton Public School	1/AM 1/PM	Bent Street	-
Bus 37 to South Grafton Public School	1/AM	Bent Street Craig Street Oliver Street	-
Bus 14 to South Grafton Public School	1/AM 1/PM	Bent Street Clarence Street Craig Street Fry Street Mary Street Oliver Street	-
Bus 21 to South Grafton Public School	1/AM	Bent Street	-
Bus 25 to South Grafton Public School	1/AM	Bent Street	-
Bus 4 to South Grafton Public School	1/PM	Bent Street Craig Street Oliver Street	-
Bus 26 to South Grafton Public School	1/PM	Bent Street	-
Bus 8 to South Grafton Public School	1/PM	Bent Street Craig Street Oliver Street	-
Bus 6 to South Grafton Public School	1/AM	Oliver Street	-
Bus 2 to St Andrew's Christian School - Clarenza	1/PM	Clarence Street Fry Street Mary Street Oliver Street	-
Bus 27 to St Andrew's Christian School - Clarenza	1/AM	Craig Street Mary Street Oliver Street	-
Bus 5 to St Andrew's Christian School - Clarenza	1/AM 1/PM	Craig Street Oliver Street	-

Services	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
Bus 26 to St Andrew's Christian School - Clarenza	1/PM	Craig Street Mary Street Oliver Street	-
Route 377 to St Andrew's Christian School - Clarenza	1/AM 1/PM	Fry Street Mary Street Oliver Street	-
Bus 1 to St Andrew's Christian School - Clarenza	1/PM	Mary Street Oliver Street	-
Bus 6 to St Andrew's Christian School - Clarenza	1/AM	Oliver Street	-
Bus 7 to St Andrew's Christian School - Clarenza	1/AM	Oliver Street	-
Bus 2 to St Andrew's Christian School – Clarenza	1/PM	Oliver Street	-
Bus 1 to St Andrew's Christian School - Clarenza	1/AM	Oliver Street	-
Bus 26 to St Andrew's Christian School - Clarenza	1/AM	Craig Street Mary Street	-
Bus 5 to St Andrew's Christian School - Clarenza	1/PM	Oliver Street	-
Bus 8 to St Andrew's Christian School - Clarenza	1/PM	Oliver Street	-
Bus 7 to St Andrew's Christian School - Clarenza	1/PM	Oliver Street	-
Bus 6 to St Andrew's Christian School - Clarenza	1/PM	Oliver Street	-
Bus 27 to St Andrew's Christian School - Clarenza	1/PM	Oliver Street	-
Bus 10 to St Hames Primary School	1/PM	Clarence Street	-
Bus 7 to St James Primary School	1/PM	Pacific Highway	-
Bus 45 to St Joseph's Primary School (Maclean)	1/AM 1/PM	Charles Street	-
Bus 2 to St Joseph's Primary School (Maclean)	1/AM 1/PM	Clarence Street	-
Bus 46 to St Joseph's Primary School (Maclean)	1/AM 1/PM	Pacific Highway	-
Bus 47 to St Joseph's Primary School (Maclean)	1/AM 1/PM	Pacific Highway	-
Route 378 to St Joseph's Primary School (South Grafton)	1/AM	Bent Street	-
Bus 8 to St Joseph's Primary School (South Grafton)	1/AM	Bent Street Craig Street	-
Bus 33 to St Joseph's Primary School (South Grafton)	1/AM 1/PM	Bent Street	-

Services	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
Bus 7 to St Joseph's Primary School (South Grafton)	1/AM	Bent Street Craig Street	-
Bus 34 to St Joseph's Primary School (South Grafton)	1/AM 1/PM	Bent Street	-
Bus 37 to St Joseph's Primary School (South Grafton)	1/AM	Bent Street Craig Street	-
Bus 14 to St Joseph's Primary School (South Grafton)	1/AM	Bent Street Craig Street	-
Bus 14 to St Joseph's Primary School (South Grafton)	1/PM	Clarence Street Craig Street	-
Bus 21 to St Joseph's Primary School (South Grafton)	1/AM	Bent Street	-
Bus 25 to St Joseph's Primary School (South Grafton)	1/AM	Bent Street	-
Bus 26 to St Joseph's Primary School (South Grafton)	1/PM	Bent Street	-
Route 378 to St Mary's Primary School (Grafton)	1/AM	Bent Street Craig Street	-
Bus 34 to St Mary's Primary School (Grafton)	1/AM 1/PM	Bent Street	-
Bus 12 to St Mary's Primary School (Grafton)	1/AM 1/PM	Bent Street Craig Street	-
Route 373 to St Mary's Primary School (Grafton)	1/AM	Bent Street Craig Street	-
Bus 32 to St Mary's Primary School (Grafton)	1/PM	Bent Street Oliver Street	-
Bus 33 to St Mary's Primary School (Grafton)	1/PM	Bent Street	-
Bus 2 to St Mary's Primary School (Grafton)	1/PM	Clarence Street Fry Street Mary Street Oliver Street	-
Bus 12 to St Mary's Primary School (Grafton)	1/AM 1/PM	Fry Street Oliver Street	-
Bus 18 to St Mary's Primary School (Grafton)	1/PM	Fry Street Mary Street Oliver Street	-
Bus 1 to St Mary's Primary School (Grafton)	1/PM	Mary Street Oliver Street Trenayr Road	-
Bus 8 to St Mary's Primary School (Grafton)	1/AM	Oliver Street	-
Bus 8 to St Mary's Primary School (Grafton)	1/PM	Oliver Street	-
Bus 2 to St Mary's Primary School (Grafton)	1/AM	Oliver Street	-

Services	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
Route 377 to St Mary's Primary School (Grafton)	1/AM	Oliver Street	-
Bus 1 to St Mary's Primary School (Grafton)	1/AM	Oliver Street	-
Bus 7 to St Mary's Primary School (Grafton)	1/PM	Oliver Street	-
Bus 1 to St Mary's Primary School (Grafton)	1/AM	Trenayr Road	-
Bus 38 to St Mary's Primary School (Grafton)	1/PM	Pacific Highway	-
Bus 1 to Ulmarra Public School	1/AM	Pacific Highway	-
Bus 16 to Ulmarra Public School	1/PM	Pacific Highway	-
Route 378 to Westlawn Public School	1/AM	Bent Street Craig Street	-
Bus 34 to Westlawn Public School	1/AM	Bent Street	-
Bus 12 to Westlawn Public School	1/AM	Bent Street	-
Bus 12 to Westlawn Public School	1/AM	Fry Street Oliver Street	-
Route 373 to Westlawn Public School	1/AM	Bent Street Craig Street	-
Bus 32 to Westlawn Public School	1/PM	Bent Street Oliver Street	-
Bus 12 to Westlawn Public School	1/PM	Bent Street Craig Street	-
Bus 34 to Westlawn Public School	1/PM	Bent Street	-
Bus 33 to Westlawn Public School	1/PM	Bent Street	-
Bus 2 to Westlawn Public School	1/PM	Clarence Street Fry Street Mary Street Oliver Street	-
Bus 18 to Westlawn Public School	1/PM	Fry Street Oliver Street	-
Bus 1 to Westlawn Public School	1/PM	Mary Street Fry Street Oliver Street Trenayr Road	-
Bus 8 to Westlawn Public School	1/AM	Oliver Street	-
Bus 8 to Westlawn Public School	1/AM	Oliver Street	-
Bus 2 to Westlawn Public School	1/AM	Oliver Street	-
Route 377 to Westlawn Public School	1/AM	Bent Street Craig Street	-
Bus 1 to Westlawn Public School	1/AM	Oliver Street	-
Bus 32 to Westlawn Public School	1/AM	Oliver Street	-
Bus 8 to Westlawn Public School	1/PM	Oliver Street	-

Services	Weekday frequency	Roads used by the service and by Project traffic	Interface with the Project alignment
Bus 7 to Westlawn Public School	1/PM	Oliver Street	-
Bus 1 to Westlawn Public School	1/AM	Trenayr Road	-
Bus 14 to Yamba Public School	1/AM	Clarence Street	-
Bus 7 to Yamba Public School	1/PM	Pacific Highway	-

The increase in construction traffic, particularly HV traffic, has the potential to impact these school bus routes. Although not assessed in detail during this phase of the Project, in order to mitigate the impacts upon school bus operations, the bus operators will be consulted as part of the Project and made aware of the various construction activities. The Principal Contractor will also be made aware of the presence of school bus routes and their operational hours as part of the Project induction process.

2.2.5 Long-distance services

Privately operated long-distance coach services that use roads within the impact assessment area were identified through a review of data sourced from DTMR (Queensland) and TfNSW (NSW). These existing coach service routes may use roads:

- That will be intersected by the Project alignment
- That are proposed to be used for construction traffic

Long-distance coach services that use roads within the impact assessment area that may interface with Project activities are listed in Table 2.7.

Table 2.7 Long-distance coach services with potential to interface with Project activities

Services	Roads used by the service and by Project traffic	Interface with the Project alignment
Brisbane City to Grafton	Pacific Motorway	-
Brisbane City to Mount Isa	Ipswich Motorway National Highway Logan Motorway Cunningham Highway Warrego Highway Tourist Road Mackenzie Street Bridge Street	-
Brisbane City to Charleville	Ipswich Motorway National Highway Logan Motorway Cunningham Highway Warrego Highway Gatton-Helidon Road Tourist Road Mackenzie Street Bridge Street	-
Toowoomba to St George	Hursley Road Leichhardt Highway	-
Toowoomba to Cunnamulla	Hursley Road Toowoomba-Cecil Plains Road Gore Highway Yandilla Street	-

Services	Roads used by the service and by Project traffic	Interface with the Project alignment
Toowoomba to Rockhampton	Warrego Highway	-
Toowoomba to Lightning Ridge	Gore Highway Barwon Highway Leichhardt Highway	-
Brisbane City to Grafton	Pacific Motorway Summerland Way Villers Street Dobie Street Bent Street Craig Street Charles Street	-
Route 141 - Grafton to Moree Town (Transport for NSW Coach Service)	Gwydir Highway	-
Route 142 - Moree Town to Grafton (Transport for NSW Coach Service)	Gwydir Highway	-

2.2.6 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*, *Land Act 1994* and the *Transport Infrastructure Act 1994*.

The Project interfaces with the State stock route network in 12 locations. 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.

Locations of stock routes that intersect with the Project footprint are identified in Table 2.8. There are no stock routes along the construction traffic routes in NSW.

Table 2.8 Stock routes within the impact assessment area

Location and Project interface point (approximate chainage)	Stock route ID, type, status and class	Description
Kildonan Road Ch 33.1 km (NS2B)	ID: 005GWND Type: Road Status: Open Class: Primary	This stock route follows Kildonan Road. The Project alignment crosses this stock route at Kurumbul.
Rainbow Reserve and Eukabilla Road Ch 33.4 km (NS2B)	ID: RAINBOW RESERVE Type: Reserve Status: Open Class: Primary	This stock reserve encompasses the Rainbow Reserve camping area and Eukabilla Road. The Project alignment enters into this stock reserve at Ch 33.15 km (NS2B) and crosses Eukabilla Road at 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 leaves exits the stock reserve.

Location and Project interface point (approximate chainage)	Stock route ID, type, status and class	Description
Wondalli-Kurumbul Road and Yelarbon-Kurumbul Road Ch 7.2 km	ID: 081GWND Type: Road Status: Open Class: Secondary	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.
Yelarbon Ch 25.4 km	ID: 811GWND Type: Road Status: Open Class: Minor and unused	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.
East of Sawmill Road Ch 27.0 km	ID: RESERVE Type: Reserve Status: Open Class: Minor and unused	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 of Sawmill Road to the north. The Project involves curve easing of East of Sawmill Road, which will encroach by up to 15 m into the north-west corner of the stock reserve. The existing Yelarbon levee extends diagonally across this stock reserve. Modifications to the existing Yelarbon levee, if they are to occur, will temporarily require works within the stock reserve.
Lovells Crossing Road Ch 65.8 km	ID: 813GWD Type: Road Status: Open Class: Minor and unused	This stock route follows Lovells Crossing Road. The Project alignment crosses this stock route approximately 3 km north of Inglewood.
Millmerran-Inglewood Road (Inglewood) Ch 73.1 km to Ch 76.5 km	ID: 820GWD Type: Road Status: Open Class: Minor and unused	This stock route follows Millmerran-Inglewood Road. The Project alignment crosses this stock route twice in ten kilometres, once at Ch 75.0 km and again at Ch 85.0 km.
Millmerran-Inglewood Road (Inglewood) Ch 84.2 km	ID: 820GWD Type: Road Status: Open Class: Minor and unused	This stock route follows or runs parallel to the east of Millmerran-Inglewood Road. The Project alignment crosses this stock route at the point of the stock route re-joining Millmerran-Inglewood Road.
Koorongarra-Anderson Road Ch 96.1 km	ID: 856TOOW Type: Road Status: Open Class: Minor and unused	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 Koorongarra-Anderson Road and Millmerran-Inglewood Road.
Millmerran-Inglewood Road (near Heckendorfs Road) Ch 115.5 km	ID: 820TOOW Type: Road Status: Open Class: Minor and unused	This stock route follows Millmerran-Inglewood Road. The Project alignment crosses this stock route approximately 900 m south of the intersection of Heckendorfs Road and Millmerran-Inglewood Road.
Koorongarra Road (Commodore Mine) Ch 127.2 km	ID: 820TOOW Type: Road Status: Open Class: Minor and unused	The stock route follows Millmerran-Koorongarra Road and Millmerran-Inglewood Road. This Project alignment crosses this stock route approximately 550 m north of the intersection between Millmerran-Inglewood Road, Millmerran-Koorongarra Road and Schwartens Road.
Warrego Highway Ch 203.01 km	ID: No ID – Unused Type: Road Status: Open Class: Minor and unused	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.

2.2.7 State 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.

Strategic touring routes within the impact assessment area that are proposed to be used for construction traffic are listed in Table 2.9.

Table 2.9 Strategic touring routes that are proposed to be used for construction traffic

Strategic touring route	Section of route proposed to be used by Project traffic
Adventure Way	Warrego Highway, between Haigslea-Amberley Road and Ipswich Motorway
Warrego Way	Warrego Highway, between Haigslea-Amberley Road and Ipswich Motorway
Pacific Coast Way	Pacific Highway between Logan Motorway and Smith Street Motorway
Leichhardt Way	Leichhardt Highway for 800 m between Leichhardt Highway and Lagoon Street
New England Highway	New England Highway between Bruxner Way and Bruxner Highway, and again between Gwydir Highway (Meade Street) and Gwydir Highway (Ferguson Street)
Australian Country Way	New England Highway between Bruxner Way and Bruxner Highway
Legendary Pacific Coast Drive	Pacific Highway between Logan Highway and Gwydir Highway

2.3 Existing rail facilities

QR 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 610.0 km and consists of a primary rail corridor from Toowoomba to Thallon via Warwick, with branch lines from:

- Warwick to Wallangarra
- Wyreemah to Millmerran.

The South Western System adjoins the West Moreton System at Toowoomba.

The Project utilises approximately 46.8 km of the existing rail corridor for the South Western Line and approximately 24.4 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.

2.3.1 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.

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 (refer Table 2.10).

Table 2.10 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 2.11

Table 2.11 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 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.

2.3.2 Millmerran Branch Line

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

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 (refer Table 2.12).

Table 2.12 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 2.13.

Table 2.13 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 tal.
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.

2.3.3 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 sometimes referred to as passing loops.

The Project will utilise 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, 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.

2.4 Cycling and pedestrian network

On-road cycleways that use roads within the impact assessment area were identified through a review of data sourced from the Queensland Principle Cycle Network Plans (PCNP) and the NSW RMS online 'Cycleway Finder' tool. The PCNP is a guide for future cycleway planning and presents the core routes that are required to increase cycling amongst the population.

Eleven cycleways in Queensland and six within NSW use roads that are proposed to be used for construction traffic. These cycleways are summarised in Table 2.14.

Table 2.14 Cycleways with potential to interface with Project activities

Jurisdiction	Cycleway
TRC	Warrego Highway, between Tor Street and Kingsthorpe-Haden Road (Charlton/Gowrie Mountain)
	Toowoomba Bypass, between Mort Street and Toowoomba-Cecil Plains Road (Charlton)
	Toowoomba-Cecil Plains Road, between Warrego Highway and Hanrahan Road (Charlton)
	Charlton Connection Road, between Warrego Highway and Toowoomba-Cecil Plains Road (Charlton)
	McDougall Street, between Toowoomba-Cecil Plains Road and Hursley Road (Charlton)
	Drayton-Wellcamp Road, between Deuble Road and Euston Road (Wellcamp)
	Gore Highway, between Harrow Street and Ferguson Road (Westbrook)
	Railway Street, between Toowoomba Road and Murray Street (Pittsworth)
	Short Street, between Railway Street and Yandilla Street (Pittsworth)
	Yandilla Street between Short Street and Cypress Street (Pittsworth)
Ipswich City Council	Warrego Highway, between Wulkuraka Connection Road and Mt Crosby Road
NSW	Oliver Street, between Clarence Street and Mary Street
	Mary Street, between Oliver Street and Fry Street
	Fry Street, between Mary Street and Alice Street
	Summerland Way, between Ecles Street and Bruxner Highway
	Bruxner Way, between Bulwer Street and New England Highway
	New England Highway, between Bruxner Highway and Rouse Street

Several of the proposed construction routes use roads that also have a moderate to high volume of pedestrian activity. This is particularly true for construction routes that are aligned through the towns of Toowoomba, Pittsworth, Millmerran, Inglewood, Yelarbon and Grafton.

Given the largely rural and semi-rural nature of the Project footprint, there is little in the way of dedicated pedestrian infrastructure. Instead, pedestrian movements are largely via co-usage of local government roads. Locations where pedestrians currently have access, via public road, from one side of the proposed Project alignment to the other are listed in Table 2.3. Locations that have an existing QR level crossing are also identified in the table.

There are no existing active dedicated pedestrian level crossings with the proposed rail alignment. Relevant PCNP maps are provided in Appendix R.

3 Proposed works

3.1 Basis of design

The key characteristics of the Inland Rail Program service offering are reliability, price, transit time and availability. To help achieve this service offering ARTC has developed a Basis of Design to provide consistent design requirements and parameters across the Inland Rail Program. The standardised design criteria provide guidance for consistent design, ensuring an asset is delivered that meets business and operational requirements.

The Basis of Design acts as a primary point of reference for the design of the Project; forming a baseline for design criteria and design standards. The Basis of Design consists of a series of performance specifications relating to Project design components. Performance specifications for Inland Rail and the Project are summarised in Table 3.1.

Table 3.1 Performance specifications for Inland Rail and the Project

Attribute	Specification
Reference train	
Intermodal	21 tonne axle load (TAL), 115 kilometres per hour (km/h) maximum speed, 1,800 m length (initial) 2.7 horsepower per tonne (hp/tonne) power:weight ratio
Bulk freight	25 TAL (initial), 80 km/h maximum speed, length determined by customer requirements within maximum train length
Operational specification	
Freight train transit time (terminal to terminal)	Target is driven by a range of customer preferences. But, less than 24 hours from Melbourne to Brisbane for the intermodal reference train. Flexibility to provide for faster (higher power:weight ratio) and slower (lower power:weight ratio) services to meet market requirements
Gauge	Standard (1,435 mm) with dual standard/narrow (1,435 mm/1,067 mm) gauge in appropriate Queensland sections
Maximum freight operating speed	115 km/h at 21 TAL
Maximum axle loads (initial)	21 tonnes at 115 km/h 23 tonnes at 90 km/h 25 tonnes at 80 km/h
Maximum train length	1,800 m (initial), with potential for operation of 3,600 m trains
Minimum design standards	
General alignment standards	
Design speed	115 km/h
Maximum grade	1:100 target, 1:80 maximum (compensated) 1:200 maximum at arrival or departure points at loops
Curve radius	1,200 m target, 800 m minimum
Flood immunity	Track drainage must have the capacity for a 1% AEP without overtopping the formation
Medium speed alignment standards (mountainous terrain)	
Design speed	80 km/h minimum
Maximum grade	1:100 target, 1:50 maximum (compensated) 1:200 maximum at arrival or departure points at loops
Curve radius	800 m target, 400 m minimum
Corridor width	40 m minimum

Attribute	Specification
Rail	Minimum 53 kg/m on existing track; 60 kg/m on new or upgraded track
Concrete sleepers	Rated to 30 TAL
Sleeper spacing	667 mm spacing (1,500/km) - existing track 600 mm (1,666/km) - new corridors/track or re-sleepering existing track
Turnouts	Rated at track speed on the straight and 80 km/h entry/exit on the diverging track
Crossing loops (initial)	1,800 m (clearance point to clearance point) plus signalling overlap No level crossing across loops or within road vehicle sighting distance from loops
Future proofing	
Train length	To provide for future extension of maximum train length to 3,600 m
New structures	Capable of 30 TAL at 80 km/h minimum
Formation	Formation on new track suitable for 30 TAL at 80 km/h
Crossing loops	Loops designed and located to allow future extension for 3,600 m trains
Reliability and availability	Competitive with road

3.2 Construction

The general construction activities for the Project will include:

- Site set out and pegging
- Clearing – utilising dozers, chainsaws, excavators, trucks and similar equipment
- Bulk earthworks – major cut to fill operations include the winning of suitable construction material from sections of cut along the railway alignment or from borrow areas external to the site
- Supply, delivery and installation of ballast and concrete sleepers
- Construction of drainage facilities – cut off drains, table drains and culvert structures
- Installation of rail track and other items of rail infrastructure using rail mounted equipment
- Construction and installation of concrete railway bridges and culverts
- Installation of railway signalling and communications equipment
- Construction of railway maintenance facilities
- Other miscellaneous activities to complete the works.

Construction of the Project will commence once the detail design is complete and all the necessary approvals have been obtained. The indicative construction timetable for the Project is:

- Contract award end of 2020
- Pre-construction activities and early works commence in 2021
- Target completion of construction by the beginning of 2026
- Six months testing and commissioning phase from early to mid 2026.

The broad milestone dates for construction are indicative only and are subject to change during the detail design and construction phases as a result of:

- Weather conditions
- Changes to construction methods and materials
- Unexpected finds, such as threatened biodiversity species or cultural heritage values
- Community interest in the Project or issues that need to be addressed.

Variations to the construction sequences in relation to programme optimisation, constructability, resource availability and local conditions (weather and industry) will be investigated during the detailed design phase of the Project. The schedule of environmental controls, including traffic management and noise controls, would be adjusted accordingly.

The Project is part of a larger Inland Rail Program of works. It is anticipated that 16,000 jobs will be required program-wide at the peak of construction, with an average of 800 jobs per annum over the 10 year construction period. An average of 700 additional jobs per annum is anticipated over 50 years of operation (2024 to 2074).

Workforce on site for the Project is estimated to peak at 950 full-time equivalents (FTE) between weeks 50 and 70 of construction. The average number of full-time equivalent workforce on site across the full construction period is over 400 people.

The major construction activities for the Project consist of transportation of quarry materials (ballast, capping materials), pre-cast concrete, in-situ concrete, consolidated sleepers, earthworks materials, workforce, delivery of water, delivery/collection of plant, tools and other materials.

Due to the large workforce required during the construction of the Project, the location of the alignment and lack of suitable established accommodation options, especially for the southern half of the Project, three workforce accommodation camps have been proposed. For construction logistical purposes, non-resident workforce accommodation would be optimally located in the proximity of the townships of Yelarbon, Inglewood and Millmerran. Details on these non-resident workforce accommodation facilities are found in Section 5.4. Accommodation demands north of Millmerran could reasonably be serviced by established accommodation in Pittsworth and Toowoomba. The impact of the locations of these non-resident workforce accommodation facilities will be required to be assessed once the locations have been finalised.

Further details on construction activities and traffic and workforce generated traffic are provided in Section 5.

3.3 Operation

Operation phase activities will include the use of the railway for freight purposes, operation and maintenance of safety systems, signalling, and general track and infrastructure maintenance.

The hours of operation are anticipated to be on a 24 hour/7 day calendar.

The Project will involve operation of a single rail track with crossing loops, initially to accommodate double stacked freight trains 1,800 m long and 6.5 m high. Train speeds will vary according to axle loads and track geometry, and range from 80 to 115 km/hr.

It is estimated that once operational, the Project will involve an annual average of about 14 train services per day in 2026. 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. Annual freight tonnages will increase in parallel, from approximately 14.2 million tonnes per year in 2026 to 21.8 million tonnes per year in 2040. Standard ARTC maintenance activities will be undertaken during operations in accordance with task-specific ARTC work method statements (available on the ARTC Extranet: <https://extranet.artc.com.au/>). Typically, these activities include:

- Minor maintenance works, such as:
 - Bridge inspections
 - Culvert cleanout
 - Sleeper replacement
 - Rail welding
 - Rail grinding
 - Ballast profile management
 - Track tamping

- Clearing/slashing vegetation within the rail corridor. The rail corridor will be maintained free of woody vegetation.
- Major periodic maintenance, such as:
 - Ballast cleaning
 - Formation work
 - Reconditioning of track
 - Adjustment
 - Turnout replacement
 - Correction of track level and line
 - Maintenance of structures including waterproofing, jointing etc.

These activities will occur on a scheduled basis, in addition to being in response to unplanned requirements, e.g. maintenance following adverse weather events.

3.3.1 Road-rail interface locations

The Project alignment crosses several State-controlled roads and local government roads. A summary of the number of intersections with each public road type is presented in Table 3.2.

Table 3.2 Public road intersections included in the reference design for the Project

Road type	Number of intersections ¹
State-controlled	9
GRC	18
TRC	26

Table note:

- 1 Only includes locations where a crossing solution is provided. Excludes intersection locations where no crossing is provided in the reference design.

Each intersection between rail and road requires a design treatment. Design treatments for public road-rail intersections that are included in the 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.
- 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.

Assessment of each road-rail interface (existing and proposed) has been conducted using a national system called the Australian Level Crossing Assessment Model (ALCAM). 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, 2019)
- ONRSR Guideline: Meaning of duty to ensure safety so far as is reasonably practicable - SFARIP (ONRSR, 2016b)
- Queensland Level Crossing Safety Strategy 2012-2021 (DTMR, 2012).

Both the ONRSR Policy and QLCSS 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 SFARIP, as defined in ONRSR Guideline (ONRSR, 2016). The 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 SFARIP can be achieved through the provision of level crossings in lower risk locations.

ARTC has conducted, and will continue to undertake, consultation with DTMR and local councils in relation to the preferred road-rail interface treatments for each location.

The reference design includes locations where there are existing road-rail intersections, as well locations where new road-rail intersections will be required. Existing public road-rail intersection locations along the Project alignment are summarised in Table 3.3, with a description of the proposed reference design treatment for each. These locations are shown on Figure 1.2.

Table 3.3 Existing public road-rail intersections and proposed design treatments

Interface ID ¹	Road name	Existing QR crossing type	Proposed treatment in the reference design
State-controlled roads			
310-11-E-1	Cunningham Highway (Wondalli Street)	Active level crossing	No crossing provided at this location – relocated
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
Goondiwindi Regional Council			
310-4-E-2	South Kurumbul Road	Passive level crossing	Active level crossing
310-12-E-1	Suttons Road	Passive level crossing	Passive level crossing
310-14-E-0	Springborg Road	Passive level crossing	Passive level crossing
310-16-E-1	Whetstone Access Road	Passive level crossing	Active level crossing
Toowoomba Regional Council			
310-40-E-1	Hall Road	Passive level crossing	Passive level crossing
310-41-E-6	Gilgai Lane	Passive level crossing	Passive level crossing
310-42-E-1	Fysh Road	Active level crossing	No crossing provided at this location – relocated
310-43-E-3	Elsden Road	Passive level crossing	Active level crossing
310-45-E-1	Longhurst Road	Passive level crossing	Active level crossing

Table note:

1 Interface IDs shown on Figure 1.2.

The proposed public road-rail interface locations and road closures associated with the Project are listed in Table 3.4. These are locations without an existing road-rail interface and are shown on Figure 1.2.

Table 3.4 Proposed public road-rail interface and design treatments

Interface ID ¹	Road name	Proposed treatment in the reference design
State-controlled roads		
310-11-P-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)
Goondiwindi Regional Council		
270-11-P-9a	Stock Reserve	Grade separation: rail-over-road (bridge)
270-12-P-1	Kildonan Road	Active level 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
310-5-P-1	Wondalli-Kurumbul Road	Passive level crossing
310-8-E-0	Unnamed Road	Passive level crossing
310-10-P-1	Unnamed Road	Passive level crossing
310-14-E-1	Springborg Road	No crossing provided at this location – relocated
310-17-P-7a	McDougalls Crossing Road	Active level crossing
310-18-P-8	Cremascos Road	Active level crossing
310-19-P-8	Unnamed Road	No crossing provided at this location – consolidated
310-20-P-7	Unnamed Road	No crossing provided at this location – consolidated
310-20-P-12	Bybera Road	No crossing provided at this location – relocated
310-20-P-12z	Bybera Road	Passive level crossing
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	Grade separation: rail-over-road (culverts)
310-28-P-3	Unnamed Road	Active level crossing
Toowoomba Regional Council		
310-30-P-2	Unnamed Road	Passive level crossing
310-31-P-7	Koorongarra Road	Passive level crossing
310-32-P-4	Paton Road	Passive level crossing
310-33-P-1	Nicol Creek Road	Passive level crossing
310-34-P-1	Millwood Road	Passive level crossing
310-35-P-4a	Heckendorf Road	No crossing provided at this location – road diverted/re-aligned
310-36-P-1	Blackwell Road	Active level crossing

Interface ID ¹	Road name	Proposed treatment in the reference design
310-36-P-8a	Scraggs Road	Passive level crossing
310-37-P-12	Schwartens Road	No crossing provided at this location – consolidated
310-38-P-3	Owens Scrub Road	Active level crossing
310-39-P-1	Lindenmayer Road	Passive level crossing
310-42-E-0	Harris Road	Active level crossing
310-43-E-8	Mann Silo Road	Passive level crossing
310-46-E-1	Yarranlea Road	Grade separation: rail-over-road (bridge)
310-46-P-3	Roche 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-1	Unnamed 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-5	Geitz Road	No crossing provided at this location – consolidated
310-50-P-11	Linthorpe Valley Road	Passive 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-1	Unnamed Road	No crossing provided at this location – road diverted/re-aligned
310-52-P-3	Purcell Road	Passive level crossing
310-53-P-1	Athol School Road	No crossing provided at this location – consolidated
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

Table note:

1 Interface IDs shown on Figure 1.2.

The 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 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 - Manual of uniform traffic control devices: Part 7 and with the Manual of Uniform Traffic Control Devices Part 7: Railway Crossings (DTMR, 2019e).

In consultation through the development of the reference design, DTMR requested that separation distances be sufficient to allow for storage of two 42.5 m A-triple vehicles. Through detailed assessment of the existing road network, it was found that 42.5 m A-triple vehicles do not use roads in proximity to the Project alignment. Therefore, ARTC has retained a minimum separation distance of 49.5 m for the purpose of the reference design. ARTC will continue to consult with DTMR through the development of the detail design to identify opportunities to accommodate, where possible, greater separation distances between rail and neighbouring roads.

Where the rail alignment interfaces with stock routes, the design vehicle has been assumed to be a standard light vehicle.

3.3.2 Road alterations

This section discusses potential alterations to the local road network during the construction and operation phases of the Project. These proposed alterations may include both temporary and permanent alterations to the road network to facilitate the construction of the rail alignment and road closures and diversions along the Project rail corridor (i.e. in the vicinity of road-rail interface locations).

The proposed public road alterations as a part of the Project are summarised in Table 3.5. The impacts of these proposed alterations are discussed further in section 6.4.3.2.

Table 3.5 Proposed road realignments, diversions and closures

Interface ID	Road name	Proposed treatment
Department Transport and Main Roads		
310-11-E-1	Cunningham Highway (Wondalli Street)	No crossing provided - relocate
GRC		
270-12-P-2	Kildonan Road - Stock Reserve	No crossing provided - relocate
270-12-P-4	Eukabilla Road	No crossing provided - road divert/re-align
270-12-P-6a	Eukabilla Road	No crossing provided - road divert/re-align
310-14-E-1	Springborg Road	No crossing provided - relocate
310-19-P-8	Unnamed Road	No crossing provided - consolidate
310-20-P-7	Unnamed Road	No crossing provided - consolidate
310-20-P-12	Bybera Road	No crossing provided - relocate
TRC		
310-35-P-4a	Heckendorf Road	No crossing provided - road divert/re-align
310-37-P-12	Schwartens Road	No crossing provided - consolidate
310-42-E-1	Fysh Road	No crossing provided - relocate
310-46-P-4c	Murlaggan Road	No crossing provided - relocate
310-47-P-1	Kahler Road	No crossing provided - consolidate
310-47-P-3	French Road	No crossing provided - road divert/re-align
310-48-P-9	Quibet Road	No crossing provided - road divert/re-align
310-48-P-10	Dallman Road	No crossing provided - road divert/re-align
310-49-P-1	Unnamed Road	No crossing provided - road divert/re-align
310-49-P-6	McEwan Lane	No crossing provided - consolidate
310-49-P-8	Paint Mine Road	No crossing provided - road divert/re-align
310-50-P-5	Geitz Road	No crossing provided - consolidate
310-51-P-8	Bushy Lane	No crossing provided - road divert/re-align
310-52-P-1	Unnamed Road	No crossing provided - road divert/re-align
310-53-P-1	Athol School Road	No crossing provided - consolidate
State of QLD		
310-24-P-3	Unnamed Road (Stock Route)	No crossing provided - road divert/re-align
310-25-P-1	Unnamed Road	No crossing provided - road divert/re-align

4 Baseline operations

This section discusses the existing operational conditions for SCRs and LGRs that may be impacted by Project activities.

4.1 Existing road links

4.1.1 Level of service definition

LOS is a qualitative measure describing the operational conditions within a traffic stream. This will be determined for both the existing road links as well as during the various construction stages where the Project's construction activities could potentially have an impact on the operational performance of the surrounding road network. The findings from the analysis will lead to the formulation of potential mitigation measures to address the identified impacts.

LOS is defined in terms of service measures such as speed and travel time, freedom to manoeuvre, traffic interruptions, comfort and convenience. The practical application of LOS to different road environments takes into account factors such as road hierarchy, volume/capacity ratios, terrain types, proportion of HVs and road gradients. The methodology and LOS criteria have been obtained from the *Guide to Traffic Management Part 3: Traffic Studies and Analysis* and *Highway Capacity Manual 2016*.

There are six LOS, each of which represents a range of operating conditions and the driver's perception of those conditions, and can generally be described as:

- **LOS A:** A condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.
- **LOS B:** In the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is a little less than with LOS A.
- **LOS C:** Also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.
- **LOS D:** Close to the limit of stable flow and approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.
- **LOS E:** Occurs when traffic volumes are at or close to capacity and there is virtually no freedom to select desired speeds and to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause flow breakdown.
- **LOS F:** In the zone of forced flow. The amount of traffic approaching the point under consideration exceeds that which can pass it. Flow breakdown occurs, and queuing and delays result.

Road authorities generally prefer to design new rural road projects for LOS A or B at opening and LOS C to D in the design year. However, some rural projects and most urban projects will have practical and financial limits on the extent of work that can be achieved and consequently the performance criteria will have to be negotiated throughout the traffic analysis process. In this regard, an analysis of the existing level of service on the road network provides a useful benchmark by which to assess changes as a result of the Project. The colours adopted to represent the various LOS are as shown in Table 4.1.

Table 4.1 LOS categories and colour scheme

LOS A
LOS B
LOS C
LOS D
LOS E
LOS F

4.1.2 Link analysis criteria

The LOS criteria are based on the design hour volume to AADT ratio with respective saturation flows per terrain type as obtained from *Austroads Part 2 - Guide to Traffic Engineering Practice: Roadway Capacity* and is provided in Table 4.2 and Table 4.3. The thresholds outlined in these tables were adopted for all two-way two-lane roads. The LOS criteria adopted are for the purpose of identifying any changes to the network performance in the future scenarios by comparing the scenarios with and without the additional traffic generated by the Project. Table 4.4 outlines the criteria adopted for multi-lane highway sections.

Table 4.2 Saturation flow rate – uninterrupted two-lane two-way rural roads (vehicles per day)

Design hour volume to AADT ratio (K-value)	Level of service				
	A	B	C	D	E
Level terrain					
0.1	2,400	4,800	7,900	13,500	22,900
0.11	2,200	4,400	7,200	12,200	20,800
0.12	2,000	4,000	6,600	11,200	19,000
0.13	1,900	3,700	6,100	10,400	17,600
0.14	1,700	3,400	5,700	9,600	16,300
0.15	1,600	3,200	5,300	9,000	15,200
Rolling terrain					
0.1	1,100	2,800	5,200	8,000	14,800
0.11	1,000	2,500	4,700	7,200	13,500
0.12	900	2,300	4,400	6,600	12,300
0.13	900	2,100	4,000	6,100	11,400
0.14	800	2,000	3,700	5,700	10,600
0.15	700	1,800	3,500	5,300	9,900
Mountainous terrain					
0.1	500	1,300	2,400	3,700	8,100
0.11	400	1,200	2,200	3,400	7,300
0.12	400	1,100	2,000	3,100	6,700
0.13	400	1,000	1,800	2,900	6,200
0.14	300	900	1,700	2,700	5,800
0.15	300	900	1,600	2,500	5,400

Source: Austroads Part 2 - Guide to Traffic Engineering Practice: Roadway Capacity

Table 4.3 Saturation flow rate – uninterrupted two-lane-two-way rural roads (pc/h/ln)

Design hour volume to AADT ratio (K-value)	Level of service				
	A	B	C	D	E
Level terrain					
0.1	250	500	800	1,350	2,300
0.11	250	500	800	1,350	2,300
0.12	250	500	800	1,350	2,300
0.13	250	500	800	1,350	2,300
0.14	250	500	800	1,350	2,300
0.15	250	500	800	1,350	2,300
Rolling terrain					
0.1	50	300	500	800	1,500
0.11	50	300	500	800	1,500
0.12	50	300	500	800	1,500
0.13	50	300	500	800	1,500
0.14	50	300	500	800	1,500
0.15	50	300	500	800	1,500
Mountainous terrain					
0.1	50	150	250	350	800
0.11	50	150	250	350	800
0.12	50	150	250	350	800
0.13	50	150	250	350	800
0.14	50	150	250	350	800
0.15	50	150	250	350	800

Source: Austroads Part 2 - Guide to Traffic Engineering Practice: Roadway Capacity. Values rounded to the nearest 50.

Table 4.4 Saturation flow rate – Multi-lane highways (pc/h)

Number of lanes	Level of service				
	A	B	C	D	E
One lane	200	380	600	900	1400
Two lanes	900	1400	1800	2200	2800
Three lanes	1350	2100	2700	3300	4200

Source: Austroads Part 2 - Guide to Traffic Engineering Practice: Roadway Capacity. Values rounded to the nearest 50.

4.1.3 Baseline traffic volumes

Baseline AADT volumes and HV percentages by direction have been tabulated for each road section along the Project construction traffic routes. These tables also provide the road hierarchy and data source for each of these road segments. The data sources used in the assessment have been provided in Table 4.5.

Table 4.5 Traffic data sources

Source ID	Traffic data source
A	Volumes obtained from DTMR detailed segment and weekly reports
B	Volumes adopted from adjacent DTMR road segment
C	Volumes obtained from RMS opensource Traffic Viewer. Adjacent road link volumes were adopted on links where traffic information is not available
D	Urban Local Road - Volumes derived by assuming LOS A with associated AADT of 2000 veh/day as depicted in Austroads Part 2 - Guide to Traffic Engineering Practice: Roadway Capacity
	Urban Collector Road - Volumes derived by assuming LOS B with associated AADT of 3800 veh/day as depicted in Austroads Part 2 - Guide to Traffic Engineering Practice: Roadway Capacity
	Rural Local Road - Volumes derived by assuming AADT of 400 veh/day based on a review of proximate rural local roads
	Rural Collector Road - Volumes derived by assuming LOS A with K-value of 0.12 with associated AADT of 2000 veh/day as depicted in Austroads Part 2 - Guide to Traffic Engineering Practice: Roadway Capacity
E	Rural Arterial Road - Volumes derived by assuming LOS A with K-value of 0.15 with associated AADT of 1,600 veh/day as depicted in Austroads Part 2 - Guide to Traffic Engineering Practice: Roadway Capacity
	Urban Arterial Road - Volumes derived by assuming LOS A with K-value of 0.12 with associated AADT of 2,000 veh/day as depicted in Austroads Part 2 - Guide to Traffic Engineering Practice: Roadway Capacity
F	Volumes obtained through the use of 24-hour 7-day traffic surveys
G	Volumes adopted from adjacent surveyed link road or adjacent DTMR detailed segment and weekly reports
H	Volumes obtained from QLD Globe
I	Volumes obtained from relevant authority.

4.1.4 Existing construction route traffic volumes

The existing baseline construction route traffic volumes for roads that may be used by construction traffic are provided in Table 4.6. The traffic volumes represent both SCR and LGR associated volumes traversing along construction route link roads. The volumes were used for all capacity and pavement impact assessments. The traffic volumes account for all SCR census-based traffic volumes, surveyed traffic volumes as well as assumed traffic volumes where information was not available.

The traffic volumes provide information relating to AADT, average daily traffic (ADT) and percent HVs for both directions of travel. Traffic volumes were adjusted for by means of a compound growth equation as mentioned in Section 1.6.1, to determine base year 2019 traffic volumes for analyses. Assumed traffic volumes were assumed to account for base year 2019 traffic volumes.

Table 4.6 Existing baseline construction route traffic volumes

Road name	Road section	Road hierarchy	Data source	Traffic volume base year	Gazettal/ Northbound/ Eastbound		Anti-Gazettal/ Southbound/ Westbound	
					AADT	% heavy vehicles	AADT	% heavy vehicles
State Controlled Roads: Department Transport and Main Roads								
Barwon Highway	31A - Between Leichhardt Highway and Town Common Road	Urban Collector	H	2017	728	32%	728	32%
Charlton Connection Road	320 - Between Toowoomba-Cecil Plains Road and Jordan Court	Urban Collector	H	2017	1,318	28%	1,318	28%
	320 - Between Jordan Court and Warrego Highway	Urban Collector	H	2017	1,318	28%	1,318	28%
Cunningham Highway	17D - Between NSW/QLD Border and Leichhardt Highway	Rural Arterial	A	2017	1,536	43%	1,601	45%
	17D - Between Leichhardt Highway and Wyaga Road	Rural Arterial	A	2017	705	47%	751	50%
	17D - Between Wyaga Road and Yelarbon-Keetah Road	Rural Arterial	A	2017	705	47%	751	50%
	17D - Between Yelarbon-Keetah Road and Texas-Yelarbon Road	Rural Arterial	A	2017	776	45%	820	45%
	17D - Between Texas-Yelarbon Road and Inglewood-Texas Road	Rural Arterial	A	2017	776	45%	820	45%
	17C - Between Inglewood-Texas Road and Millmerran-Inglewood Road	Rural Arterial	A	2017	1,038	41%	1,118	40%
	17C - Between Millmerran-Inglewood Road and Inglewood Quarry Access Road	Rural Arterial	A	2017	806	45%	841	44%
	17C - Between Inglewood Quarry Access Road and Coolmunda Dam Access	Rural Arterial	A	2017	806	45%	841	44%
Gore Highway	28A - Between Blackwell Road and Saleyards Road	Rural Arterial	H	2017	990	37%	990	37%
	28A - Between Saleyards Road and West Street	Rural Arterial	H	2017	990	37%	990	37%
	28A - Between West Street and Millmerran-Inglewood Road	Rural Arterial	H	2017	990	37%	990	37%
	28A - Between Millmerran-Inglewood Road and Millmerran-Leyburn Road	Rural Arterial	A	2017	1,429	32%	1,398	33%
	28A - Between Millmerran-Leyburn Road and Pampas-Horrane Road	Rural Arterial	A	2017	1,429	32%	1,398	33%
	28A - Between Pampas-Horrane Road and Brookstead-Norwin Road	Rural Arterial	A	2017	1,429	32%	1,398	33%
	28A - Between Brookstead-Norwin Road and Tummalville Road	Rural Arterial	A	2017	1,429	32%	1,398	33%

Road name	Road section	Road hierarchy	Data source	Traffic volume base year	Gazettal/ Northbound/ Eastbound		Anti-Gazettal/ Southbound/ Westbound	
					AADT	% heavy vehicles	AADT	% heavy vehicles
	28A - Between Tumnaville Road and Vines Street	Rural Arterial	A	2017	1,429	32%	1,398	33%
	28A - Between Vines Street and Toowoomba Bypass	Rural Arterial	A	2017	2,394	20%	2,427	20%
	28A - Between Toowoomba Bypass and Westbrook Road	Rural Arterial	A	2017	2,394	20%	2,427	20%
	28A - Between Westbrook Road and Warrego Highway	Rural Arterial	A	2017	4,478	15%	4,346	18%
Inglewood-Texas Road	231 - Between Cunningham Highway and Greenup Limevale Road	Rural Collector	A	2017	113	29%	121	29%
	231 - Between Greenup Limevale Road and Texas-Yelarbon Road	Rural Collector	A	2017	113	29%	121	29%
	231 - Between Texas-Yelarbon Road and Stanthorpe-Texas Road	Urban Collector	A	2017	331	23%	343	19%
	231 - Between Stanthorpe-Texas Road and Old Texas-Yelarbon Road	Urban Collector	A	2017	378	17%	374	18%
	231 - Between Old Texas-Yelarbon Road and NSW/QLD Border	Urban Collector	A	2017	378	17%	374	18%
Ipswich Motorway	17A - Between Cunningham Highway and Logan Motorway	Urban Motorway	A	2017	54,594	5%	54,247	3%
Leichhardt Highway	26C - Between Cunningham Highway and Hunt Street	Rural Arterial	A	2017	1,251	45%	1,400	43%
	26C - Between Hunt Street and Barwon Highway	Rural Arterial	A	2017	1,251	45%	1,400	43%
Logan Motorway (managed by Transurban)	210A - Between Ipswich Motorway and Pacific Motorway	Urban Motorway	G	2017	54,594	5%	54,247	5%
Millmerran-Inglewood Road	337 - Between Cunningham Highway and Thornton Road	Rural Arterial	A	2017	167	35%	167	32%
	337 - Between Thornton Road and Council Boundary	Rural Arterial	A	2017	167	35%	167	32%
	337 - Between Council Boundary and Kooroongarra Road	Rural Arterial	A	2017	493	29%	500	23%
	337 - Between Kooroongarra Road and Blackwell Road	Rural Collector	A	2017	493	29%	500	23%
	337 - Between Blackwell Road and Campbell Street	Rural Arterial	A	2017	493	29%	500	23%
	337 - Between Campbell Street and Gore Highway	Rural Arterial	A	2017	345	29%	347	31%
Millmerran-Leyburn Road	335 - Between Gore Highway and Reiche Road	Rural Collector	A	2017	113	32%	114	31%

Road name	Road section	Road hierarchy	Data source	Traffic volume base year	Gazettal/ Northbound/ Eastbound		Anti-Gazettal/ Southbound/ Westbound	
					AADT	% heavy vehicles	AADT	% heavy vehicles
Oakey-Pittsworth Road	323 - Between Gore Highway and Quibet Road	Rural Collector	A	2017	391	21%	383	23%
Pacific Motorway	12A - Between Logan Highway and NSW/QLD border	Urban Motorway	G	2017	78,160	8%	78,858	8%
Pampas-Horrane Road	327 - Between Gore Highway and Bostock Road	Rural Arterial	H	2017	64	44%	64	44%
Pittsworth-Felton Road	332 - Between Golf Course Road and Short Street	Urban Arterial	H	2017	1,398	10%	1,398	10%
Texas-Yelarbon Road	2322 - Between Cunningham Highway and Old Texas-Yelarbon Road	Rural Arterial	A	2017	96	47%	93	42%
Toowoomba-Cecil Plains Road	324 - Between Warrego Highway and McDougall Street	Urban Arterial	A	2017	6,172	22%	6,121	21%
	324 - Between McDougall Street and Boundary Street	Urban Collector	A	2017	6,172	22%	6,121	21%
	324 - Between Boundary Street and Charlton Connection Road	Urban Collector	A	2017	2,874	25%	2,598	30%
	324 - Between Charlton Connection Road and Hursley Road	Urban Collector	A	2017	1,569	18%	1,548	18%
	324 - Between Hursley Road and Hanrahans Road	Rural Arterial	A	2017	1,569	18%	1,548	18%
	324 - Between Hanrahans Road and 2 km west of Brimblecombe Road	Rural Arterial	A	2017	1,002	16%	942	18%
Toowoomba Bypass	319 - Between Gore Highway and Toowoomba-Cecil Plains Road	Rural Arterial	I	2019	1,459	46%	1,459	46%
	319 - Between Toowoomba-Cecil Plains Road and New England Highway	Rural Arterial	I	2019	1,459	46%	1,459	46%
	319 - Between New England Highway and Warrego Highway	Rural Arterial	I	2019	1,459	46%	1,459	46%
Warrego Highway	18B - Between Kingsthorpe Haden Road and Toowoomba Bypass	Urban Arterial	A	2017	6,319	0%	6,283	0%
	18B - Between Toowoomba Bypass and Charlton Connection Road	Urban Arterial	A	2017	6,319	0%	6,283	0%
	18B - Between Charlton Connection Road and McDougall Street	Urban Arterial	A	2017	6,947	12%	7,750	11%
	18B - Between McDougall Street and Bridge Street	Urban Arterial	A	2017	9,854	7%	10,321	8%
	18B - Between Bridge Street and Toowoomba-Cecil Plains Road	Urban Arterial	A	2017	5,811	8%	4,995	7%
	18B - Between Toowoomba-Cecil Plains Road and Karrool Street	Urban Arterial	A	2017	7,162	19%	7,306	19%

Road name	Road section	Road hierarchy	Data source	Traffic volume base year	Gazettal/ Northbound/ Eastbound		Anti-Gazettal/ Southbound/ Westbound	
					AADT	% heavy vehicles	AADT	% heavy vehicles
	18B - Between Karrool Street and Gore Highway	Urban Arterial	A	2017	7,162	19%	7,306	19%
	18B - Between Gore Highway and Fifth Avenue	Urban Arterial	A	2017	7,162	19%	7,306	19%
	18A - Between Toowoomba Bypass and Gatton-Helidon Road	Rural Motorway	A	2017	10,238	17%	9,821	18%
	18A - Between Gatton-Helidon Road and Gatton-Esk Road	Rural Motorway	A	2017	7,329	19%	8,402	21%
	18A - Between Gatton-Esk Road and Laidley-Plainland Road	Rural Motorway	A	2017	11,410	19%	11,297	20%
	18A - Between Laidley-Plainland Road and Tallegalla Two Tree Hill Road	Rural Motorway	A	2017	11,410	19%	11,297	20%
	18A - Between Tallegalla Two Tree Hill Road and Haigslea Amberley Road	Rural Motorway	A	2017	15,252	21%	14,884	18%
	18A - Between Haigslea Amberley Road and Brisbane Valley Highway	Rural Motorway	A	2017	17,087	15%	15,819	15%
	18A - Between Brisbane Valley Road and Mount Crosby Road	Urban Motorway	A	2017	23,696	14%	21,237	17%
	18A - Between Mount Crosby Road and Cunningham Highway	Urban Motorway	A	2017	29,392	14%	28,468	15%
Yelarbon-Keetah Road	241 - Between Cunningham Highway and Old Warwick Road	Rural Arterial	H	2017	67	26%	67	26%
State-Controlled Roads: Roads and Maritime Services								
Bruxner Highway	Between New England Highway and Summerland Way	Rural Arterial	C	2012	406	9%	420	10%
Gwydir Highway	Between Stephens Road and Delungra Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Delungra Road and Delungra Bypass Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Delungra Bypass Road and Copeton Dam Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Copeton Dam Road and Bannockburn Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Bannockburn Road and Campbell Street	Rural Arterial	C	2017	739	21%	739	23%
	Between Campbell Street and Tingha Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Tingha Road and Elsmore Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Elsmore Road and Woodstock Road	Rural Arterial	C	2017	739	21%	739	23%

Road name	Road section	Road hierarchy	Data source	Traffic volume base year	Gazettal/ Northbound/ Eastbound		Anti-Gazettal/ Southbound/ Westbound	
					AADT	% heavy vehicles	AADT	% heavy vehicles
	Between Woodstock Road and Waterloo Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Waterloo Road and Coronation Avenue	Rural Arterial	C	2017	739	21%	739	23%
	Between Coronation Avenue and New England Highway	Rural Arterial	C	2017	739	21%	739	23%
	Between New England Highway and Shannon Vale Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Shannon Vale Road and Bald Nob Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Bald Nob Road and Old Grafton Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Old Grafton Road and Coombadjha Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Coombadjha Road and Old Glen Innes Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Old Glen Innes Road and Rogan Bridge Road	Rural Arterial	C	2017	739	21%	739	23%
	Between Rogan Bridge Road and Bent Street	Rural Arterial	C	2017	739	21%	739	23%
New England Highway	Between Bruxner Way and Bruxner Highway	Rural Motorway	C	2011	1,219	17%	1,202	34%
	Between Gwydir Highway and Gwydir Highway	Rural Arterial	C	2017	1,061	22%	1,107	25%
Newell Highway	Between NSW/QLD Border and Bruxner Way	Rural Arterial	C	2017	2,048	32%	2,003	33%
Pacific Motorway	Between NSW/QLD border and Gwydir Highway	Urban Motorway	C	2017	7,242	24%	8,982	23%
Summerland Way	Between Bruxner Highway and Red Lane	Rural Arterial	C	2017	12,553	5%	12,529	5%
	Between Trenayr Road and Turf Street	Rural Arterial	C	2017	1,677	15%	1,676	16%
Clarence Valley Council								
Bent Street	Between Craig Street and Gwydir Highway	Urban Collector	C	2019	12,102	15%	12,023	15%
Charles Street	Between Bent Street and Pacific Highway	Urban Arterial	E	2019	2,000	15%	2,000	15%
Clarence Street	Between Oliver Street and Craig Street	Urban Collector	D	2019	3,800	15%	3,800	15%
Clark Road	Full Extent	Rural Local	D	2019	400	15%	400	15%
Craig Street	Between Villiers Street and Clarence Street	Urban Collector	C	2019	12,102	15%	12,023	15%
	Between Clarence Street and Bent Street	Urban Collector	C	2019	12,102	15%	12,023	15%
Dobie Street	Between Villers Street and Summerland Way	Urban Collector	D	2018	3,800	15%	3,800	15%

Road name	Road section	Road hierarchy	Data source	Traffic volume base year	Gazettal/ Northbound/ Eastbound		Anti-Gazettal/ Southbound/ Westbound	
					AADT	% heavy vehicles	AADT	% heavy vehicles
Fry Street	Between Mary Street and Alice Street	Urban Collector	D	2019	3,800	15%	3,800	15%
Mary Street	Between Fry Street and Oliver Street	Urban Collector	D	2019	3,800	15%	3,800	15%
Oliver Street	Between Clarence Street and Mary Street	Urban Collector	D	2019	3,800	15%	3,800	15%
Red Lane	Between Summerland Way and Trenayr Road	Rural Local	D	2019	400	15%	400	15%
Trenayr Road	Between Red Lane and Clark Road	Rural Collector	D	2019	2,000	15%	2,000	15%
	Between Summerland Way and Clark Road	Rural Collector	D	2018	2,000	15%	2,000	15%
Villers Street	Between Craig Street and Dobie Street	Urban Collector	D	2018	3,800	15%	3,800	15%
Goondiwindi Regional Council								
Boodle Street	Between Boodle Street and Hunt Street	Urban Local	D	2018	3,800	15%	3,800	15%
Bybera Road	Between Cunningham Highway and Private Access	Rural Collector	F	2018	10	35%	12	32%
	Between Private Access and Unnamed Road	Rural Local	F	2018	10	35%	12	32%
Cemetery Road	Between Moorobie Lane and Unnamed Road	Rural Local	I	2007	65	15%	65	15%
Coolmunda Dam Access	Full Extent	Rural Local	I	2015	34	25%	34	25%
Cremascos Road	Between Cunningham Highway and 400 m west of Private Access	Rural Local	F	2018	63	33%	62	32%
East Sawmill Road	Between Cunningham Highway and Springborg Road	Rural Collector	D	2019	2,000	15%	2,000	15%
Elizabeth Street	Between Cunningham Highway and Callandoon Street	Rural Collector	D	2019	2,000	15%	2,000	15%
Eukabilla Road	Full Extent	Rural Local	D	2019	400	15%	400	15%
Fosters Road	Between Cunningham Highway and Grays Road	Rural Local	I	2010	12	8%	12	8%
Grays Road	Between Millmerran-Inglewood Road and Mosquito Creek Road	Rural Local	I	2007	11	8%	11	8%
Hunt Street	Between Leichhardt Highway and Boodle Street	Urban Collector	D	2018	3,800	15%	3,800	15%
Inglewood Quarry Access Road	Full Extent	Rural Local	D	2019	400	15%	400	15%
Kildonan Road	Between Yelarbon-Keetah Road and Cunningham Highway	Rural Arterial	F	2018	110	23%	105	25%
	Between Callandoon Street and Unnamed Road	Rural Collector	F	2018	4	33%	3	25%

Road name	Road section	Road hierarchy	Data source	Traffic volume base year	Gazettal/ Northbound/ Eastbound		Anti-Gazettal/ Southbound/ Westbound	
					AADT	% heavy vehicles	AADT	% heavy vehicles
Lovells Crossing Road	Between Unnamed Road and Unnamed Road	Rural Collector	F	2018	4	33%	3	25%
McDougalls Crossings Road	Between Cunningham Highway and 800 m west of Cremascos Road	Rural Collector	D	2019	2,000	15%	2,000	15%
Mooroobie Lane	Between Wondalli-Kurumbul Road and Cemetery Road	Rural Local	I	2009	11	17%	11	17%
Mosquito Creek Road	Between Grays Road and Cunningham Highway	Rural Local	I	2010	9	13%	9	13%
Old Texas-Yelarbon Road	Between Texas-Yelarbon Road and Rocky Creek Road	Urban Collector	I	2007	34	19%	34	19%
	Between Rocky Creek Road and Inglewood-Texas Road	Urban Collector	I	2007	34	19%	34	19%
Queen Street South	Between Yelarbon-Kurumbul Road and Danes Lane	Rural Local	D	2019	400	15%	400	15%
South Kurumbul Road	Between Yelarbon-Kurumbul Road and Kildonan Road	Rural Local	D	2019	400	15%	400	15%
Springborg Road	Between Cunningham Highway and Railway Line	Rural Local	F	2018	5	23%	5	11%
Suttons Road	Between East Sawmill Road and Unnamed Road	Rural Local	F	2018	4	59%	5	74%
Thornton Road	Between Millmerran-Inglewood Road and Unnamed Road	Rural Collector	F	2018	3	25%	3	5%
Town Commons Road	Between Waggamba Road and Barwon Highway	Urban Local	I	2006	174	29%	174	29%
Unnamed Road	Between Cunningham Highway and Private Access	Rural Local	D	2019	400	15%	400	15%
Unnamed Road	Between Cemetery Road and Unnamed Road	Rural Local	D	2019	400	15%	400	15%
Unnamed Road	Between Texas-Yelarbon Road and Private Land	Rural Local	D	2019	400	15%	400	15%
Unnamed Road	Between Woodcocks Road and Queen Street North	Rural Local	D	2019	400	15%	400	15%
Unnamed Road	Between East Sawmill Road and Suttons Road	Rural Local	D	2019	400	15%	400	15%
Unnamed Road	Full extent	Rural Local	D	2019	400	15%	400	15%
Whetstone Access Road	Between Cunningham Highway and 600 m west of Railway Line	Rural Local	F	2018	10	16%	10	39%
Wondalli-Kurumbul Road	Between South Western System (Railway) and Bickers Road	Rural Local	I	2007	6	19%	6	19%

Road name	Road section	Road hierarchy	Data source	Traffic volume base year	Gazettal/ Northbound/ Eastbound		Anti-Gazettal/ Southbound/ Westbound	
					AADT	% heavy vehicles	AADT	% heavy vehicles
Woodcocks Road	Between Cunningham Highway and Unnamed Road	Rural Collector	D	2019	2,000	15%	2,000	15%
Yelarbon-Kurumbul Road	Yelarbon-Kurumbul Road	Rural Collector	I	2004	11	11%	11	11%
Gwydir Shire Council								
Edwards Street	Between North Star Road and I B Bore Road	Rural Arterial	G	2018	184	26%	202	30%
North Star Road	Between MPSC Council Boundary and Edwards Street	Rural Arterial	F	2018	134	22%	141	25%
	Between Edward Street and Getta Getta Road	Rural Arterial	F	2018	134	22%	141	25%
	Between Getta Getta Road and Blue Nobby Road	Rural Arterial	F	2018	134	22%	141	25%
	Between Blue Nobby Road and Hibernia Road	Rural Arterial	F	2018	134	22%	141	25%
	Between Hibernia Road and Yallaroi Road	Rural Arterial	F	2018	134	22%	141	25%
	Between Yallaroi Road and Baroma Road	Rural Arterial	F	2018	134	22%	141	25%
	Between Baroma Road and Warialda Road	Rural Arterial	F	2018	134	22%	141	25%
Stephen Street	Between Long Street and Gwydir Highway	Rural Arterial	E	2018	1,600	15%	1,600	15%
Warialda Road	Between North Star Road and Gournama Road	Rural Arterial	E	2018	1,600	15%	1,600	15%
	Between Gournama Road and Oregon Road	Rural Arterial	E	2018	1,600	15%	1,600	15%
	Between Oregon Street and Stephen Street	Rural Arterial	E	2018	1,600	15%	1,600	15%
Inverell Shire Council								
Bruxner Way	Between Texas Bridge Road and Glenrock Road	Rural Motorway	C	2011	112	21%	101	24%
	Between Glenrock Road and New England Highway	Rural Motorway	C	2011	112	21%	101	24%
Campbell Street	Between Byron Street and Otho Street	Urban Local	D	2018	2,000	15%	2,000	15%
Texas Bridge Road	Between NSW/QLD Border and Bruxner Highway	Rural Arterial	E	2019	1,600	15%	1,600	15%
Moree Plains Shire Council								
Bruxner Way	Between Newell Highway and Tucka Tucka Road	Rural Arterial	F	2018	137	26%	135	24%
	Between Tucka Tucka Road and North Star Road	Rural Arterial	F	2018	137	26%	135	24%

Road name	Road section	Road hierarchy	Data source	Traffic volume base year	Gazettal/ Northbound/ Eastbound		Anti-Gazettal/ Southbound/ Westbound	
					AADT	% heavy vehicles	AADT	% heavy vehicles
North Star Road	Between Bruxner Way and Gwydir Shire Council boundary	Rural Arterial	F	2018	144	23%	147	27%
River Road	Between Newell Highway and Boggabilla Weir	Rural Local	D	2018	400	15%	400	15%
Toowoomba Regional Council								
Airport Quarry Wellcamp Access Road (Privately owned road)	Between Toowoomba-Cecil Plains Road and Toowoomba Wellcamp Airport	Rural Local	D	2019	400	15%	400	15%
Alderley Street	Between Greenwattle Street and Gore Highway	Urban Collector	I	2014	3,117	11%	3,117	11%
	Between Gore Highway and Condamine Street	Urban Collector	I	2014	3,117	11%	3,117	11%
Athol School Road	Between Gore Highway and Trader Road	Rural Collector	I	2017	96	10%	96	10%
Biddeston Southbrook Road	Between Gore Highway and Stower Road	Rural Collector	I	2017	106	22%	106	22%
Blackwell Road	Between Millmerran-Inglewood Road and Gore Highway	Rural Arterial	I	2017	12	8%	12	8%
Blackwell Road	Between Bunkers Hill School Road and Macaulay Road	Rural Local	I	2017	263	26%	263	26%
Bligh Street	Between Six Mile Road and Concrete Millmerran	Rural Arterial	E	2019	1,600	15%	1,600	15%
	Between Concrete Millmerran and Crosby Street	Rural Arterial	E	2019	1,600	15%	1,600	15%
Bostock Road	Between Pampas-Horrane Road and Unnamed Road	Rural Collector	I	2015	42	24%	42	24%
Brimblecombe Road	Between Toowoomba-Cecil Plains Road and Gowrie Mountain School Road	Rural Collector	I	2013	51	29%	51	29%
Bunkers Hill School Road	Between Gore Highway and Blackwell Road	Rural Local	I	2017	261	21%	261	21%
Bushy Lane West	Between Gore Highway and 650 m west of Gore Highway	Rural Local	D	2019	400	15%	400	15%
Campbell Street	Between Millmerran-Inglewood Road and Commens Street	Urban Collector	I	2013	428	16%	438	16%
Chamberlain Road	Between Warrego Highway and Robson Road	Rural Local	D	2019	400	15%	400	15%
Commodore Peak Road	Between Millmerran-Inglewood Road and Blackwell Road	Rural Local	I	2017	14	13%	14	13%
Condamine Street	Full Extent	Urban Collector	I	2016	497	16%	497	16%

Road name	Road section	Road hierarchy	Data source	Traffic volume base year	Gazettal/ Northbound/ Eastbound		Anti-Gazettal/ Southbound/ Westbound	
					AADT	% heavy vehicles	AADT	% heavy vehicles
Dieckmann Road	Between Gore Highway and Madelaine Street	Rural Local	D	2019	400	15%	400	15%
Draper Road	Between Steger Road and Leeson's Road	Urban Collector	I	2013	30	10%	30	10%
Drayton Wellcamp Road	Between Wellcamp-Westbrook Road and Boundary Street South	Urban Collector	I	2015	1,081	15%	1,081	15%
Euston Road	Between Boundary Court and Greenwattle Street	Urban Collector	I	2016	3,018	10%	3,018	10%
Forestry Road	Between Millmerran-Inglewood Road and Unnamed Road	Rural Local	D	2019	400	15%	400	15%
Fysh Road	Between Gore Highway and Fysh Road	Rural Local	D	2019	400	15%	400	15%
Gap Road	Between Gore Highway and Cypress Street	Rural Collector	I	2015	540	30%	540	30%
Geitz Road	Between Gore Highway and Luck Road	Rural Local	D	2019	400	15%	400	15%
Gilgal Lane	Between Gore Highway and Railway Line	Rural Collector	D	2019	2,000	15%	2,000	15%
Greenwattle Street	Between Euston Road and Alderley Street	Urban Arterial	I	2013	2,409	8%	2,409	8%
Grevillea Street	Full Extent	Rural Local	D	2019	400	15%	400	15%
Hall Road	Between Gore Highway and Railway Line	Rural Collector	D	2019	2,000	15%	2,000	15%
Heckendorf Road	Between Millmerran-Inglewood Road and Bora Creek Road	Rural Local	I	2017	12	13%	12	13%
Kahler Road	Between Murlaggan Road and Glen Devon Road	Rural Local	D	2019	400	15%	400	15%
Kooroongara Road	Between Millmerran-Inglewood Road and Bliss Road	Rural Collector	I	2014	38	13%	38	13%
Kooroongarra Road	Between Millmerran-Inglewood Road and Halls Road	Rural Collector	I	2014	38	13%	38	13%
Kooroongarra Road	Between Millwood Road and Cunningham Highway	Rural Collector	I	2016	36	19%	36	19%
Leeson's Road	Full Extent	Rural Collector	I	2016	36	19%	36	19%
Lindenmayer Road	Between Gore Highway and Unnamed Road	Rural Collector	D	2019	2,000	15%	2,000	15%
Linthorpe Road	Between Gore Highway and Loveday Road	Rural Collector	I	2014	92	14%	92	14%
Lochaber Road	Between McEwan Lane and Gore Highway	Rural Arterial	I	2015	216	9%	216	9%
Macaulay Road	Between Blackwell Road and Wellcamp-Westbrook Road	Rural Local	I	2017	292	19%	292	19%
McDougall Street	Between Toowoomba-Cecil Plains Road and Hursley Road	Urban Collector	I	2015	3,026	20%	3,026	20%

Road name	Road section	Road hierarchy	Data source	Traffic volume base year	Gazettal/ Northbound/ Eastbound		Anti-Gazettal/ Southbound/ Westbound	
					AADT	% heavy vehicles	AADT	% heavy vehicles
Millwood Road	Between Millmerran-Inglewood Road and Kooroongarra Road	Rural Local	I	2015	12	21%	12	21%
Murlaggan Road	Between Gore Highway and Roche Road	Rural Collector	I	2017	24	24%	24	24%
	Between Roche Road and Yarranlea Road	Rural Arterial	I	2017	24	24%	24	24%
Omara Road	Between Toowoomba-Cecil Plains Road and Warrego Highway	Rural Collector	I	2018	1,695	25%	1,695	25%
Owens Scrub Road	Between Millmerran-Inglewood Road and Foxwood Road	Rural Local	I	2015	67	21%	67	21%
Paint Mine Road	Between Gore Highway and Loveday Road	Rural Local	D	2019	400	15%	400	15%
Paton Road	Between Millmerran-Inglewood Road and Kooroongarra Road	Rural Local	D	2019	400	15%	400	15%
Pittsworth-Felton Road	Between Cypress Street and Golf Course Road	Urban Arterial	E	2019	2,000	15%	2,000	15%
Railway Street	Between Short Street and Vines Street	Urban Collector	I	2017	28	18%	28	18%
Roche Road	Between Murlaggan Road and Saint Helens Road	Rural Arterial	D	2019	1,600	15%	1,600	15%
Saleyards Road	Between Millmerran-Inglewood Road and Gore Highway	Rural Arterial	I	2015	123	30%	123	30%
Scrubby Road	Between Gore Highway and Jentz Road	Rural Collector	I	2017	104	55%	104	55%
Short Street	Between Yandilla Street and Toowoomba Road	Urban Collector	I	2015	385	8%	385	8%
Six Mile Road	Between Rodney Road and Bligh Street	Rural Collector	I	2017	14	16%	14	16%
Steger Road	Between Warrego Highway and Draper Road	Urban Collector	I	2013	30	10%	30	10%
Toowoomba Road	Between Vines Street and Gore Highway	Urban Collector	I	2013	238	10%	238	10%
Tummalville Road	Between Gore Highway and Mann Silo Road	Rural Local	I	2014	49	24%	49	24%
Unnamed Road	Between Gore Highway and Millmerran Indoor Sports Centre	Urban Local	D	2019	2,000	15%	2,000	15%
Unnamed Road	Between Toowoomba-Cecil Plains Road and Unnamed Road	Rural Local	D	2019	400	15%	400	15%
Unnamed Road	Between Tummalville Road and Scrubby Road	Rural Local	D	2019	400	15%	400	15%
Unnamed Road	Between Drayton Westbrook Road and Unnamed Road	Rural Local	D	2019	400	15%	400	15%
Unnamed Road	Between Bostock Road and Unnamed Road	Rural Local	D	2019	400	15%	400	15%
Unnamed Road	Between Forestry Road and Unnamed Road	Rural Local	D	2019	400	15%	400	15%

Road name	Road section	Road hierarchy	Data source	Traffic volume base year	Gazettal/ Northbound/ Eastbound		Anti-Gazettal/ Southbound/ Westbound	
					AADT	% heavy vehicles	AADT	% heavy vehicles
Unnamed Road	Between Gore Highway and Private Access	Rural Local	D	2019	400	15%	400	15%
Ware Street	Between Gore Highway and Railway Line	Rural Local	D	2019	400	15%	400	15%
Wellcamp-Westbrook Road	Between Macaulay Road and Toowoomba-Cecil Plains Road	Rural Local	I	2017	357	15%	357	15%
	Between Toowoomba-Cecil Plains Road and Drayton Wellcamp Road	Urban Collector	I	2017	461	24%	461	24%
West Street	Between Gore Highway and Rodney Road	Urban Collector	I	2017	50	46%	50	46%
Yarranlea Road	Between Gore Highway and Railway Line	Rural Arterial	I	2014	15	22%	15	22%
	Between Railway Line and Saint Helens Road	Rural Arterial	I	2014	15	22%	15	22%

4.2 Existing intersection performance

An increase in vehicles through an intersection as a result of the Project will likely increase traffic delays. Increases in delays potentially has an economic and social impact on the community through increased travel times, driver impatience (leading to possible crashes) and the associated economic cost of these delays to private and commercial/HV trips according to the GTIA. The following data is required to evaluate existing intersection performance:

- Existing intersection geometry and lane configuration data
- Existing traffic signal phasing and sequence data where required
- Vehicle movement data
- Peak hour traffic volume data.

The delay-based analysis criteria adopted for the purposes of the TIA are provided in Table 4.7. The table indicates the LOS per intersection control type associated with a respective delay per vehicle measured in seconds. LOS defined for signals were used for level crossing SIDRA analysis.

Table 4.7 Level of service definitions based on vehicle delay in seconds

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

Source: SIDRA Intersection 8 User Guide

In the absence of traffic count data at intersections, an assessment has been undertaken to highlight intersections which are more likely to experience impacts resulting from the addition of construction traffic flows consistent with the warrants outlined in *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings*.

Delay-based LOS assessment has been conducted, with analysis presented in Section 6.4.3.

4.3 Existing pavement load (standard axle repetitions)

A preliminary desktop pavement impact assessment has been undertaken based on the existing background traffic data available for state-controlled road sections impacted by proposed construction traffic. These traffic volumes have been converted into SAR based on the HV classes provided by relevant road controlling authorities. A SAR is a unit measurement which converts the wheel loads of traffic to an equivalent number of standard loads and is usually expressed in terms of the equivalent number of 80 kilo-Newtons (kN) single axle load.

4.3.1 Equivalent axle load per heavy vehicle type

Detailed road segment reports with 12 bin vehicle breakdown details were used to calculate SAR/HV along SCRs on the DTMR road network. The SAR/HV was calculated by means of the methodologies set out in *Austroads Guide to Pavement Technology Part 2: Pavement Structural Design 2012* (as referenced in the GTIA). It is noted that a more recent version of this guide is available and will be used for pavement design. The SAR/HV along the road network with associated primary construction routes are provided in Table 4.8. In the calculation of SAR/HV for the existing road network, SAR/HVAG (SAR per HV axle group) values were used as per DTMR's Class-Specific Traffic Load Distributions (CTLD) Spreadsheet (July 2018).

Table 4.8 Standard axle repetitions/heavy vehicle on primary construction routes along state-controlled roads

Road name	Road section	Source	SAR/HV	
			Gazettal	Anti-gazettal
SCRs: Department Transport and Main Roads				
Barwon Highway	31A - Between Leichhardt Highway and Town Common Road	Assumed	3.43	3.28
Charlton Connection Road	320 - Between Toowoomba-Cecil Plains Road and Jordan Court	Assumed	2.48	2.43
	320 - Between Jordan Court and Warrego Highway	Assumed	2.48	2.43
Cunningham Highway	17D - Between NSW/QLD Border and Leichhardt Highway	Calculated	2.37	3.43
	17D - Between Leichhardt Highway and Wyaga Road	Calculated	2.39	3.57
	17D - Between Wyaga Road and Yelarbon-Keetah Road	Calculated	2.39	3.57
	17D - Between Yelarbon-Keetah Road and Texas-Yelarbon Road	Calculated	2.34	3.61
	17D - Between Texas-Yelarbon Road and Inglewood-Texas Road	Calculated	2.34	3.61
	17C - Between Inglewood-Texas Road and Millmerran-Inglewood Road	Calculated	2.12	3.32
	17C - Between Millmerran-Inglewood Road and Inglewood Quarry Access Road	Calculated	2.22	3.45
	17C - Between Inglewood Quarry Access Road and Coolmunda Dam Access	Calculated	2.22	3.45
	Gore Highway	28A - Between Blackwell Road and Saleyards Road	Assumed	1.45
28A - Between Saleyards Road and West Street		Assumed	1.45	3.21
28A - Between West Street and Millmerran-Inglewood Road		Assumed	1.45	3.21
28A - Between Millmerran-Inglewood Road and Millmerran-Leyburn Road		Calculated	1.45	3.21
28A - Between Millmerran-Leyburn Road and Pampas-Horrane Road		Calculated	1.45	3.21
28A - Between Pampas-Horrane Road and Brookstead-Norwin Road		Calculated	1.45	3.21
28A - Between Brookstead-Norwin Road and Tummalville Road		Calculated	1.45	3.21
28A - Between Tummalville Road and Vines Street		Calculated	1.45	3.21
28A - Between Vines Street and Toowoomba Bypass		Calculated	1.29	2.88
28A - Between Toowoomba Bypass and Westbrook Road		Calculated	1.29	2.88
28A - Between Westbrook Road and Warrego Highway		Calculated	1.16	2.20
Inglewood-Texas Road	231 - Between Cunningham Highway and Greenup Limevale Road	Calculated	2.92	2.95
	231 - Between Greenup Limevale Road and Texas-Yelarbon Road	Calculated	2.92	2.95
	231 - Between Texas-Yelarbon Road and Stanthorpe-Texas Road	Calculated	2.20	2.44

Road name	Road section	Source	SAR/HV	
			Gazettal	Anti-gazettal
	231 - Between Stanthorpe-Texas Road and Old Texas-Yelarbon Road	Calculated	2.21	2.17
	231 - Between Old Texas-Yelarbon Road and NSW/QLD Border	Calculated	2.21	2.17
Ipswich Motorway	17A - Between Cunningham Highway and Logan Motorway	Calculated	2.06	1.82
Leichhardt Highway	26C - Between Cunningham Highway and Hunt Street	Calculated	3.43	3.28
	26C - Between Hunt Street and Barwon Highway	Calculated	3.43	3.28
Logan Motorway (managed by Transurban)	210A - Between Ipswich Motorway and Pacific Motorway	Assumed	2.06	1.82
Millmerran-Inglewood Road	337 - Between Cunningham Highway and Thornton Road	Calculated	3.14	3.27
	337 - Between Thornton Road and Council Boundary	Calculated	3.14	3.27
	337 - Between Council Boundary and Kooroongarra Road	Calculated	2.50	2.92
	337 - Between Kooroongarra Road and Blackwell Road	Calculated	2.50	2.92
	337 - Between Blackwell Road and Campbell Street	Calculated	2.50	2.92
	337 - Between Campbell Street and Gore Highway	Calculated	2.93	2.96
Millmerran-Leyburn Road	335 - Between Gore Highway and Reiche Road	Calculated	2.92	2.95
Oakey-Pittsworth Road	323 - Between Gore Highway and Quibet Road	Calculated	3.42	3.18
Pacific Motorway	12A - Between Logan Highway and NSW/QLD border	Assumed	2.06	1.82
Pampas-Horrane Road	327 - Between Gore Highway and Bostock Road	Assumed	3.42	3.18
Pittsworth-Felton Road	332 - Between Golf Course Road and Short Street	Assumed	3.42	3.18
Texas-Yelarbon Road	2322 - Between Cunningham Highway and Old Texas-Yelarbon Road	Calculated	3.62	4.03
Toowoomba-Cecil Plains Road	324 - Between Warrego Highway and McDougall Street	Calculated	2.30	2.23
	324 - Between McDougall Street and Boundary Street	Calculated	2.30	2.23
	324 - Between Boundary Street and Charlton Connection Road	Calculated	2.90	2.68
	324 - Between Charlton Connection Road and Hursley Road	Calculated	2.48	2.43
	324 - Between Hursley Road and Hanrahans Road	Calculated	2.48	2.43
	324 - Between Hanrahans Road and 2 km west of Brimblecombe Road	Calculated	2.64	2.30
Toowoomba Bypass	319 - Between Gore Highway and Toowoomba-Cecil Plains Road	Assumed	1.29	2.88
	319 - Between Toowoomba-Cecil Plains Road and New England Highway	Assumed	4.02	4.71
	319 - Between New England Highway and Warrego Highway	Assumed	4.02	4.71

Road name	Road section	Source	SAR/HV	
			Gazettal	Anti-gazettal
Warrego Highway	18B - Between Kingsthorpe Haden Road and Toowoomba Bypass	Assumed	1.37	1.55
	18B - Between Toowoomba Bypass and Charlton Connection Road	Assumed	1.37	1.55
	18B - Between Charlton Connection Road and McDougall Street	Calculated	1.37	1.55
	18B - Between McDougall Street and Bridge Street	Calculated	1.27	1.42
	18B - Between Bridge Street and Toowoomba-Cecil Plains Road	Calculated	1.56	1.77
	18B - Between Toowoomba-Cecil Plains Road and Karrool Street	Calculated	2.33	2.54
	18B - Between Karrool Street and Gore Highway	Calculated	2.33	2.54
	18B - Between Gore Highway and Fifth Avenue	Calculated	2.33	2.54
	18A - Between Toowoomba Bypass and Gatton-Helidon Road	Calculated	4.02	4.71
	18A - Between Gatton-Helidon Road and Gatton-Esk Road	Calculated	3.48	4.56
	18A - Between Gatton-Esk Road and Laidley-Plainland Road	Calculated	3.83	4.62
	18A - Between Laidley-Plainland Road and Tallegalla Two Tree Hill Road	Calculated	3.83	4.62
	18A - Between Tallegalla Two Tree Hill Road and Haigslea Amberley Road	Calculated	4.20	4.33
	18A - Between Haigslea Amberley Road and Brisbane Valley Highway	Calculated	3.59	4.92
	18A - Between Brisbane Valley Road and Mount Crosby Road	Calculated	3.51	4.08
	18A - Between Mount Crosby Road and Cunningham Highway	Calculated	3.17	3.65
Yelarbon-Keetah Road	241 - Between Cunningham Highway and Old Warwick Road	Assumed	2.34	3.61

SAR/HV values were also used as part of the pavement impact analyses for the primary construction routes along RMS SCR's. SARs were also determined for the primary construction routes along RMS SCR's. As annual 12-bin vehicle breakdown information was not available for RMS roads, SAR/HV information provided within *Austroads Guide to Pavement Technology Part 2: Pavement Structural Design 2012* was used based on Weigh-in-Motion (WiM) sites across NSW. As not all roads were represented in the guide, SAR/HV values were assumed based on similar, proximate roads.

Table 4.9 outlines the road name and the assumed WiM site(s) used for the purpose of the analysis.

Table 4.9 Standard axle repetitions/heavy vehicle on representative weigh in motion sites across New South Wales

Project road assessed	WiM site road name	WiM ID	Location	%HV	SAR/ HVAG	SAR/ HV
Bruxner Highway	Newell Highway	2600	Newell Highway at Boggabilla	33.3	0.923	3.24
Gwydir Highway	New England Highway	700	Branxton	14.4	0.803	2.19
	New England Highway	AR	Armidale	18.7	0.714	1.97
	Average:			16.55	0.759	2.08
New England Highway	New England Highway	700	Branxton	14.4	0.803	2.19
	New England Highway	AR	Armidale	18.7	0.714	1.97
	Average:			16.55	0.759	2.08
Newell Highway	Newell Highway	TO	Tocumwal	24.6	0.87	2.77
	Newell Highway	2600	Boggabilla	33.3	0.923	3.24
	Newell Highway	3800	Marsden	39	1.03	3.47
	Newell Highway	JE	Jerilderie	35.3	1.048	3.54
	Average:			33.05	0.968	3.255
Pacific Highway	Pacific Highway	283	Brunswick Heads	14.2	0.807	2.30
Summerland Way	New England Highway	700	Branxton	14.4	0.803	2.19
	New England Highway	AR	Armidale	18.7	0.714	1.97
	Average:			16.6	0.759	2.08

Table note:

HVAG = Heavy Vehicle Axle Group

4.3.2 Existing standard axle repetitions over 20-year design life

SARs for the background HV component were calculated based on the HV splits for the relevant road sections. It must be noted that all base pavement loading SARs were calculated as granular pavement with thin bituminous surfacing with a load damage unit equivalent to ESA/SAR4 and load damage exponent 4, irrespective of pavements containing one or more boundary layers for both DTMR and RMS roads. This is because raw road asset data from DTMR does not capture loaded and unloaded HV movements which do not make it feasible to calculate SAR5s and SAR12s (load damage units applicable to pavements with one or more boundary layers). This was completed in accordance with the following process:

- The existing background traffic data (AADT) for the relevant road sections, where available, were obtained from DTMR and RMS
- Relevant SAR rates were applied to existing HV proportions for each direction of travel
- The existing SAR4 for each construction route road section on all affected SCR's was determined in accordance with Section 6.4 of the GTIA Manual
- A two per cent HV compound growth rate was applied to determine future projected yearly SAR over a 20-year design life
- Existing SAR4 and associated capacities were graphically represented for each link over a 20-year design life.

Detailed findings of existing SAR across a 20-year design life are provided in Appendix D of this report.

4.4 Road-rail interface traffic volumes

Existing and proposed new road-rail interfaces are listed in Section 3.3.1 and shown on Figure 1.2. Base year 2018 traffic volumes at existing and proposed public road-rail interface locations along formed roads are provided in Table 4.10.

Table 4.10 Existing traffic volumes at proposed road-rail interface locations

Road-rail interface ID	AM peak volume		PM peak volume		Peak day volume		% heavy vehicles (average weekday)	
	Northbound/ Eastbound	Southbound /Westbound	Northbound/ Eastbound	Southbound /Westbound	Northbound/ Eastbound	Southbound /Westbound	Northbound/ Eastbound	Southbound /Westbound
Department Transport and Main Roads								
310-11-P-0	52	61	61	62	841	802	45%	44%
310-11-E-1	52	61	61	62	841	802	45%	44%
310-24-P-2	17	16	14	14	202	193	38%	33%
310-35-P-4	22	20	20	19	264	260	33%	26%
310-37-P-12a	22	20	20	19	264	260	33%	26%
310-40-E-2	9	8	10	12	112	120	36%	41%
310-44-E-2	128	138	121	158	1730	1762	N/A	N/A
310-48-P-8	50	77	68	80	794	883	20%	30%
310-55-P-1	28	23	25	23	227	247	N/A	N/A
310-56-P-2	519	501	605	518	7399	7252	N/A	N/A
GRC								
270-12-P-1	10	10	11	11	142	121	26%	29%
270-12-P-4	1	1	1	1	13	9	42%	34%
270-12-P-6a	1	1	1	1	11	8	79%	16%
310-4-E-2	2	3	5	3	35	43	24%	34%
310-5-P-1	2	3	5	3	35	43	24%	34%
310-8-E-0	2	3	5	3	35	43	24%	34%
310-10-P-1	1	1	1	1	7	7	59%	74%
310-12-E-1	1	1	1	1	7	7	59%	74%
310-14-E-0	0	1	1	0	4	5	0%	0%
310-14-E-1	0	1	1	0	4	5	0%	0%
310-16-E-1	1	2	2	1	15	16	19%	42%
310-17-P-7a	4	20	13	4	83	83	34%	34%
310-18-P-8	4	20	13	4	83	83	34%	34%
310-19-P-8	1	1	2	2	13	13	36%	38%
310-20-P-7	1	1	2	2	13	13	36%	38%
310-20-P-12	1	1	2	2	13	13	36%	38%
310-20-P-12z	1	1	2	2	13	13	36%	38%
310-21-P-9	1	0	1	1	6	5	40%	31%
310-22-P-9	0	0	1	1	6	7	31%	7%
310-25-P-3	1	2	2	1	14	14	5%	11%
310-26-P-2	1	1	1	1	7	7	37%	29%
310-27-P-3	1	1	1	1	7	7	37%	29%

Road-rail interface ID	AM peak volume		PM peak volume		Peak day volume		% heavy vehicles (average weekday)	
	Northbound/ Eastbound	Southbound /Westbound	Northbound/ Eastbound	Southbound /Westbound	Northbound/ Eastbound	Southbound /Westbound	Northbound/ Eastbound	Southbound /Westbound
310-28-P-3	1	1	1	1	7	7	37%	29%
TRC								
310-30-P-2	1	1	1	1	7	7	37%	29%
310-31-P-7	1	2	1	1	13	13	15%	22%
310-32-P-4	4	4	2	2	32	34	75%	72%
310-33-P-1	4	3	3	2	39	37	70%	80%
310-34-P-1	2	3	3	2	19	18	41%	39%
310-35-P-4a	4	1	1	2	18	14	48%	57%
310-36-P-1	4	1	1	2	18	14	48%	57%
310-36-P-8a	4	1	1	2	18	14	48%	57%
310-37-P-12	4	1	1	2	18	14	48%	57%
310-38-P-3	18	35	37	27	249	233	13%	18%
310-39-P-1	2	8	7	2	33	31	18%	14%
310-40-E-1	1	1	1	1	4	4	44%	80%
310-41-E-6	1	1	1	1	14	10	21%	52%
310-42-E-0	1	1	1	1	14	10	21%	52%
310-42-E-1	9	6	8	7	82	86	28%	27%
310-43-E-3	1	1	1	2	8	10	19%	25%
310-43-E-8	3	5	4	4	41	46	30%	15%
310-45-E-1	1	1	1	2	8	10	19%	25%
310-46-E-1	12	12	11	10	116	116	82%	84%
310-46-P-3	1	1	1	2	8	10	19%	25%
310-46-P-4c	1	1	1	2	8	10	19%	25%
310-47-P-1	1	1	1	2	8	10	19%	25%
310-47-P-3	1	1	1	2	8	10	19%	25%
310-48-P-1	1	1	1	2	8	10	19%	25%
310-48-P-9	11	29	24	14	207	202	22%	27%
310-48-P-10	11	29	24	14	207	202	22%	27%
310-49-P-1	11	29	24	14	207	202	22%	27%
310-49-P-2	11	29	24	14	207	202	22%	27%
310-49-P-6	11	29	24	14	207	202	22%	27%
310-49-P-8	1	1	1	2	8	10	19%	25%
310-49-P-11	9	20	18	12	159	166	18%	26%
310-50-P-5	1	1	1	2	8	10	19%	25%
310-50-P-11	5	5	6	4	62	51	21%	22%
310-51-P-8	13	3	4	8	71	58	26%	28%
310-51-P-11z	10	7	8	10	106	116	16%	23%
310-52-P-1	10	7	8	10	106	116	16%	23%
310-52-P-3	10	7	8	10	106	116	16%	23%

Road-rail interface ID	AM peak volume		PM peak volume		Peak day volume		% heavy vehicles (average weekday)	
	Northbound/ Eastbound	Southbound /Westbound	Northbound/ Eastbound	Southbound /Westbound	Northbound/ Eastbound	Southbound /Westbound	Northbound/ Eastbound	Southbound /Westbound
310-53-P-1	10	7	8	10	106	116	16%	23%
310-55-P-5	2	5	6	3	46	47	27%	34%
310-57-P-1	2	5	6	3	46	47	27%	34%
310-57-P-4	2	5	6	3	46	47	27%	34%

These volumes were included as part of the vehicle queueing and delay capacity assessments during the operational years of the proposed level crossings. These volumes are provided for the locations with traffic volumes that were assumed to exceed ten vehicles per day (at the 30 per cent design phase). Details of the analysis are provided in Section 6.4.3. It is evident from Table 4.10 that existing traffic volumes are typically low during both AM and PM peak hours for the majority of these sites.

4.5 Existing road safety issues (crash data)

Crash data for the impact assessment area was obtained for the most recent five-year time period available from DTMR and RMS. As a result, the analysis has considered the following time periods:

- RMS: 01/07/2012 to 30/06/2017
- DTMR: 01/11/2012 to 31/10/2017.

DTMR and RMS apply different categorisations for crash severity. As a result, crash data has been summarised separately for each of these regions. Additionally, DTMR does not report on non-injury (i.e. uncategorised) crashes as of 2010, therefore, non-injury crashes have been removed from the RMS dataset in this analysis. The crashes are classified using Definition for Coding Accidents (DCA) code groups, with Table 4.11 demonstrating the DCA code group descriptions. These code groups have been used to determine the type of crash that occurs most frequently (highest prevalence out of total accidents by magnitude based on the data provided).

Table 4.11 Definition for Coding Accidents code group descriptions

DCA code group	DCA code group description
Multiple vehicle crashes	
1	From adjacent approaches
2	Head on
3	Opposing vehicle turning
4	Rear end
5	Lane change
6	Parallel lanes, turning
7	U-turn
8	Entering roadway
9	Overtaking, same direction
10	Hit parked vehicle
11	Hit railway train
Single vehicle crashes	
12	Pedestrian
13	Obstruction on carriageway
14	Hit animal

DCA code group	DCA code group description
15	Off carriageway on straight
16	Off carriageway on straight, hit object
17	Out of control on straight
18	Off carriageway on curve
19	Off carriageway on curve, hit object
20	Out of control on curve
Exceptions	
21	Exceptions (i.e. crashes which are unlikely to be attributable to and road environment factor)

4.5.1 Crash analysis – construction routes

A summary of incidents, recorded by DTMR and RMS, by crash severity within the impact assessment area is provided in Table 4.12. Maps showing the location of the reported crashes within the impact assessment area are provided in Appendix E. The impact assessment area for this analysis has been defined as road sections along which construction traffic travels.

Table 4.12 Construction traffic route crash data summary

Road name	Length (km)	Background volume (AADT)	Peak construction volume (ADT)	Total	Total five-year crashes				Most frequent DCA group	
				Five-year crashes	Fatal	Hospitalisation	Medical treatment	Minor injury	DCA code group	DCA %
SCRs: Department of Transport Main Roads										
Barwon Highway	No crashes									
Charlton Connection Road	1.54	2,637	3	2	0	2	0	0	4	50%
Cunningham Highway	101.00	1,456-2,156	59	45	1	21	17	6	16	16%
Gore Highway	93.00	1,980 – 8,824	58	121	5	49	55	12	4	26%
Inglewood-Texas Road	53.00	234 - 674	4	8	0	8	0	0	14	50%
Ipswich Motorway	8.40	108,841	7	104	0	45	41	18	4	31%
Leichhardt Highway	0.83	2,651	9	5	0	3	2	0	1	40%
Logan Motorway (managed by Transurban)	30.00	108,841	7	264	2	109	129	24	4	33%
Millmerran-Inglewood Road	68.40	334-993	340	8	1	2	3	2	20	25%
Millmerran-Leyburn Road	No crashes									
Oakey-Pittsworth Road	No crashes									
Pacific Motorway	216.00	2,651	7	496	26	181	205	84	16	19%
Pampas-Horrane Road	No crashes									
Pittsworth-Felton Road	1.36	2,795	12	5	0	2	3	0	1	60%
Texas-Yelarbon Road	52.86	189	43	2	0	1	0	1	10	50%
Toowoomba-Cecil Plains Road	16.50	1,944 – 12,293	21	45	1	16	23	5	4	27%
Toowoomba Bypass	No crashes									
Warrego Highway	95.80	10,806 – 57,860	328	500	14	214	218	54	4	27%
Yelarbon-Keetah Road	No crashes									

Road name	Length (km)	Background volume (AADT)	Peak construction volume (ADT)	Total	Total five-year crashes				Most frequent DCA group	
				Five-year crashes	Fatal	Hospitalisation	Medical treatment	Minor injury	DCA code group	DCA %
State Controlled Roads: Roads and Maritime Services										
Bruxner Highway	125.00	626	7	126	9	38	55	24	19	21%
Gwydir Highway	316.00	1,478	5	121	5	37	66	13	19	25%
New England Highway	5.00	2,421	7	2	0	0	0	2	1	50%
Newell Highway	7.60	4,051	59	11	3	3	3	2	14	27%
Pacific Motorway	216.00	16,224	7	496	26	181	205	84	16	19%
Summerland Way	89.50	25,082	7	53	7	17	25	4	16	40%
Clarence Valley Council										
Bent Street	0.94	7,600	7	11	0	2	9	0	4	36%
Charles Street	No crashes									
Clarence Street	0.59	7,600	7	14	0	0	8	2	1	79%
Clark Road	No crashes									
Craig Street	0.75	24,125	5	7	0	2	1	3	4	29%
Dobie Street	No crashes									
Fry Street	No crashes									
Mary Street	0.23	7,600	7	2	0	0	2	0	1	100%
Oliver Street	1.18	7,600	7	15	0	2	6	4	1	87%
Red Lane	No crashes									
Trenayr Road	No crashes									
Villers Street	1.30	Data Unavailable	5	8	0	2	4	2	1	63%
Goondiwindi Regional Council										
Bybera Road	No crashes									
Cemetery Road	No crashes									

Road name	Length (km)	Background volume (AADT)	Peak construction volume (ADT)	Total	Total five-year crashes				Most frequent DCA group	
				Five-year crashes	Fatal	Hospitalisation	Medical treatment	Minor injury	DCA code group	DCA %
Coolmunda Dam Access	No crashes									
Cremascos Road	No crashes									
East Sawmill Road	3.69	4,000	215	1	0	0	1	0	17	100%
Elizabeth Street	0.42	800	94	1	0	0	1	0	1	100%
Eukabilla Road	No crashes									
Fosters Road	No crashes									
Grays Road	No crashes									
Hunt Street	No crashes									
Inglewood Quarry Access Road	No crashes									
Kildonan Road	No crashes									
Lovells Crossing Road	4.68	7	94	1	0	1	0	0	19	100%
McDougalls Crossings Road	No crashes									
Moorroobie Lane	No crashes									
Mosquito Creek Road	No crashes									
Old Texas-Yelarbon Road	No crashes									
Queen Street South	No crashes									
South Kurumbul Road	No crashes									
Springborg Road	No crashes									
Suttons Road	No crashes									
Thornton Road	No crashes									
Town Commons Road	No crashes									
Unnamed Road	No crashes									
Whetstone Access Road	No crashes									
Wondalli-Kurumbul Road	No crashes									

Road name	Length (km)	Background volume (AADT)	Peak construction volume (ADT)	Total	Total five-year crashes				Most frequent DCA group	
				Five-year crashes	Fatal	Hospitalisation	Medical treatment	Minor injury	DCA code group	DCA %
Woodcocks Road	No crashes									
Yelarbon-Kurumbul Road	No crashes									
Gwydir Shire Council (GSC)										
Edwards Street	No crashes									
Forest Creek Road	No crashes									
North Star Road	70.00	275	31	1	0	1	0	0	2	100%
Stephen Street	No crashes									
Warialda Road	24.00	3,200	5	4	0	3	1	0	14	75%
Inverell Shire Council (ISC)										
Bruxner Way	128.00	213	7	10	0	4	4	2	19	30%
Campbell Street	No crashes									
Texas Bridge Road	No crashes									
Moree Plains Shire Council (MPSC)										
Bruxner Way	20.00	272	7	2	0	0	0	2	N/A	50%
North Star Road	70.00	291	31	1	0	1	0	0	2	100%
River Road	No crashes									
TRC										
Airport Quarry Wellcamp Access Road (Privately owned road)	No crashes									
Alderley Street	0.98	6,234	65	1	0	0	1	0	5	100%
Athol School Road	No crashes									
Biddeston Southbrook Road	No crashes									
Blackwell Road	No crashes									
Blackwell Road	No crashes									

Road name	Length (km)	Background volume (AADT)	Peak construction volume (ADT)	Total	Total five-year crashes				Most frequent DCA group	
				Five-year crashes	Fatal	Hospitalisation	Medical treatment	Minor injury	DCA code group	DCA %
Bligh Street	No crashes									
Bostock Road	No crashes									
Brimblecombe Road	No crashes									
Bunkers Hill School Road	1.50	522	1	1	0	1	0	0	14	100%
Bushy Lane West	No crashes									
Campbell Street	No crashes									
Chamberlain Road	No crashes									
Commodore Peak Road	No crashes									
Condamine Street	No crashes									
Cypress Street	No crashes									
Dieckmann Road	No crashes									
Draper Road	No crashes									
Drayton Wellcamp Road	61.00	2,163	67	5	0	2	3	0	1	40%
Euston Road	1.49	6,037	65	5	0	2	3	0	4	40%
Filmers Road	No crashes									
Forestry Road	No crashes									
Fysh Road	No crashes									
Gap Road	No crashes									
Geitz Road	No crashes									
Gilgal Lane	No crashes									
Greenwattle Street	0.10	4,818	65	2	0	1	1	0	1	50%
Grevillea Street	No crashes									
Hall Road	No crashes									
Heckendorf Road	No crashes									

Road name	Length (km)	Background volume (AADT)	Peak construction volume (ADT)	Total	Total five-year crashes				Most frequent DCA group	
				Five-year crashes	Fatal	Hospitalisation	Medical treatment	Minor injury	DCA code group	DCA %
Kahler Road	No crashes									
Kooroongarra Road	No crashes									
Leesons Road	2.57	73	73	1	0	1	0	0	17	100%
Lindenmayer Road	No crashes									
Linthorpe Road	No crashes									
Lochaber Road	No crashes									
Macauley Road	No crashes									
McDougall Street	No crashes									
Millwood Road	No crashes									
Murlaggan Road	No crashes									
Omara Road	3.14	3,389	61	1	0	0	1	0	4	100%
Ott Street	No crashes									
Owens Scrub Road	No crashes									
Paint Mine Road	No crashes									
Paton Road	No crashes									
Railway Street	1.12	56	21	2	0	0	2	0	3	50%
Roche Road	No crashes									
Saleyards Road	No crashes									
Scrubby Road	No crashes									
Short Street	No crashes									
Six Mile Road	No crashes									
Steger Road	3.15	60	14	1	0	0	1	0	16	100%
Toowoomba Road	2.91	476	21	3	0	1	2	0	5	33%
Tummaville Road	No crashes									

Road name	Length (km)	Background volume (AADT)	Peak construction volume (ADT)	Total	Total five-year crashes				Most frequent DCA group	
				Five-year crashes	Fatal	Hospitalisation	Medical treatment	Minor injury	DCA code group	DCA %
Ware Street	No crashes									
Wellcamp-Westbrook Road	No crashes									
West Street	No crashes									
Yarranlea Road	No crashes									

Table note:

* No DCA Code Group identified as being most commonly occurring

1. Ranges in values presented where multiple AADT count sites occur along a section of road that is proposed to be used for construction traffic.

4.5.2 Crash analysis – road-rail interface

Crashes by crash severity and type which have occurred within a 200 m radius from existing and proposed public road-rail interface locations have been evaluated. A summary of these findings has been provided in Table 4.13 and a figure showing the proposed road-rail interface and 200 m buffer has been provided in Appendix F.

The findings show that crashes in the five-year period have occurred within 200 m of the following existing and proposed public road-rail interfaces:

- 310-56-P-2 Warrego Highway – Hospitalisation
- 310-51-P-8 Bushy Lane – Medical Treatment
- 310-52-P-1 Biddeston Southbrook Road – Hospitalisation
- 310-53-P-1 Athol School Road. – Hospitalisation.

No fatalities were recorded at any of the proposed road-rail interface locations. No at-grade crossings are proposed at these locations. It is proposed that these crossings with more than one reported crash will either be closed, roads diverted/realigned, or grade separations provided.

Table 4.13 Crash analysis – proposed public road-rail interface (within 200 m radius)

Interface ID	Road name	Proposed treatment	Recorded crashes (200 m buffer)	Most frequent DCA group code	DCA %
Department Transport and Main Roads					
310-11-P-0	Cunningham Highway (Wondalli Street)	Grade separation - road over	No crashes recorded	-	-
310-11-E-1	Cunningham Highway (Wondalli Street)	No crossing provided - relocate	No crashes recorded	-	-
310-24-P-2	Millmerran-Inglewood Road	Active level crossing	No crashes recorded	-	-
310-35-P-4	Millmerran-Inglewood Road	Grade separation - rail over	No crashes recorded	-	-
310-37-P-12a	Millmerran-Inglewood Road	Grade separation - rail over	No crashes recorded	-	-
310-40-E-2	Millmerran-Leyburn Road	Active level crossing	No crashes recorded	-	-
310-44-E-2	Gore Highway	Grade separation - road over	No crashes recorded	-	-
310-48-P-8	Oakey-Pittsworth Road	Grade separation - rail over	No crashes recorded	-	-
310-55-P-1	Toowoomba-Cecil Plains Road	Grade separation - rail over	No crashes recorded	-	-
310-56-P-2	Warrego Highway	Grade separation - rail over	One crash recorded (crash intensity-hospitalisation)	2	100%
Goondiwindi Regional Council					
270-11-P-9a	Stock Reserve	Grade separation - rail over	No crashes recorded	-	-
270-12-P-1	Kildonan Road	Active level crossing	No crashes recorded	-	-
270-12-P-2	Kildonan Road - Stock Reserve	No crossing provided - relocate	No crashes recorded	-	-
270-12-P-4	Eukabilla Road	No crossing provided - road divert/re-align	No crashes recorded	-	-

Interface ID	Road name	Proposed treatment	Recorded crashes (200 m buffer)	Most frequent DCA group code	DCA %
270-12-P-6a	Eukabilla Road	No crossing provided - road divert/re-align	No crashes recorded	-	-
310-4-E-2	South Kurumbul Road	Active level crossing	No crashes recorded	-	-
310-5-P-1	Wondalli-Kurumbul Road	Passive level crossing	No crashes recorded	-	-
310-8-E-0	Unnamed Road	Passive level crossing	No crashes recorded	-	-
310-10-P-1	Unnamed Road	Passive level crossing	No crashes recorded	-	-
310-12-E-1	Suttons Road	Passive level crossing	No crashes recorded	-	-
310-14-E-0	Springborg Road	Passive level crossing	No crashes recorded	-	-
310-14-E-1	Springborg Road	No crossing provided - relocate	No crashes recorded	-	-
310-16-E-1	Whetstone Access Road	Active level crossing	No crashes recorded	-	-
310-17-P-7a	McDougalls Crossing Road	Active level crossing	No crashes recorded	-	-
310-18-P-8	Cremascos Road	Active level crossing	No crashes recorded	-	-
310-19-P-8	Unnamed Road	No crossing provided - consolidate	No crashes recorded	-	-
310-20-P-7	Unnamed Road	No crossing provided - consolidate	No crashes recorded	-	-
310-20-P-12	Bybera Road	No crossing provided - relocate	No crashes recorded	-	-
310-20-P-12z	Bybera Road	Passive level crossing	No crashes recorded	-	-
310-21-P-9	Lovells Crossing Road	Active level crossing	No crashes recorded	-	-
310-22-P-9	Thornton Road	Active level crossing	No crashes recorded	-	-
310-25-P-3	Grays Road	Passive level crossing	No crashes recorded	-	-
310-26-P-2	Wongavale-Yugilbar Road	Passive level crossing	No crashes recorded	-	-
310-27-P-3	Unnamed Road	Grade separation - rail over	No crashes recorded	-	-
310-28-P-3	Unnamed Road	Active level crossing	No crashes recorded	-	-
Toowoomba Regional Council					
310-30-P-2	Unnamed Road	Passive level crossing	No crashes recorded	-	-
310-31-P-7	Kooroongarra Road	Passive level crossing	No crashes recorded	-	-
310-32-P-4	Paton Road	Passive level crossing	No crashes recorded	-	-
310-33-P-1	Nicol Creek Road	Passive level crossing	No crashes recorded	-	-
310-34-P-1	Millwood Road	Passive level crossing	No crashes recorded	-	-

Interface ID	Road name	Proposed treatment	Recorded crashes (200 m buffer)	Most frequent DCA group code	DCA %
310-35-P-4a	Heckendorf Road	No crossing provided - road divert/re-align	No crashes recorded	-	-
310-36-P-1	Blackwell Road	Active level crossing	No crashes recorded	-	-
310-36-P-8a	Scraggs Road	Passive level crossing	No crashes recorded	-	-
310-37-P-12	Schwartens Road	No crossing provided - consolidate	No crashes recorded	-	-
310-38-P-3	Owens Scrub Road	Active level crossing	No crashes recorded	-	-
310-39-P-1	Lindenmayer Road	Passive level crossing	No crashes recorded	-	-
310-40-E-1	Hall Road	Passive level crossing	No crashes recorded	-	-
310-41-E-6	Gilgai Lane	Passive level crossing	No crashes recorded	-	-
310-42-E-0	Harris Road	Active level crossing	No crashes recorded	-	-
310-42-E-1	Fysh Road	No crossing provided - relocate	No crashes recorded	-	-
310-43-E-3	Elsden Road	Active level crossing	No crashes recorded	-	-
310-43-E-8	Mann Silo Road	Passive level crossing	No crashes recorded	-	-
310-45-E-1	Longhurst Road	Active level crossing	No crashes recorded	-	-
310-46-E-1	Yarranlea Road	Grade separation - rail over	No crashes recorded	-	-
310-46-P-3	Roche Road	Grade separation - rail over	No crashes recorded	-	-
310-46-P-4c	Murlaggan Road	No crossing provided - relocate	No crashes recorded	-	-
310-47-P-1	Kahler Road	No crossing provided - consolidate	No crashes recorded	-	-
310-47-P-3	French Road	No crossing provided - road divert/re-align	No crashes recorded	-	-
310-48-P-1	Tip Road	Active level crossing	No crashes recorded	-	-
310-48-P-9	Quibet Road	No crossing provided - road divert/re-align	No crashes recorded	-	-
310-48-P-10	Dallman Road	No crossing provided - road divert/re-align	No crashes recorded	-	-
310-49-P-1	Unnamed Road	No crossing provided - road divert/re-align	No crashes recorded	-	-
310-49-P-2	Lochaber Road	Grade separation - rail over	No crashes recorded	-	-
310-49-P-6	McEwan Lane	No crossing provided - consolidate	No crashes recorded	-	-
310-49-P-8	Paint Mine Road	No crossing provided - road divert/re-align	No crashes recorded	-	-
310-49-P-11	Linthorpe Road	Grade separation - road over	No crashes recorded	-	-
310-50-P-5	Geitz Road	No crossing provided - consolidate	No crashes recorded	-	-

Interface ID	Road name	Proposed treatment	Recorded crashes (200 m buffer)	Most frequent DCA group code	DCA %
310-50-P-11	Linthorpe Valley Road	Passive level crossing	No crashes recorded	-	-
310-51-P-8	Bushy Lane	No crossing provided - road divert/re-align	One crash recorded (crash intensity - medical treatment)	3	100%
310-51-P-11z	Biddeston Southbrook Road	Grade separation - rail over	No crashes recorded	-	-
310-52-P-1	Unnamed Road	No crossing provided - road divert/re-align	One crash recorded (crash intensity - hospitalisation)	14	100%
310-52-P-3	Purcell Road	Passive level crossing	No crashes recorded	-	-
310-53-P-1	Athol School Road	No crossing provided - consolidate	One crash recorded (crash intensity - hospitalisation)	2	100%
310-55-P-5	Brimblecombe Road	Grade separation - rail over	No crashes recorded	-	-
310-57-P-1	Chamberlain Road	Grade separation - rail over	No crashes recorded	-	-
310-57-P-4	Leesons Road	Active level crossing	No crashes recorded	-	-

5 Construction traffic generation and assignment

5.1 Construction transport modes

The construction routes assumed as a part of this TIA are routes which the Principal Contractor may use to transport materials from the assumed suppliers to designated Project laydown areas. However, the determination of the final construction and HV routes will be subject to consultation between DTMR, Councils, ARTC and the Principal Contractor during the next phase of the Project.

Most construction materials are expected to be delivered to key laydown area delivery points along the rail corridor. These delivery points will be designated locations. From these locations, construction material will be distributed to the surrounding 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.

Table 5.1 lists the major construction activities and related transport modes for the traffic generated by the respective activities, as well as indicative dates. The exact schedule of delivery is unknown at this stage of the Project; therefore a uniform delivery schedule has been utilised as an indicative schedule. Further information on the construction delivery schedule will be required to be developed by the appointed Principal Contractor once delivery materials and routes are determined.

Table 5.1 Construction activities contributing to traffic generation and transport mode

Material	Delivery method	Quantity/volume	Start date*	End date*
General fill	Road/haul routes	9,595,807 m ³	21/05/2021	19/02/2024
Structural fill	Road/haul routes	2,070,678 m ³	21/05/2021	19/02/2024
Capping	Road	584,214 m ³	12/02/2022	9/04/2025
Top ballast	Road	217,585 t ¹	11/03/2024	21/08/2025
Bottom ballast	Road	438,570 t ¹	22/12/2023	27/05/2025
Sleepers	Road	378,850 items	1/12/2023	11/02/2026
Rail	Rail	41,155 t	11/10/2024	11/02/2026
Precast concrete – bridge	Road	34 bridges (of various length and sizes)	29/07/2022	7/02/2025
In situ concrete – bridge and culverts	Road	120,379 m ³	16/07/2021	7/02/2025
Culverts	Road	~2,700 culverts (various sizes)	16/07/2021	17/08/2023
Construction water	Road	2,536 ML	14/04/2021	3/02/2026
Workforce	Road	900 FTE (peak)	2/01/2021	11/02/2026
Plant and Tools	Road	150 veh/month	2/01/2021	11/02/2026

Table note:

- * Start and end dates indicative only
- 1. Additional contingency tonnage included in volume

5.2 Construction staging

Staging relates to construction start and end dates of all construction related activities within the envisaged construction period. The start and end dates of all associated construction are taken into account in order to determine the peak period for the Project. Although some materials might be delivered prior to construction start and end dates, it was conservatively assumed that delivery and construction start and end dates would occur during the same time. Fluctuations may occur on site due to the early delivery of materials. However, reference design does not require the design and detailing of the construction activities to be programmed to the day or to the hour, therefore, this information is currently unavailable. This will be assessed as a part of the detail design for the Project when a Principal Contractor is appointed. Likewise, consideration of micro fluctuations will need to be taken into account at that stage. Nonetheless, the mitigation measures provided as a part of this assessment acknowledge these possibilities and the requirement for a Traffic Management Sub-plan to ensure that the impact on the road network is managed.

Construction schedules relating to other committed rail corridor projects were considered in the Section 11 in order to determine potential construction schedule overlapping of the Project's peak period and to account for cumulative impacts.

5.3 Estimated material requirements

The construction TIA has been undertaken based on the material sources, quantities and durations identified as part of the reference design. Not all material and resources required to construct the Project will require transportation. For example, in some instances, fill and water may be sourced adjacent to the intended location of use.

The final sources, quantities and durations of construction materials and activities may differ from what is presented here. Should alternative sources be identified, these may be assessed during the detail design phase of the Project using the process documented in this report and, if required, mitigation measures applied as defined in Section 9.

5.3.1 Bulk earthworks

The bulk earthworks for rail and road components of the Project are summarised in Table 5.2.

Table 5.2 Summary of bulk earthworks for rail and road components

Earthworks	Volume
Cut	
Unusable cut (without treatment)	148,905 m ³
Useable cut (without treatment)	12,376,132 m ³
Total cut (rail)	12,525,037 m³
Fill	
General (rail)	9,595,807 m ³
Structural (rail)	2,070,678 m ³
Capping (rail)	584,214 m ³
Fill requirement (rail)	12,250,699 m³
Fill requirement (road)	1,096,670 m³
Total fill requirement	13,347,369 m³
Balance	822,332 m³ material deficit

The total fill requirement (i.e. rail, road and supporting infrastructure) based on the reference design for the Project is 13,347,369 m³. If all unusable cut material is able to be treated for re-use, then the total material deficit for the Project will be 822,332 m³. However, this deficit may be up to 971,237 m³ depending on the feasibility and success of material treatment options. The fill deficit for the Project will be met through the importation of appropriate material type from operational licensed quarries or from borrow pits established for the Project (refer Section 5.6.5).

5.3.2 Borrow material

Potential borrow areas have been identified along the proposed alignment by ARTC and are shown in Figure 5.1 and listed in Table 5.3.

It is anticipated that structural fill will be either processed from the excavated materials in cuttings or sourced from the identified potential borrow sites and that all capping material will be sourced from nearby existing quarries. For any structural fill imported from borrow pit sites, it may be necessary to undertake some processing (sorting or screening) of the material at the borrow location, prior to movement to site.

It has currently been assumed that the potential borrow pit areas are:

- Likely to be suitable as sources of bulk fill (general fill Types 1, 2 and 3)
- Likely to be suitable as sources of structural fill.

They are included in the TIA as part of the material routes.

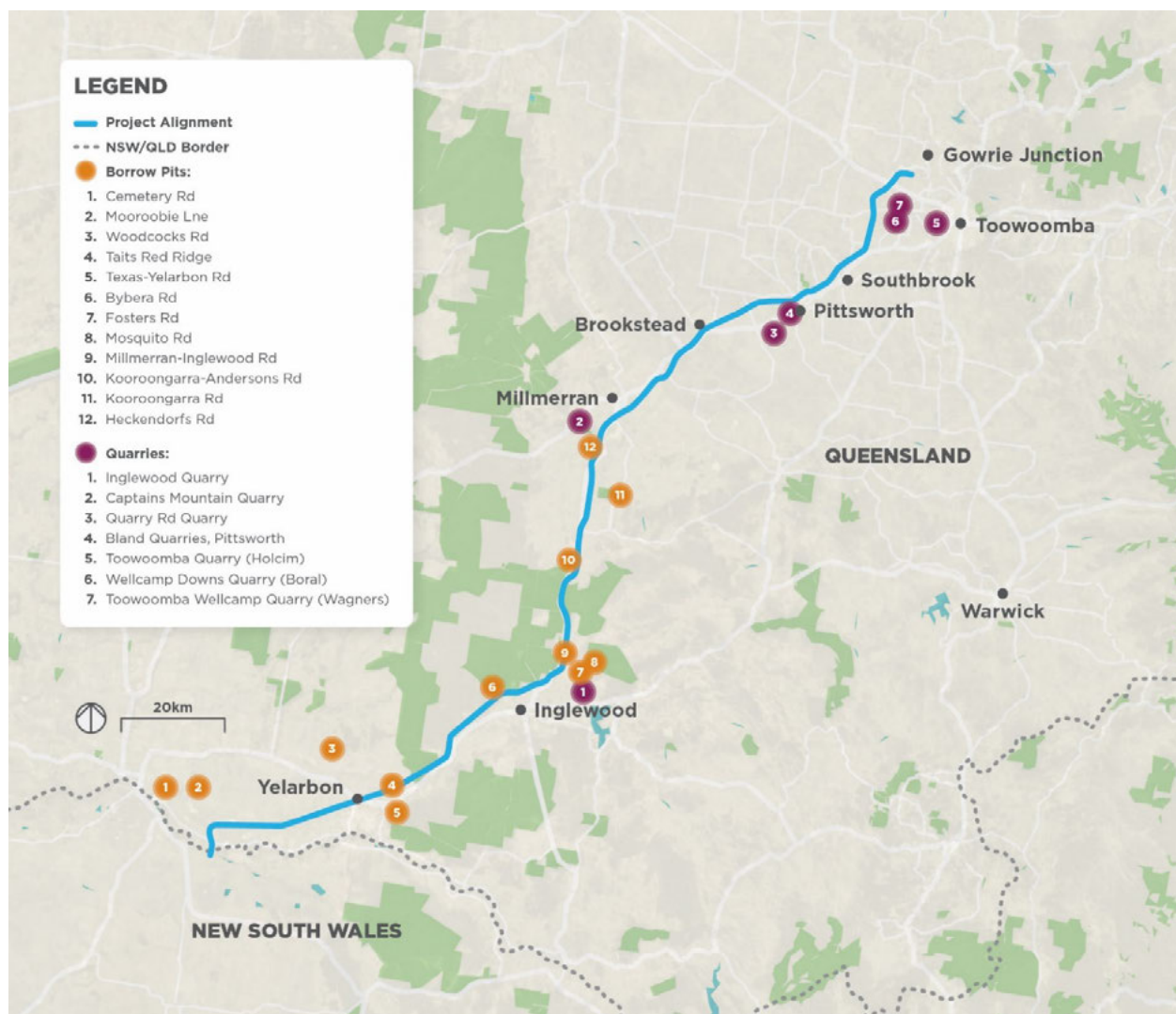


Figure 5.1 Potential borrow and quarry sites

Table 5.3 Potential borrow sites

Borrow site ID	Name	Proposed use	Potential available material
1	Cemetery Road	Structural fill	Structural/general fill
2	Mooroobie Lane	Structural fill	Structural/general fill
3	Woodcocks Road	Structural fill	Structural/general fill
4	Taits Red Ridge	Structural fill	Structural/general fill
5	Texas-Yelarbon Road	Structural fill	Structural/general fill
6	Bybera Road	Structural fill	Structural/general fill
7	Fosters Road	Structural fill	Structural/general fill
8	Mosquito Road	Structural fill	Structural/general fill
9	Millmerran-Inglewood Road	Structural fill	Structural/general fill
10	Kooroongarra-Andersons Road, Canning Creek	Structural fill/spoil removal	Structural/general fill
11	Kooroongarra Road	Structural fill	Structural/general fill
12	Heckendorfs Road	Structural fill	Structural/general fill

5.3.3 Quarry material

The expected volumes of capping and rail ballast and allocated source quarries for the Project alignment are shown in Table 5.4. Total amounts for ballast and capping are based on the following:

- Bottom Ballast: 2 tonnes per metre of alignment
- Top Ballast: 1 tonne per metre of alignment
- Capping: 2 tonnes per metre of alignment.

Table 5.4 Quarry materials

Material type	Quarry site	Supply chainage from	Approx. quantity (t)	Laydown m ²	Comment	Material type
Bottom ballast	Inglewood Quarry	30.50	39.86	18,720	NS2B-LDN035.6	
	Inglewood Quarry	0.00	0.90	7,200	B2G-LDN000.9	
	Inglewood Quarry	0.90	6.30	15,100	B2G-LDN006.3	
	Inglewood Quarry	6.30	16.00	14,000	B2G-LDN016.0	Including passing loop
	Inglewood Quarry	16.00	20.30	9,900	B2G-LDN020.3	
	Inglewood Quarry	20.30	25.90	9,700	B2G-LDN025.9	
	Inglewood Quarry	25.90	30.00	11,700	B2G-LDN030.0	
	Inglewood Quarry	30.00	37.60	15,500	B2G-LDN037.6	
	Inglewood Quarry	37.60	45.50	12,500	B2G-LDN045.5	
	Inglewood Quarry	45.50	50.10	19,300	B2G-LDN050.1	Including passing loop
	Inglewood Quarry	50.10	60.40	15,700	B2G-LDN060.4	
	Inglewood Quarry	60.40	65.80	8,600	B2G-LDN065.8	
	Inglewood Quarry	65.80	69.00	8,200	B2G-LDN069.0	
	Inglewood Quarry	69.00	74.00	12,000	B2G-LDN074.0	
	Inglewood Quarry	74.00	81.00	17,800	B2G-LDN081.0	
	Captains Mountain Quarry (Millmerran)	81.00	91.80	27,900	B2G-LDN091.8	Including passing loop
	Captains Mountain Quarry (Millmerran)	91.80	104.50	20,300	B2G-LDN104.5	
	Captains Mountain Quarry (Millmerran)	104.50	112.10	12,000	B2G-LDN112.1	
	Captains Mountain Quarry (Millmerran)	112.10	116.50	8,100	B2G-LDN116.5	
	Captains Mountain Quarry (Millmerran)	116.50	120.20	13,300	B2G-LDN120.2	
	Captains Mountain Quarry (Millmerran)	120.20	129.80	17,700	B2G-LDN129.8	Including passing loop
	Captains Mountain Quarry (Millmerran)	129.80	133.50	17,300	B2G-LDN133.5	
	Quarry Road Quarry	133.50	147.10	17,400	B2G-LDN147.1	
	Quarry Road Quarry	147.10	150.90	13,900	B2G-LDN150.9	
	Quarry Road Quarry	150.90	161.00	13,400	B2G-LDN161.0	
	Bland Quarries Pittsworth	161.00	164.30	4,600	B2G-LDN164.3	

Material type	Quarry site	Supply chainage from	Approx. quantity (t)	Laydown m ²	Comment	Material type
	Bland Quarries Pittsworth	164.30	165.60	5,300	B2G-LDN165.6	
	Bland Quarries Pittsworth	165.60	169.60	6,400	B2G-LDN169.6	
	Bland Quarries Pittsworth	169.60	172.00	3,900	B2G-LDN172.0	
	Bland Quarries Pittsworth	172.00	173.50	7,900	B2G-LDN173.5	Including passing loop
	Bland Quarries Pittsworth	173.50	175.50	5,500	B2G-LDN175.5	
	Bland Quarries Pittsworth	175.50	179.00	7,500	B2G-LDN179.0	
	Bland Quarries Pittsworth	179.00	183.00	6,000	B2G-LDN183.0	
	Wellcamp Quarries	183.00	185.00	5,200	B2G-LDN185.0	
	Wellcamp Quarries	185.00	188.20	7,300	B2G-LDN188.2	
	Wellcamp Quarries	188.20	192.30	18,100	B2G-LDN192.3	
	Holcim Australia Toowoomba Quarry	192.30	206.30	14,000	B2G-LDN206.3	
Top ballast	Inglewood Quarry	30.50	39.86	9,360	NS2B-LDN035.6	NS2B design north of Macintyre River
	Inglewood Quarry	0.00	0.90	3,600	B2G-LDN000.9	
	Inglewood Quarry	0.90	6.30	7,550	B2G-LDN006.3	
	Inglewood Quarry	6.30	16.00	9,200	B2G-LDN016.0	Including passing loop
	Inglewood Quarry	16.00	20.30	4,950	B2G-LDN020.3	
	Inglewood Quarry	20.30	25.90	4,850	B2G-LDN025.9	
	Inglewood Quarry	25.90	30.00	5,850	B2G-LDN030.0	
	Inglewood Quarry	30.00	37.60	7,750	B2G-LDN037.6	
	Inglewood Quarry	37.60	45.50	6,250	B2G-LDN045.5	
	Inglewood Quarry	45.50	50.10	7,450	B2G-LDN050.1	Including passing loop
	Inglewood Quarry	50.10	60.40	7,850	B2G-LDN060.4	
	Inglewood Quarry	60.40	65.80	4,300	B2G-LDN065.8	
	Inglewood Quarry	65.80	69.00	4,100	B2G-LDN069.0	
	Inglewood Quarry	69.00	74.00	6,000	B2G-LDN074.0	
	Inglewood Quarry	74.00	81.00	8,900	B2G-LDN081.0	
	Captains Mountain Quarry (Millmerran)	81.00	91.80	13,950	B2G-LDN091.8	Including passing loop

Material type	Quarry site	Supply chainage from	Approx. quantity (t)	Laydown m ²	Comment	Material type
	Captains Mountain Quarry (Millmerran)	91.80	104.50	10,150	B2G-LDN104.5	
	Captains Mountain Quarry (Millmerran)	104.50	112.10	6,000	B2G-LDN112.1	
	Captains Mountain Quarry (Millmerran)	112.10	116.50	4,050	B2G-LDN116.5	
	Captains Mountain Quarry (Millmerran)	116.50	120.20	6,650	B2G-LDN120.2	
	Captains Mountain Quarry (Millmerran)	120.20	129.80	6,650	B2G-LDN129.8	Including passing loop
	Captains Mountain Quarry (Millmerran)	129.80	133.50	8,650	B2G-LDN133.5	
	Quarry Road Quarry	133.50	147.10	8,700	B2G-LDN147.1	
	Quarry Road Quarry	147.10	150.90	6,950	B2G-LDN150.9	
	Quarry Road Quarry	150.90	161.00	6,700	B2G-LDN161.0	
	Bland Quarries Pittsworth	161.00	164.30	2,300	B2G-LDN164.3	
	Bland Quarries Pittsworth	164.30	165.60	2,650	B2G-LDN165.6	
	Bland Quarries Pittsworth	165.60	169.60	3,200	B2G-LDN169.6	
	Bland Quarries Pittsworth	169.60	172.00	1,950	B2G-LDN172.0	
	Bland Quarries Pittsworth	172.00	173.50	1,750	B2G-LDN173.5	
	Bland Quarries Pittsworth	173.50	175.50	2,750	B2G-LDN175.5	
	Bland Quarries Pittsworth	175.50	179.00	3,750	B2G-LDN179.0	
	Bland Quarries Pittsworth	179.00	183.00	3,000	B2G-LDN183.0	
	Wellcamp Quarries	183.00	185.00	2,600	B2G-LDN185.0	
	Wellcamp Quarries	185.00	188.20	3,650	B2G-LDN188.2	
	Wellcamp Quarries	188.20	192.30	9,050	B2G-LDN192.3	
	Holcim Australia Toowoomba Quarry	192.30	206.30	7,000	B2G-LDN206.3	

Material type	Quarry site	Supply chainage from	Approx. quantity (t)	Laydown m ²	Comment	Material type
Capping	Inglewood Quarry	31.10	39.86	17,520	NS2B-LDN035.6	NS2B design north of Macintyre River
	Inglewood Quarry	0.00	0.90	7,200	B2G-LDN000.9	
	Inglewood Quarry	0.90	6.30	3,950	B2G-LDN006.3	
	Inglewood Quarry	6.30	16.00	18,400	B2G-LDN016.0	Including passing loop
	Inglewood Quarry	16.00	20.30	9,900	B2G-LDN020.3	
	Inglewood Quarry	20.30	25.90	9,700	B2G-LDN025.9	
	Inglewood Quarry	25.90	30.00	11,700	B2G-LDN030.0	
	Inglewood Quarry	30.00	37.60	15,500	B2G-LDN037.6	
	Inglewood Quarry	37.60	45.50	12,500	B2G-LDN045.5	
	Inglewood Quarry	45.50	50.10	19,300	B2G-LDN050.1	Including passing loop
	Inglewood Quarry	50.10	60.40	15,700	B2G-LDN060.4	
	Inglewood Quarry	60.40	65.80	8,600	B2G-LDN065.8	
	Inglewood Quarry	65.80	69.00	8,200	B2G-LDN069.0	
	Inglewood Quarry	69.00	74.00	12,000	B2G-LDN074.0	
	Inglewood Quarry	74.00	81.00	17,800	B2G-LDN081.0	
	Captains Mountain Quarry (Millmerran)	81.00	91.80	27,900	B2G-LDN091.8	Including passing loop
	Captains Mountain Quarry (Millmerran)	91.80	104.50	20,300	B2G-LDN104.5	
	Captains Mountain Quarry (Millmerran)	104.50	112.10	12,000	B2G-LDN112.1	
	Captains Mountain Quarry (Millmerran)	112.10	116.50	8,100	B2G-LDN116.5	
	Captains Mountain Quarry (Millmerran)	116.50	120.20	13,300	B2G-LDN120.2	
	Captains Mountain Quarry (Millmerran)	120.20	129.80	17,700	B2G-LDN129.8	Including passing loop
	Captains Mountain Quarry (Millmerran)	129.80	133.50	17,300	B2G-LDN133.5	
	Quarry Road Quarry	133.50	147.10	17,400	B2G-LDN147.1	
	Quarry Road Quarry	147.10	150.90	13,900	B2G-LDN150.9	
	Quarry Road Quarry	150.90	161.00	13,400	B2G-LDN161.0	
	Bland Quarries Pittsworth	161.00	164.30	4,600	B2G-LDN164.3	
	Bland Quarries Pittsworth	164.30	165.60	5,300	B2G-LDN165.6	

Material type	Quarry site	Supply chainage from	Approx. quantity (t)	Laydown m ²	Comment	Material type
	Bland Quarries Pittsworth	165.60	169.60	6,400	B2G-LDN169.6	
	Bland Quarries Pittsworth	169.60	172.00	3,900	B2G-LDN172.0	
	Bland Quarries Pittsworth	172.00	173.50	7,900	B2G-LDN173.5	
	Bland Quarries Pittsworth	173.50	175.50	5,500	B2G-LDN175.5	
	Bland Quarries Pittsworth	175.50	179.00	7,500	B2G-LDN179.0	
	Bland Quarries Pittsworth	179.00	183.00	6,000	B2G-LDN183.0	
	Wellcamp Quarries	183.00	185.00	5,200	B2G-LDN185.0	
	Wellcamp Quarries	185.00	188.20	7,300	B2G-LDN188.2	
	Wellcamp Quarries	188.20	192.30	18,100	B2G-LDN192.3	
	Holcim Australia Toowoomba Quarry	192.30	206.30	14,000	B2G-LDN206.3	

5.3.4 Precast and bulk concrete

Two locations have been identified for the temporary siting of a precast concrete facility and concrete batch plant for the Project (refer Table 5.5). Whilst two locations have been nominated, only one plant is expected to be necessary to supplement the supply of concrete from established plants. The proposed locations are immediately north and south of the Condamine River floodplain outside the 1% AEP flood line.

Table 5.5 Precast concrete facility and concrete batch plant locations

ID ¹	Location	Chainage	Description
B2G-LDN150.5	Gore Highway and Dieckmann Road	Ch 150.5 km	Precast concrete facility and concrete batch plant - north
B2G-LDN137.0	Gore Highway	Ch 137.0 km	Precast concrete facility and concrete batch plant - south

The locations for the potential precast concrete facility and concrete batch plant for the Project are shown on Figure 5.2. Also shown are locations of established precast concrete suppliers and concrete batch plants in proximity to the Project that may be used in support of construction.

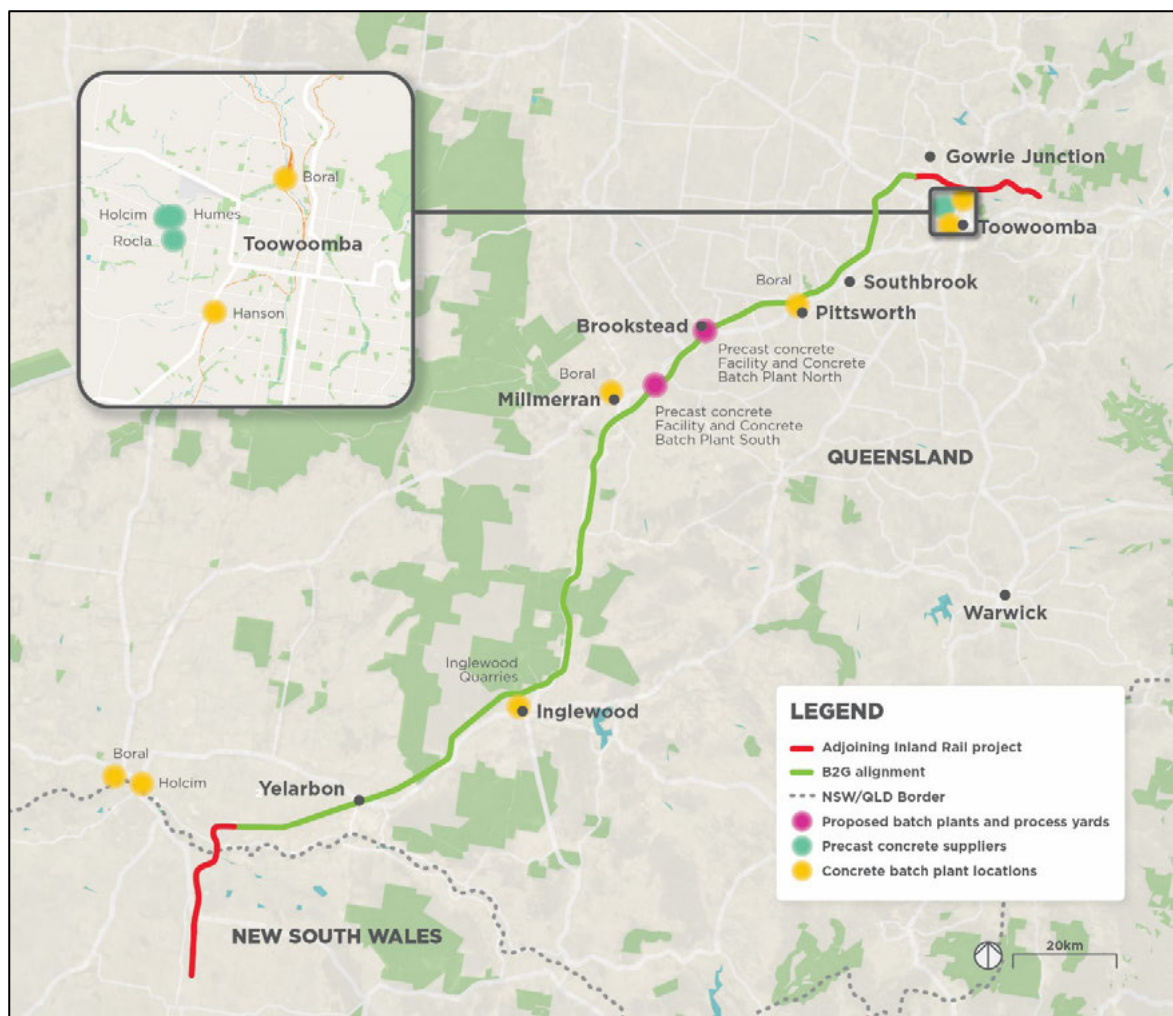


Figure 5.2 Established concrete suppliers and locations for the proposed precast concrete facility and concrete batch plant

5.3.5 Construction water requirements

Significant volumes of water will be required for various activities associated with construction of the Project, including for earthworks, concrete production, track works and the operation of non-resident accommodation camps. The following sections provide a discussion on the anticipated water demand for each of these purposes.

5.3.5.1 Earthworks

The greatest water demand for the Project will be for earthworks, which predominately includes conditioning of fill material, haul road and laydown pad maintenance and dust suppression.

The rates of water application for earthworks activities have been adopted based on the rates used during earthworks for a recent, previous transport infrastructure project in the region and are as follows:

- Material conditioning is expected to require approximately 100 L/m³ of fill, however this is variable, dependent upon material properties.
- General dust suppression across the site will be a constant activity. An allowance of 50 L/m³ of fill has been made. This allowance also covers the water required to re-establish vegetation on disturbed surfaces following the completion of works.
- Haul road and laydown area maintenance will also require water. An allowance of 40 L/m³ of fill has been made.

Based on these rates of application and the volume of fill required for the reference design (13,347,369 m³, refer Table 5.2), a total of 2,536 ML of water that is not quality dependent is estimated to be required for earthworks during construction. Water volumes for each earthworks activity are presented in Table 5.6.

Fill and water volumes for the Project will be confirmed during the detail design process.

Table 5.6 Construction water requirements for earthworks activities

Earthworks activity	Assumed application rate (L/m ³)	Total volume (ML)
Rail (Fill = 12.251 Mm³)		
Material conditioning	100	1,225
Dust suppression and revegetation ¹	50	613
Haul road and laydown area maintenance	40	490
Roads (Fill = 1.097 Mm³)		
Material conditioning	100	110
Dust suppression and revegetation ¹	50	55
Haul road and laydown area maintenance	40	44
Total		2,536

Table note:

- 1 This allowance covers the water required to re-establish vegetation on disturbed surfaces following the completion of works.

5.3.5.2 Concrete

The Project is expected to rely on a combination of existing commercial concrete batching plants and a temporary plant for the batching and precast of concrete, established to service the Project.

Concrete batching has specific water quality requirements in order to achieve structural integrity and asset life objectives. The water requirements for use in the supply of concrete are specified in AS 1379: *Specification and supply of concrete*. Established plants are connected into mains water supply, so the quality and uninterrupted supply of water is not an issue for existing commercial facilities. Therefore, the water requirement for concrete supplied by existing concrete/precast concrete suppliers does not contribute to the Project's direct water requirement.

Locations for two temporary plants, with combined concrete batching and precast function, have been nominated in the Toowoomba LGA to service the Project, one at Ch 137.0 km (Yandilla) and another at Ch 150.5 km (Dieckmann Road) (refer Table 5.5). The demand for an on-site temporary batching and precast plant is driven by the large number and scale of concrete structural elements that are included in the design solution for the crossing of the Condamine River floodplain. Whilst two locations have been nominated, only one plant is expected to be necessary to supplement the supply of concrete from established commercial operators.

If a temporary batching and precast plant is established, a dedicated water supply sourced from mains water will be required. A temporary concrete batching and precast plant would be established with on-site water storage tanks, which would be filled by water trucks drawing water from mains connections in local towns, being Brookstead or Millmerran, if capacity is available. Alternatively, water would be sourced from further afield.

A water requirement of 200 L/m³ has been estimated for the on-site batching of concrete (wet and precast). Using this rate, the water requirement for on-site concrete batching activities is estimated to be 15 ML, as summarised in Table 5.7.

Table 5.7 Estimated water usage for on-site concrete production

Concrete product	Volume required for the reference design (m ³) ¹	Water requirement (L/m ³)	Total estimated water usage (ML)
Precast	24,000	200	4.8
Wet (bulk)	51,000 ²	200	10.2
Total:			15.0

Table notes:

- 1 Excludes concrete (insitu and precast) for culverts, which will all be supplied by existing commercial suppliers.
- 2 For insitu concrete required between Ch 138 km and Ch 165 km. Insitu concrete required outside of this chainage range will be supplied by existing commercial concrete batching plants.

The availability of mains water for the use in a temporary batching facility would be discussed with TRC as the construction approach is refined during the detail design process. In the planning of water access, maintaining the uninterrupted supply of potable water to existing residential and commercial users will be the priority.

5.3.5.3 Trackworks

The predominant requirement for construction water during track works is for dust suppression relating to ballasting works, in particular ballast dropping and ballast regulating works during track tamping activities.

Based on previous rail project experiences, a conservative allowance of 6 L per track metre has been assumed for dust suppression during ballast dropping and 4 L per track metre for dust suppression during tamping and regulating activities.

For 216.2 km of rail alignment, track works is estimated to require a total of 2.16 ML of water that is not quality dependent. A breakdown of this total volume is presented in Table 5.8.

Table 5.8 Construction water requirements for track work activities

Track works activity	Assumed application rate (L/m)	Total project volume (ML)
Dust suppression during ballast dropping	6	1.30
Dust suppression during tamping and regulating	4	0.86
Total		2.16

5.4 Workforce

A preliminary estimate of the workforce required to undertake the works to the nominated program is shown below. Workforce on site for the Project is estimated to peak at 900 full time equivalents between weeks 50 and 70, in 2022. The average size of the full-time equivalent workforce on site across the full construction period is over 400 people. The estimated workforce over the construction period has been provided in Figure 5.3.

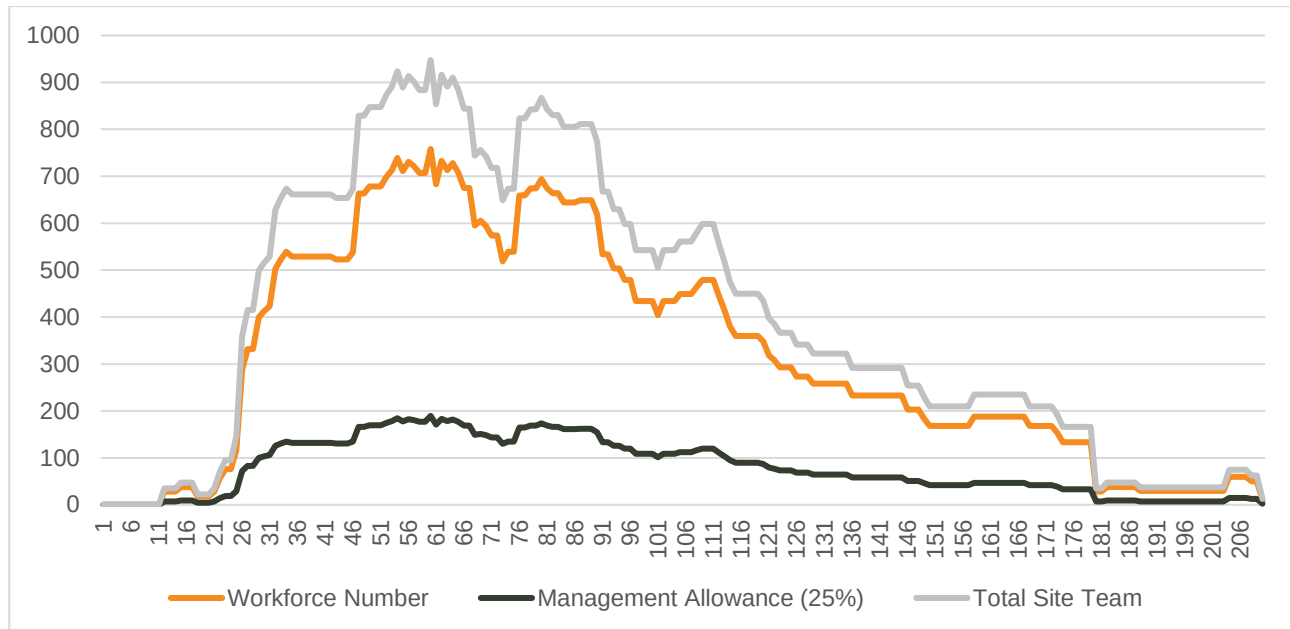


Figure 5.3 Estimated site workforce

The accommodation requirements for workforce in the northern extent of the Project are expected to be sufficiently met by existing accommodation available in Toowoomba, and surrounding towns such as Southbrook and Pittsworth. Existing accommodation is less readily available south of Pittsworth. To compensate for this shortage in accommodation, the Project includes allowance for three non-resident workforce accommodation facilities to accommodate the construction workforce. Each facility will be required to hold 300 staff during the peak between weeks 50 and 70. The average occupancy of the non-resident workforce accommodation outside of the peak period will be approximately 150 people per facility.

An initial assessment of workforce demand and safe commutable distances has identified a potential need for non-resident workforce accommodation in the vicinity of Yelarbon, Inglewood and Millmerran. Locations for non-resident workforce accommodation in proximity to these townships have been identified with consideration for:

- The proximity of the camp to likely construction sites, for fatigue management purposes (maximum desirable commute of 30 minutes)
- Land tenure and ownership of the site
- Available land area
- Proximity to supporting infrastructure and services, such as water and electricity
- Likelihood of noise, vibration and air quality impacts originating from the non-resident workforce accommodation
- Likelihood of disturbing significant vegetation communities, threatened species or heritage sites
- Road access
- Potential for planned future developments to impact on the non-resident workforce accommodation, or vice versa.

Based on these criteria, three properties have been identified as suitable for the establishment of non-resident workforce accommodation. The locations of these properties are summarised in Table 5.9.

Table 5.9 Non-resident workforce accommodation locations

Lot and plan	Address
Lot 30 MH721	Cunningham Highway, Yelarbon
Lot 5 MH75	Millmerran-Inglewood Road, Inglewood
Lot 135 DY1033	553 Turallin Road, Turallin

Population centres near the Project alignment large enough to offer both workforce and accommodation are listed in Table 5.10.

Table 5.10 Available accommodation

Town/City	Population	No. of hotels/ motels ¹	No of available rentals (as of Mar 2019) ²
Toowoomba	100,000	100	500
Pittsworth	3300	2	10
Goondiwindi	5,500	18	17

Table notes:

1 Based on available, published data.

2 Rounded estimates

It has been assumed that workers will travel to the sites in light vehicles. Workforce construction traffic routes have been provide in Appendix O.

5.5 Hours of work

The construction program will generally be based on the following worksite hours:

- General construction activities:
 - Monday to Friday – 6.30 am to 6.00 pm
 - Saturday – 6.30 am to 1.00 pm
 - No work planned on Sundays or public holiday
- Track possessions may occur on a 7 day/24-hour calendar basis, subject to agreement with QR.

Track possession of QR's assets will generally be allocated over weekend periods, with extended track possession occurring over holiday periods.

There may be circumstances where work outside the above standard hours, including night works, will be required, for example, the delivery of materials. Work outside standard hours will only be undertaken where consultation with the local community has been undertaken.

The construction program utilises a 5-day week at full productivity. The half day is to account for maintenance and cycle time calculations that the contractor will carry out. This level of conservatism is deemed appropriate at this stage of design and program development.

Despite delivery of some construction materials continuing outside of standard construction hours, the traffic impact analysis has conservatively assumed a 12-hour delivery period coinciding with the standard construction hours.

5.6 Construction transport routes

For the purposes of the TIA, it has been assumed that all construction material deliveries are being made to laydown area delivery points along the Project footprint. Primary construction routes determined for the Project are used for the purposes of the TIA. Proposed construction transport routes are identified in Section 2.2. Appendix G to Appendix O illustrate the various primary construction routes.

All routes generally follow roads that are proposed to be used for the transport of each material type, considering distance and where possible staying on arterial roads and avoiding populated areas such as town centres. All routes passing through or originating in Toowoomba have been formed using haulage routes that were used for construction of the Toowoomba Second Range Crossing (now Toowoomba Bypass) as a guide. The National Heavy Vehicle Regulator (NHVR) journey planner was also used to identify roads suitable for HVs.

5.6.1 Delivery of water

ARTC recognises water sourcing and availability is critical to supporting the construction program for the Project. Sources of construction water will be finalised as the construction approach is refined during the detail design phase of the Project (post-EIS). Through this process detailed water demand planning will be undertaken, including detailed contingency options in the event that protracted dry seasonal conditions prevail and water supply options become unavailable.

The ultimate water sourcing strategy for the Project will be documented in a Construction Water Plan and be dependent on:

- Climatic conditions in the lead up to construction
- Confirmation of private water sources made available to the Project by landowners under private agreement
- Confirmation of access agreements with local governments for sourcing of mains water.

Options for the sourcing of construction water, subject to availability, are anticipated to be as follows:

- Commercial, licensed water supplies where capacity exists
- Public surface water storages, i.e. dams and weirs
- Permanently (perennial) flowing watercourses
- Privately held water storages, i.e. dams or ring tanks, under private agreement
- Existing registered and licensed bores
- Treated water, e.g. from waste water treatment plants
- New bores established to service the Project under appropriate water licence or entitlement (least preferred option).

An assessment of the suitability of each source will need to be made for each construction activity requiring water, based on the following considerations:

- Legal access
- Volumetric requirement for the activity
- Water quality requirement for the activity, e.g. camps will need potable water
- Source location relative to the location of need.

Construction water will be supplied to various points along the alignment by water trucks for activities including earthworks, haul road maintenance, dust suppression, trackworks and concrete batching. For the purpose of incorporating the delivery of water into the TIA, the assessment has considered the supply of water from public water storages (dams and weirs). This logic will need to be revised once the construction water strategy for the Project is confirmed during detail design.

Proposed construction transport routes for water are illustrated in Appendix N.

5.6.2 Spoil disposal routes

The total fill requirement (i.e. rail, road and supporting infrastructure) based on the reference design for the Project is 13,347,369 m³. If all unusable cut material is able to be treated for re-use, then the total material deficit for the Project will be 822,332 m³. However, this deficit may be up to 971,237 m³ depending on the feasibility and success of material treatment options. As a result of this deficit, spoil disposal is considered to be the least beneficial option and will only be considered where material cannot be treated or otherwise re-used.

A number of opportunities existing for the reuse of this material. Table 5.11 details options for management of spoil generated by the Project and how this TIA has considered the transport of this material along the road network. The options are presented in order of preference.

Table 5.11 Spoil management hierarchy

Rank	Options	Example	
1	Avoid and reduce spoil.	Reduce the amount of spoil generated by the Project by ensuring cuts are only to the extent required for safe and effective construction of the Project	The quantity of spoil generated is proposed to be reduced by: - Aligning the Project to avoid, where possible, steep terrain and topographical constraints to minimise earthworks and provide for more efficient track geometry and grade - Considering the shape and size of batters to encourage cut and fill balancing - Optimising the number, width and depth of cuts to avoid the generation of material that would be considered surplus to Project requirements. - Where practicable, spoil will continue to be reduced during detail design and construction methodology development.
2	Re-use within the rail corridor (with or without treatment)	Re-use within the Project, subject to the material complying with the ARTC Earthworks Material Specification, to establish formation, fill embankments and mounds within short haulage distance of the source location.	Approximately 12,376,132 m³ of cut material that is expected to be suitable for immediate re-use as topsoil, general earth fill and structural fill for the construction of zoned embankments. In addition to the material-specific treatment and re-use opportunities, the following conceptual opportunities have been identified for the re-use of excess cut: - Use excess rock material for scour protection at bridge and culverts, if suitable - Use excess material for construction of temporary works, such as access roads, laydown areas etc. - Construction of the rail maintenance access road at rail formation level - Extend rail formation for future passing loops - Re-habilitate borrow sites.

Rank	Options	Example	
3	Re-use for environmental works and land restoration (with or without treatment)	Re-use for environmental works, subject to the material complying with the required specifications intended for its purpose. Examples include: - Re-use in the rehabilitation of native vegetation - Re-use in flood mitigation works, e.g. Yelarbon levee modification - Re-use for land reinstatement, e.g. the end-of-use closure of borrow pits used by the Project or the reinstatement of laydown facilities - Re-use for landfill covers (day and intermediate covers) and final capping (where deemed suitable) at licenced facilities within the commonly adopted haul route distance of 50 km from the Project	Use excess rock material for scour protection at bridge and culverts, if suitable
4	Re-use on other development (with or without treatment)	Re-use for fill embankments and mounds on projects within a reasonable haulage distance from the source location, subject to the material complying with the required specifications intended for its purpose. Other projects in the Inland Rail Program should be prioritised in the first instance.	Supply of excess material to other developments near the Project for use as fill
5	Dispose offsite as waste	Disposal of excess spoil as waste at an approved facility licenced to receive the material. Offsite disposal to landfill should only occur if the material is considered unsuitable for other uses, e.g. due to geotechnical, contamination or saturation reasons.	Not considered in the TIA

Due to the overall material deficit, and the potential opportunities for reuse of localised excess cut, offsite spoil disposal routes have not been included in the TIA. If offsite spoil disposal is foreseen following the confirmation of mass haul during detail design, an impact assessment of material haulage routes to the identified disposal locations will be undertaken at that time, prior to the commencement of construction.

Proposed construction transport routes for mass haul are illustrated in Appendix G.

5.6.3 Pre-cast concrete routes

For the TIA, it has been assumed that all precast bridge girders required for bridges along the Project alignment will be delivered from the proposed Precast Concrete Facility and Batch Plant North (Ch 150.5 km approximately). Precast drainage structures, such as reinforced concrete pipes and reinforced concrete box culverts, have been assumed to be delivered from suppliers in Toowoomba. No precast concrete routes have been assigned to the Precast Concrete Facility and Batch Plant South (Ch 137.0 km approximately). However, due to the proximity of both proposed batch plants (less than 15 km apart) and their location along the Gore Highway the change in traffic impact will be negligible should the southern plant be chosen over the northern one.

Routes are based on roads most likely to be used for the transportation of precast concrete considering input from the NHVR journey planner which provides guidance in identifying suitable roads for HVs. For the transportation of some of the larger precast concrete girders, it is expected that police escort will be required. To reduce traffic impact transportation will most likely have to occur outside busy daytime hours. Further discussion on the use of OSOM vehicles for the delivery of precast concrete girders is provided in Section 5.6.10.

Proposed construction transport routes for pre-cast concrete are illustrated in Appendix J and Appendix K.

5.6.4 Bulk concrete traffic routes

For the purposes of the TIA, it has been assumed that existing concrete suppliers in the vicinity of the construction corridor as well as the Precast Concrete Facility and Batch Plant North (Ch 150.5 km approximately) will be utilised to provide all bulk concrete. Concrete truck routes were determined based on the location of the concrete supplier in relation to the Project alignment as well as considering the roads most likely to be used for the transportation of concrete. The suppliers outlined provide viable options for the Project, however at the time of construction, it will ultimately be up to the Principal Contractor to determine the most appropriate suppliers to use. This may result in changes to the construction traffic routes outlined in this assessment.

For the purpose of the TIA it has been decided that only the northern precast concrete facility and batch plant will be included in the traffic routes. However, due to the proximity of both proposed batch plants (less than 15 km apart) and their location along the Gore Highway the change in traffic impact will be negligible should the southern plant be chosen over the northern one.

Proposed construction transport routes for concrete are illustrated in Appendix H and Appendix I.

5.6.5 Quarry routes

For the purpose of the TIA it has been assumed that all material deliveries will be made by road from the locations shown in Figure 5.1. Proposed construction transport routes for quarry materials are illustrated in Appendix L.

5.6.6 Consolidated sleeper routes

Concrete sleepers are expected to be sourced from a manufacturer in Grafton in NSW. It is expected that sleepers will be distributed via the road network to various laydown area delivery points for the Project. Sleepers may originate from alternative locations. However, a production facility for the sleeper configurations required for the Inland Rail network, and this Project, is operational in Grafton.

Road transportation routes will be formulated using the NHVR journey planner which provides guidance in identifying suitable roads for HVs. The sleeper routes will then be consolidated where feasible to minimise the number of roads utilised.

Two overarching sleeper routes have thus far been identified for the Project:

- North of Millmerran, deliveries will be via the Pacific, Warrego and Gore highways
- South of Millmerran, deliveries will be via the Summerland Way and Bruxner Highway.

Proposed construction transport routes for sleepers are illustrated in Appendix M.

5.6.7 Rail routes

For the purposes of this assessment, it has been assumed that rail will be supplied by a single source. It will be delivered by the existing QR and ARTC rail network to the nominated sites along the Project alignment where possible. If required, distribution from this point across the Project will be carried out by a combination of truck (to get around physical constraints such as incomplete bridges etc.) and by work train when that option becomes available. The flexibility to move rail along the alignment by truck, within the Project footprint on construction haul roads, will be required. This requirement will be confirmed during the detail design phase of the Project.

5.6.8 Delivery and collection of plant, tools, materials

It is envisaged that the delivery and collection of plant, tools and materials to the construction areas will be cascaded across the road network and occur irregularly. It is considered that the spreading of the trips of this construction activity across the external road network would have a minimal impact and be of an irregular pattern to model. It has therefore been conservatively assumed that these activities would follow the same proposed routes as the workforce.

5.6.9 Laydown areas

Several laydown areas have been identified along the length of the Project. These laydown areas are situated next to the rail corridor to facilitate direct access to/from the laydown to the rail corridor. The laydown areas will act as a centralised point for all material storage. Some laydowns will also consist of fuel storage areas and site office compounds. Establishing temporary laydown areas will generally involve clearing, grubbing, topsoil stripping, installing environmental controls, laying hardstand material, and constructing parking areas and access tracks.

Each bridge location along the alignment will have a dedicated laydown/work area. The area may also include crane pads for the lifting of the bridge members. These areas are primarily for the bridge works; however, larger areas have been provided for locations requiring the storage of other materials that are not associated with the construction of the bridge.

Each laydown has been positioned to avoid or minimise potential impacts to environmental constraints and social receptors. The locations of the laydown areas have been chosen to avoid areas that are within the 1% AEP floodplains where possible. However, by virtue of the requirement of laydown areas for constructing bridges, some laydown areas must be within floodplains and near water sources. In such instances, the following precautions will be taken:

- The potential site will be surveyed to understand the exact extent of potential flooding impact to facilities and storage areas
- The earthworks and temporary drainage will be designed to minimise flooding impacts
- Critical equipment would be placed on earthworks and plinths that raise it above the predicted 1% AEP water level.

Excess material resulting mainly from the excavation of track formation and cess drains will be stockpiled along the rail corridor. The stockpiles will be located as close as possible to the source of the excavated material and will be formed into permanent spoil mounds, spread out to minimise height.

A full list of laydown areas and their planned utilisation is provided in Table 5.12. The movement of materials, plant and workforce personnel to and from these locations have been included in the TIA.

Table 5.12 Laydown areas and utilisation

ID	Location	Chainage (km)	Size (m ²)	Laydown utilisation											Comments
				Rail	Sleepers	Ballast	Bridge	Culverts	Aggregates	Fuel	Site office	Batch Plant	Parking	Other	
NS2B-LDN031.0	Kildonan Road	31.0	184,000				✓	✓					✓		Access available off existing (sealed) Kildonan Road
NS2B-LDN032.5	Kildonan Road	32.5	160,000				✓						✓		Access available off existing (sealed) Kildonan Road
NS2B-LDN033.2	Kildonan Road	33.2	7,000	✓				✓					✓	✓	Access available directly off existing (sealed) Kildonan Road
NS2B-LDN035.6	Eukabilla Road	35.6	87,000	✓	✓	✓		✓	✓	✓	✓		✓	✓	Access available directly off existing (sealed) Eukabilla Road Fuel (<10,000 L)
B2G-LDN000.9	Georges Road (extension)	0.9	126,000		✓	✓			✓				✓		General construction laydown
B2G-LDN006.3	Yelarbon-Kurumbul Road	6.3	10,000	✓	✓	✓		✓	✓	✓			✓	✓	General construction laydown: Fuel (<10,000 L) Road upgrade laydown
B2G-LDN016.0	Yelarbon-Kurumbul Road	16.0	26,000	✓	✓	✓		✓	✓				✓		General construction laydown:
B2G-LDN020.3	Yelarbon-Kurumbul Road	20.3	8,000			✓							✓		General construction laydown
B2G-LDN025.9	Yelarbon (south)	25.9	21,000	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	Multi use construction laydown: Fuel storage (<10,000 L) Road upgrade laydown
B2G-LDN025.9	Yelarbon (north)	25.9	11,000	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	Multi use construction laydown including satellite offices Bridge laydown for Cunningham Highway bridge Fuel (<10,000 L)
B2G-LDN030.0	Suttons Road	30.0	11,000	✓	✓	✓		✓	✓				✓		General construction laydown
B2G-LDN037.6	Springborg Road	37.6	12,000	✓	✓	✓		✓	✓				✓	✓	General construction laydown Road upgrade laydown

ID	Location	Chainage (km)	Size (m ²)	Laydown utilisation											Comments
				Rail	Sleepers	Ballast	Bridge	Culverts	Aggregates	Fuel	Site office	Batch Plant	Parking	Other	
B2G-FBW045.0	Whetstone Access Road (south)	45.0	125,000	✓									✓	✓	Flash butt welding facility
B2G-LDN045.5	Whetstone Access Road (north)	45.5	18,000	✓	✓	✓		✓	✓				✓	✓	Multi use construction laydown Road upgrade laydown
B2G-LDN050.1	McDougalls Crossing Road	50.1	32,000	✓	✓	✓		✓	✓				✓		Multi use construction laydown
B2G-LDN052.8	Cremascos Road	52.8	11,000				✓						✓		Bridge construction site Laydown for Macintyre Brook bail bridge #1
B2G-LDN054.2	Cremascos Road	54.2	54,000		✓	✓		✓	✓	✓	✓		✓	✓	Multi use construction laydown including satellite offices Fuel storage (<10,000 L) Road upgrade laydown
B2G-LDN055.4	Cremascos Road	55.4	12,000				✓						✓		Bridge construction site Laydown for Macintyre Brook rail bridge #2
B2G-LDN060.4	Bybera Road	60.4	27,000		✓	✓		✓	✓				✓	✓	Multi use construction laydown
B2G-LDN065.8	Lovells Crossing Road	65.8	25,000		✓	✓		✓	✓				✓	✓	Multi use construction laydown Road upgrade laydown
B2G-LDN067.6	Thornton Road	67.6	10,000				✓	✓					✓		Bridge construction site Laydown for Pariagara Creek rail bridge
B2G-LDN069.0	Thornton Road	69.0	100,000	✓	✓	✓		✓	✓				✓	✓	Multi use construction laydown Road upgrade laydown
B2G-LDN073.0	Millmerran-Inglewood Road	73.0	10,000				✓						✓		Laydown for Millmerran-Inglewood Road rail bridge #1
B2G-LDN074.0	Millmerran-Inglewood Road	74.0	147,000	✓	✓	✓		✓	✓	✓	✓		✓	✓	Multi use construction laydown including satellite offices Fuel storage (<10,000 L)

ID	Location	Chainage (km)	Size (m ²)	Laydown utilisation											Comments
				Rail	Sleepers	Ballast	Bridge	Culverts	Aggregates	Fuel	Site office	Batch Plant	Parking	Other	
B2G-LDN081.0	Millmerran-Inglewood Road	81.0	27,000	✓	✓	✓		✓	✓	✓	✓		✓	✓	Multi use construction laydown Fuel storage (<10,000 L)
B2G-LDN088.4	Cattle Creek	88.4	10,000				✓	✓					✓		Bridge construction site Laydown for Cattle Tree Creek rail bridge
B2G-LDN091.8	Millmerran-Inglewood Road	91.8	15,500	✓	✓	✓		✓	✓				✓		Multi use construction laydown
B2G-LDN093.8	Millmerran-Inglewood Road	93.8	12,800				✓	✓					✓		Bridge construction site Laydown for Native Dog Creek rail bridge
B2G-LDN098.0	Millmerran-Inglewood Road	98.0	30,500				✓	✓					✓		Bridge construction site Laydown for Bringalily Creek #1 rail bridge
B2G-LDN100.6	Millmerran-Inglewood Road	100.6	3,500				✓	✓					✓		Bridge construction site Laydown for Bringalily Creek #3 rail bridge
B2G-LDN104.5	Nicol Creek	104.5	25,800	✓	✓	✓	✓	✓	✓				✓	✓	Multi use construction laydown Bridge construction site Laydown for Nicol Creek rail bridge
B2G-LDN112.1	Koorongarra-Bull Creek Road	112.1	26,000	✓	✓	✓		✓	✓				✓		Multi use construction laydown
B2G-LDN115.6	Millmerran-Inglewood Road	115.6	14,000				✓						✓		Bridge construction site Laydown for Millmerran-Inglewood Road rail bridge
B2G-LDN116.5	Millmerran-Inglewood Road	116.5	109,000	✓	✓	✓		✓	✓	✓	✓		✓	✓	Construction laydown including main site offices for southern extent of the Project Fuel storage (<20,000 L)
B2G-LDN120.2	Blackwell Road	120.2	90,000	✓	✓	✓		✓	✓				✓	✓	Multi use construction laydown Road upgrade laydown

ID	Location	Chainage (km)	Size (m ²)	Laydown utilisation											Comments
				Rail	Sleepers	Ballast	Bridge	Culverts	Aggregates	Fuel	Site office	Batch Plant	Parking	Other	
B2G-LDN127.0	Millmerran-Inglewood Road	127.0	10,000				✓	✓					✓		Bridge construction site Laydown for Millmerran-Inglewood #3 road bridge
B2G-LDN127.8	Millmerran-Inglewood Road	127.8	10,000				✓						✓		Bridge construction site Laydown for Back Creek rail bridge
B2G-LDN129.8	Owens Scrub Road	129.8	10,300		✓	✓		✓	✓				✓	✓	General construction laydown Road upgrade laydown
B2G-LDN133.5	Pfeffers Lindenmeyers Road	133.5	26,000		✓	✓		✓	✓				✓		General construction laydown
B2G-LDN137.0	Yandilla	137.0	145,000										✓	✓	Potential pre-cast facility and concrete batch plant
B2G-LDN138.5	Grasstree Creek Bridge	138.5	44,600		✓	✓	✓	✓	✓				✓	✓	Bridge construction site Laydown for Grasstree Creek #1 and #2 rail bridge Road upgrade laydown
B2G-LDN140.2	Condamine River	140.2	76,000		✓	✓		✓					✓		Large area for storage of pre-cast concrete
B2G-LDN141.3	Condamine River Bridge	141.3	12,000				✓	✓					✓		Bridge construction site Laydown for Condamine River South Branch rail bridge
B2G-LDN143.0	Condamine River Main Branch #1 Rail Bridge	143.0	12,000				✓						✓		Bridge construction site Laydown for Condamine River Main Branch rail bridge
B2G-LDN144.6	Condamine River Main Branch #2 Rail Bridge	144.6	142,500		✓		✓	✓					✓		Large area for storage of pre-cast concrete
B2G-LDN147.1	Fysh Road	147.1	5,000		✓	✓		✓	✓				✓		General construction laydown
B2G-LDN149.0	Condamine River Bridge (North Branch)	149.0	45,400				✓	✓					✓		Laydown for Condamine River North Branch rail bridge

ID	Location	Chainage (km)	Size (m ²)	Laydown utilisation											Comments
				Rail	Sleepers	Ballast	Bridge	Culverts	Aggregates	Fuel	Site office	Batch Plant	Parking	Other	
B2G-LDN150.5	Dieckmann Road	150.5	129,000										✓	✓	Potential precast facility and concrete batch plant
B2G-LDN150.9	Gore Highway	150.9	5,000		✓	✓			✓				✓		Material access/temporary laydown
B2G-LDN153.1	Gore Highway	153.1	90,600		✓		✓	✓	✓				✓	✓	Bridge construction site Laydown for Gore Highway bridge Road upgrade laydown
B2G-LDN161.0	Pittsworth-Tummaville Road	161.0	65,500	✓	✓	✓		✓	✓	✓	✓		✓	✓	Construction laydown including main site offices for northern section of the Project Fuel storage (<20,000 L) Laydown for Yarranlea Road rail bridge
B2G-LDN163.3	Roche Road	163.3	5,300			✓	✓		✓				✓		Material access/temporary laydown Laydown for Roche Road rail bridge
B2G-LDN164.3	Murlaggan Road	164.3	24,600	✓	✓	✓		✓	✓				✓		Multi use construction laydown
B2G-LDN165.6	Kahler Road	165.6	8,300			✓			✓				✓		Multi use construction laydown
B2G-LDN169.6	Gore Highway	169.6	30,000	✓	✓	✓		✓	✓				✓	✓	Material access/temporary laydown at cut/fill location Road upgrade laydown
B2G-LDN171.0	Pittsworth	171.0	6,800				✓						✓		Bridge construction site Laydown for Oakey Pittsworth Road rail bridge
B2G-LDN172.0	Gore Highway	172.0	15,400	✓		✓		✓	✓				✓	✓	Material access/temporary laydown at cut/fill location Road upgrade laydown
B2G-LDN172.6	Lochaber Road	172.6	27,000				✓						✓		Laydown for Lochaber Road rail bridge
B2G-LDN173.5	Gore Highway	173.5	17,000	✓		✓		✓	✓				✓	✓	Multi use construction laydown

ID	Location	Chainage (km)	Size (m ²)	Laydown utilisation											Comments
				Rail	Sleepers	Ballast	Bridge	Culverts	Aggregates	Fuel	Site office	Batch Plant	Parking	Other	
B2G-LDN175.5	Linthorpe Road Bridge	175.5	72,000	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	Multi use construction laydown including satellite offices Fuel storage (<10,000 L) Road upgrade laydown
B2G-LDN179.0	Linthorpe Valley Road	179.0	22,000	✓	✓	✓		✓	✓				✓		Multi use construction laydown
B2G-LDN183.0	Bushy Lane	183.0	19,000	✓	✓	✓		✓	✓				✓	✓	Material access/temporary laydown at cut/fill location Road upgrade laydown
B2G-LDN183.8	Southbrook-Rockview Road	183.8	15,000				✓						✓		Laydown for Biddeston-Southbrook Road rail bridge
B2G-LDN185.0	Gore Highway	185.0	32,000	✓		✓		✓	✓				✓		Material access/temporary laydown at cut/fill location
B2G-LDN188.2	Athol School Road	188.2	81,000	✓	✓	✓		✓	✓	✓	✓		✓	✓	Multi use construction laydown including satellite offices Fuel storage (<10,000 L) Road upgrade laydown
B2G-LDN192.3	Off Berghofer Road	192.3	30,400	✓	✓	✓		✓	✓	✓	✓		✓		Multi use construction laydown Laydown for bridge alternative to fill Fuel storage (<10,000 L)
B2G-LDN196.2	Toowoomba-Cecil Plains Road	196.2	4,000		✓		✓	✓					✓		Bridge construction site Laydown for Toowoomba-Cecil Plains Road rail bridge
B2G-LDN197.0	Westbrook Creek	197.0	4,300				✓	✓					✓		Bridge construction site Laydown for Westbrook Creek rail bridge
B2G-LDN198.1	Dry Creek	198.1	4,000				✓	✓					✓		Bridge construction site Laydown for Dry Creek rail bridge
B2G-LDN198.7	Brimblecombe Road	198.7	2,500		✓		✓						✓		Bridge construction site Laydown for Brimblecombe Road rail bridge

ID	Location	Chainage (km)	Size (m ²)	Laydown utilisation											Comments
				Rail	Sleepers	Ballast	Bridge	Culverts	Aggregates	Fuel	Site office	Batch Plant	Parking	Other	
B2G-LDN203.0	Warrego Highway	203.0	4,100		✓		✓	✓					✓		Bridge construction site Laydown for Warrego Highway rail bridge
B2G-LDN204.2	Chamberlain Road	204.2	38,000				✓						✓		Bridge construction site Laydown for Chamberlain Road rail bridge
B2G-LDN206.3	Leesons Road	206.3	30,000	✓	✓	✓		✓	✓	✓	✓		✓	✓	Multi use construction laydown including satellite offices Fuel storage (<10,000 L) Road upgrade laydown
B2G-LDN206.9	Draper Road	206.9	80,500											✓	Allowance for construction interface with InterLinkSQ

5.6.10 Road network and restrictions on vehicle size

The nominated construction transport routes have taken into consideration the restrictions on vehicle sizes through the NHVR Journey Planner Tool. However, if required and necessary for the Project, all RAV and OSOM vehicles required to transport special equipment will require permits, to be obtained from the relevant road managing authority. At this stage, oversize vehicles are only assumed to be required the transportation of 29 metre Super-T precast concrete girders. As stated, this requirement may change during detail design phase. Similarly, at this stage, the PBS3B vehicles are not nominated as the design vehicle for construction traffic. The Principal Contractor may stipulate the use of these vehicles but will be required to prepare route assessments accordingly.

While vehicle tracking has been considered in the development of construction routes, the development of final construction routes will include an assessment of above and underground services that may be affected by OSOM vehicles.

The relevant routes being utilised to transport 29m Super-T precast concrete girders trips are shown in and Appendix J to Appendix K, with the potentially impacted links listed below:

- DTMR
 - Charlton Connection Road - Between Toowoomba-Cecil Plains Road and Jordan Court
 - Charlton Connection Road - Between Jordan Court and Warrego Highway
 - Cunningham Highway - Between Wyaga Road and Yelarbon-Keetah Road
 - Cunningham Highway - Between Yelarbon-Keetah Road and Texas-Yelarbon Road
 - Cunningham Highway - Between Texas-Yelarbon Road and Inglewood-Texas Road
 - Cunningham Highway - Between Inglewood-Texas Road and Millmerran-Inglewood Road
 - Gore Highway - Between Millmerran-Inglewood Road and Millmerran-Leyburn Road
 - Gore Highway - Between Millmerran-Leyburn Road and Pampas-Horrane Road
 - Gore Highway - Between Pampas-Horrane Road and Brookstead-Norwin Road
 - Gore Highway - Between Brookstead-Norwin Road and Tummaville Road
 - Gore Highway - Between Tummaville Road and Vines Street
 - Gore Highway - Between Vines Street and Toowoomba Bypass
 - Gore Highway - Between Toowoomba Bypass and Westbrook Road
 - Millmerran-Inglewood Road - Between Cunningham Highway and Thornton Road
 - Millmerran-Inglewood Road - Between Thornton Road and Council boundary
 - Millmerran-Inglewood Road - Between Council boundary and Kooroongarra Road
 - Millmerran-Inglewood Road - Between Kooroongarra Road and Blackwell Road
 - Millmerran-Inglewood Road - Between Blackwell Road and Campbell Street
 - Millmerran-Inglewood Road - Between Campbell Street and Gore Highway
 - Millmerran-Leyburn Road - Between Gore Highway and Reiche Road
 - Oakey-Pittsworth Road - Between Gore Highway and Quibet Road
 - Toowoomba-Cecil Plains Road - Between McDougall Street and Boundary Street
 - Toowoomba-Cecil Plains Road - Between Boundary Street and Charlton Connection Road
 - Toowoomba-Cecil Plains Road - Between Charlton Connection Road and Hursley Road

- Toowoomba-Cecil Plains Road - Between Hursley Road and Hanrahans Road
- Toowoomba-Cecil Plains Road - Between Hanrahans Road and 2 km west of Brimblecombe Road
- Toowoomba Bypass - Between Gore Highway and Toowoomba-Cecil Plains Road
- Toowoomba Bypass - Between Toowoomba-Cecil Plains Road and New England Highway
- Warrego Highway - Between Kingsthorpe Haden Road and Toowoomba Bypass
- Warrego Highway - Between Toowoomba Bypass and Charlton Connection Road
- Yelarbon-Keetah Road - Between Cunningham Highway and Old Warwick Road

■ GRC

- Bybera Road - Between Cunningham Highway and Private Access
- Cremascos Road - Between Cunningham Highway and 400 m west of Private Access
- East Sawmill Road - Between Cunningham Highway and Springborg Road
- Elizabeth Street - Between Cunningham Highway and Callandoon Street
- Eukabilla Road - Full Extent
- Kildonan Road - Between Yelarbon-Keetah Road and Cunningham Highway
- Lovells Crossing Road - Between Callandoon Street and Unnamed Road
- Lovells Crossing Road - Between Unnamed Road and Unnamed Road
- McDougalls Crossings Road - Between Cunningham Highway and 800 m west of Cremascos Road
- Springborg Road - Between Cunningham Highway and Railway Line
- Thornton Road - Between Millmerran-Inglewood Road and Unnamed Road
- Whetstone Access Road - Between Cunningham Highway and 600 m west of Railway Line
- Yelarbon-Kurumbul Road - Between Cunningham Highway and Wondalli-Kurumbul Road

■ TRC

- Athol School Road - Between Gore Highway and Trader Road
- Biddeston Southbrook Road - Between Gore Highway and Stower Road
- Blackwell Road - Between Millmerran-Inglewood Road and Gore Highway
- Blackwell Road - Between Bunkers Hill School Road and Macaulay Road
- Brimblecombe Road - Between Toowoomba-Cecil Plains Road and Gowrie Mountain School Road
- Bunkers Hill School Road - Between Gore Highway and Blackwell Road
- Bushy Lane West - Between Gore Highway and 650 m west of Gore Highway
- Chamberlain Road - Between Warrego Highway and Robson Road
- Dieckmann Road - Between Gore Highway and Madelaine Street
- Fysh Road - Between Gore Highway and Fysh Road
- Geitz Road - Between Gore Highway and Luck Road
- Gilgal Lane - Between Gore Highway and Railway Line
- Hall Road - Between Gore Highway and Railway Line
- Heckendorf Road - Between Millmerran-Inglewood Road and Bora Creek Road
- Leasons Road - Full Extent

- Linthorpe Road - Between Gore Highway and Loveday Road
- Lochaber Road - Between McEwan Lane and Gore Highway
- Macaulay Road - Between Blackwell Road and Wellcamp-Westbrook Road
- McDougall Street - Between Toowoomba-Cecil Plains Road and Hursley Road
- Millwood Road - Between Millmerran-Inglewood Road and Kooroongarra Road
- Murlaggan Road - Between Gore Highway and Roche Road
- Murlaggan Road - Between Roche Road and Yarranlea Road
- Owens Scrub Road - Between Millmerran-Inglewood Road and Foxwood Road
- Paint Mine Road - Between Gore Highway and Loveday Road
- Paton Road - Between Millmerran-Inglewood Road and Kooroongarra Road
- Roche Road - Between Murlaggan Road and Saint Helens Road
- Unnamed Road - Between Toowoomba-Cecil Plains Road and Unnamed Road
- Unnamed Road - Between Gore Highway and Private Access
- Wellcamp-Westbrook Road - Between Macaulay Road and Toowoomba-Cecil Plains Road
- Yarranlea Road - Between Gore Highway and Railway Line
- Yarranlea Road - Between Railway Line and Saint Helens Road.

Maps highlighting precast concrete routes are provided in Appendix J to Appendix K. Maps indicating the multi-combination HV routes are provided in Appendix P.

5.6.11 Access off/onto roads

The following laydown areas will have to be accessed directly off a SCR road:

- Cunningham Highway
- Millmerran-Inglewood Road
- Gore Highway
- Warrego Highway
- Pittsworth-Tummalville Road
- Lochaber Road
- Linthorpe Road
- Linthorpe Valley Road
- Southbrook Rockview Road
- Athol School Road.

Each construction site access location along the Project alignment requiring access directly off/onto a SCR road will need to be negotiated with and approved by DTMR.

The required accesses will need:

- Appropriate site distances in both the vertical and horizontal
- Deceleration lanes for the trucks to slow down in
- Acceleration lanes for re-entering construction traffic
- Appropriate signage and line marking.

A typical construction traffic access to a laydown area is shown Figure 5.4.

This applies to the following laydown areas (LDN)/non-resident workforce accommodation camp locations (CMP) below:

- B2G-CMP026.0
- B2G-LDN073.0 (via access track B2G-TRK073.0)
- B2G-LDN074.0 (via access track B2G-TRK073.6 and B2G-TRK074.8)
- B2G-LDN088.4 (via access track B2G-TRK088.4)
- B2G-LDN091.8
- B2G-LDN093.8 (via access track B2G-TRK093.6)
- B2G-LDN098.0
- B2G-LDN100.6 (via access track B2G-TRK100.7)
- B2G-LDN115.6 (via access track B2G-TRK115.7)
- B2G-LDN127.0 and B2G-LDN127.8 (via access track B2G-TRK127.0)
- B2G-LDN137.0 (via access track B2G-TRK137.0)
- B2G-LDN149.0
- B2G-LDN153.1
- B2G-LDN161.0
- B2G-LDN169.6
- B2G-LDN172.0 (access potentially via Lochaber Road turn off)
- B2G-LDN172.6
- B2G-LDN173.5 (access possible via Frosts Road turn off)
- B2G-LDN175.5
- B2G-LDN179.0
- B2G-LDN183.0 (access potentially via Bushy Lane)
- B2G-LDN-183.8
- B2G-LDN185.0 (access potentially via truck rest area located at Ch 185.3 km)
- B2G-LDN188.2
- B2G-LDN203.0.



Figure 5.4 Typical construction traffic access to laydown area adjacent to DTMR road

5.6.12 Load restricted bridges/restricted waterway crossings

Table 5.13 lists identified potential construction traffic access restrictions. As this list is based on a desktop study it may not be exhaustive.

No detailed assessment has currently been undertaken with regards to these access restrictions and should HVs be required to use them; an assessment will need to be undertaken and further investigation and inspections will need to take place – the outcomes of which may lead to upgrading these bridges for construction and operational purposes

Table 5.13 Potential construction traffic restrictions

Name/location	Restriction	Council	Construction route	Comment
Mooroobie Lane	Creek crossing/potential floodway	GRC	import of fill	Mooroobie Lane is used to access Cemetery Road Borrow Site and Mooroobie Lane Borrow Site
McDougalls Crossing	Creek crossing/potential load limited crossing structure	GRC	All construction traffic (no precast concrete girders)	Crossing structure over Macintyre Brook potentially unsuitable for construction traffic
Cremascos Road	Creek crossing/potential load limited crossing structure	GRC	All construction traffic	Crossing structure over Macintyre Brook potentially unsuitable for construction traffic

Name/location	Restriction	Council	Construction route	Comment
Bybera Road	Creek crossing/potential load limited crossing structure	GRC	All construction traffic (no precast concrete girders)	Crossing structure over Macintyre Brook potentially unsuitable for construction traffic
Lovell's Crossing	Creek crossing/potential load limited crossing structure	GRC	All construction traffic (no precast concrete girders)	Crossing structure over Macintyre Brook potentially unsuitable for construction traffic
Grays Road	Creek crossing/potential load limited crossing structure	GRC	Import of fill	Crossing structure over Canning Creek potentially unsuitable for construction traffic Grays Road is used to access Mosquito Road borrow site
Leesons Road	Rail underpass height restrictions	TRC	Import of fill	Potential rail bridge height restrictions
Leesons Road	Creek crossing/load limited crossing structure	TRC	Import of fill	Crossing structure potentially unsuitable for construction traffic

5.7 Traffic generation by activity

This section presents the traffic generated based on the quantities of construction materials, workforce and equipment as per the above sections.

Buffer factors have been applied to each transportation task to allow for additional journeys that may be required as a consequence of factors such as material quality compliance issues, breakages etc. These buffer factors also cater for potential minor changes to material volumes resulting from design and rail alignment updates (horizontal or vertical). The proposed buffers are considered conservative. It is also envisaged that these factors would cover any peak delivery times. The adjustment/buffer factors are provided in Table 5.14.

Table 5.14 Estimated buffers

Material	Delivery method	Estimated buffer for traffic assessment
Workforce	Road	0%
General fill	Road	5% (there is no import of general fill)
Structural fill	Road	10%.
Capping	Road	10%.
Top ballast	Road	7.5%
Bottom ballast	Road	7.5%
Sleepers	Road	2.5%
Precast concrete – bridge	Road	2.5% (to allow for a few broken beams)
Precast concrete – culverts	Road	2.5% (to allow for a few broken beams)
In situ Concrete – bridge and culverts	Road	5% (over-excavation, wastage)
Culverts	Road	2.5% (Quality compliance)
Water (earthworks)	Road	10%
Water (dust suppression)	Road	10%
Water (haul road and laydown maintenance)	Road	10%

Total trips by construction activity for each road section have been estimated using material requirements and delivery schedule provided in the above sections. These total trips have been summarised in Table 5.15 by activity and year of construction for the Project.

Table 5.15 Total construction vehicle movements by activity, per year

Transportation task ¹	2021	2022	2023	2024	2025	2026	Buffer included for traffic assessment
Movement of workforce to/from non-resident workforce accommodation camps	141,727	142,299	142,299	142,299	135,435	22,573	0%
Material movement: cut to fill	34,285	88,505	33,947	5,860	0	0	10%
Material movement: cut to spoil ²	28,402	78,288	58,579	0	0	0	10%
Material movement: general fill	45,298	71,523	20,472	2,559	0	0	5%
Delivery of precast concrete bridge components	23	229	717	572	8	0	2.5%
Delivery of material from quarries	1,433	9,282	3,927	26,035	30,593	0	7.5%
Delivery of sleepers	0	0	100	976	3,503	292	2.5%
Delivery of water	2,6538	45,095	37,971	19,630	8,957	15	10%
Delivery of precast concrete culverts	323	1,982	686	0	0	0	2.5%
Delivery of in situ concrete for culverts	479	3,116	1,536	0	0	0	5%
Delivery of in situ concrete for bridges	0	3,225	8,884	3,595	40	0	5%
Movement of plant, equipment and tools	1,810	1,810	1,810	1,810	1,810	302	0%

Table notes:

- 1 Traffic impacts associated with the off-site disposal of waste have not been assessed, as waste volumes generated during construction of the Project are not expected to be significant (refer Chapter 20: Waste 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 for will be investigated prior to offsite disposal.

The total trips are distributed along the construction routes, resulting in the total trips by road section as shown in Table 5.16.

Table 5.16 Total trips by road section per year over the construction period

Road name	Road section	Year of construction					
		2021	2022	2023	2024	2025	2026
State Controlled Roads: Department Transport and Main Roads							
Barwon Highway	31A - Between Leichhardt Highway and Town Common Road	220	1,019	61	0	0	0
Charlton Connection Road	320 - Between Toowoomba-Cecil Plains Road and Jordan Court	0	216	274	495	40	0
	320 - Between Jordan Court and Warrego Highway	0	216	274	495	40	0
Cunningham Highway	17D - Between NSW/QLD Border and Leichhardt Highway	8,798	7,729	7,112	7,114	102	1
	17D - Between Leichhardt Highway and Wyaga Road	220	1,019	61	0	0	0
	17D - Between Wyaga Road and Yelarbon-Keetah Road	23,376	25,909	18,759	17,113	19,255	2,745

Road name	Road section	Year of construction					
		2021	2022	2023	2024	2025	2026
	17D - Between Yelarbon-Keetah Road and Texas-Yelarbon Road	33,517	23,873	8,607	6,303	8,142	688
	17D - Between Texas-Yelarbon Road and Inglewood-Texas Road	66,822	52,901	20,337	23,059	19,853	1,915
	17C - Between Inglewood-Texas Road and Millmerran-Inglewood Road	67,671	59,522	27,564	32,853	29,853	3,724
	17C - Between Millmerran-Inglewood Road and Inglewood Quarry Access Road	19,989	57,435	8,228	17,352	10,731	4
	17C - Between Inglewood Quarry Access Road and Coolmunda Dam Access	8,031	11,607	4,301	6,079	2,093	4
Gore Highway	28A - Between Blackwell Road and Saleyards Road	0	0	0	407	4,544	0
	28A - Between Saleyards Road and West Street	18	213	124	190	2,146	0
	28A - Between West Street and Millmerran-Inglewood Road	56,018	56,963	57,988	56,400	58,126	9,330
	28A - Between Millmerran-Inglewood Road and Millmerran-Leyburn Road	36,524	41,176	69,054	43,246	38,914	5,946
	28A - Between Millmerran-Leyburn Road and Pampas-Horrane Road	25,682	30,683	59,938	34,566	26,033	4,149
	28A - Between Pampas-Horrane Road and Brookstead-Norwin Road	23,245	49,612	56,956	36,885	26,445	3,870
	28A - Between Brookstead-Norwin Road and Tummalville Road	14,144	38,381	42,295	24,709	17,357	2,376
	28A - Between Tummalville Road and Vines Street	21,386	109,518	46,020	25,926	18,258	2,424
	28A - Between Vines Street and Toowoomba Bypass	29,597	121,196	29,974	28,341	27,212	3,693
	28A - Between Toowoomba Bypass and Westbrook Road	24,393	29,723	27,961	25,142	24,253	3,866
	28A - Between Westbrook Road and Warrego Highway	24,370	29,548	27,906	25,089	24,245	3,866
Inglewood-Texas Road	231 - Between Cunningham Highway and Greenup Limevale Road	0	0	0	232	929	77
	231 - Between Greenup Limevale Road and Texas-Yelarbon Road	0	0	0	232	929	77
	231 - Between Texas-Yelarbon Road and Stanthorpe-Texas Road	0	0	0	232	929	77
	231 - Between Stanthorpe-Texas Road and Old Texas-Yelarbon Road	0	0	0	232	929	77
	231 - Between Old Texas-Yelarbon Road and NSW/QLD Border	0	0	0	433	1,734	144
Ipswich Motorway	17A - Between Cunningham Highway and Logan Motorway	0	0	0	442	1,770	147
Leichhardt Highway	26C - Between Cunningham Highway and Hunt Street	220	1,019	61	0	0	0
	26C - Between Hunt Street and Barwon Highway	220	1,019	61	0	0	0

Road name	Road section	Year of construction					
		2021	2022	2023	2024	2025	2026
Logan Motorway (managed by Transurban)	210A - Between Ipswich Motorway and Pacific Motorway	0	0	0	442	1,770	147
Millmerran-Inglewood Road	337 - Between Cunningham Highway and Thornton Road	46,491	49,465	18,611	21,927	18,962	2,523
	337 - Between Thornton Road and Council Boundary	43,215	40,030	20,890	21,771	17,774	2,249
	337 - Between Council Boundary and Kooroongarra Road	6,731	11,483	15,002	11,485	7,713	1,033
	337 - Between Kooroongarra Road and Blackwell Road	15,928	32,977	85,922	28,311	22,802	2,576
	337 - Between Blackwell Road and Campbell Street	21,333	53,018	109,264	27,284	21,339	3,500
	337 - Between Campbell Street and Gore Highway	3,773	6,993	33,522	10,124	6,294	503
Millmerran-Leyburn Road	335 - Between Gore Highway and Reiche Road	1,826	2,469	2,551	1,806	1,806	301
Oakey-Pittsworth Road	323 - Between Gore Highway and Quibet Road	1,806	1,806	1,942	1,806	1,806	301
Pacific Motorway	12A - Between Logan Highway and NSW/QLD border	0	0	0	442	1,770	147
Pampas-Horrane Road	327 - Between Gore Highway and Bostock Road	986	4,463	6,738	3,026	894	3
Pittsworth-Felton Road	332 - Between Golf Course Road and Short Street	355	1,852	1,568	473	318	1
Texas-Yelarbon Road	2322 - Between Cunningham Highway and Old Texas-Yelarbon Road	6,610	3,777	0	201	804	67
Toowoomba-Cecil Plains Road	324 - Between Warrego Highway and McDougall Street	5,417	5,417	5,417	5,417	5,417	903
	324 - Between McDougall Street and Boundary Street	5,763	7,742	6,974	6,078	5,458	903
	324 - Between Boundary Street and Charlton Connection Road	5,763	7,742	6,974	6,078	5,458	903
	324 - Between Charlton Connection Road and Hursley Road	5,763	7,526	6,700	5,582	5,417	903
	324 - Between Hursley Road and Hanrahans Road	8,136	16,242	17,802	10,276	9,759	962
	324 - Between Hanrahans Road and 2 km west of Brimblecombe Road	6,663	11,674	10,535	7,632	10,408	938
Toowoomba Bypass	319 - Between Gore Highway and Toowoomba-Cecil Plains Road	6,310	61,603	587	645	3,267	128
	319 - Between Toowoomba-Cecil Plains Road and New England Highway	5,988	59,879	0	473	1,778	147
	319 - Between New England Highway and Warrego Highway	0	0	0	442	1,770	147

Road name	Road section	Year of construction					
		2021	2022	2023	2024	2025	2026
Warrego Highway	18B - Between Kingsthorpe Haden Road and Toowoomba Bypass	17,973	73,775	25,396	14,210	12,371	1,840
	18B - Between Toowoomba Bypass and Charlton Connection Road	10,179	12,090	16,012	12,395	10,528	1,536
	18B - Between Charlton Connection Road and McDougall Street	10,835	10,835	10,835	10,835	10,835	1,806
	18B - Between McDougall Street and Bridge Street	10,835	10,835	10,835	10,835	10,835	1,806
	18B - Between Bridge Street and Toowoomba-Cecil Plains Road	10,835	10,835	10,835	10,835	10,835	1,806
	18B - Between Toowoomba-Cecil Plains Road and Karrool Street	16,252	16,252	16,252	16,252	16,252	2,709
	18B - Between Karrool Street and Gore Highway	16,252	16,252	16,252	16,252	16,252	2,709
	18B - Between Gore Highway and Fifth Avenue	16,252	16,252	16,252	16,252	16,252	2,709
	18A - Between Toowoomba Bypass and Gatton-Helidon Road	0	0	0	442	1,770	147
	18A - Between Gatton-Helidon Road and Gatton-Esk Road	0	0	0	442	1,770	147
	18A - Between Gatton-Esk Road and Laidley-Plainland Road	0	0	0	442	1,770	147
	18A - Between Laidley-Plainland Road and Tallegalla Two Tree Hill Road	0	0	0	442	1,770	147
	18A - Between Tallegalla Two Tree Hill Road and Haigslea Amberley Road	0	0	0	442	1,770	147
	18A - Between Haigslea Amberley Road and Brisbane Valley Highway	0	0	0	442	1,770	147
	18A - Between Brisbane Valley Road and Mount Crosby Road	0	0	0	442	1,770	147
	18A - Between Mount Crosby Road and Cunningham Highway	0	0	0	442	1,770	147
Yelarbon-Keetah Road	241 - Between Cunningham Highway and Old Warwick Road	20,314	9,327	745	1,079	0	0
State-Controlled Roads: Roads and Maritime Services							
Bruxner Highway	Between New England Highway and Summerland Way	0	0	0	433	1,734	144
Gwydir Highway	Between Stephens Road and Delungra Road	0	0	100	100	0	0
	Between Delungra Road and Delungra Bypass Road	0	0	100	100	0	0
	Between Delungra Bypass Road and Copeton Dam Road	0	0	100	100	0	0
	Between Copeton Dam Road and Bannockburn Road	0	0	100	100	0	0
	Between Bannockburn Road and Campbell Street	0	0	100	100	0	0
	Between Campbell Street and Tingha Road	0	0	100	100	0	0

Road name	Road section	Year of construction					
		2021	2022	2023	2024	2025	2026
	Between Tingha Road and Elsmore Road	0	0	100	100	0	0
	Between Elsmore Road and Woodstock Road	0	0	100	100	0	0
	Between Woodstock Road and Waterloo Road	0	0	100	100	0	0
	Between Waterloo Road and Coronation Avenue	0	0	100	100	0	0
	Between Coronation Avenue and New England Highway	0	0	100	100	0	0
	Between New England Highway and Shannon Vale Road	0	0	100	100	0	0
	Between Shannon Vale Road and Bald Nob Road	0	0	100	100	0	0
	Between Bald Nob Road and Old Grafton Road	0	0	100	100	0	0
	Between Old Grafton Road and Coombadjha Road	0	0	100	100	0	0
	Between Coombadjha Road and Old Glen Innes Road	0	0	100	100	0	0
	Between Old Glen Innes Road and Rogan Bridge Road	0	0	100	100	0	0
	Between Rogan Bridge Road and Bent Street	0	0	100	100	0	0
New England Highway	Between Bruxner Way and Bruxner Highway	0	0	0	433	1,734	144
	Between Gwydir Highway and Gwydir Highway	0	0	100	100	0	0
Newell Highway	Between NSW/QLD Border and Bruxner Way	8,798	7,729	7,112	7,114	102	1
Pacific Motorway	Between NSW/QLD border and Gwydir Highway	0	0	0	442	1,770	147
Summerland Way	Between Bruxner Highway and Red Lane	0	0	0	433	1,734	144
	Between Trenayr Road and Turf Street	0	0	100	100	0	0
Clarence Valley Council							
Bent Street	Between Craig Street and Gwydir Highway	0	0	100	542	1,770	147
Charles Street	Between Bent Street and Pacific Highway	0	0	0	442	1,770	147
Clarence Street	Between Oliver Street and Craig Street	0	0	0	442	1,770	147
Clark Road	Full Extent	0	0	100	533	1,734	144
Craig Street	Between Villiers Street and Clarence Street	0	0	100	100	0	0
	Between Clarence Street and Bent Street	0	0	100	542	1,770	147
Dobie Street	Between Villers Street and Summerland Way	0	0	100	100	0	0

Road name	Road section	Year of construction					
		2021	2022	2023	2024	2025	2026
Fry Street	Between Mary Street and Alice Street	0	0	0	442	1,770	147
Mary Street	Between Fry Street and Oliver Street	0	0	0	442	1,770	147
Oliver Street	Between Clarence Street and Mary Street	0	0	0	442	1,770	147
Red Lane	Between Summerland Way and Trenayr Road	0	0	0	433	1,734	144
Trenayr Road	Between Red Lane and Clark Road	0	0	0	433	1,734	144
	Between Summerland Way and Clark Road	0	0	100	100	0	0
Villers Street	Between Craig Street and Dobie Street	0	0	100	100	0	0
Goondiwindi Regional Council							
Boodle Street	Between Boodle Street and Hunt Street	0	0	0	0	0	0
Bybera Road	Between Cunningham Highway and Private Access	45,672	28,408	2,918	5,891	3,185	312
	Between Private Access and Unnamed Road	10,525	36,547	0	0	0	0
Cemetery Road	Between Moorobie Lane and Unnamed Road	6,610	3,777	0	0	0	0
Coolmunda Dam Access	Full Extent	8,031	11,607	4,301	6,079	2,093	4
Cremascos Road	Between Cunningham Highway and 400 m west of private access	3,708	4,202	4,272	3,705	3,767	621
East Sawmill Road	Between Cunningham Highway and Springborg Road	22,148	12,116	3,053	3,058	2,534	309
Elizabeth Street	Between Cunningham Highway and Callandoon Street	21,699	21,757	21,728	22,552	22,061	3,612
Eukabilla Road	Full Extent	2,523	2,167	1,949	1,950	0	0
Fosters Road	Between Cunningham Highway and Grays Road	10,525	36,547	0	0	0	0
Grays Road	Between Millmerran-Inglewood Road and Mosquito Creek Road	1,806	9,269	6,283	1,806	1,806	301
Hunt Street	Between Leichhardt Highway and Boodle Street	0	0	0	0	0	0
Inglewood Quarry Access Road	Full Extent	1,436	9,289	3,931	11,273	8,637	0
Kildonan Road	Between Yelarbon-Keetah Road and Cunningham Highway	29,112	17,056	7,857	8,193	102	1
Lovells Crossing Road	Between Callandoon Street and Unnamed Road	21,699	21,757	21,728	22,552	22,061	3,612
	Between Unnamed Road and Unnamed Road	3,641	3,698	3,670	4,494	4,003	602
McDougalls Crossings Road	Between Cunningham Highway and 800 m west of Cremascos Road	6,380	3,546	2,843	4,640	3,378	310
Moorobie Lane	Between Wondalli-Kurumbul Road and Cemetery Road	13,220	7,554	0	0	0	0

Road name	Road section	Year of construction					
		2021	2022	2023	2024	2025	2026
Mosquito Creek Road	Between Grays Road and Cunningham Highway	0	7,463	4,478	0	0	0
Old Texas-Yelarbon Road	Between Texas-Yelarbon Road and Rocky Creek Road	0	0	0	201	804	67
	Between Rocky Creek Road and Inglewood-Texas Road	0	0	0	201	804	67
Queen Street South	Between Yelarbon-Kurumbul Road and Danes Lane	72	72	72	72	72	12
South Kurumbul Road	Between Yelarbon-Kurumbul Road and Kildonan Road	856	315	147	148	102	1
Springborg Road	Between Cunningham Highway and Railway Line	2,925	3,009	2,639	2,244	2,780	324
Suttons Road	Between East Sawmill Road and Unnamed Road	18,858	6,286	0	0	0	0
Thornton Road	Between Millmerran-Inglewood Road and Unnamed Road	3,648	20,207	2,529	3,769	2,705	323
Town Commons Road	Between Waggamba Road and Barwon Highway	220	1,019	61	0	0	0
Unnamed Road	Between Cunningham Highway and Private Access	179	1,514	880	138	0	0
Unnamed Road	Between Cemetery Road and Unnamed Road	6,610	3,777	0	0	0	0
Unnamed Road	Between Texas-Yelarbon Road and Private Land	6,610	3,777	0	0	0	0
Unnamed Road	Between Woodcocks Road and Queen Street North	6,610	3,777	0	0	0	0
Unnamed Road	Between East Sawmill Road and Suttons Road	7,351	3,434	0	0	0	0
Unnamed Road	Full extent	18,858	6,286	0	0	0	0
Whetstone Access Road	Between Cunningham Highway and 600 m west of Railway Line	3,642	2,763	2,424	3,894	2,791	310
Wondalli-Kurumbul Road	Between South Western System (Railway) and Bickers Road	13,220	7,554	0	0	0	0
Woodcocks Road	Between Cunningham Highway and Unnamed Road	6,610	3,777	0	0	0	0
Yelarbon-Kurumbul Road	Yelarbon-Kurumbul Road	13,807	17,653	15,050	12,449	15,289	1,884
Gwydir Shire Council							
Edwards Street	Between North Star Road and I B Bore Road	6,292	6,864	6,964	6,964	0	0
North Star Road	Between MPSC Council Boundary and Edwards Street	6,292	6,864	6,964	6,964	0	0
	Between Edward Street and Getta Getta Road	6,292	6,864	6,964	6,964	0	0
	Between Getta Getta Road and Blue Nobby Road	0	0	100	100	0	0
	Between Blue Nobby Road and Hibernia Road	0	0	100	100	0	0
	Between Hibernia Road and Yallaroi Road	0	0	100	100	0	0

Road name	Road section	Year of construction					
		2021	2022	2023	2024	2025	2026
	Between Yallaroi Road and Baroma Road	0	0	100	100	0	0
	Between Baroma Road and Warialda Road	0	0	100	100	0	0
Stephen Street	Between Long Street and Gwydir Highway	0	0	100	100	0	0
Warialda Road	Between North Star Road and Gournama Road	0	0	100	100	0	0
	Between Gournama Road and Oregon Road	0	0	100	100	0	0
	Between Oregon Street and Stephen Street	0	0	100	100	0	0
Inverell Shire Council							
Bruxner Way	Between Texas Bridge Road and Glenrock Road	0	0	0	433	1,734	144
	Between Glenrock Road and New England Highway	0	0	0	433	1,734	144
Campbell Street	Between Byron Street and Otho Street	0	0	100	100	0	0
Texas Bridge Road	Between NSW/QLD Border and Bruxner Highway	0	0	0	433	1,734	144
Moree Plains Shire Council							
Bruxner Way	Between Newell Highway and Tucka Tucka Road	6,292	6,864	6,964	6,964	0	0
	Between Tucka Tucka Road and North Star Road	6,292	6,864	6,964	6,964	0	0
North Star Road	Between Bruxner Way and Gwydir Shire Council boundary	6,292	6,864	6,964	6,964	0	0
River Road	Between Newell Highway and Boggabilla Weir	2,506	865	148	150	102	1
Toowoomba Regional Council							
Airport Quarry Wellcamp Access Road (Privately owned road)	Between Toowoomba-Cecil Plains Road and Toowoomba Wellcamp Airport	0	0	0	208	1,727	0
Alderley Street	Between Greenwattle Street and Gore Highway	2,396	8,891	11,100	3,133	2,170	49
	Between Gore Highway and Condamine Street	0	108	72	0	0	0
Athol School Road	Between Gore Highway and Trader Road	2,705	6,450	5,179	3,147	3,705	322
Biddeston Southbrook Road	Between Gore Highway and Stower Road	2,159	3,627	3,241	2,614	2,123	301
Blackwell Road	Between Millmerran-Inglewood Road and Gore Highway	3,792	4,475	4,755	8,081	16,567	612
Blackwell Road	Between Bunkers Hill School Road and Macaulay Road	23	175	26	0	0	0
Bligh Street	Between Six Mile Road and Concrete Millmerran	56	1,196	2,132	230	0	0

Road name	Road section	Year of construction					
		2021	2022	2023	2024	2025	2026
	Between Concrete Millmerran and Crosby Street	56	1,196	2,132	230	0	0
Bostock Road	Between Pampas-Horrane Road and Unnamed Road	986	4,463	6,738	3,026	894	3
Brimblecombe Road	Between Toowoomba-Cecil Plains Road and Gowrie Mountain School Road	3,684	3,737	3,874	3,871	3,684	614
Bunkers Hill School Road	Between Gore Highway and Blackwell Road	23	175	26	0	0	0
Bushy Lane West	Between Gore Highway and 650 m west of Gore Highway	3,684	3,810	3,707	4,497	4,047	623
Campbell Street	Between Millmerran-Inglewood Road and Commens Street	21,701	22,506	23,617	22,116	24,068	3,612
Chamberlain Road	Between Warrego Highway and Robson Road	1,806	1,806	2,019	2,187	1,806	301
Commodore Peak Road	Between Millmerran-Inglewood Road and Blackwell Road	0	14,645	29,289	0	0	0
Condamine Street	Full Extent	0	108	72	0	0	0
Dieckmann Road	Between Gore Highway and Madelaine Street	143	758	1,755	579	140	1
Draper Road	Between Steger Road and Leeson's Road	3,612	3,612	3,612	3,612	3,612	602
Drayton Wellcamp Road	Between Wellcamp-Westbrook Road and Boundary Street South	2,396	8,891	11,100	4,433	2,496	49
Euston Road	Between Boundary Court and Greenwattle Street	2,396	8,891	11,100	3,133	2,170	49
Forestry Road	Between Millmerran-Inglewood Road and Unnamed Road	0	10,069	4,478	0	0	0
Fysh Road	Between Gore Highway and Fysh Road	2	25	15	172	1,999	0
Gap Road	Between Gore Highway and Cypress Street	1,109	6,015	5,156	2,023	993	1
Geitz Road	Between Gore Highway and Luck Road	1,806	24,853	1,820	2,668	2,122	301
Gilgal Lane	Between Gore Highway and Railway Line	1,815	1,914	3,030	4,151	1,906	309
Greenwattle Street	Between Euston Road and Alderley Street	2,396	8,891	11,100	3,133	2,170	49
Grevillea Street	Full Extent	0	277	338	332	0	0
Hall Road	Between Gore Highway and Railway Line	1,962	3,138	4,626	2,360	2,031	309
Heckendorf Road	Between Millmerran-Inglewood Road and Bora Creek Road	13	152	5,847	1,414	1,269	5
Kahler Road	Between Murlaggan Road and Glen Devon Road	1,806	1,806	1,806	1,870	2,079	301
Kooroongara Road	Between Millmerran-Inglewood Road and Bliss Road	0	0	26,368	5,860	0	0
Kooroongarra Road	Between Millmerran-Inglewood Road and Halls Road	0	29,289	58,579	0	0	0

Road name	Road section	Year of construction					
		2021	2022	2023	2024	2025	2026
Kooroongarra Road	Between Millwood Road and Cunningham Highway	0	0	5,758	1,280	0	0
Leesons Road	Full Extent	4,352	4,689	8,946	5,908	4,643	617
Lindenmayer Road	Between Gore Highway and Unnamed Road	3,612	3,612	3,612	3,820	5,827	608
Linthorpe Road	Between Gore Highway and Loveday Road	2,577	10,579	5,083	4,666	2,951	325
Lochaber Road	Between McEwan Lane and Gore Highway	1,806	1,806	1,911	1,806	1,806	301
Macaulay Road	Between Blackwell Road and Wellcamp-Westbrook Road	23	175	26	0	0	0
McDougall Street	Between Toowoomba-Cecil Plains Road and Hursley Road	323	1,982	686	0	0	0
Millwood Road	Between Millmerran-Inglewood Road and Kooroongarra Road	3,888	19,444	40,158	5,712	5,502	611
Murlaggan Road	Between Gore Highway and Roche Road	13,211	67,130	33,597	13,456	7,797	1,210
	Between Roche Road and Yarranlea Road	0	0	228	0	0	0
Omara Road	Between Toowoomba-Cecil Plains Road and Warrego Highway	1,150	2,845	6,708	2,820	1,369	25
Owens Scrub Road	Between Millmerran-Inglewood Road and Foxwood Road	2,335	3,964	4,647	2,934	4,819	314
Paint Mine Road	Between Gore Highway and Loveday Road	1,806	1,865	1,817	1,806	1,806	301
Paton Road	Between Millmerran-Inglewood Road and Kooroongarra Road	3,687	3,715	3,829	3,889	6,785	623
Pittsworth-Felton Road	Between Cypress Street and Golf Course Road	355	1,852	1,568	473	318	1
Railway Street	Between Short Street and Vines Street	699	3,600	3,140	1,840	625	1
Roche Road	Between Murlaggan Road and Saint Helens Road	1,806	1,806	2,033	1,806	1,806	301
Saleyards Road	Between Millmerran-Inglewood Road and Gore Highway	18	213	124	216	2,398	0
Scrubby Road	Between Gore Highway and Jentz Road	0	2,534	0	3,722	2,132	0
Short Street	Between Yandilla Street and Toowoomba Road	355	1,852	1,568	473	318	1
Six Mile Road	Between Rodney Road and Bligh Street	56	1,196	2,132	230	0	0
Steger Road	Between Warrego Highway and Draper Road	3,612	3,612	3,612	3,612	3,612	602
Toowoomba Road	Between Vines Street and Gore Highway	699	3,600	3,140	1,840	625	1
Tummaville Road	Between Gore Highway and Mann Silo Road	0	2,534	0	5,135	3,056	0
Unnamed Road	Between Gore Highway and Millmerran Indoor Sports Centre	55,980	55,980	55,980	55,980	55,980	9,330
Unnamed Road	Between Toowoomba-Cecil Plains Road and Unnamed Road	0	96	58	176	2,019	0

Road name	Road section	Year of construction					
		2021	2022	2023	2024	2025	2026
Unnamed Road	Between Tummaville Road and Scrubby Road	0	2,534	0	5,135	3,056	0
Unnamed Road	Between Drayton Westbrook Road and Unnamed Road	0	0	0	1,300	326	0
Unnamed Road	Between Bostock Road and Unnamed Road	986	4,463	6,738	3,026	894	3
Unnamed Road	Between Forestry Road and Unnamed Road	0	10,069	4,478	0	0	0
Unnamed Road	Between Gore Highway and Private Access	3,612	3,621	3,617	3,612	3,612	602
Ware Street	Between Gore Highway and Railway Line	0	19	619	0	0	0
Wellcamp-Westbrook Road	Between Macaulay Road and Toowoomba-Cecil Plains Road	23	175	26	0	0	0
	Between Toowoomba-Cecil Plains Road and Drayton Wellcamp Road	2,396	8,891	11,100	4,433	2,496	49
West Street	Between Gore Highway and Rodney Road	56	1,196	2,132	230	0	0
Yarranlea Road	Between Gore Highway and Railway Line	2,633	5,836	5,460	4,750	3,081	323
	Between Railway Line and Saint Helens Road	0	0	228	0	0	0

Peak daily trips along each road segment have been calculated from the total trips by construction activity using the following key assumptions:

- Two hundred and sixty-one working days per year, resulting in an average of 22 working days per month. This is a conservative assumption as it does not consider potential deliveries occurring on Saturdays or Sundays.
- Equal distribution of loads throughout the delivery period
 - Buffer factors provided in Table 5.14 are to cover any potential ‘peak’ delivery times within this period.
 - Peak delivery movements for different construction activities will likely not coincide with each other as the start date of construction activities are typically reliant on the end date of others.

While buffer factors have been included in the analysis to cover potential ‘peak’ delivery times, fluctuations may occur on site to coincide with the appointed contractor’s delivery schedule. Reference design does not require the design and detailing of the construction activities to be programmed to the day or to the hour, therefore, potential fluctuations in peak deliveries will be assessed as a part of the detail design for the Project when a Principal Contractor is appointed. This assessment will inform the Traffic Management Sub-plan discussed in Section 9 which will ensure that the transport task is managed to reduce overlapping peak periods and impacts on the wider road network, such as peak school hours.

Table 5.17 summarises the peak daily traffic volumes which would occur along each road segment of the proposed primary construction routes for each year of construction. It also identifies the peak month of construction where these are currently scheduled to occur. Plots of the full construction impact by month on the links are provided in Appendix S

The transport of precast bridge girders may require the use of oversize vehicles. If any need arises for an oversize vehicle movement (excess mass or over-dimensional loads), DTMR and other relevant authorities will be notified, and permissions will be obtained as required under the *Transport Operations (Road Use Management) Act (Qld) 1995*.

Table 5.17 Peak daily number of construction traffic movements over the construction period per road section

Road name	Road section	Year of construction						Peak construction months
		2021	2022	2023	2024	2025	2026	
State Controlled Roads: Department Transport and Main Roads								
Barwon Highway	31A - Between Leichhardt Highway and Town Common Road	2	8	0	0	0	0	May 2022 to August 2022
Charlton Connection Road	320 - Between Toowoomba-Cecil Plains Road and Jordan Court	0	1	3	3	1	0	October 2023 to May 2024
	320 - Between Jordan Court and Warrego Highway	0	1	3	3	1	0	October 2023 to May 2024
Cunningham Highway	17D - Between NSW/QLD Border and Leichhardt Highway	59	41	31	31	1	0	June 2021 to June 2021
	17D - Between Leichhardt Highway and Wyaga Road	2	8	0	0	0	0	May 2022 to August 2022
	17D - Between Wyaga Road and Yelarbon-Keetah Road	108	164	164	77	89	62	November 2022 to January 2023
	17D - Between Yelarbon-Keetah Road and Texas-Yelarbon Road	270	270	147	36	51	17	December 2021 to February 2022
	17D - Between Texas-Yelarbon Road and Inglewood-Texas Road	565	565	215	109	113	45	December 2021 to January 2022
	17C - Between Inglewood-Texas Road and Millmerran-Inglewood Road	550	550	235	155	150	86	December 2021 to January 2022
	17C - Between Millmerran-Inglewood Road and Inglewood Quarry Access Road	224	282	165	128	92	0	March 2022 to July 2022
	17C - Between Inglewood Quarry Access Road and Coolmunda Dam Access	64	72	19	50	12	0	March 2022 to July 2022
Gore Highway	28A - Between Blackwell Road and Saleyards Road	0	0	0	9	58	0	January 2025 to March 2025
	28A - Between Saleyards Road and West Street	1	1	1	4	30	0	January 2025 to March 2025
	28A - Between West Street and Millmerran-Inglewood Road	214	221	222	216	242	212	January 2025 to March 2025
	28A - Between Millmerran-Inglewood Road and Millmerran-Leyburn Road	145	174	308	278	170	136	June 2023 to June 2023
	28A - Between Millmerran-Leyburn Road and Pampas-Horrane Road	103	137	277	245	100	96	June 2023 to June 2023
	28A - Between Pampas-Horrane Road and Brookstead-Norwin Road	93	242	265	241	117	90	July 2023 to July 2023
	28A - Between Brookstead-Norwin Road and Tummaville Road	58	189	213	191	82	56	July 2023 to July 2023

Road name	Road section	Year of construction						Peak construction months
		2021	2022	2023	2024	2025	2026	
	28A - Between Tummaville Road and Vines Street	337	699	224	198	82	57	April 2022 to April 2022
	28A - Between Vines Street and Toowoomba Bypass	369	732	141	121	125	87	April 2022 to April 2022
	28A - Between Toowoomba Bypass and Westbrook Road	95	123	123	102	94	88	June 2022 to November 2022
	28A - Between Westbrook Road and Warrego Highway	94	122	122	101	94	88	April 2023 to May 2023
Inglewood-Texas Road	231 - Between Cunningham Highway and Greenup Limevale Road	0	0	0	4	4	4	October 2024 to January 2026
	231 - Between Greenup Limevale Road and Texas-Yelarbon Road	0	0	0	4	4	4	October 2024 to January 2026
	231 - Between Texas-Yelarbon Road and Stanthorpe-Texas Road	0	0	0	4	4	4	October 2024 to January 2026
	231 - Between Stanthorpe-Texas Road and Old Texas-Yelarbon Road	0	0	0	4	4	4	October 2024 to January 2026
	231 - Between Old Texas-Yelarbon Road and NSW/QLD Border	0	0	0	7	7	7	October 2024 to January 2026
Ipswich Motorway	17A - Between Cunningham Highway and Logan Motorway	0	0	0	7	7	7	October 2024 to January 2026
Leichhardt Highway	26C - Between Cunningham Highway and Hunt Street	3	9	5	0	0	0	May 2022 to August 2022
	26C - Between Hunt Street and Barwon Highway	2	8	0	0	0	0	May 2022 to August 2022
Logan Motorway (managed by Transurban)	210A - Between Ipswich Motorway and Pacific Motorway	0	0	0	7	7	7	October 2024 to January 2026
Millmerran-Inglewood Road	337 - Between Cunningham Highway and Thornton Road	340	340	75	128	86	59	December 2021 to January 2022
	337 - Between Thornton Road and Council Boundary	321	321	134	187	86	52	December 2021 to January 2022
	337 - Between Council Boundary and Kooroongarra Road	29	148	70	123	37	24	June 2022 to June 2022
	337 - Between Kooroongarra Road and Blackwell Road	65	210	401	321	137	59	June 2023 to June 2023
	337 - Between Blackwell Road and Campbell Street	86	363	498	218	81	80	July 2023 to July 2023
	337 - Between Campbell Street and Gore Highway	19	38	170	149	45	12	June 2023 to June 2023
Millmerran-Leyburn Road	335 - Between Gore Highway and Reiche Road	8	12	13	7	7	7	April 2023 to June 2023
Oakey-Pittsworth Road	323 - Between Gore Highway and Quibet Road	7	7	13	7	7	7	October 2023 to October 2023

Road name	Road section	Year of construction						Peak construction months
		2021	2022	2023	2024	2025	2026	
Pacific Motorway	12A - Between Logan Highway and NSW/QLD border	0	0	0	7	7	7	October 2024 to January 2026
Pampas-Horrane Road	327 - Between Gore Highway and Bostock Road	5	36	36	12	5	0	December 2022 to May 2023
Pittsworth-Felton Road	332 - Between Golf Course Road and Short Street	2	12	12	2	2	0	December 2022 to May 2023
Texas-Yelarbon Road	2322 - Between Cunningham Highway and Old Texas-Yelarbon Road	43	43	0	3	3	3	June 2021 to April 2022
Toowoomba-Cecil Plains Road	324 - Between Warrego Highway and McDougall Street	21	21	21	21	21	21	January 2021 to February 2026
	324 - Between McDougall Street and Boundary Street	27	30	29	26	21	21	May 2022 to October 2022
	324 - Between Boundary Street and Charlton Connection Road	27	30	29	26	21	21	May 2022 to October 2022
	324 - Between Charlton Connection Road and Hursley Road	27	29	28	23	21	21	April 2022 to October 2022
	324 - Between Hursley Road and Hanrahans Road	38	73	93	89	58	22	March 2023 to March 2023
	324 - Between Hanrahans Road and 2 km west of Brimblecombe Road	27	55	57	36	84	22	March 2025 to April 2025
Toowoomba Bypass	319 - Between Gore Highway and Toowoomba-Cecil Plains Road	278	279	4	11	30	6	March 2022 to October 2022
	319 - Between Toowoomba-Cecil Plains Road and New England Highway	272	272	0	7	7	7	December 2021 to October 2022
	319 - Between New England Highway and Warrego Highway	0	0	0	7	7	7	October 2024 to January 2026
Warrego Highway	18B - Between Kingsthorpe Haden Road and Toowoomba Bypass	319	328	288	106	50	42	May 2022 to October 2022
	18B - Between Toowoomba Bypass and Charlton Connection Road	40	49	68	99	43	35	May 2024 to May 2024
	18B - Between Charlton Connection Road and McDougall Street	41	41	41	41	41	41	January 2021 to February 2026
	18B - Between McDougall Street and Bridge Street	41	41	41	41	41	41	January 2021 to February 2026
	18B - Between Bridge Street and Toowoomba-Cecil Plains Road	41	41	41	41	41	41	January 2021 to February 2026
	18B - Between Toowoomba-Cecil Plains Road and Karrool Street	62	62	62	62	62	62	January 2021 to February 2026
	18B - Between Karrool Street and Gore Highway	62	62	62	62	62	62	January 2021 to February 2026

Road name	Road section	Year of construction						Peak construction months
		2021	2022	2023	2024	2025	2026	
	18B - Between Gore Highway and Fifth Avenue	62	62	62	62	62	62	January 2021 to February 2026
	18A - Between Toowoomba Bypass and Gatton-Helidon Road	0	0	0	7	7	7	October 2024 to January 2026
	18A - Between Gatton-Helidon Road and Gatton-Esk Road	0	0	0	7	7	7	October 2024 to January 2026
	18A - Between Gatton-Esk Road and Laidley-Plainland Road	0	0	0	7	7	7	October 2024 to January 2026
	18A - Between Laidley-Plainland Road and Tallegalla Two Tree Hill Road	0	0	0	7	7	7	October 2024 to January 2026
	18A - Between Tallegalla Two Tree Hill Road and Haigslea Amberley Road	0	0	0	7	7	7	October 2024 to January 2026
	18A - Between Haigslea Amberley Road and Brisbane Valley Highway	0	0	0	7	7	7	October 2024 to January 2026
	18A - Between Brisbane Valley Road and Mount Crosby Road	0	0	0	7	7	7	October 2024 to January 2026
	18A - Between Mount Crosby Road and Cunningham Highway	0	0	0	7	7	7	October 2024 to January 2026
Yelarbon-Keetah Road	241 - Between Cunningham Highway and Old Warwick Road	209	209	8	16	0	0	December 2021 to February 2022
State-Controlled Roads: Roads and Maritime Services								
Bruxner Highway	Between New England Highway and Summerland Way	0	0	0	7	7	7	October 2024 to January 2026
Gwydir Highway	Between Stephens Road and Delungra Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Delungra Road and Delungra Bypass Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Delungra Bypass Road and Copeton Dam Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Copeton Dam Road and Bannockburn Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Bannockburn Road and Campbell Street	0	0	5	5	0	0	December 2023 to January 2024
	Between Campbell Street and Tingha Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Tingha Road and Elsmore Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Elsmore Road and Woodstock Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Woodstock Road and Waterloo Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Waterloo Road and Coronation Avenue	0	0	5	5	0	0	December 2023 to January 2024

Road name	Road section	Year of construction						Peak construction months
		2021	2022	2023	2024	2025	2026	
	Between Coronation Avenue and New England Highway	0	0	5	5	0	0	December 2023 to January 2024
	Between New England Highway and Shannon Vale Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Shannon Vale Road and Bald Nob Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Bald Nob Road and Old Grafton Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Old Grafton Road and Coombadjha Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Coombadjha Road and Old Glen Innes Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Old Glen Innes Road and Rogan Bridge Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Rogan Bridge Road and Bent Street	0	0	5	5	0	0	December 2023 to January 2024
New England Highway	Between Bruxner Way and Bruxner Highway	0	0	0	7	7	7	October 2024 to January 2026
	Between Gwydir Highway and Gwydir Highway	0	0	5	5	0	0	December 2023 to January 2024
Newell Highway	Between NSW/QLD Border and Bruxner Way	59	40	31	31	1	0	June 2021 to June 2021
Pacific Motorway	Between NSW/QLD border and Gwydir Highway	0	0	0	7	7	7	October 2024 to January 2026
Summerland Way	Between Bruxner Highway and Red Lane	0	0	0	7	7	7	October 2024 to January 2026
	Between Trenayr Road and Turf Street	0	0	5	5	0	0	December 2023 to January 2024
Clarence Valley Council								
Bent Street	Between Craig Street and Gwydir Highway	0	0	5	7	7	7	October 2024 to January 2026
Charles Street	Between Bent Street and Pacific Highway	0	0	0	7	7	7	October 2024 to January 2026
Clarence Street	Between Oliver Street and Craig Street	0	0	0	7	7	7	October 2024 to January 2026
Clark Road	Full Extent	0	0	5	7	7	7	October 2024 to January 2026
Craig Street	Between Villiers Street and Clarence Street	0	0	5	5	0	0	December 2023 to January 2024
	Between Clarence Street and Bent Street	0	0	5	7	7	7	October 2024 to January 2026
Dobie Street	Between Villers Street and Summerland Way	0	0	5	5	0	0	December 2023 to January 2024
Fry Street	Between Mary Street and Alice Street	0	0	0	7	7	7	October 2024 to January 2026
Mary Street	Between Fry Street and Oliver Street	0	0	0	7	7	7	October 2024 to January 2026
Oliver Street	Between Clarence Street and Mary Street	0	0	0	7	7	7	October 2024 to January 2026
Red Lane	Between Summerland Way and Trenayr Road	0	0	0	7	7	7	October 2024 to January 2026

Road name	Road section	Year of construction						Peak construction months
		2021	2022	2023	2024	2025	2026	
Trenayr Road	Between Red Lane and Clark Road	0	0	0	7	7	7	October 2024 to January 2026
	Between Summerland Way and Clark Road	0	0	5	5	0	0	December 2023 to January 2024
Villers Street	Between Craig Street and Dobie Street	0	0	5	5	0	0	December 2023 to January 2024
Goondiwindi Regional Council								
Boodle Street	Between Boodle Street and Hunt Street	1	5	5	0	0	0	September 2022 to July 2023
Bybera Road	Between Cunningham Highway and Private Access	403	403	11	48	17	7	September 2021 to January 2022
	Between Private Access and Unnamed Road	96	210	0	0	0	0	March 2022 to September 2022
Cemetery Road	Between Moorobie Lane and Unnamed Road	43	43	0	0	0	0	June 2021 to April 2022
Coolmunda Dam Access	Full Extent	64	72	19	50	12	0	March 2022 to July 2022
Cremascos Road	Between Cunningham Highway and 400 m west of private access	14	20	20	14	14	14	December 2022 to January 2023
East Sawmill Road	Between Cunningham Highway and Springborg Road	215	215	31	23	13	7	December 2021 to February 2022
Elizabeth Street	Between Cunningham Highway and Callandoon Street	82	82	82	94	86	82	May 2024 to July 2024
Eukabilla Road	Full Extent	13	13	12	12	0	0	December 2021 to February 2022
Fosters Road	Between Cunningham Highway and Grays Road	96	210	0	0	0	0	March 2022 to September 2022
Grays Road	Between Millmerran-Inglewood Road and Mosquito Creek Road	7	75	75	7	7	7	August 2022 to March 2023
Hunt Street	Between Leichhardt Highway and Boodle Street	1	5	5	0	0	0	September 2022 to July 2023
Inglewood Quarry Access Road	Full Extent	65	146	146	83	80	0	November 2022 to January 2023
Kildonan Road	Between Yelarbon-Keetah Road and Cunningham Highway	250	250	39	47	1	0	December 2021 to February 2022
Lovells Crossing Road	Between Callandoon Street and Unnamed Road	82	82	82	94	86	82	May 2024 to July 2024
	Between Unnamed Road and Unnamed Road	14	14	14	26	17	14	May 2024 to July 2024
McDougalls Crossings Road	Between Cunningham Highway and 800 m west of Cremascos Road	46	46	12	35	18	7	September 2021 to January 2022
Moorobie Lane	Between Wondalli-Kurumbul Road and Cemetery Road	86	86	0	0	0	0	June 2021 to April 2022
Mosquito Creek Road	Between Grays Road and Cunningham Highway	0	68	68	0	0	0	August 2022 to March 2023

Road name	Road section	Year of construction						Peak construction months
		2021	2022	2023	2024	2025	2026	
Old Texas-Yelarbon Road	Between Texas-Yelarbon Road and Rocky Creek Road	0	0	0	3	3	3	October 2024 to January 2026
	Between Rocky Creek Road and Inglewood-Texas Road	0	0	0	3	3	3	October 2024 to January 2026
Queen Street South	Between Yelarbon-Kurumbul Road and Danes Lane	0	0	0	0	0	0	January 2021 to February 2026
South Kurumbul Road	Between Yelarbon-Kurumbul Road and Kildonan Road	33	2	1	1	1	0	June 2021 to June 2021
Springborg Road	Between Cunningham Highway and Railway Line	48	28	28	12	14	8	June 2021 to June 2021
Suttons Road	Between East Sawmill Road and Unnamed Road	143	143	0	0	0	0	July 2021 to February 2022
Thornton Road	Between Millmerran-Inglewood Road and Unnamed Road	22	123	10	25	13	8	March 2022 to September 2022
Town Commons Road	Between Waggamba Road and Barwon Highway	2	8	0	0	0	0	May 2022 to August 2022
Unnamed Road	Between Cunningham Highway and Private Access	3	9	7	2	0	0	December 2022 to December 2022
Unnamed Road	Between Cemetery Road and Unnamed Road	43	43	0	0	0	0	June 2021 to April 2022
Unnamed Road	Between Texas-Yelarbon Road and Private Land	43	43	0	0	0	0	June 2021 to April 2022
Unnamed Road	Between Woodcocks Road and Queen Street North	43	43	0	0	0	0	June 2021 to April 2022
Unnamed Road	Between East Sawmill Road and Suttons Road	100	39	0	0	0	0	July 2021 to July 2021
Unnamed Road	Full extent	143	143	0	0	0	0	July 2021 to February 2022
Whetstone Access Road	Between Cunningham Highway and 600 m west of Railway Line	23	23	11	32	15	7	May 2024 to July 2024
Wondalli-Kurumbul Road	Between South Western System (Railway) and Bickers Road	86	86	0	0	0	0	June 2021 to April 2022
Woodcocks Road	Between Cunningham Highway and Unnamed Road	43	43	0	0	0	0	June 2021 to April 2022
Yelarbon-Kurumbul Road	Yelarbon-Kurumbul Road	151	174	174	64	78	44	November 2022 to January 2023
Gwydir Shire Council								
Edwards Street	Between North Star Road and I B Bore Road	26	26	31	31	0	0	December 2023 to January 2024
North Star Road	Between MPSC Council Boundary and Edwards Street	26	26	31	31	0	0	December 2023 to January 2024
	Between Edward Street and Getta Getta Road	26	26	31	31	0	0	December 2023 to January 2024
	Between Getta Getta Road and Blue Nobby Road	0	0	5	5	0	0	December 2023 to January 2024

Road name	Road section	Year of construction						Peak construction months
		2021	2022	2023	2024	2025	2026	
	Between Blue Nobby Road and Hibernia Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Hibernia Road and Yallaro Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Yallaro Road and Baroma Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Baroma Road and Warialda Road	0	0	5	5	0	0	December 2023 to January 2024
Stephen Street	Between Long Street and Gwydir Highway	0	0	5	5	0	0	December 2023 to January 2024
Warialda Road	Between North Star Road and Gournama Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Gournama Road and Oregon Road	0	0	5	5	0	0	December 2023 to January 2024
	Between Oregon Street and Stephen Street	0	0	5	5	0	0	December 2023 to January 2024
Inverell Shire Council								
Bruxner Way	Between Texas Bridge Road and Glenrock Road	0	0	0	7	7	7	October 2024 to January 2026
	Between Glenrock Road and New England Highway	0	0	0	7	7	7	October 2024 to January 2026
Campbell Street	Between Byron Street and Otho Street	0	0	5	5	0	0	December 2023 to January 2024
Texas Bridge Road	Between NSW/QLD Border and Bruxner Highway	0	0	0	7	7	7	October 2024 to January 2026
Moree Plains Shire Council								
Bruxner Way	Between Newell Highway and Tucka Tucka Road	26	26	31	31	0	0	December 2023 to January 2024
	Between Tucka Tucka Road and North Star Road	26	26	31	31	0	0	December 2023 to January 2024
North Star Road	Between Bruxner Way and Gwydir Shire Council boundary	26	26	31	31	0	0	December 2023 to January 2024
River Road	Between Newell Highway and Boggabilla Weir	33	14	1	1	1	0	June 2021 to June 2021
Toowoomba Regional Council								
Airport Quarry Wellcamp Access Road (Privately owned road)	Between Toowoomba-Cecil Plains Road and Toowoomba Wellcamp Airport	0	0	0	5	24	0	March 2025 to April 2025
Alderley Street	Between Greenwattle Street and Gore Highway	12	45	65	13	12	1	January 2023 to May 2023
	Between Gore Highway and Condamine Street	0	1	1	0	0	0	April 2022 to June 2023
Athol School Road	Between Gore Highway and Trader Road	11	31	31	15	24	8	April 2023 to May 2023
Biddeston Southbrook Road	Between Gore Highway and Stower Road	9	17	17	16	9	7	June 2022 to May 2023

Road name	Road section	Year of construction						Peak construction months
		2021	2022	2023	2024	2025	2026	
Blackwell Road	Between Millmerran-Inglewood Road and Gore Highway	15	20	20	82	162	14	January 2025 to March 2025
Blackwell Road	Between Bunkers Hill School Road and Macaulay Road	1	1	0	0	0	0	December 2021 to November 2022
Bligh Street	Between Six Mile Road and Concrete Millmerran	2	9	11	4	0	0	April 2023 to May 2023
	Between Concrete Millmerran and Crosby Street	2	9	11	4	0	0	April 2023 to May 2023
Bostock Road	Between Pampas-Horrane Road and Unnamed Road	5	36	36	12	5	0	December 2022 to May 2023
Brimblecombe Road	Between Toowoomba-Cecil Plains Road and Gowrie Mountain School Road	14	14	16	17	14	14	February 2024 to February 2024
Bunkers Hill School Road	Between Gore Highway and Blackwell Road	1	1	0	0	0	0	December 2021 to November 2022
Bushy Lane West	Between Gore Highway and 650 m west of Gore Highway	14	14	14	22	17	14	July 2024 to September 2024
Campbell Street	Between Millmerran-Inglewood Road and Commens Street	83	90	92	87	111	82	January 2025 to March 2025
Chamberlain Road	Between Warrego Highway and Robson Road	7	7	10	10	7	7	March 2024 to May 2024
Commodore Peak Road	Between Millmerran-Inglewood Road and Blackwell Road	0	133	133	0	0	0	August 2022 to October 2023
Condamine Street	Full Extent	0	1	1	0	0	0	April 2022 to June 2023
Dieckmann Road	Between Gore Highway and Madelaine Street	1	4	21	3	1	0	July 2023 to July 2023
Draper Road	Between Steger Road and Leasons Road	14	14	14	14	14	14	January 2021 to February 2026
Drayton Wellcamp Road	Between Wellcamp-Westbrook Road and Boundary Street South	12	45	65	67	15	1	May 2024 to May 2024
Euston Road	Between Boundary Court and Greenwattle Street	12	45	65	13	12	1	January 2023 to May 2023
Forestry Road	Between Millmerran-Inglewood Road and Unnamed Road	0	118	68	0	0	0	June 2022 to June 2022
Fysh Road	Between Gore Highway and Fysh Road	0	0	0	4	23	0	January 2025 to March 2025
Gap Road	Between Gore Highway and Cypress Street	6	35	35	11	6	0	December 2022 to February 2023
Geitz Road	Between Gore Highway and Luck Road	7	138	7	19	10	7	April 2022 to November 2022
Gilgal Lane	Between Gore Highway and Railway Line	7	7	16	17	7	7	May 2024 to July 2024
Greenwattle Street	Between Euston Road and Alderley Street	12	45	65	13	12	1	January 2023 to May 2023
Grevillea Street	Full Extent	0	1	7	5	0	0	October 2023 to October 2023

Road name	Road section	Year of construction						Peak construction months
		2021	2022	2023	2024	2025	2026	
Hall Road	Between Gore Highway and Railway Line	8	21	21	14	8	7	December 2022 to June 2023
Heckendorf Road	Between Millmerran-Inglewood Road and Bora Creek Road	1	1	30	29	14	0	April 2023 to July 2023
Kahler Road	Between Murlaggan Road and Glen Devon Road	7	7	7	8	9	7	July 2025 to August 2025
Kooroongara Road	Between Millmerran-Inglewood Road and Bliss Road	0	0	133	133	0	0	April 2023 to February 2024
Kooroongarra Road	Between Millmerran-Inglewood Road and Halls Road	0	266	266	0	0	0	August 2022 to October 2023
Kooroongarra Road	Between Millwood Road and Cunningham Highway	0	0	29	29	0	0	April 2023 to February 2024
Leesons Road	Full Extent	17	18	37	73	21	14	May 2024 to May 2024
Lindenmayer Road	Between Gore Highway and Unnamed Road	14	14	14	18	44	14	January 2025 to March 2025
Linthorpe Road	Between Gore Highway and Loveday Road	11	241	28	28	14	8	April 2022 to April 2022
Lochaber Road	Between McEwan Lane and Gore Highway	7	7	9	7	7	7	December 2023 to December 2023
Macaulay Road	Between Blackwell Road and Wellcamp-Westbrook Road	1	1	0	0	0	0	December 2021 to November 2022
McDougall Street	Between Toowoomba-Cecil Plains Road and Hursley Road	5	8	5	0	0	0	May 2022 to October 2022
Millwood Road	Between Millmerran-Inglewood Road and Kooroongarra Road	15	155	184	45	34	14	April 2023 to July 2023
Murlaggan Road	Between Gore Highway and Roche Road	300	300	161	161	32	28	February 2022 to October 2022
	Between Roche Road and Yarranlea Road	0	0	5	0	0	0	September 2023 to September 2023
Omara Road	Between Toowoomba-Cecil Plains Road and Warrego Highway	6	13	33	61	9	1	May 2024 to May 2024
Owens Scrub Road	Between Millmerran-Inglewood Road and Foxwood Road	10	23	23	15	39	7	January 2025 to March 2025
Paint Mine Road	Between Gore Highway and Loveday Road	7	7	7	7	7	7	February 2022 to February 2023
Paton Road	Between Millmerran-Inglewood Road and Kooroongarra Road	14	14	15	18	52	14	January 2025 to March 2025
Pittsworth-Felton Road	Between Cypress Street and Golf Course Road	2	12	12	2	2	0	December 2022 to May 2023
Railway Street	Between Short Street and Vines Street	4	21	21	17	4	0	June 2022 to May 2023
Roche Road	Between Murlaggan Road and Saint Helens Road	7	7	12	7	7	7	September 2023 to September 2023
Saleyards Road	Between Millmerran-Inglewood Road and Gore Highway	1	1	1	5	29	0	January 2025 to March 2025

Road name	Road section	Year of construction						Peak construction months
		2021	2022	2023	2024	2025	2026	
Scrubby Road	Between Gore Highway and Jentz Road	0	115	0	49	19	0	April 2022 to April 2022
Short Street	Between Yandilla Street and Toowoomba Road	2	12	12	2	2	0	December 2022 to May 2023
Six Mile Road	Between Rodney Road and Bligh Street	2	9	11	4	0	0	April 2023 to May 2023
Steger Road	Between Warrego Highway and Draper Road	14	14	14	14	14	14	January 2021 to February 2026
Toowoomba Road	Between Vines Street and Gore Highway	4	21	21	17	4	0	June 2022 to May 2023
Tummalville Road	Between Gore Highway and Mann Silo Road	0	115	0	71	29	0	April 2022 to April 2022
Unnamed Road	Between Gore Highway and Millmerran Indoor Sports Centre	212	212	212	212	212	212	January 2021 to February 2026
Unnamed Road	Between Toowoomba-Cecil Plains Road and Unnamed Road	0	0	0	4	33	0	March 2025 to April 2025
Unnamed Road	Between Tummalville Road and Scrubby Road	0	115	0	71	29	0	April 2022 to April 2022
Unnamed Road	Between Drayton Westbrook Road and Unnamed Road	0	0	0	56	3	0	May 2024 to May 2024
Unnamed Road	Between Bostock Road and Unnamed Road	5	36	36	12	5	0	December 2022 to May 2023
Unnamed Road	Between Forestry Road and Unnamed Road	0	118	68	0	0	0	June 2022 to June 2022
Unnamed Road	Between Gore Highway and Private Access	14	14	14	14	14	14	March 2022 to June 2023
Ware Street	Between Gore Highway and Railway Line	0	0	14	0	0	0	June 2023 to July 2023
Wellcamp-Westbrook Road	Between Macaulay Road and Toowoomba-Cecil Plains Road	1	1	0	0	0	0	December 2021 to November 2022
	Between Toowoomba-Cecil Plains Road and Drayton Wellcamp Road	12	45	65	67	15	1	May 2024 to May 2024
West Street	Between Gore Highway and Rodney Road	2	9	11	4	0	0	April 2023 to May 2023
Yarranlea Road	Between Gore Highway and Railway Line	11	30	31	35	15	8	July 2024 to September 2024
	Between Railway Line and Saint Helens Road	0	0	5	0	0	0	September 2023 to September 2023

5.8 Construction program

A construction program has been developed for to inform the EIS. This construction program is based upon:

- Seven geographic areas of bulk earthworks:
 - Area 1 Ch 0.0 – 40.0:
 - Cut to fill volume of 32,446 bank cubic meters (bcm) with a scraper crew
 - An excavator and truck crew with a cut to spoil volume of 18,784 bcm
 - An import to structural fill volume (from borrow pits) of 440,628 bcm
 - Area 2 Ch 40.0 – 73.1:
 - Cut to fill volume of 1,993,635 bcm with two scraper crews
 - An excavator and truck crew with a cut to fill volume of 80,712 bcm to be delivered to Area 1
 - An excavator and truck crew with a cut to fill volume of 475,382 bcm to be delivered to Area 3
 - An excavator and truck crew with a cut to spoil volume of 825,177 bcm
 - An import to structural fill (from borrow pits) of 298,671 bcm
 - Area 3 Ch 73.1 – 100.0:
 - Cut to fill (Ch 29.5 – 34.5) of 276,734 bcm with a scraper crew
 - An excavator and truck crew with a cut to spoil volume of 36,472 bcm
 - A cut/import to structural fill (from borrow pits) volume of 303,915
 - Area 4 Ch 100.0 – 148.0:
 - Cut to fill volume of 1,025,075 bcm with a scraper crew
 - An excavator and truck crew with a cut to spoil volume of 1,230,144 bcm
 - An import of structural fill volume from Area 5A (Ch 160 - 184.0) of 451,180 bcm
 - Area 5A Ch 148.0 – 184.0:
 - Cut to fill volume of 1,902,540 bcm with a scraper crew
 - An excavator and truck crew with a cut to fill volume of rock 361,086 bcm
 - An excavator and truck crew with a cut to fill volume of 922,130 bcm to be delivered to Area 6
 - An excavator and truck crew with a cut to spoil volume of 70,929 bcm
 - A cut to structural fill volume from cutting Ch 160.0 – 184.0 of 321,530 bcm
 - Area 5B Ch 184.0 - 203.0:
 - Cut to fill volume of 2,031,950 bcm with a scraper crew
 - An excavator and truck crew with a cut to fill (rock) volume of 240,261 bcm
 - An excavator and truck crew with a cut to fill volume of 65,720 bcm to be delivered to Area 6
 - A cut to structural fill volume of 40,375 bcm to be delivered to Area 6
 - A cut to structural fill volume of 163,705 bcm from this area.
 - Area 6 Ch 203.0 – 207.0:
 - Import to fill volume of 922,130 bcm from Area 5A (Ch 203.0 – 207.0)
 - Import to fill volume of 65,720 bcm from Area 5B (Ch 203.0 – 207.0)
 - An import of structural fill volume from Area 5B (Ch 203.0 – 207.0) of 40,587 bcm

- Assumes up to seven bridge structures crews are utilised
- Assumes up to 17 separate drainage crews, over seven areas, to install the required number of longitudinal drains and cross-drainage structures
- Assumes two work fronts carrying out track-works. This area will contain opportunity if the program is to be delivered earlier than currently shown.
- Assumes up to 10 separate road civil works crews to construct roadworks along the alignment.

It is acknowledged that there are multiple options available for dividing the works into suitable work fronts and that the assessed approach is only one of several feasible options for constructing the Project.

6 Traffic impact assessment

6.1 Traffic analysis

This section examines the impact of the Project on the road network. The Project related traffic consists of traffic generated by both construction and operational activities. However, it is anticipated that the impacts would primarily be during construction of the Project. Throughout operation, the impacts from the Project are expected to be low given the expected nature of operations (i.e. low vehicle movements to/from depots, transportation of maintenance material within the rail corridor). Therefore, the associated Project traffic volumes are not expected to trigger the five per cent threshold outlined in GTIA (refer Table 1.5).

6.1.1 Traffic growth rates

Traffic growth rates on SCRs were derived based on historic permanent census traffic data where available. An evaluation of the traffic growth rates within this traffic data revealed an overall annual average AADT growth rate of two per cent. The proportion of this growth which was HVs varied by link but was generally consistent with the AADT growth and has been assumed as such. This is considered reasonable for reference design. Traffic growth rates were requested from all asset owners impacted by construction traffic. However, in the absence of available historical count data or forecast models, the two per cent growth rate calculated from the SCRs was adopted in the analyses for all SCRs and LGRs for all vehicle types. This is considered reasonable for reference design given the observed growth on roads evaluated. The data and evaluation are provided in Appendix A for DTMR roads and Appendix B for RMS.

6.1.2 Seasonal variation

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 6.1.

During harvest, HVs 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:

- Road-rail interface analysis: It was considered to adopt 95th percentile output results from SIDRA modelling results instead of industry standard 85th percentile outputs. This is considered conservative as it accounts 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 analyses per road type as derived from the *Austrroads Part 2 – Guide to Traffic Engineering Practice: Roadway Capacity* already accounts for the 30th highest hour traffic volumes of similar road types. This provides for upper LOS threshold limits which accounts for any micro fluctuations and peaks in traffic throughout the year.

Seasonality is to be considered further in the development of the Traffic Management Sub-plan discussed in Section 9.2.

Table 6.1 Harvest periods for broadacre crops

Broadacre crops	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wheat												
Sorghum												
Maize												
Mungbean												
Chickpea												
Barley												
Soybeans												
Cotton												

Source: Agricultural Opportunities in Southern Queensland, Regional Development Australia (n.d.)

6.2 Construction

This section examines the impact of the Project related traffic on the existing road network operation. The following traffic analysis was performed on identified primary construction routes:

- Comparison of the Project traffic to the existing traffic to determine if the five per cent threshold is breached (road links)
- LOS analysis
- Preliminary assessment of assumed construction turning volumes to highlight potential temporary turning treatment requirements during construction.

6.2.1 Five per cent traffic comparison on links

An assessment of impacts of construction traffic movements for the Project on the existing road network was undertaken by comparing projected traffic volumes without (background) and with the Project. Performance criteria specified in the GTIA state that traffic generated by a development is considered to result in an impact if that traffic equals or exceeds five per cent of the existing AADT on a road section. Table 6.2 indicates the parameters adopted for the percentage comparison.

A summary of the five per cent traffic comparison analysis on road links nominated for construction traffic routes is provided in Table 6.3, for the gazetted road direction, and Table 6.4, for the anti-gazetted road direction.

Table 6.2 Percentage impact parameter

Percentage impact range	Colour highlighted
Less than 5%	Green
Greater than or equal to 5% and less than 10%	Orange
Greater than or equal to 10%	Red

Table 6.3 Five per cent comparison summary (gazettal/northbound/eastbound directions)

Road name	Road section	2021	2022	2023	2024	2025	2026
State Controlled Roads: Department Transport and Main Roads							
Barwon Highway	31A - Between Leichhardt Highway and Town Common Road	0.3%	1.0%	0.0%	0.0%	0.0%	0.0%
Charlton Connection Road	320 - Between Toowoomba-Cecil Plains Road and Jordan Court	0.0%	0.1%	0.2%	0.2%	0.1%	0.0%
	320 - Between Jordan Court and Warrego Highway	0.0%	0.1%	0.2%	0.2%	0.1%	0.0%
Cunningham Highway	17D - Between NSW/QLD Border and Leichhardt Highway	3.6%	2.4%	1.8%	1.8%	0.0%	0.0%
	17D - Between Leichhardt Highway and Wyaga Road	0.3%	1.1%	0.0%	0.0%	0.0%	0.0%
	17D - Between Wyaga Road and Yelarbon-Keetah Road	14.2%	21.1%	20.7%	9.5%	10.8%	7.4%
	17D - Between Yelarbon-Keetah Road and Texas-Yelarbon Road	32.1%	31.5%	16.8%	4.1%	5.6%	1.8%
	17D - Between Texas-Yelarbon Road and Inglewood-Texas Road	67.3%	66.0%	24.6%	12.2%	12.4%	4.8%
	17C - Between Inglewood-Texas Road and Millmerran-Inglewood Road	48.9%	48.0%	20.1%	13.0%	12.3%	6.9%
	17C - Between Millmerran-Inglewood Road and Inglewood Quarry Access Road	25.7%	31.7%	18.2%	13.8%	9.8%	0.0%
	17C - Between Inglewood Quarry Access Road and Coolmunda Dam Access	7.3%	8.1%	2.1%	5.4%	1.3%	0.0%
Gore Highway	28A - Between Blackwell Road and Saleyards Road	0.0%	0.0%	0.0%	0.8%	5.0%	0.0%
	28A - Between Saleyards Road and West Street	0.1%	0.1%	0.1%	0.4%	2.6%	0.0%
	28A - Between West Street and Millmerran-Inglewood Road	19.9%	20.2%	19.9%	19.0%	20.8%	17.9%
	28A - Between Millmerran-Inglewood Road and Millmerran-Leyburn Road	9.4%	11.0%	19.1%	16.9%	10.2%	8.0%
	28A - Between Millmerran-Leyburn Road and Pampas-Horrane Road	6.7%	8.7%	17.2%	15.0%	6.0%	5.6%
	28A - Between Pampas-Horrane Road and Brookstead-Norwin Road	6.0%	15.3%	16.5%	14.7%	7.0%	5.3%
	28A - Between Brookstead-Norwin Road and Tummaville Road	3.8%	12.0%	13.2%	11.6%	4.9%	3.3%
	28A - Between Tummaville Road and Vines Street	21.8%	44.3%	13.9%	12.1%	4.9%	3.4%
	28A - Between Vines Street and Toowoomba Bypass	14.2%	27.7%	5.2%	4.4%	4.5%	3.0%
	28A - Between Toowoomba Bypass and Westbrook Road	3.6%	4.6%	4.5%	3.7%	3.4%	3.1%
	28A - Between Westbrook Road and Warrego Highway	1.9%	2.5%	2.4%	2.0%	1.8%	1.6%

Road name	Road section	2021	2022	2023	2024	2025	2026
Inglewood-Texas Road	231 - Between Cunningham Highway and Greenup Limevale Road	0.0%	0.0%	0.0%	2.7%	2.7%	2.6%
	231 - Between Greenup Limevale Road and Texas-Yelarbon Road	0.0%	0.0%	0.0%	2.7%	2.7%	2.6%
	231 - Between Texas-Yelarbon Road and Stanthorpe-Texas Road	0.0%	0.0%	0.0%	0.9%	0.9%	0.9%
	231 - Between Stanthorpe-Texas Road and Old Texas-Yelarbon Road	0.0%	0.0%	0.0%	0.8%	0.8%	0.8%
	231 - Between Old Texas-Yelarbon Road and NSW/QLD Border	0.0%	0.0%	0.0%	1.5%	1.5%	1.5%
Ipswich Motorway	17A - Between Cunningham Highway and Logan Motorway	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Leichhardt Highway	26C - Between Cunningham Highway and Hunt Street	0.2%	0.7%	0.4%	0.0%	0.0%	0.0%
	26C - Between Hunt Street and Barwon Highway	0.2%	0.6%	0.0%	0.0%	0.0%	0.0%
Logan Motorway (managed by Transurban)	210A - Between Ipswich Motorway and Pacific Motorway	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Millmerran-Inglewood Road	337 - Between Cunningham Highway and Thornton Road	188.2%	184.5%	39.9%	66.9%	44.1%	29.3%
	337 - Between Thornton Road and Council Boundary	177.5%	174.0%	71.0%	97.7%	43.7%	26.1%
	337 - Between Council Boundary and Kooroongarra Road	5.5%	27.2%	12.6%	21.7%	6.3%	4.0%
	337 - Between Kooroongarra Road and Blackwell Road	12.2%	38.6%	72.3%	56.7%	23.7%	10.0%
	337 - Between Blackwell Road and Campbell Street	16.2%	66.7%	89.6%	38.4%	14.0%	13.6%
	337 - Between Campbell Street and Gore Highway	5.2%	10.0%	43.7%	37.6%	11.0%	3.0%
Millmerran-Leyburn Road	335 - Between Gore Highway and Reiche Road	6.3%	9.3%	10.3%	5.3%	5.2%	5.1%
Oakey-Pittsworth Road	323 - Between Gore Highway and Quibet Road	1.6%	1.6%	2.9%	1.5%	1.5%	1.5%
Pacific Motorway	12A - Between Logan Highway and NSW/QLD border	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pampas-Horrane Road	327 - Between Gore Highway and Bostock Road	7.2%	50.8%	49.8%	16.5%	6.7%	0.1%
Pittsworth-Felton Road	332 - Between Golf Course Road and Short Street	0.1%	0.8%	0.7%	0.1%	0.1%	0.0%
Texas-Yelarbon Road	2322 - Between Cunningham Highway and Old Texas-Yelarbon Road	41.3%	40.5%	0.0%	2.8%	2.7%	2.7%
Toowoomba-Cecil Plains Road	324 - Between Warrego Highway and McDougall Street	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
	324 - Between McDougall Street and Boundary Street	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%
	324 - Between Boundary Street and Charlton Connection Road	0.9%	1.0%	0.9%	0.8%	0.6%	0.6%
	324 - Between Charlton Connection Road and Hursley Road	1.6%	1.7%	1.6%	1.3%	1.1%	1.1%

Road name	Road section	2021	2022	2023	2024	2025	2026
	324 - Between Hursley Road and Hanrahans Road	2.2%	4.2%	5.3%	4.9%	3.2%	1.2%
	324 - Between Hanrahans Road and 2 km west of Brimblecombe Road	2.5%	4.9%	5.0%	3.1%	7.1%	1.8%
Toowoomba Bypass	319 - Between Gore Highway and Toowoomba-Cecil Plains Road	18.3%	18.0%	0.3%	0.7%	1.8%	0.3%
	319 - Between Toowoomba-Cecil Plains Road and New England Highway	17.9%	17.6%	0.0%	0.4%	0.4%	0.4%
	319 - Between New England Highway and Warrego Highway	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%
Warrego Highway	18B - Between Kingsthorpe Haden Road and Toowoomba Bypass	4.7%	4.7%	4.0%	1.5%	0.7%	0.6%
	18B - Between Toowoomba Bypass and Charlton Connection Road	0.6%	0.7%	1.0%	1.4%	0.6%	0.5%
	18B - Between Charlton Connection Road and McDougall Street	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
	18B - Between McDougall Street and Bridge Street	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%
	18B - Between Bridge Street and Toowoomba-Cecil Plains Road	0.7%	0.6%	0.6%	0.6%	0.6%	0.6%
	18B - Between Toowoomba-Cecil Plains Road and Karrool Street	0.8%	0.8%	0.8%	0.7%	0.7%	0.7%
	18B - Between Karrool Street and Gore Highway	0.8%	0.8%	0.8%	0.7%	0.7%	0.7%
	18B - Between Gore Highway and Fifth Avenue	0.8%	0.8%	0.8%	0.7%	0.7%	0.7%
	18A - Between Toowoomba Bypass and Gatton-Helidon Road	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
	18A - Between Gatton-Helidon Road and Gatton-Esk Road	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
	18A - Between Gatton-Esk Road and Laidley-Plainland Road	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%
	18A - Between Laidley-Plainland Road and Tallegalla Two Tree Hill Road	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%
	18A - Between Tallegalla Two Tree Hill Road and Haigslea Amberley Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	18A - Between Haigslea Amberley Road and Brisbane Valley Highway	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	18A - Between Brisbane Valley Road and Mount Crosby Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	18A - Between Mount Crosby Road and Cunningham Highway	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Yelarbon-Keetah Road	241 - Between Cunningham Highway and Old Warwick Road	287.8%	282.2%	10.8%	21.3%	0.0%	0.0%
State-Controlled Roads: Roads and Maritime Services							
Bruxner Highway	Between New England Highway and Summerland Way	0.0%	0.0%	0.0%	1.3%	1.3%	1.2%
Gwydir Highway	Between Stephens Road and Delungra Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Delungra Road and Delungra Bypass Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%

Road name	Road section	2021	2022	2023	2024	2025	2026
	Between Delungra Bypass Road and Copeton Dam Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Copeton Dam Road and Bannockburn Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Bannockburn Road and Campbell Street	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Campbell Street and Tingha Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Tingha Road and Elsmore Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Elsmore Road and Woodstock Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Woodstock Road and Waterloo Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Waterloo Road and Coronation Avenue	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Coronation Avenue and New England Highway	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between New England Highway and Shannon Vale Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Shannon Vale Road and Bald Nob Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Bald Nob Road and Old Grafton Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Old Grafton Road and Coombadjha Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Coombadjha Road and Old Glen Innes Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Old Glen Innes Road and Rogan Bridge Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Rogan Bridge Road and Bent Street	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
New England Highway	Between Bruxner Way and Bruxner Highway	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%
	Between Gwydir Highway and Gwydir Highway	0.0%	0.0%	0.4%	0.4%	0.0%	0.0%
Newell Highway	Between NSW/QLD Border and Bruxner Way	2.7%	1.8%	1.3%	1.3%	0.0%	0.0%
Pacific Motorway	Between NSW/QLD border and Gwydir Highway	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
Summerland Way	Between Bruxner Highway and Red Lane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Between Trenayr Road and Turf Street	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%
Clarence Valley Council							
Bent Street	Between Craig Street and Gwydir Highway	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
Charles Street	Between Bent Street and Pacific Highway	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%
Clarence Street	Between Oliver Street and Craig Street	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%

Road name	Road section	2021	2022	2023	2024	2025	2026
Clark Road	Full extent	0.0%	0.0%	1.0%	1.5%	1.5%	1.4%
Craig Street	Between Villiers Street and Clarence Street	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Between Clarence Street and Bent Street	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
Dobie Street	Between Villers Street and Summerland Way	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%
Fry Street	Between Mary Street and Alice Street	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%
Mary Street	Between Fry Street and Oliver Street	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%
Oliver Street	Between Clarence Street and Mary Street	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%
Red Lane	Between Summerland Way and Trenayr Road	0.0%	0.0%	0.0%	1.5%	1.5%	1.4%
Trenayr Road	Between Red Lane and Clark Road	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%
	Between Summerland Way and Clark Road	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%
Villers Street	Between Craig Street and Dobie Street	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%
Goondiwindi Regional Council							
Boodle Street	Between Boodle Street and Hunt Street	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%
Bybera Road	Between Cunningham Highway and Private Access	3793.6%	3719.2%	101.4%	424.4%	143.9%	62.4%
	Between Private Access and Unnamed Road	901.7%	1939.9%	0.0%	0.0%	0.0%	0.0%
Cemetery Road	Between Moorobie Lane and Unnamed Road	50.4%	49.4%	0.0%	0.0%	0.0%	0.0%
Coolmunda Dam Access	Full extent	168.6%	186.9%	48.4%	125.2%	29.0%	0.2%
Cremascos Road	Between Cunningham Highway and 400 m west of private access	21.3%	30.0%	29.4%	20.1%	19.7%	19.3%
East Sawmill Road	Between Cunningham Highway and Springborg Road	10.3%	10.1%	1.4%	1.1%	0.6%	0.3%
Elizabeth Street	Between Cunningham Highway and Callandoon Street	4.0%	3.9%	3.8%	4.3%	3.8%	3.6%
Eukabilla Road	Full extent	3.2%	3.2%	2.7%	2.6%	0.0%	0.0%
Fosters Road	Between Cunningham Highway and Grays Road	669.2%	1439.7%	0.0%	0.0%	0.0%	0.0%
Grays Road	Between Millmerran-Inglewood Road and Mosquito Creek Road	47.1%	504.5%	494.6%	44.4%	43.5%	42.7%
Hunt Street	Between Leichhardt Highway and Boodle Street	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%
Inglewood Quarry Access Road	Full extent	15.7%	34.4%	33.7%	18.7%	17.8%	0.0%

Road name	Road section	2021	2022	2023	2024	2025	2026
Kildonan Road	Between Yelarbon-Keetah Road and Cunningham Highway	214.1%	209.9%	32.3%	38.3%	0.5%	0.0%
Lovells Crossing Road	Between Callandoon Street and Unnamed Road	1941.4%	1903.4%	1866.1%	2087.8%	1866.2%	1751.4%
	Between Unnamed Road and Unnamed Road	330.0%	323.6%	317.2%	569.3%	377.5%	291.9%
McDougalls Crossings Road	Between Cunningham Highway and 800 m west of Cremascos Road	2.2%	2.1%	0.5%	1.6%	0.8%	0.3%
Mooroobie Lane	Between Wondalli-Kurumbul Road and Cemetery Road	615.4%	603.3%	0.0%	0.0%	0.0%	0.0%
Mosquito Creek Road	Between Grays Road and Cunningham Highway	0.0%	629.3%	617.0%	0.0%	0.0%	0.0%
Old Texas-Yelarbon Road	Between Texas-Yelarbon Road and Rocky Creek Road	0.0%	0.0%	0.0%	6.4%	6.3%	6.1%
	Between Rocky Creek Road and Inglewood-Texas Road	0.0%	0.0%	0.0%	6.4%	6.3%	6.1%
Queen Street South	Between Yelarbon-Kurumbul Road and Danes Lane	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
South Kurumbul Road	Between Yelarbon-Kurumbul Road and Kildonan Road	8.0%	0.4%	0.1%	0.1%	0.1%	0.0%
Springborg Road	Between Cunningham Highway and Railway Line	906.5%	522.6%	512.3%	209.2%	250.6%	129.8%
Suttons Road	Between East Sawmill Road and Unnamed Road	3365.6%	3299.6%	0.0%	0.0%	0.0%	0.0%
Thornton Road	Between Millmerran-Inglewood Road and Unnamed Road	696.1%	3789.2%	311.7%	742.7%	387.0%	214.7%
Town Commons Road	Between Waggamba Road and Barwon Highway	0.9%	3.5%	0.1%	0.0%	0.0%	0.0%
Unnamed Road	Between Cunningham Highway and Private Access	0.8%	2.1%	1.5%	0.4%	0.0%	0.0%
Unnamed Road	Between Cemetery Road and Unnamed Road	10.3%	10.1%	0.0%	0.0%	0.0%	0.0%
Unnamed Road	Between Texas-Yelarbon Road and Private Land	10.3%	10.1%	0.0%	0.0%	0.0%	0.0%
Unnamed Road	Between Woodcocks Road and Queen Street North	10.3%	10.1%	0.0%	0.0%	0.0%	0.0%
Unnamed Road	Between East Sawmill Road and Suttons Road	24.0%	9.2%	0.0%	0.0%	0.0%	0.0%
Unnamed Road	Full extent	34.3%	33.7%	0.0%	0.0%	0.0%	0.0%
Whetstone Access Road	Between Cunningham Highway and 600 m west of Railway Line	213.3%	209.1%	100.8%	281.4%	127.0%	61.7%
Wondalli-Kurumbul Road	Between South Western System (Railway) and Bickers Road	1084.3%	1063.1%	0.0%	0.0%	0.0%	0.0%
Woodcocks Road	Between Cunningham Highway and Unnamed Road	2.1%	2.0%	0.0%	0.0%	0.0%	0.0%
Yelarbon-Kurumbul Road	Yelarbon-Kurumbul Road	1027.6%	1159.8%	1137.1%	407.5%	491.7%	269.5%

Road name	Road section	2021	2022	2023	2024	2025	2026
Gwydir Shire Council							
Edwards Street	Between North Star Road and I B Bore Road	13.3%	13.1%	15.0%	14.7%	0.0%	0.0%
North Star Road	Between MPSC Council Boundary and Edwards Street	18.3%	17.9%	20.6%	20.2%	0.0%	0.0%
	Between Edward Street and Getta Getta Road	0.0%	0.0%	3.1%	3.0%	0.0%	0.0%
	Between Getta Getta Road and Blue Nobby Road	0.0%	0.0%	3.1%	3.0%	0.0%	0.0%
	Between Blue Nobby Road and Hibernia Road	0.0%	0.0%	3.1%	3.0%	0.0%	0.0%
	Between Hibernia Road and Yallaroi Road	0.0%	0.0%	3.1%	3.0%	0.0%	0.0%
	Between Yallaroi Road and Baroma Road	0.0%	0.0%	3.1%	3.0%	0.0%	0.0%
	Between Baroma Road and Warialda Road	0.0%	0.0%	3.1%	3.0%	0.0%	0.0%
Stephen Street	Between Long Street and Gwydir Highway	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%
Warialda Road	Between North Star Road and Gournama Road	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%
	Between Gournama Road and Oregon Road	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%
	Between Oregon Street and Stephen Street	1.5%	1.5%	1.7%	1.7%	0.0%	0.0%
Inverell Shire Council							
Bruxner Way	Between Texas Bridge Road and Glenrock Road	0.0%	0.0%	0.0%	4.5%	4.4%	4.4%
	Between Glenrock Road and New England Highway	0.0%	0.0%	0.0%	4.5%	4.4%	4.4%
Campbell Street	Between Byron Street and Otho Street	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%
Texas Bridge Road	Between NSW/QLD Border and Bruxner Highway	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%
Moree Plains Shire Council							
Bruxner Way	Between Newell Highway and Tucka Tucka Road	17.9%	17.5%	20.2%	19.8%	0.0%	0.0%
	Between Tucka Tucka Road and North Star Road	17.9%	17.5%	20.2%	19.8%	0.0%	0.0%
North Star Road	Between Bruxner Way and Gwydir Shire Council boundary	17.0%	16.7%	19.2%	18.8%	0.0%	0.0%
River Road	Between Newell Highway and Boggabilla Weir	7.9%	3.3%	0.1%	0.1%	0.1%	0.0%
Toowoomba Regional Council							
Airport Quarry Wellcamp Access Road (Privately owned road)	Between Toowoomba-Cecil Plains Road and Toowoomba Wellcamp Airport	0.0%	0.0%	0.0%	1.1%	5.3%	0.0%

Road name	Road section	2021	2022	2023	2024	2025	2026
Alderley Street	Between Greenwattle Street and Gore Highway	0.3%	1.2%	1.7%	0.3%	0.3%	0.0%
	Between Gore Highway and Condamine Street	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Athol School Road	Between Gore Highway and Trader Road	10.9%	29.1%	28.9%	13.5%	21.1%	6.6%
Biddeston Southbrook Road	Between Gore Highway and Stower Road	7.5%	14.9%	14.6%	13.2%	7.0%	5.4%
Blackwell Road	Between Millmerran-Inglewood Road and Gore Highway	113.2%	149.2%	146.2%	578.4%	1116.6%	95.5%
Blackwell Road	Between Bunkers Hill School Road and Macaulay Road	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%
Bligh Street	Between Six Mile Road and Concrete Millmerran	0.1%	0.6%	0.6%	0.2%	0.0%	0.0%
	Between Concrete Millmerran and Crosby Street	0.1%	0.6%	0.6%	0.2%	0.0%	0.0%
Bostock Road	Between Pampas-Horrane Road and Unnamed Road	10.7%	75.3%	73.8%	24.4%	10.0%	0.1%
Brimblecombe Road	Between Toowoomba-Cecil Plains Road and Gowrie Mountain School Road	23.4%	23.3%	25.3%	27.2%	21.6%	21.2%
Bunkers Hill School Road	Between Gore Highway and Blackwell Road	0.3%	0.2%	0.1%	0.0%	0.0%	0.0%
Bushy Lane West	Between Gore Highway and 650 m west of Gore Highway	3.4%	3.4%	3.3%	4.9%	3.7%	3.1%
Campbell Street	Between Millmerran-Inglewood Road and Commens Street	16.3%	17.2%	17.3%	16.0%	19.9%	14.5%
Chamberlain Road	Between Warrego Highway and Robson Road	1.6%	1.6%	2.3%	2.4%	1.5%	1.5%
Commodore Peak Road	Between Millmerran-Inglewood Road and Blackwell Road	0.0%	874.7%	857.5%	0.0%	0.0%	0.0%
Condamine Street	Full extent	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%
Dieckmann Road	Between Gore Highway and Madelaine Street	0.2%	1.0%	5.0%	0.6%	0.2%	0.0%
Draper Road	Between Steger Road and Leeson's Road	38.9%	38.2%	37.4%	36.7%	36.0%	35.3%
Drayton Wellcamp Road	Between Wellcamp-Westbrook Road and Boundary Street South	1.0%	3.6%	5.1%	5.2%	1.1%	0.1%
Euston Road	Between Boundary Court and Greenwattle Street	0.4%	1.3%	1.9%	0.4%	0.3%	0.0%
Forestry Road	Between Millmerran-Inglewood Road and Unnamed Road	0.0%	27.9%	15.7%	0.0%	0.0%	0.0%
Fysh Road	Between Gore Highway and Fysh Road	0.0%	0.0%	0.0%	0.9%	5.1%	0.0%
Gap Road	Between Gore Highway and Cypress Street	0.9%	5.7%	5.6%	1.7%	0.9%	0.0%
Geitz Road	Between Gore Highway and Luck Road	1.6%	32.4%	1.7%	4.3%	2.2%	1.5%
Gilgal Lane	Between Gore Highway and Railway Line	0.3%	0.3%	0.7%	0.8%	0.3%	0.3%

Road name	Road section	2021	2022	2023	2024	2025	2026
Greenwattle Street	Between Euston Road and Alderley Street	0.4%	1.6%	2.2%	0.4%	0.4%	0.0%
Grevillea Street	Full extent	0.0%	0.3%	1.7%	1.0%	0.0%	0.0%
Hall Road	Between Gore Highway and Railway Line	0.4%	1.0%	1.0%	0.6%	0.4%	0.3%
Heckendorf Road	Between Millmerran-Inglewood Road and Bora Creek Road	4.6%	4.5%	226.2%	217.5%	99.5%	1.8%
Kahler Road	Between Murlaggan Road and Glen Devon Road	1.6%	1.6%	1.6%	1.9%	2.1%	1.5%
Kooroongara Road	Between Millmerran-Inglewood Road and Bliss Road	0.0%	0.0%	293.2%	287.5%	0.0%	0.0%
Kooroongarra Road	Between Millmerran-Inglewood Road and Halls Road	0.0%	598.0%	586.3%	0.0%	0.0%	0.0%
Kooroongarra Road	Between Millwood Road and Cunningham Highway	0.0%	0.0%	69.8%	68.4%	0.0%	0.0%
Leesons Road	Full extent	43.3%	44.2%	89.2%	171.5%	47.3%	31.9%
Lindenmayer Road	Between Gore Highway and Unnamed Road	0.7%	0.6%	0.6%	0.8%	1.9%	0.6%
Linthorpe Road	Between Gore Highway and Loveday Road	10.1%	224.9%	25.7%	25.0%	12.4%	6.6%
Lochaber Road	Between McEwan Lane and Gore Highway	2.8%	2.8%	3.4%	2.7%	2.6%	2.6%
Macaulay Road	Between Blackwell Road and Wellcamp-Westbrook Road	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%
McDougall Street	Between Toowoomba-Cecil Plains Road and Hursley Road	0.2%	0.2%	0.2%	0.0%	0.0%	0.0%
Millwood Road	Between Millmerran-Inglewood Road and Kooroongarra Road	114.0%	1125.9%	1310.6%	317.1%	234.6%	94.2%
Murlaggan Road	Between Gore Highway and Roche Road	1156.5%	1134.2%	595.7%	584.0%	115.4%	96.6%
	Between Roche Road and Yarranlea Road	0.0%	0.0%	20.1%	0.0%	0.0%	0.0%
Omara Road	Between Toowoomba-Cecil Plains Road and Warrego Highway	0.3%	0.7%	1.8%	3.2%	0.4%	0.0%
Owens Scrub Road	Between Millmerran-Inglewood Road and Foxwood Road	12.7%	29.4%	28.8%	18.7%	47.3%	8.9%
Paint Mine Road	Between Gore Highway and Loveday Road	1.6%	1.7%	1.6%	1.5%	1.5%	1.5%
Paton Road	Between Millmerran-Inglewood Road and Kooroongarra Road	3.4%	3.3%	3.5%	4.2%	11.6%	3.1%
Pittsworth-Felton Road	Between Cypress Street and Golf Course Road	0.1%	0.6%	0.5%	0.1%	0.1%	0.0%
Railway Street	Between Short Street and Vines Street	11.6%	67.1%	65.8%	53.5%	10.7%	0.0%
Roche Road	Between Murlaggan Road and Saint Helens Road	0.4%	0.4%	0.7%	0.4%	0.4%	0.4%
Saleyards Road	Between Millmerran-Inglewood Road and Gore Highway	0.6%	0.6%	0.6%	3.3%	19.1%	0.0%
Scrubby Road	Between Gore Highway and Jentz Road	0.0%	100.4%	0.0%	40.7%	15.5%	0.0%

Road name	Road section	2021	2022	2023	2024	2025	2026
Short Street	Between Yandilla Street and Toowoomba Road	0.4%	2.7%	2.6%	0.4%	0.4%	0.0%
Six Mile Road	Between Rodney Road and Bligh Street	16.4%	62.3%	72.2%	26.3%	0.0%	0.0%
Steger Road	Between Warrego Highway and Draper Road	38.9%	38.2%	37.4%	36.7%	36.0%	35.3%
Toowoomba Road	Between Vines Street and Gore Highway	1.3%	7.3%	7.2%	5.8%	1.2%	0.0%
Tummalville Road	Between Gore Highway and Mann Silo Road	0.0%	200.6%	0.0%	119.6%	47.2%	0.0%
Unnamed Road	Between Gore Highway and Millmerran Indoor Sports Centre	10.2%	10.0%	9.8%	9.6%	9.4%	9.2%
Unnamed Road	Between Toowoomba-Cecil Plains Road and Unnamed Road	0.0%	0.1%	0.1%	0.9%	7.3%	0.0%
Unnamed Road	Between Tummalville Road and Scrubby Road	0.0%	27.1%	0.0%	16.2%	6.4%	0.0%
Unnamed Road	Between Drayton Westbrook Road and Unnamed Road	0.0%	0.0%	0.0%	12.6%	0.7%	0.0%
Unnamed Road	Between Bostock Road and Unnamed Road	1.2%	8.5%	8.3%	2.7%	1.1%	0.0%
Unnamed Road	Between Forestry Road and Unnamed Road	0.0%	27.9%	15.7%	0.0%	0.0%	0.0%
Unnamed Road	Between Gore Highway and Private Access	3.3%	3.2%	3.2%	3.1%	3.0%	3.0%
Ware Street	Between Gore Highway and Railway Line	0.0%	0.0%	3.2%	0.0%	0.0%	0.0%
Wellcamp-Westbrook Road	Between Macaulay Road and Toowoomba-Cecil Plains Road	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
	Between Toowoomba-Cecil Plains Road and Drayton Wellcamp Road	2.4%	8.8%	12.4%	12.7%	2.7%	0.2%
West Street	Between Gore Highway and Rodney Road	4.4%	16.9%	19.6%	7.1%	0.0%	0.0%
Yarranlea Road	Between Gore Highway and Railway Line	65.6%	176.1%	177.1%	198.8%	84.8%	41.0%
	Between Railway Line and Saint Helens Road	0.0%	0.0%	31.2%	0.0%	0.0%	0.0%

Table 6.4 Five per cent comparison summary (anti-gazettal/southbound/westbound directions)

Road name	Road section	2021	2022	2023	2024	2025	2026
State Controlled Roads: Department Transport and Main Roads							
Barwon Highway	31A - Between Leichhardt Highway and Town Common Road	0.3%	1.0%	0.0%	0.0%	0.0%	0.0%
Charlton Connection Road	320 - Between Toowoomba-Cecil Plains Road and Jordan Court	0.0%	0.1%	0.2%	0.2%	0.1%	0.0%
	320 - Between Jordan Court and Warrego Highway	0.0%	0.1%	0.2%	0.2%	0.1%	0.0%
Cunningham Highway	17D - Between NSW/QLD Border and Leichhardt Highway	3.4%	2.3%	1.7%	1.7%	0.0%	0.0%
	17D - Between Leichhardt Highway and Wyaga Road	0.3%	1.0%	0.0%	0.0%	0.0%	0.0%
	17D - Between Wyaga Road and Yelarbon-Keetah Road	13.3%	19.8%	19.4%	8.9%	10.1%	7.0%
	17D - Between Yelarbon-Keetah Road and Texas-Yelarbon Road	30.4%	29.8%	15.9%	3.9%	5.3%	1.7%
	17D - Between Texas-Yelarbon Road and Inglewood-Texas Road	63.7%	62.4%	23.3%	11.6%	11.7%	4.5%
	17C - Between Inglewood-Texas Road and Millmerran-Inglewood Road	45.4%	44.5%	18.7%	12.0%	11.5%	6.4%
	17C - Between Millmerran-Inglewood Road and Inglewood Quarry Access Road	24.7%	30.4%	17.4%	13.2%	9.4%	0.0%
	17C - Between Inglewood Quarry Access Road and Coolmunda Dam Access	7.0%	7.7%	2.0%	5.2%	1.2%	0.0%
Gore Highway	28A - Between Blackwell Road and Saleyards Road	0.0%	0.0%	0.0%	0.8%	5.0%	0.0%
	28A - Between Saleyards Road and West Street	0.1%	0.1%	0.1%	0.4%	2.6%	0.0%
	28A - Between West Street and Millmerran-Inglewood Road	19.9%	20.2%	19.9%	19.0%	20.8%	17.9%
	28A - Between Millmerran-Inglewood Road and Millmerran-Leyburn Road	9.6%	11.3%	19.6%	17.3%	10.4%	8.2%
	28A - Between Millmerran-Leyburn Road and Pampas-Horrane Road	6.8%	8.8%	17.6%	15.3%	6.1%	5.7%
	28A - Between Pampas-Horrane Road and Brookstead-Norwin Road	6.1%	15.7%	16.8%	15.0%	7.1%	5.4%
	28A - Between Brookstead-Norwin Road and Tumnaville Road	3.9%	12.3%	13.5%	11.9%	5.0%	3.3%
	28A - Between Tumnaville Road and Vines Street	22.2%	45.3%	14.2%	12.3%	5.0%	3.4%
	28A - Between Vines Street and Toowoomba Bypass	14.0%	27.3%	5.1%	4.3%	4.4%	3.0%
	28A - Between Toowoomba Bypass and Westbrook Road	3.6%	4.6%	4.5%	3.6%	3.3%	3.0%
	28A - Between Westbrook Road and Warrego Highway	2.0%	2.5%	2.5%	2.0%	1.8%	1.7%
Inglewood-Texas Road	231 - Between Cunningham Highway and Greenup Limevale Road	0.0%	0.0%	0.0%	2.5%	2.5%	2.4%
	231 - Between Greenup Limevale Road and Texas-Yelarbon Road	0.0%	0.0%	0.0%	2.5%	2.5%	2.4%

Road name	Road section	2021	2022	2023	2024	2025	2026
	231 - Between Texas-Yelarbon Road and Stanthorpe-Texas Road	0.0%	0.0%	0.0%	0.9%	0.9%	0.9%
	231 - Between Stanthorpe-Texas Road and Old Texas-Yelarbon Road	0.0%	0.0%	0.0%	0.8%	0.8%	0.8%
	231 - Between Old Texas-Yelarbon Road and NSW/QLD Border	0.0%	0.0%	0.0%	1.5%	1.5%	1.5%
Ipswich Motorway	17A - Between Cunningham Highway and Logan Motorway	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Leichhardt Highway	26C - Between Cunningham Highway and Hunt Street	0.2%	0.6%	0.3%	0.0%	0.0%	0.0%
	26C - Between Hunt Street and Barwon Highway	0.1%	0.5%	0.0%	0.0%	0.0%	0.0%
Logan Motorway (managed by Transurban)	210A - Between Ipswich Motorway and Pacific Motorway	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Millmerran-Inglewood Road	337 - Between Cunningham Highway and Thornton Road	188.2%	184.5%	39.9%	66.9%	44.1%	29.3%
	337 - Between Thornton Road and Council Boundary	177.5%	174.0%	71.0%	97.7%	43.7%	26.1%
	337 - Between Council Boundary and Kooroongarra Road	5.4%	26.8%	12.4%	21.4%	6.2%	4.0%
	337 - Between Kooroongarra Road and Blackwell Road	12.1%	38.0%	71.3%	55.9%	23.4%	9.9%
	337 - Between Blackwell Road and Campbell Street	15.9%	65.7%	88.4%	37.9%	13.8%	13.4%
	337 - Between Campbell Street and Gore Highway	5.2%	9.9%	43.4%	37.4%	11.0%	3.0%
Millmerran-Leyburn Road	335 - Between Gore Highway and Reiche Road	6.3%	9.2%	10.2%	5.2%	5.1%	5.0%
Oakey-Pittsworth Road	323 - Between Gore Highway and Quibet Road	1.6%	1.6%	3.0%	1.6%	1.5%	1.5%
Pacific Motorway	12A - Between Logan Highway and NSW/QLD border	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pampas-Horrane Road	327 - Between Gore Highway and Bostock Road	7.2%	50.8%	49.8%	16.5%	6.7%	0.1%
Pittsworth-Felton Road	332 - Between Golf Course Road and Short Street	0.1%	0.8%	0.7%	0.1%	0.1%	0.0%
Texas-Yelarbon Road	2322 - Between Cunningham Highway and Old Texas-Yelarbon Road	42.6%	41.8%	0.0%	2.9%	2.8%	2.7%
Toowoomba-Cecil Plains Road	324 - Between Warrego Highway and McDougall Street	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
	324 - Between McDougall Street and Boundary Street	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%
	324 - Between Boundary Street and Charlton Connection Road	0.9%	1.1%	1.0%	0.9%	0.7%	0.7%
	324 - Between Charlton Connection Road and Hursley Road	1.6%	1.7%	1.6%	1.3%	1.1%	1.1%
	324 - Between Hursley Road and Hanrahans Road	2.2%	4.3%	5.3%	5.0%	3.2%	1.2%
	324 - Between Hanrahans Road and 2 km west of Brimblecombe Road	2.6%	5.2%	5.3%	3.3%	7.6%	1.9%

Road name	Road section	2021	2022	2023	2024	2025	2026
Toowoomba Bypass	319 - Between Gore Highway and Toowoomba-Cecil Plains Road	18.3%	18.0%	0.3%	0.7%	1.8%	0.3%
	319 - Between Toowoomba-Cecil Plains Road and New England Highway	17.9%	17.6%	0.0%	0.4%	0.4%	0.4%
	319 - Between New England Highway and Warrego Highway	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%
Warrego Highway	18B - Between Kingsthorpe Haden Road and Toowoomba Bypass	4.7%	4.7%	4.1%	1.5%	0.7%	0.6%
	18B - Between Toowoomba Bypass and Charlton Connection Road	0.6%	0.7%	1.0%	1.4%	0.6%	0.5%
	18B - Between Charlton Connection Road and McDougall Street	0.5%	0.5%	0.5%	0.5%	0.5%	0.4%
	18B - Between McDougall Street and Bridge Street	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%
	18B - Between Bridge Street and Toowoomba-Cecil Plains Road	0.8%	0.7%	0.7%	0.7%	0.7%	0.7%
	18B - Between Toowoomba-Cecil Plains Road and Karrool Street	0.8%	0.8%	0.7%	0.7%	0.7%	0.7%
	18B - Between Karrool Street and Gore Highway	0.8%	0.8%	0.7%	0.7%	0.7%	0.7%
	18B - Between Gore Highway and Fifth Avenue	0.8%	0.8%	0.7%	0.7%	0.7%	0.7%
	18A - Between Toowoomba Bypass and Gatton-Helidon Road	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
	18A - Between Gatton-Helidon Road and Gatton-Esk Road	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
	18A - Between Gatton-Esk Road and Laidley-Plainland Road	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%
	18A - Between Laidley-Plainland Road and Tallegalla Two Tree Hill Road	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%
	18A - Between Tallegalla Two Tree Hill Road and Haigslea Amberley Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	18A - Between Haigslea Amberley Road and Brisbane Valley Highway	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	18A - Between Brisbane Valley Road and Mount Crosby Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	18A - Between Mount Crosby Road and Cunningham Highway	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Yelarbon-Keetah Road	241 - Between Cunningham Highway and Old Warwick Road	287.8%	282.2%	10.8%	21.3%	0.0%	0.0%
State-Controlled Roads: Roads and Maritime Services							
Bruxner Highway	Between New England Highway and Summerland Way	0.0%	0.0%	0.0%	1.2%	1.2%	1.2%
Gwydir Highway	Between Stephens Road and Delungra Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Delungra Road and Delungra Bypass Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Delungra Bypass Road and Copeton Dam Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Copeton Dam Road and Bannockburn Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%

Road name	Road section	2021	2022	2023	2024	2025	2026
	Between Bannockburn Road and Campbell Street	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Campbell Street and Tingha Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Tingha Road and Elsmore Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Elsmore Road and Woodstock Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Woodstock Road and Waterloo Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Waterloo Road and Coronation Avenue	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Coronation Avenue and New England Highway	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between New England Highway and Shannon Vale Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Shannon Vale Road and Bald Nob Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Bald Nob Road and Old Grafton Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Old Grafton Road and Coombadjha Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Coombadjha Road and Old Glen Innes Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Old Glen Innes Road and Rogan Bridge Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Rogan Bridge Road and Bent Street	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
New England Highway	Between Bruxner Way and Bruxner Highway	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%
	Between Gwydir Highway and Gwydir Highway	0.0%	0.0%	0.4%	0.4%	0.0%	0.0%
Newell Highway	Between NSW/QLD Border and Bruxner Way	2.7%	1.8%	1.4%	1.4%	0.0%	0.0%
Pacific Motorway	Between NSW/QLD border and Gwydir Highway	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
Summerland Way	Between Bruxner Highway and Red Lane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Between Trenayr Road and Turf Street	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%
Clarence Valley Council							
Bent Street	Between Craig Street and Gwydir Highway	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
Charles Street	Between Bent Street and Pacific Highway	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%
Clarence Street	Between Oliver Street and Craig Street	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%
Clark Road	Full extent	0.0%	0.0%	1.0%	1.5%	1.5%	1.4%
Craig Street	Between Villiers Street and Clarence Street	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Road name	Road section	2021	2022	2023	2024	2025	2026
	Between Clarence Street and Bent Street	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
Dobie Street	Between Villers Street and Summerland Way	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%
Fry Street	Between Mary Street and Alice Street	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%
Mary Street	Between Fry Street and Oliver Street	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%
Oliver Street	Between Clarence Street and Mary Street	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%
Red Lane	Between Summerland Way and Trenayr Road	0.0%	0.0%	0.0%	1.5%	1.5%	1.4%
Trenayr Road	Between Red Lane and Clark Road	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%
	Between Summerland Way and Clark Road	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%
Villers Street	Between Craig Street and Dobie Street	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%
Goondiwindi Regional Council							
Boodle Street	Between Boodle Street and Hunt Street	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%
Bybera Road	Between Cunningham Highway and Private Access	3161.3%	3099.3%	84.5%	353.6%	119.9%	52.0%
	Between Private Access and Unnamed Road	751.4%	1616.6%	0.0%	0.0%	0.0%	0.0%
Cemetery Road	Between Moorobie Lane and Unnamed Road	50.4%	49.4%	0.0%	0.0%	0.0%	0.0%
Coolmunda Dam Access	Full Extent	168.6%	186.9%	48.4%	125.2%	29.0%	0.2%
Cremascos Road	Between Cunningham Highway and 400 m west of private access	21.6%	30.5%	29.9%	20.4%	20.0%	19.6%
East Sawmill Road	Between Cunningham Highway and Springborg Road	10.3%	10.1%	1.4%	1.1%	0.6%	0.3%
Elizabeth Street	Between Cunningham Highway and Callandoon Street	4.0%	3.9%	3.8%	4.3%	3.8%	3.6%
Eukabilla Road	Full Extent	3.2%	3.2%	2.7%	2.6%	0.0%	0.0%
Fosters Road	Between Cunningham Highway and Grays Road	669.2%	1439.7%	0.0%	0.0%	0.0%	0.0%
Grays Road	Between Millmerran-Inglewood Road and Mosquito Creek Road	47.1%	504.5%	494.6%	44.4%	43.5%	42.7%
Hunt Street	Between Leichhardt Highway and Boodle Street	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%
Inglewood Quarry Access Road	Full Extent	15.7%	34.4%	33.7%	18.7%	17.8%	0.0%
Kildonan Road	Between Yelarbon-Keetah Road and Cunningham Highway	224.3%	219.9%	33.9%	40.1%	0.5%	0.0%
Lovells Crossing Road	Between Callandoon Street and Unnamed Road	2588.6%	2537.8%	2488.1%	2783.8%	2488.3%	2335.2%
	Between Unnamed Road and Unnamed Road	440.0%	431.4%	423.0%	759.1%	503.3%	389.2%

Road name	Road section	2021	2022	2023	2024	2025	2026
McDougalls Crossings Road	Between Cunningham Highway and 800 m west of Cremascos Road	2.2%	2.1%	0.5%	1.6%	0.8%	0.3%
Mooroobie Lane	Between Wondalli-Kurumbul Road and Cemetery Road	615.4%	603.3%	0.0%	0.0%	0.0%	0.0%
Mosquito Creek Road	Between Grays Road and Cunningham Highway	0.0%	629.3%	617.0%	0.0%	0.0%	0.0%
Old Texas-Yelarbon Road	Between Texas-Yelarbon Road and Rocky Creek Road	0.0%	0.0%	0.0%	6.4%	6.3%	6.1%
	Between Rocky Creek Road and Inglewood-Texas Road	0.0%	0.0%	0.0%	6.4%	6.3%	6.1%
Queen Street South	Between Yelarbon-Kurumbul Road and Danes Lane	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
South Kurumbul Road	Between Yelarbon-Kurumbul Road and Kildonan Road	8.0%	0.4%	0.1%	0.1%	0.1%	0.0%
Springborg Road	Between Cunningham Highway and Railway Line	906.5%	522.6%	512.3%	209.2%	250.6%	129.8%
Suttons Road	Between East Sawmill Road and Unnamed Road	2692.5%	2639.7%	0.0%	0.0%	0.0%	0.0%
Thornton Road	Between Millmerran-Inglewood Road and Unnamed Road	696.1%	3789.2%	311.7%	742.7%	387.0%	214.7%
Town Commons Road	Between Waggamba Road and Barwon Highway	0.9%	3.5%	0.1%	0.0%	0.0%	0.0%
Unnamed Road	Between Cunningham Highway and Private Access	0.8%	2.1%	1.5%	0.4%	0.0%	0.0%
Unnamed Road	Between Cemetery Road and Unnamed Road	10.3%	10.1%	0.0%	0.0%	0.0%	0.0%
Unnamed Road	Between Texas-Yelarbon Road and Private Land	10.3%	10.1%	0.0%	0.0%	0.0%	0.0%
Unnamed Road	Between Woodcocks Road and Queen Street North	10.3%	10.1%	0.0%	0.0%	0.0%	0.0%
Unnamed Road	Between East Sawmill Road and Suttons Road	24.0%	9.2%	0.0%	0.0%	0.0%	0.0%
Unnamed Road	Full extent	34.3%	33.7%	0.0%	0.0%	0.0%	0.0%
Whetstone Access Road	Between Cunningham Highway and 600 m west of Railway Line	213.3%	209.1%	100.8%	281.4%	127.0%	61.7%
Wondalli-Kurumbul Road	Between South Western System (Railway) and Bickers Road	1084.3%	1063.1%	0.0%	0.0%	0.0%	0.0%
Woodcocks Road	Between Cunningham Highway and Unnamed Road	2.1%	2.0%	0.0%	0.0%	0.0%	0.0%
Yelarbon-Kurumbul Road	Yelarbon-Kurumbul Road	1027.6%	1159.8%	1137.1%	407.5%	491.7%	269.5%
Gwydir Shire Council							
Edwards Street	Between North Star Road and I B Bore Road	12.1%	11.9%	13.7%	13.4%	0.0%	0.0%
North Star Road	Between MPSC Council Boundary and Edwards Street	17.4%	17.0%	19.6%	19.2%	0.0%	0.0%
	Between Edward Street and Getta Getta Road	0.0%	0.0%	2.9%	2.9%	0.0%	0.0%

Road name	Road section	2021	2022	2023	2024	2025	2026
	Between Getta Getta Road and Blue Nobby Road	0.0%	0.0%	2.9%	2.9%	0.0%	0.0%
	Between Blue Nobby Road and Hibernia Road	0.0%	0.0%	2.9%	2.9%	0.0%	0.0%
	Between Hibernia Road and Yallaroi Road	0.0%	0.0%	2.9%	2.9%	0.0%	0.0%
	Between Yallaroi Road and Baroma Road	0.0%	0.0%	2.9%	2.9%	0.0%	0.0%
	Between Baroma Road and Warialda Road	0.0%	0.0%	2.9%	2.9%	0.0%	0.0%
Stephen Street	Between Long Street and Gwydir Highway	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%
Warialda Road	Between North Star Road and Gournama Road	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%
	Between Gournama Road and Oregon Road	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%
	Between Oregon Street and Stephen Street	1.5%	1.5%	1.7%	1.7%	0.0%	0.0%
Inverell Shire Council							
Bruxner Way	Between Texas Bridge Road and Glenrock Road	0.0%	0.0%	0.0%	5.0%	4.9%	4.8%
	Between Glenrock Road and New England Highway	0.0%	0.0%	0.0%	5.0%	4.9%	4.8%
Campbell Street	Between Byron Street and Otho Street	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%
Texas Bridge Road	Between NSW/QLD Border and Bruxner Highway	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%
Moree Plains Shire Council							
Bruxner Way	Between Newell Highway and Tucka Tucka Road	18.1%	17.8%	20.5%	20.1%	0.0%	0.0%
	Between Tucka Tucka Road and North Star Road	18.1%	17.8%	20.5%	20.1%	0.0%	0.0%
North Star Road	Between Bruxner Way and Gwydir Shire Council boundary	16.7%	16.3%	18.8%	18.4%	0.0%	0.0%
River Road	Between Newell Highway and Boggabilla Weir	7.9%	3.3%	0.1%	0.1%	0.1%	0.0%
Toowoomba Regional Council							
Airport Quarry Wellcamp Access Road (Privately owned road)	Between Toowoomba-Cecil Plains Road and Toowoomba Wellcamp Airport	0.0%	0.0%	0.0%	1.1%	5.3%	0.0%
Alderley Street	Between Greenwattle Street and Gore Highway	0.3%	1.2%	1.7%	0.3%	0.3%	0.0%
	Between Gore Highway and Condamine Street	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Athol School Road	Between Gore Highway and Trader Road	10.9%	29.1%	28.9%	13.5%	21.1%	6.6%

Road name	Road section	2021	2022	2023	2024	2025	2026
Biddeston Southbrook Road	Between Gore Highway and Stower Road	7.5%	14.9%	14.6%	13.2%	7.0%	5.4%
Blackwell Road	Between Millmerran-Inglewood Road and Gore Highway	113.2%	149.2%	146.2%	578.4%	1116.6%	95.5%
Blackwell Road	Between Bunkers Hill School Road and Macaulay Road	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%
Bligh Street	Between Six Mile Road and Concrete Millmerran	0.1%	0.6%	0.6%	0.2%	0.0%	0.0%
	Between Concrete Millmerran and Crosby Street	0.1%	0.6%	0.6%	0.2%	0.0%	0.0%
Bostock Road	Between Pampas-Horrane Road and Unnamed Road	10.7%	75.3%	73.8%	24.4%	10.0%	0.1%
Brimblecombe Road	Between Toowoomba-Cecil Plains Road and Gowrie Mountain School Road	23.4%	23.3%	25.3%	27.2%	21.6%	21.2%
Bunkers Hill School Road	Between Gore Highway and Blackwell Road	0.3%	0.2%	0.1%	0.0%	0.0%	0.0%
Bushy Lane West	Between Gore Highway and 650 m west of Gore Highway	3.4%	3.4%	3.3%	4.9%	3.7%	3.1%
Campbell Street	Between Millmerran-Inglewood Road and Commens Street	16.3%	17.2%	17.3%	16.0%	19.9%	14.5%
Chamberlain Road	Between Warrego Highway and Robson Road	1.6%	1.6%	2.3%	2.4%	1.5%	1.5%
Commodore Peak Road	Between Millmerran-Inglewood Road and Blackwell Road	0.0%	874.7%	857.5%	0.0%	0.0%	0.0%
Condamine Street	Full extent	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%
Dieckmann Road	Between Gore Highway and Madelaine Street	0.2%	1.0%	5.0%	0.6%	0.2%	0.0%
Draper Road	Between Steger Road and Leasons Road	38.9%	38.2%	37.4%	36.7%	36.0%	35.3%
Drayton Wellcamp Road	Between Wellcamp-Westbrook Road and Boundary Street South	1.0%	3.6%	5.1%	5.2%	1.1%	0.1%
Euston Road	Between Boundary Court and Greenwattle Street	0.4%	1.3%	1.9%	0.4%	0.3%	0.0%
Forestry Road	Between Millmerran-Inglewood Road and Unnamed Road	0.0%	27.9%	15.7%	0.0%	0.0%	0.0%
Fysh Road	Between Gore Highway and Fysh Road	0.0%	0.0%	0.0%	0.9%	5.1%	0.0%
Gap Road	Between Gore Highway and Cypress Street	0.9%	5.7%	5.6%	1.7%	0.9%	0.0%
Geitz Road	Between Gore Highway and Luck Road	1.6%	32.4%	1.7%	4.3%	2.2%	1.5%
Gilgal Lane	Between Gore Highway and Railway Line	0.3%	0.3%	0.7%	0.8%	0.3%	0.3%
Greenwattle Street	Between Euston Road and Alderley Street	0.4%	1.6%	2.2%	0.4%	0.4%	0.0%
Grevillea Street	Full extent	0.0%	0.3%	1.7%	1.0%	0.0%	0.0%
Hall Road	Between Gore Highway and Railway Line	0.4%	1.0%	1.0%	0.6%	0.4%	0.3%

Road name	Road section	2021	2022	2023	2024	2025	2026
Heckendorf Road	Between Millmerran-Inglewood Road and Bora Creek Road	4.6%	4.5%	226.2%	217.5%	99.5%	1.8%
Kahler Road	Between Murlaggan Road and Glen Devon Road	1.6%	1.6%	1.6%	1.9%	2.1%	1.5%
Kooroongara Road	Between Millmerran-Inglewood Road and Bliss Road	0.0%	0.0%	293.2%	287.5%	0.0%	0.0%
Kooroongarra Road	Between Millmerran-Inglewood Road and Halls Road	0.0%	598.0%	586.3%	0.0%	0.0%	0.0%
Kooroongarra Road	Between Millwood Road and Cunningham Highway	0.0%	0.0%	69.8%	68.4%	0.0%	0.0%
Leesons Road	Full extent	43.3%	44.2%	89.2%	171.5%	47.3%	31.9%
Lindenmayer Road	Between Gore Highway and Unnamed Road	0.7%	0.6%	0.6%	0.8%	1.9%	0.6%
Linthorpe Road	Between Gore Highway and Loveday Road	10.1%	224.9%	25.7%	25.0%	12.4%	6.6%
Lochaber Road	Between McEwan Lane and Gore Highway	2.8%	2.8%	3.4%	2.7%	2.6%	2.6%
Macaulay Road	Between Blackwell Road and Wellcamp-Westbrook Road	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%
McDougall Street	Between Toowoomba-Cecil Plains Road and Hursley Road	0.2%	0.2%	0.2%	0.0%	0.0%	0.0%
Millwood Road	Between Millmerran-Inglewood Road and Kooroongarra Road	114.0%	1125.9%	1310.6%	317.1%	234.6%	94.2%
Murlaggan Road	Between Gore Highway and Roche Road	1156.5%	1134.2%	595.7%	584.0%	115.4%	96.6%
	Between Roche Road and Yarranlea Road	0.0%	0.0%	20.1%	0.0%	0.0%	0.0%
Omara Road	Between Toowoomba-Cecil Plains Road and Warrego Highway	0.3%	0.7%	1.8%	3.2%	0.4%	0.0%
Owens Scrub Road	Between Millmerran-Inglewood Road and Foxwood Road	12.7%	29.4%	28.8%	18.7%	47.3%	8.9%
Paint Mine Road	Between Gore Highway and Loveday Road	1.6%	1.7%	1.6%	1.5%	1.5%	1.5%
Paton Road	Between Millmerran-Inglewood Road and Kooroongarra Road	3.4%	3.3%	3.5%	4.2%	11.6%	3.1%
Pittsworth-Felton Road	Between Cypress Street and Golf Course Road	0.1%	0.6%	0.5%	0.1%	0.1%	0.0%
Railway Street	Between Short Street and Vines Street	11.6%	67.1%	65.8%	53.5%	10.7%	0.0%
Roche Road	Between Murlaggan Road and Saint Helens Road	0.4%	0.4%	0.7%	0.4%	0.4%	0.4%
Saleyards Road	Between Millmerran-Inglewood Road and Gore Highway	0.6%	0.6%	0.6%	3.3%	19.1%	0.0%
Scrubby Road	Between Gore Highway and Jentz Road	0.0%	100.4%	0.0%	40.7%	15.5%	0.0%
Short Street	Between Yandilla Street and Toowoomba Road	0.4%	2.7%	2.6%	0.4%	0.4%	0.0%
Six Mile Road	Between Rodney Road and Bligh Street	16.4%	62.3%	72.2%	26.3%	0.0%	0.0%
Steger Road	Between Warrego Highway and Draper Road	38.9%	38.2%	37.4%	36.7%	36.0%	35.3%

Road name	Road section	2021	2022	2023	2024	2025	2026
Toowoomba Road	Between Vines Street and Gore Highway	1.3%	7.3%	7.2%	5.8%	1.2%	0.0%
Tummalville Road	Between Gore Highway and Mann Silo Road	0.0%	200.6%	0.0%	119.6%	47.2%	0.0%
Unnamed Road	Between Gore Highway and Millmerran Indoor Sports Centre	10.2%	10.0%	9.8%	9.6%	9.4%	9.2%
Unnamed Road	Between Toowoomba-Cecil Plains Road and Unnamed Road	0.0%	0.1%	0.1%	0.9%	7.3%	0.0%
Unnamed Road	Between Tummalville Road and Scrubby Road	0.0%	27.1%	0.0%	16.2%	6.4%	0.0%
Unnamed Road	Between Drayton Westbrook Road and Unnamed Road	0.0%	0.0%	0.0%	12.6%	0.7%	0.0%
Unnamed Road	Between Bostock Road and Unnamed Road	1.2%	8.5%	8.3%	2.7%	1.1%	0.0%
Unnamed Road	Between Forestry Road and Unnamed Road	0.0%	27.9%	15.7%	0.0%	0.0%	0.0%
Unnamed Road	Between Gore Highway and Private Access	3.3%	3.2%	3.2%	3.1%	3.0%	3.0%
Ware Street	Between Gore Highway and Railway Line	0.0%	0.0%	3.2%	0.0%	0.0%	0.0%
Wellcamp-Westbrook Road	Between Macaulay Road and Toowoomba-Cecil Plains Road	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
	Between Toowoomba-Cecil Plains Road and Drayton Wellcamp Road	2.4%	8.8%	12.4%	12.7%	2.7%	0.2%
West Street	Between Gore Highway and Rodney Road	4.4%	16.9%	19.6%	7.1%	0.0%	0.0%
Yarranlea Road	Between Gore Highway and Railway Line	65.6%	176.1%	177.1%	198.8%	84.8%	41.0%
	Between Railway Line and Saint Helens Road	0.0%	0.0%	31.2%	0.0%	0.0%	0.0%

Table 6.3 and Table 6.4 show that Year 2021 and Year 2022 of the construction period is likely to generate the highest construction related traffic volumes on the surrounding road network. During these years, some routes contain road sections that are projected to exceed 10 per cent of the background traffic with the addition of Project construction traffic. Large exceedances of the 10 per cent margin is largely attributed to the low background traffic volumes along these road sections.

Table 6.5 shows a summary for each road authority of the number of roads with construction traffic that exceeds five per cent of base AADT. Certain sections of these routes will generate construction related traffic volumes in excess of five per cent or 10 per cent of the background traffic during construction.

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. Further comparisons to identify the magnitude of the Project related traffic against the background traffic are discussed with results in Section 6.2.2.

The impacts identified due to various construction activities are expected to be short term and only for the duration of the specific activities. Generally, the level of impacts identified would only be for limited periods which can be mitigated through adequate traffic management measures.

Table 6.5 Number of roads exceeding five per cent base AADT by road authority

Road authority	Number of roads	
	5–10% base AADT	> 10% base AADT
DTMR	1	8
NSW Roads and Maritime Services	0	0
Clarence Valley Council	0	0
Goondiwindi Regional Council	2	23
Gwydir Shire Council	0	2
Inverell Shire Council	1	0
Moree Plains Shire Council	1	2
Toowoomba Regional Council	7	31

6.2.2 Level of service comparison on links

The primary aim of the LOS analysis is to determine the level of impact Project generated traffic has on the road network by determining the change in LOS in the peak hour for each road section. The following section summarises the performance analyses carried out to determine the “without” and “with Project” traffic LOS for various construction route road sections during the year construction is expected.

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
- It has been assumed that 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 GARID, LOS C is considered to be the minimum standard on rural roads, although a LOS D may be acceptable during some circumstances. Therefore, all road sections currently operating at or above LOS D are considered to be operating above the acceptable standard. The LOS analysis was undertaken for the construction route sections which exceeds the five per cent threshold, as well as all construction route sections of which traffic volumes were assumed. All road segments have been analysed based on their operations, using thresholds defined in Section 4.1.2 for all road types. Although a number of the assessed road segments are physically a single lane bitumen road, they have been analysed by direction as a two-way road as traffic is able to travel in both directions. One-way roads have been assessed for a single direction. The LOS “with” and “without” the Project related traffic has been summarised in Table 6.6 and Table 6.7.

Table 6.6 Primary construction routes level of service results gazetted direction/northbound/eastbound

Construction routes - >5%		Analysis type	Without Project traffic								With Project traffic						
Road name	Road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026	
State Controlled Roads: Department Transport and Main Roads																	
Cunningham Highway	Between Wyaga Road and Yelarbon-Keetah Road	Two-way two-lane highway	A	A	A	A	B	B	B	A	B	B	B	B	B	B	
Cunningham Highway	Between Yelarbon-Keetah Road and Texas-Yelarbon Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Cunningham Highway	Between Texas-Yelarbon Road and Inglewood-Texas Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Cunningham Highway	Between Inglewood-Texas Road and Millmerran-Inglewood Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Cunningham Highway	Between Millmerran-Inglewood Road and Inglewood Quarry Access Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Cunningham Highway	Between Inglewood Quarry Access Road and Coolmunda Dam Access	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Gore Highway	Between Blackwell Road and Saleyards Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Gore Highway	Between West Street and Millmerran-Inglewood Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Gore Highway	Between Millmerran-Inglewood Road and Millmerran-Leyburn Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	B	B	B	B	B	B	
Gore Highway	Between Millmerran-Leyburn Road and Pampas-Horrane Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Gore Highway	Between Pampas-Horrane Road and Brookstead-Norwin Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Gore Highway	Between Brookstead-Norwin Road and Tummaville Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Gore Highway	Between Tummaville Road and Vines Street	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Gore Highway	Between Vines Street and Toowoomba Bypass	Two-way two-lane highway	B	B	B	B	B	B	B	B	C	C	C	C	C	C	

Construction routes - >5%		Analysis type	Without Project traffic								With Project traffic						
Road name	Road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026	
Millmerran-Inglewood Road	Between Cunningham Highway and Thornton Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Millmerran-Inglewood Road	Between Thornton Road and Council Boundary	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Millmerran-Inglewood Road	Between Council Boundary and Kooroongarra Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Millmerran-Inglewood Road	Between Kooroongarra Road and Blackwell Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	B	B	B	B	
Millmerran-Inglewood Road	Between Blackwell Road and Campbell Street	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	B	B	B	B	
Millmerran-Inglewood Road	Between Campbell Street and Gore Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Millmerran-Leyburn Road	Between Gore Highway and Reiche Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Pampas-Horrane Road	Between Gore Highway and Bostock Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Texas-Yelarbon Road	Between Cunningham Highway and Old Texas-Yelarbon Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Toowoomba Bypass	Between Gore Highway and Toowoomba-Cecil Plains Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Toowoomba Bypass	Between Toowoomba-Cecil Plains Road and New England Highway	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Yelarbon-Keetah Road	Between Cunningham Highway and Old Warwick Road	Two-way four lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Toowoomba-Cecil Plains Road	Between Hursley Road and Hanrahans Road	Mid-block analysis	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Toowoomba-Cecil Plains Road	Between Hanrahans Road and 2 km west of Brimblecombe Road	Mid-block Analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Local Government Roads: Goondiwindi Regional Council																	
Bybera Road	Between Cunningham Highway and Private Access	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	

Construction routes - >5%		Analysis type	Without Project traffic							With Project traffic						
Road name	Road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Bybera Road	Between Private Access and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Cemetery Road	Between Moorobie Lane and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Coolmunda Dam Access	Full Extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Cremascos Road	Between Cunningham Highway and 400 m west of private access	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
East Sawmill Road	Between Cunningham Highway and Springborg Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	B	B	A	A	A	B
Fosters Road	Between Cunningham Highway and Grays Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Grays Road	Between Millmerran-Inglewood Road and Mosquito Creek Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Inglewood Quarry Access Road	Full Extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Kildonan Road	Between Yelarbon-Keetah Road and Cunningham Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Lovells Crossing Road	Between Unnamed Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Moorobie Lane	Between Wondalli-Kurumbul Road and Cemetery Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Mosquito Creek Road	Between Grays Road and Cunningham Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Old Texas-Yelarbon Road	Between Texas-Yelarbon Road and Rocky Creek Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Old Texas-Yelarbon Road	Between Rocky Creek Road and Inglewood-Texas Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
South Kurumbul Road	Between Yelarbon-Kurumbul Road and Kildonan Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Springborg Road	Between Cunningham Highway and Railway Line	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Construction routes - >5%		Analysis type	Without Project traffic								With Project traffic						
Road name	Road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026	
Suttons Road	Between East Sawmill Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Thornton Road	Between Millmerran-Inglewood Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Unnamed Road	Between Cemetery Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Unnamed Road	Between Texas-Yelarbon Road and Private Land	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Unnamed Road	Between Woodcocks Road and Queen Street North	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Unnamed Road	Between East Sawmill Road and Suttons Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Unnamed Road	Full extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Whetstone Access Road	Between Cunningham Highway and 600 m west of Railway Line	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Wondalli-Kurumbul Road	Between South Western System (Railway) and Bickers Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Yelarbon-Kurumbul Road	Between Cunningham Highway and Wondalli-Kurumbul Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Lovells Crossing Road	Between Callandoon Street and Unnamed Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Local Government Roads: Gwydir Shire Council																	
Edwards Street	Between North Star Road and I B Bore Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
North Star Road	Between MPSC Council Boundary and Edwards Street	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
North Star Road	Between Bruxner Way and Gwydir Shire Council boundary	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
River Road	Between Newell Highway and Boggabilla Weir	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A	

Construction routes - >5%		Analysis type	Without Project traffic							With Project traffic						
Road name	Road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Local Government Roads: Inverell Shire Council																
Bruxner Way	Between Texas Bridge Road and Glenrock Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Bruxner Way	Between Glenrock Road and New England Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Local Government Roads: Moree Plains Shire Council																
Bruxner Way	Between Newell Highway and Tucka Tucka Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Bruxner Way	Between Tucka Tucka Road and North Star Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Local Government Roads: Toowoomba Regional Council																
Biddeston Southbrook Road	Between Gore Highway and Stower Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Blackwell Road	Between Millmerran-Inglewood Road and Gore Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Bostock Road	Between Pampas-Horrane Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Brimblecombe Road	Between Toowoomba-Cecil Plains Road and Gowrie Mountain School Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Commodore Peak Road	Between Millmerran-Inglewood Road and Blackwell Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Draper Road	Between Steger Road and Leeson's Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Forestry Road	Between Millmerran-Inglewood Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Gap Road	Between Gore Highway and Cypress Street	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Geitz Road	Between Gore Highway and Luck Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Heckendorf Road	Between Millmerran-Inglewood Road and Bora Creek Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Construction routes - >5%		Analysis type	Without Project traffic							With Project traffic						
Road name	Road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Kooroongara Road	Between Millmerran-Inglewood Road and Bliss Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Kooroongara Road	Between Millmerran-Inglewood Road and Halls Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Kooroongara Road	Between Millwood Road and Cunningham Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Leesons Road	Full extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Linthorpe Road	Between Gore Highway and Loveday Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Millwood Road	Between Millmerran-Inglewood Road and Kooroongara Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Murlaggan Road	Between Gore Highway and Roche Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Murlaggan Road	Between Roche Road and Yarranlea Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Owens Scrub Road	Between Millmerran-Inglewood Road and Foxwood Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Paton Road	Between Millmerran-Inglewood Road and Kooroongara Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Scrubby Road	Between Gore Highway and Jentz Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Six Mile Road	Between Rodney Road and Bligh Street	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Steger Road	Between Warrego Highway and Draper Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Toowoomba Road	Between Vines Street and Gore Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Tummalville Road	Between Gore Highway and Mann Silo Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Gore Highway and Millmerran Indoor Sports Centre	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Construction routes - >5%		Analysis type	Without Project traffic							With Project traffic						
Road name	Road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Unnamed Road	Between Toowoomba-Cecil Plains Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Tumnaville Road and Scrubby Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Drayton Westbrook Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Bostock Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Forestry Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Yarranlea Road	Between Gore Highway and Railway Line	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Yarranlea Road	Between Railway Line and Saint Helens Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Airport Quarry Wellcamp Access Road (Privately owned road)	Between Toowoomba-Cecil Plains Road and Toowoomba Wellcamp Airport	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Athol School Road	Between Gore Highway and Trader Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Campbell Street	Between Millmerran-Inglewood Road and Commens Street	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Drayton Wellcamp Road	Between Wellcamp-Westbrook Road and Boundary Street South	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Fysh Road	Between Gore Highway and Fysh Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Railway Street	Between Short Street and Vines Street	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Saleyards Road	Between Millmerran-Inglewood Road and Gore Highway	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Wellcamp-Westbrook Road	Between Toowoomba-Cecil Plains Road and Drayton Wellcamp Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
West Street	Between Gore Highway and Rodney Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Table 6.7 Primary construction routes level of service results anti-gazettal direction/southbound/westbound

Construction routes - >5%		Analysis type	Without Project traffic								With Project traffic						
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026	
State Controlled Roads: Department Transport and Main Roads																	
Cunningham Highway	Between Wyaga Road and Yelarbon-Keetah Road	Two-way two-lane highway	A	B	B	B	B	B	B	A	B	B	B	B	B	B	
Cunningham Highway	Between Yelarbon-Keetah Road and Texas-Yelarbon Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Cunningham Highway	Between Texas-Yelarbon Road and Inglewood-Texas Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Cunningham Highway	Between Inglewood-Texas Road and Millmerran-Inglewood Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Cunningham Highway	Between Millmerran-Inglewood Road and Inglewood Quarry Access Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Cunningham Highway	Between Inglewood Quarry Access Road and Coolmunda Dam Access	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Gore Highway	Between Blackwell Road and Saleyards Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
Gore Highway	Between West Street and Millmerran-Inglewood Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Gore Highway	Between Millmerran-Inglewood Road and Millmerran-Leyburn Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	B	B	B	B	B	B	
Gore Highway	Between Millmerran-Leyburn Road and Pampas-Horrane Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Gore Highway	Between Pampas-Horrane Road and Brookstead-Norwin Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Gore Highway	Between Brookstead-Norwin Road and Tummaville Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Gore Highway	Between Tummaville Road and Vines Street	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B	

Construction routes - >5%		Analysis type	Without Project traffic							With Project traffic						
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Gore Highway	Between Vines Street and Toowoomba Bypass	Two-way two-lane highway	B	B	B	B	B	B	B	B	C	C	C	C	C	C
Millmerran-Inglewood Road	Between Cunningham Highway and Thornton Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Millmerran-Inglewood Road	Between Thornton Road and Council Boundary	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Millmerran-Inglewood Road	Between Council Boundary and Kooroongarra Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Millmerran-Inglewood Road	Between Kooroongarra Road and Blackwell Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	B	B	A	A	A
Millmerran-Inglewood Road	Between Blackwell Road and Campbell Street	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	B	B	A	A	A
Millmerran-Inglewood Road	Between Campbell Street and Gore Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Millmerran-Leyburn Road	Between Gore Highway and Reiche Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Pampas-Horrane Road	Between Gore Highway and Bostock Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Texas-Yelarbon Road	Between Cunningham Highway and Old Texas-Yelarbon Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Toowoomba Bypass	Between Gore Highway and Toowoomba-Cecil Plains Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Toowoomba Bypass	Between Toowoomba-Cecil Plains Road and New England Highway	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Yelarbon-Keetah Road	Between Cunningham Highway and Old Warwick Road	Two Way Four Lane Highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Toowoomba-Cecil Plains Road	Between Hursley Road and Hanrahans Road	Mid-block analysis	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Toowoomba-Cecil Plains Road	Between Hanrahans Road and 2 km west of Brimblecombe Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Construction routes - >5%		Analysis type	Without Project traffic							With Project traffic						
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Local Government Roads: Goondiwindi Regional Council																
Bybera Road	Between Cunningham Highway and Private Access	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Bybera Road	Between Private Access and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Cemetery Road	Between Moorobie Lane and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Coolmunda Dam Access	Full extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Cremascos Road	Between Cunningham Highway and 400 m west of private access	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
East Sawmill Road	Between Cunningham Highway and Springborg Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	B	B	A	A	A	B
Fosters Road	Between Cunningham Highway and Grays Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Grays Road	Between Millmerran-Inglewood Road and Mosquito Creek Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Inglewood Quarry Access Road	Full extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Kildonan Road	Between Yelarbon-Keetah Road and Cunningham Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Lovells Crossing Road	Between Unnamed Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Moorobie Lane	Between Wondalli-Kurumbul Road and Cemetery Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Mosquito Creek Road	Between Grays Road and Cunningham Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Old Texas-Yelarbon Road	Between Texas-Yelarbon Road and Rocky Creek Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Old Texas-Yelarbon Road	Between Rocky Creek Road and Inglewood-Texas Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Construction routes - >5%		Analysis type	Without Project traffic							With Project traffic						
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
South Kurumbul Road	Between Yelarbon-Kurumbul Road and Kildonan Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Springborg Road	Between Cunningham Highway and Railway Line	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Suttons Road	Between East Sawmill Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Thornton Road	Between Millmerran-Inglewood Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Cemetery Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Texas-Yelarbon Road and Private Land	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Woodcocks Road and Queen Street North	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between East Sawmill Road and Suttons Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Full extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Whetstone Access Road	Between Cunningham Highway and 600 m west of Railway Line	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Wondalli-Kurumbul Road	Between South Western System (Railway) and Bickers Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Yelarbon-Kurumbul Road	Between Cunningham Highway and Wondalli-Kurumbul Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Lovells Crossing Road	Between Callandoon Street and Unnamed Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Local Government Roads: Gwydir Shire Council																
Edwards Street	Between North Star Road and I B Bore Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
North Star Road	Between MPSC Council Boundary and Edwards Street	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Construction routes - >5%		Analysis type	Without Project traffic								With Project traffic					
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
North Star Road	Between Bruxner Way and Gwydir Shire Council boundary	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
River Road	Between Newell Highway and Boggabilla Weir	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Local Government Roads: Inverell Shire Council																
Bruxner Way	Between Texas Bridge Road and Glenrock Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Bruxner Way	Between Glenrock Road and New England Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Local Government Roads: Moree Plains Shire Council																
Bruxner Way	Between Newell Highway and Tucka Tucka Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Bruxner Way	Between Tucka Tucka Road and North Star Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Local Government Roads: Toowoomba Regional Council																
Biddeston Southbrook Road	Between Gore Highway and Stower Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Blackwell Road	Between Millmerran-Inglewood Road and Gore Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Bostock Road	Between Pampas-Horrane Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Brimblecombe Road	Between Toowoomba-Cecil Plains Road and Gowrie Mountain School Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Commodore Peak Road	Between Millmerran-Inglewood Road and Blackwell Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Draper Road	Between Steger Road and Leasons Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Forestry Road	Between Millmerran-Inglewood Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Construction routes - >5%		Analysis type	Without Project traffic								With Project traffic							
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026		
Gap Road	Between Gore Highway and Cypress Street	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Geitz Road	Between Gore Highway and Luck Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Heckendorf Road	Between Millmerran-Inglewood Road and Bora Creek Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Kooroongara Road	Between Millmerran-Inglewood Road and Bliss Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Kooroongarra Road	Between Millmerran-Inglewood Road and Halls Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Kooroongarra Road	Between Millwood Road and Cunningham Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Leesons Road	Full extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Linthorpe Road	Between Gore Highway and Loveday Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Millwood Road	Between Millmerran-Inglewood Road and Kooroongarra Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Murlaggan Road	Between Gore Highway and Roche Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Murlaggan Road	Between Roche Road and Yarranlea Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Owens Scrub Road	Between Millmerran-Inglewood Road and Foxwood Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Paton Road	Between Millmerran-Inglewood Road and Kooroongarra Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Scrubby Road	Between Gore Highway and Jentz Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Six Mile Road	Between Rodney Road and Bligh Street	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Steger Road	Between Warrego Highway and Draper Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		

Construction routes - >5%		Analysis type	Without Project traffic							With Project traffic						
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Toowoomba Road	Between Vines Street and Gore Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Tummalville Road	Between Gore Highway and Mann Silo Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Gore Highway and Millmerran Indoor Sports Centre	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Unnamed Road	Between Toowoomba-Cecil Plains Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Tummalville Road and Scrubby Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Drayton Westbrook Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Bostock Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unnamed Road	Between Forestry Road and Unnamed Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Yarranlea Road	Between Gore Highway and Railway Line	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Yarranlea Road	Between Railway Line and Saint Helens Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Airport Quarry Wellcamp Access Road (Privately owned road)	Between Toowoomba-Cecil Plains Road and Toowoomba Wellcamp Airport	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Athol School Road	Between Gore Highway and Trader Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Campbell Street	Between Millmerran-Inglewood Road and Commens Street	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Drayton Wellcamp Road	Between Wellcamp-Westbrook Road and Boundary Street South	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Fysh Road	Between Gore Highway and Fysh Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Construction routes - >5%		Analysis type	Without Project traffic								With Project traffic							
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026		
Railway Street	Between Short Street and Vines Street	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Saleyards Road	Between Millmerran-Inglewood Road and Gore Highway	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Wellcamp-Westbrook Road	Between Toowoomba-Cecil Plains Road and Drayton Wellcamp Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
West Street	Between Gore Highway and Rodney Road	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A		

The results of the LOS comparison indicate that the Project construction traffic may cause a change to LOS along the following construction traffic routes in each direction unless otherwise specified:

■ Department Transport and Main Roads:

- Cunningham Highway, between Wyaga Road and Yelarbon-Keetah Road (LOS A to LOS B due to the addition of up to 39 veh/hour during the peak construction hour)
- Gore Highway, between Millmerran-Inglewood Road and Millmerran-Leyburn Road (LOS A to LOS B due to the addition of up to 80 veh/hour during the peak construction hour)
- Gore Highway, between Vines Street and Toowoomba Bypass (LOS B to LOS C due to the addition of up to 92 veh/hour during the peak construction hour)
- Millmerran-Inglewood Road, between Kooroongarra Road and Blackwell Road (LOS A to LOS B due to the addition of up to 56 veh/hour during the peak construction hour)
- Millmerran-Inglewood Road, between Blackwell Road and Campbell Street (LOS A to LOS B due to the addition of up to 73 veh/hour during the peak construction hour)

■ Goondiwindi Regional Council:

- East Sawmill Road, between Cunningham Highway and Springborg Road (LOS A to LOS B due to the addition of up to 21 veh/hour during the peak construction hour).

Although there is a change in operational LOS for the road sections above, the expected operational LOS C is considered acceptable given the short duration of the construction activities. Therefore, during construction, apart from the identified road sections and the explanations provided above; the operational LOS of the overall road network will be no worse as a result of the Project. In addition, the operational performance of the road would also 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 Traffic Management Sub-plan from a physical and safety perspective prior to the commencement of construction activities to ensure that they are suitable. This will include joint visual inspection of all routes by the design and Principal 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. This requirement is discussed further in Section 9. Detailed road link analyses outputs have been provided in Appendix Q.

6.2.3 Level of service comparison on links with assumed base traffic volumes

LOS analyses were undertaken for links where no base traffic volumes were available (i.e. assumed volumes). This excluded links which exceeded the five per cent comparison as they were accounted for in Section 6.2.2. Peak hour volumes were calculated using the same assumptions in Section 6.2.2.

Table 6.8 and Table 6.9 summarises the LOS results of the 'without' and 'with' Project traffic LOS.

The volumes assumed are generally much higher than those which would be observed on the assessed links. Therefore, the LOS analysis undertaken for these links is likely to represent a "worst case" scenario.

Table 6.8 Primary construction routes level of service results gazetted direction/northbound/eastbound – assumed base traffic volumes

Construction routes – assumed volumes		Analysis type	Without Project traffic							With Project traffic						
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Local Government Roads: Clarence Valley Council																
Clark Road	Full Extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Red Lane	Between Summerland Way and Trenayr Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Trenayr Road	Between Red Lane and Clark Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Trenayr Road	Between Summerland Way and Clark Road	Two-way two-lane highway	A	A	A	A	A	A	A	B	A	A	A	A	A	B
Charles Street	Between Bent Street and Pacific Highway	Mid-block analysis	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Clarence Street	Between Oliver Street and Craig Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Dobie Street	Between Villers Street and Summerland Way	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Fry Street	Between Mary Street and Alice Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Mary Street	Between Fry Street and Oliver Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Oliver Street	Between Clarence Street and Mary Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Villers Street	Between Craig Street and Dobie Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Local Government Roads: Goondiwindi Regional Council																
Eukabilla Road	Full Extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Inglewood Quarry Access Road	Full Extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Construction routes – assumed volumes		Analysis type	Without Project traffic								With Project traffic							
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026		
McDougalls Crossings Road	Between Cunningham Highway and 800 m west of Cremascos Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Queen Street South	Between Yelarbon-Kurumbul Road and Danes Lane	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Unnamed Road	Between Cunningham Highway and Private Access	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Woodcocks Road	Between Cunningham Highway and Unnamed Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Boodle Street	Between Boodle Street and Hunt Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
Elizabeth Street	Between Cunningham Highway and Callandoon Street	Mid-block analysis	B	B	B	B	B	B	B	B	C	C	C	C	C	C		
Hunt Street	Between Leichhardt Highway and Boodle Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
Local Government Roads: Gwydir Shire Council																		
Stephen Street	Between Long Street and Gwydir Highway	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Warialda Road	Between North Star Road and Gournama Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Warialda Road	Between Gournama Road and Oregon Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Warialda Road	Between Oregon Street and Stephen Street	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Local Government Roads: Inverell Shire Council																		
Texas Bridge Road	Between NSW/QLD Border and Bruxner Highway	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Local Government Roads: Toowoomba Regional Council																		
Bligh Street	Between Six Mile Road and Concrete Millmerran	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		

Construction routes – assumed volumes		Analysis type	Without Project traffic							With Project traffic						
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Bligh Street	Between Concrete Millmerran and Crosby Street	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Bushy Lane West	Between Gore Highway and 650 m west of Gore Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Chamberlain Road	Between Warrego Highway and Robson Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Dieckmann Road	Between Gore Highway and Madelaine Street	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Kahler Road	Between Murlaggan Road and Glen Devon Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Lindenmayer Road	Between Gore Highway and Unnamed Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Paint Mine Road	Between Gore Highway and Loveday Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Pittsworth-Felton Road	Between Cypress Street and Golf Course Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Roche Road	Between Murlaggan Road and Saint Helens Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Unnamed Road	Between Gore Highway and Private Access	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Campbell Street	Between Byron Street and Otho Street	Mid-block analysis	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Gilgal Lane	Between Gore Highway and Railway Line	Mid-block analysis	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Grevillea Street	Full Extent	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Hall Road	Between Gore Highway and Railway Line	Mid-block analysis	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Ware Street	Between Gore Highway and Railway Line	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Table 6.9 Primary construction routes level of service results anti-gazettal direction/southbound/westbound – assumed base traffic volumes

Construction routes – assumed volumes		Analysis type	Without Project traffic							With Project traffic						
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Local Government Roads: Clarence Valley Council																
Clark Road	Full Extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Red Lane	Between Summerland Way and Trenayr Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Trenayr Road	Between Red Lane and Clark Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Trenayr Road	Between Summerland Way and Clark Road	Two-way two-lane highway	A	A	A	A	A	A	A	B	A	A	A	A	A	B
Charles Street	Between Bent Street and Pacific Highway	Mid-block analysis	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Clarence Street	Between Oliver Street and Craig Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Dobie Street	Between Villers Street and Summerland Way	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Fry Street	Between Mary Street and Alice Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Mary Street	Between Fry Street and Oliver Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Oliver Street	Between Clarence Street and Mary Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Villers Street	Between Craig Street and Dobie Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Local Government Roads: Goondiwindi Regional Council																
Eukabilla Road	Full Extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Inglewood Quarry Access Road	Full Extent	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Construction routes – assumed volumes		Analysis type	Without Project traffic								With Project traffic							
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026		
McDougalls Crossings Road	Between Cunningham Highway and 800 m west of Cremascos Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Queen Street South	Between Yelarbon-Kurumbul Road and Danes Lane	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Unnamed Road	Between Cunningham Highway and Private Access	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
Woodcocks Road	Between Cunningham Highway and Unnamed Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Boodle Street	Between Boodle Street and Hunt Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
Elizabeth Street	Between Cunningham Highway and Callandoon Street	Mid-block analysis	B	B	B	B	B	B	B	B	C	C	C	C	C	C		
Hunt Street	Between Leichhardt Highway and Boodle Street	Mid-block analysis	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
Local Government Roads: Gwydir Shire Council																		
Stephen Street	Between Long Street and Gwydir Highway	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Warialda Road	Between North Star Road and Gournama Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Warialda Road	Between Gournama Road and Oregon Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Warialda Road	Between Oregon Street and Stephen Street	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Local Government Roads: Inverell Shire Council																		
Texas Bridge Road	Between NSW/QLD Border and Bruxner Highway	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Local Government Roads: Toowoomba Regional Council																		
Bligh Street	Between Six Mile Road and Concrete Millmerran	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B		

Construction routes – assumed volumes		Analysis type	Without Project traffic							With Project traffic						
Road name	Road ID - road section		2020	2021	2022	2023	2024	2025	2026	2020	2021	2022	2023	2024	2025	2026
Bligh Street	Between Concrete Millmerran and Crosby Street	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Bushy Lane West	Between Gore Highway and 650 m west of Gore Highway	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Chamberlain Road	Between Warrego Highway and Robson Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Dieckmann Road	Between Gore Highway and Madelaine Street	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Kahler Road	Between Murlaggan Road and Glen Devon Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Lindenmayer Road	Between Gore Highway and Unnamed Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Paint Mine Road	Between Gore Highway and Loveday Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Pittsworth-Felton Road	Between Cypress Street and Golf Course Road	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Roche Road	Between Murlaggan Road and Saint Helens Road	Two-way two-lane highway	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Unnamed Road	Between Gore Highway and Private Access	Two-way two-lane highway	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Campbell Street	Between Byron Street and Otho Street	Mid-block analysis	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Gilgal Lane	Between Gore Highway and Railway Line	Mid-block analysis	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Grevillea Street	Full extent	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Hall Road	Between Gore Highway and Railway Line	Mid-block analysis	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Ware Street	Between Gore Highway and Railway Line	Mid-block analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A

The results of the LOS comparison indicate that the Project construction traffic may cause a change along Elizabeth Street, between Cunningham Highway and Callandoon Street (LOS B to LOS C).

Although there is a change in operational LOS for this road section, the expected operational LOS C 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.

Regardless, as per the earlier assessments, it is important that the construction traffic routes be reviewed once suppliers are confirmed prior to the commencement of construction, and included in the Traffic Management Sub-plan. This review will include joint visual inspection of all routes by the design and Principal Contractor, the asset owner and an accredited road safety auditor to agree on routes and any works require to ensure the routes are suitable for the level of construction activity proposed. This requirement is discussed further in Section 9. Detailed road link analyses outputs based on the above analysis have been provided in Appendix Q.

6.3 Construction 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 utilise 153 intersections where turning movements would occur. The intersections where turning movements along assumed construction routes would occur are provided in Table 6.10.

Table 6.10 Intersection with construction traffic turn movements

Intersection name
Department of Transport Main Roads
Barwon Highway/Leichhardt Highway
Barwon Highway/Town Commons Road
Cunningham Highway/Woodcocks Road
Cunningham Highway/Yelarbon-Kurumbul Road
Cunningham Highway/Kildonan Road
Cunningham Highway/East Sawmill Road
Cunningham Highway/Texas-Yelarbon Road
Cunningham Highway/Springborg Road
Cunningham Highway/Whetstone Access Road
Cunningham Highway/McDougalls Crossing Road
Cunningham Highway/Cremascos Road
Cunningham Highway/Bybera Road
Cunningham Highway/Yelarbon-Keetah Road
Cunningham Highway/Lovells Crossing Road
Cunningham Highway/Inglewood-Texas Road
Cunningham Highway/Millmerran-Inglewood Road
Cunningham Highway/Fosters Road
Cunningham Highway/Inglewood Quarry Access Road
Cunningham Highway/Coolmunda Dam Access
Gore Highway/Murlaggan Road
Gore Highway/Blackwell Road
Gore Highway/West Street

Intersection name
Gore Highway/Dieckmann Road
Gore Highway/Yarranlea Road/
Gore Highway/Tummaville Road
Gore Highway/Warrego Highway
Gore Highway/Millmerran-Inglewood Road
Gore Highway/Lindenmayer Road
Gore Highway/Hall Road
Gore Highway/Millmerran-Leyburn Road
Gore Highway/Gilgai Lane
Gore Highway/Pampas-Horrane Road
Gore Highway/Scrubby Road
Gore Highway/Gap Road
Gore Highway/Bunkers Hill School Road
Gore Highway/Oakey-Pittsworth Road
Gore Highway/Lochaber Road
Gore Highway/Paint Mine Road
Gore Highway/Linthorpe Road
Gore Highway/Toowoomba Road
Gore Highway/Geitz Road
Gore Highway/Bushy Lane West
Gore Highway/Biddeston Southbrook Road
Gore Highway/Unnamed Road
Gore Highway/Athol School Road
Gore Highway/Saleyards Road
Gore Highway/Toowoomba Bypass
Gore Highway/Alderley Street
Inglewood-Texas Road/Old Texas-Yelarbon Road
Leichhardt Highway/Cunningham Highway
Leichhardt Highway/Hunt Street
Logan Motorway (managed by Transurban)/Pacific Motorway
Millmerran-Inglewood Road/Thornton Road
Millmerran-Inglewood Road/Grays Road
Millmerran-Inglewood Road/Forestry Road
Millmerran-Inglewood Road/Paton Road
Millmerran-Inglewood Road/Millwood Road
Millwood Road/Kooroongarra Road
Millmerran-Inglewood Road//Heckendorf Road
Millmerran-Inglewood Road/Blackwell Road
Millmerran-Inglewood Road//Kooroongarra Road
Millmerran-Inglewood Road/Campbell Street
Millmerran-Inglewood Road/Saleyards Road
Millmerran-Inglewood Road/Owens Scrub Road

Intersection name
Pampas-Horrane Road/Bostock Road
Pittsworth-Felton Road/Short Street
Texas-Yelarbon Road/Old Texas-Yelarbon Road
Texas-Yelarbon Road/Unnamed Road
Toowoomba-Cecil Plains Road/Toowoomba-Cecil Plains Road
Toowoomba-Cecil Plains Road/Charlton Connection Road
Toowoomba-Cecil Plains Road/Toowoomba Bypass
Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road
Toowoomba-Cecil Plains Road/McDougall Street
Toowoomba-Cecil Plains Road/Omara Road
Toowoomba-Cecil Plains Road/Airport Quarry Wellcamp Access Road (Privately owned road)
Toowoomba-Cecil Plains Road/Brimblecombe Road
Toowoomba-Cecil Plains Road/Unnamed Road
Warrego Highway/Charlton Connection Road
Warrego Highway/Warrego Highway
Warrego Highway/Toowoomba-Cecil Plains Road
Warrego Highway/Omara Road
Warrego Highway/Toowoomba Bypass
Warrego Highway/Steger Road
Warrego Highway/Leesons Road
Warrego Highway/Toowoomba Bypass
Warrego Highway/Logan Motorway (managed by Transurban)
Warrego Highway/Chamberlain Road
Yelarbon-Keetah Road/Kildonan Road
GRC
Cemetery Road/Mooroobie Lane
East Sawmill Road/Springborg Road
East Sawmill Road/Unnamed Road
Eukabilla Road/Unnamed Road
Eukabilla Road/Kildonan Road
Grays Road/Mosquito Creek Road
Hunt Street/Boodle Street
Mooroobie Lane/Wondalli-Kurumbul Road
Suttons Road/East Sawmill Road
Unnamed Road/Cemetery Road
Unnamed Road/Unnamed Road
Wondalli-Kurumbul Road/Yelarbon-Kurumbul Road
Woodcocks Road/Unnamed Road
Yelarbon-Kurumbul Road/Unnamed Road
Yelarbon-Kurumbul Road/Queen Street South

Intersection name
TRC
Alderley Street/Condamine Street
Alderley Street/Greenwattle Street
Blackwell Road/Macauley Road
Bunkers Hill School Road/Blackwell Road
Bostock Road/Unnamed Road
Drayton Wellcamp Road/Wellcamp-Westbrook Road
Euston Road/Drayton Wellcamp Road
Forestry Road/Unnamed Road
Gowrie Tilgonda Road/Gowrie Lilyvale Road
Greenwattle Street/Euston Road
Kingsthorpe Tilgonda Road/Tilgonda Kingsthorpe Road
Leesons Road/Kingsthorpe Tilgonda Road
Murlaggan Road/Roche Road
Murlaggan Road/Kahler Road
Short Street/Railway Street
Six Mile Road/Bligh Street
Tilgonda Kingsthorpe Road/Gowrie Tilgonda Road
Tummaville Road/Unnamed Road
Wellcamp-Westbrook Road/Macauley Road
Yandilla Street/Cypress Street
Yarranlea Road/Murlaggan Road
Roads and Maritime Services
Bruxner Highway/New England Highway
Bruxner Way/Texas Bridge Road
Bruxner Way/North Star Road
Gwydir Highway/Stephen Street
Gwydir Highway/Campbell Street
Gwydir Highway/New England Highway
Gwydir Highway/Charles Street
New England Highway/New England Highway
New England Highway/Bruxner Way
Newell Highway/Kildonan Road
Newell Highway/River Road
Summerland Way/Bruxner Highway
Summerland Way/Dobie Street
Summerland Way/Trenayr Road
Pacific Motorway/Charles Street
Red Lane/Summerland Way
Clarence Valley Council
Bent Street/Clarence Street
Bent Street/Villers Street

Intersection name
Clark Road/Trenayr Road
Charles Street/Bent Street
Clarence Street/Oliver Street
Dobie Street/Villers Street
Mary Street/Fry Street
Oliver Street/Mary Street
Trenayr Road/Clark Road
Trenayr Road/Red Lane
Moree Plains Shire Council
Bruxner Way/North Star Road
Gwydir Shire Council
North Star Road/Edwards Street
North Star Road/Warialda Road

Construction traffic routes remain subject to confirmation through the detail design and construction planning process. Therefore, it was not considered appropriate to undertake traffic counts at each of the intersection locations listed in Table 6.10. In turn, this means that five per cent comparison at these intersections, or the SIDRA analysis of those exceeding five per cent increases, cannot be conducted at this time. This will be undertaken during detail design, once the construction traffic routes are confirmed.

In order to assist in quantifying the number of intersections which may experience potential impacts, a preliminary assessment has been undertaken to compare base traffic flows with construction flows. This assessment has been conducted to determine intersections which may require upgraded turning treatments to accommodate assumed construction traffic flows. This method is generally consistent with the warrants outlined in *Austroads Guide to Traffic Management Part 6*.

This assessment compares assumed intersection turning movements (based on 50:50 directionality) with construction flows to determine intersections which may require upgraded turning treatments to accommodate temporary construction traffic flows consistent with the warrants outlined in *Austroads Guide to Traffic Management Part 6*. As the Project is not expected to generate further operational road traffic, no turn warrant assessments were conducted for the operation of the Project. The assessments were undertaken based on peak construction volumes at the intersection, therefore these are likely to represent the worst-case construction scenarios at these locations.

The assumptions used are discussed below. As these turning movements are assumed, this analysis will be updated as part of an updated TIA once the construction traffic routes are finalised by the Principal Contractor.

Figure 6.1 indicates the left turn volume (Q_L) and right turn volume (Q_R), as well as the volumes representing Q_{T1} and Q_{T2} . The value of the major road volume (Q_M) is calculated as outlined in Table 6.10.

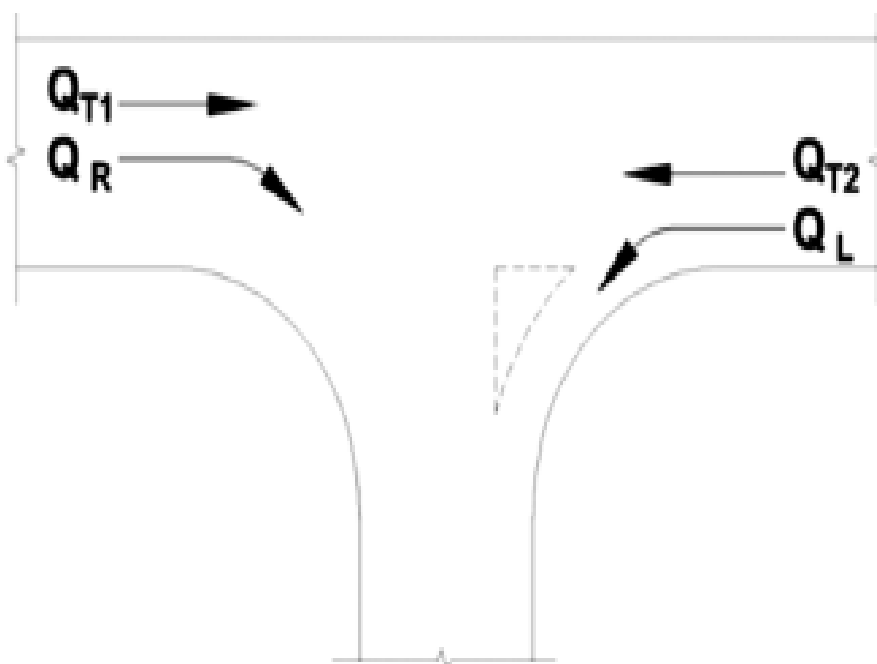


Figure 6.1 Turning movement definitions

Source: Austroads Guide to Traffic Management Part 6 – Figure 2.27 2017

As no turning count information was available, the following assumptions were used to calculate the values of Q_L and Q_R :

- For intersections with construction traffic only turning left (or only turning right) from the major road into the minor road, it was assumed that 100% of development traffic volumes turned from the major road into the minor road.
- For intersections with development traffic movements turning both left and right from the major road into the minor road, it was assumed that 50% of these vehicles turn right and 50% turn left.

Table 6.11 Calculation of the major road traffic volume (Q_M)

Road type	Turn type	Splitter island	Q_M (vehicles per hour)
Two-lane two-way	Right	No	$= Q_{T1} + Q_{T2} + Q_L$
		Yes	$= Q_{T1} + Q_{T2}$
	Left	Yes or no	$= Q_{T2}$
Four-lane two-way	Right	No	$= 50\% \times Q_{T1} + Q_{T2} + Q_L$
		Yes	$= 50\% \times Q_{T1} + Q_{T2}$
	Left	Yes or no	$= 50\% \times Q_{T2}$
Six-lane two-way	Right	No	$= 33\% \times Q_{T1} + Q_{T2} + Q_L$
		Yes	$= 33\% \times Q_{T1} + Q_{T2}$
	Left	Yes or no	$= 33\% \times Q_{T2}$

Source: Austroads Guide to Traffic Management Part 6 – 2017

The potential upgraded turning treatments outlined in this methodology are warranted only temporarily for construction traffic based on the current assumed traffic routes. For highlighted treatments, consultation with DTMR and relevant Councils will be required during the detail design phase to determine the permanence of such upgrades. Given the typical duration of construction activities in one location generally being less than a year, road-use management strategies may be introduced in the Road Use Management Plan (RUMP) and/or the Traffic Management Sub-plan in order to mitigate construction related traffic impacts at intersections.

All priority-controlled intersections in Table 6.10 were assessed to determine the number of vehicles per hour that would perform a turn movement. The intersections that would experience a development traffic turning volume of more than five vehicles per hour were plotted on the turn warrant graphs from *Austrroads Guide to Traffic Management Part 6*. These intersections are summarised below in Table 6.12, with the turn warrant graphs for each intersection provided in Appendix T.

Table 6.12 Intersections with potential turn warrant requirements (development turning volume of more than 5 veh/h)

Intersection with potential operational impacts
Goondiwindi Regional Council
Cunningham Highway/Bybera Road
Cunningham Highway/Yelarbon-Kurumbul Road
Cunningham Highway/East Sawmill Road
Cunningham Highway/Springborg Road
Cunningham Highway/Whetstone Access Road
Cunningham Highway/McDougalls Crossing Road
Cunningham Highway/Cremascos Road
Cunningham Highway/Elizabeth Street
Cunningham Highway/Yelarbon-Keetah Road
Cunningham Highway/Millmerran-Inglewood Road
Cunningham Highway/Fosters Road
Cunningham Highway/Inglewood Quarry Access Road
Cunningham Highway/Coolmunda Dam Access
Millmerran-Inglewood Road/Thornton Road
Millmerran-Inglewood Road/Grays Road
East Sawmill Road/Unnamed Road
Springborg Road/East Sawmill Road
Suttons Road/Unnamed Road
Eukabilla Road/Kildonan Road
Grays Road/Mosquito Creek Road
Mooroobie Lane/Mooroobie Lane
Mooroobie Lane/Wondalli-Kurumbul Road
Wondalli-Kurumbul Road/Yelarbon-Kurumbul Road
Toowoomba Regional Council
Gore Highway/Athol School Road
Gore Highway/Murlaggan Road
Gore Highway/Blackwell Road
Gore Highway/Yarranlea Road/
Gore Highway/Tummaville Road
Gore Highway/Millmerran-Inglewood Road
Gore Highway/Lindenmayer Road
Gore Highway/Scrubby Road
Gore Highway/Linthorpe Road
Gore Highway/Geitz Road
Gore Highway/Bushy Lane West

Intersection with potential operational impacts
Gore Highway/Unnamed Road
Gore Highway/Unnamed Road (2)
Forestry Road/Unnamed Road
Tummaville Road/Unnamed Road
Millmerran-Inglewood Road/Forestry Road
Millmerran-Inglewood Road/Paton Road
Millmerran-Inglewood Road/Millwood Road
Millwood Road/Kooroongarra Road
Millmerran-Inglewood Road/Blackwell Road
Millmerran-Inglewood Road/Kooroongarra Road
Millmerran-Inglewood Road/Kooroongarra Road (2)
Millmerran-Inglewood Road/Campbell Street
Millmerran-Inglewood Road/Commodore Peak Road
Millmerran-Inglewood Road/Owens Scrub Road
Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road
Toowoomba-Cecil Plains Road/Omara Road
Toowoomba-Cecil Plains Road/Brimblecombe Road
Warrego Highway/Leesons Road
Greenwattle Street/Alderley Street
Bunkers Hill School Road/Blackwell Road
Drayton Wellcamp Road/Wellcamp-Westbrook Road
Gwydir Shire Council
North Star Road/North Star Road
North Star Road/Edwards Street
Moree Plains Shire Council
Bruxner Way/North Star Road

Those intersections which indicated that the existing layout was not sufficient to accommodate expected development traffic are summarised in Table 6.13, highlighting the upgrades required in the sections below Table 6.13. Intersections for which the existing layout was sufficient to safely accommodate development traffic are included in Appendix T.

Where Q_M was greater than 1,200 (veh/hour), Q_L or Q_R was greater than 120 (for road speeds less than 100 km/h) or 80 (for roads with speeds greater than or equal to 100 km/hour) (veh/hour) this maximum value was adopted in order to plot the relevant point on the graph.

Table 6.13 Intersections requiring turn warrant treatments

Intersection with potential operational impacts	Existing treatment	Proposed minimum treatment requirement
Goondiwindi Regional Council		
Cunningham Highway/Bybera Road	Basic right turn	Channelised right turn - short
Cunningham Highway/Yelarbon-Kurumbul Road	Basic right turn Basic left turn	Channelised right turn Auxillary left turn - short
Cunningham Highway/East Sawmill Road	Basic right turn Basic left turn	Channelised right turn Auxillary left turn - short

Intersection with potential operational impacts	Existing treatment	Proposed minimum treatment requirement
Cunningham Highway/Springborg Road	Basic right turn Basic left turn	Channelised right turn - short Basic left turn
Cunningham Highway/Whetstone Access Road	Basic right turn Basic left turn	Channelised right turn – short Basic left turn
Cunningham Highway/McDougalls Crossing Road	Basic right turn	Channelised right turn
Cunningham Highway/Elizabeth Street	Basic right turn Basic left turn	Channelised right turn Auxillary left turn - short
Cunningham Highway/Yelarbon-Keetah Road	Basic left turn	Auxillary left turn - short
Cunningham Highway/Inglewood Quarry Access Road	Basic right turn Auxillary left turn - short	Channelised right turn – short Basic left turn
East Sawmill Road/Unnamed Road	Basic left turn	Auxillary left turn - short
Toowoomba Regional Council		
Gore Highway/Athol School Road	Basic right turn Auxillary left turn	Channelised right turn Auxillary left turn - short
Gore Highway/Yarranlea Road/	Channelised right turn Basic left turn	No further treatment proposed Auxillary left turn - short
Gore Highway/Tummaville Road	Basic right turn Basic left turn	Channelised right turn Auxillary left turn - short
Gore Highway/Lindenmayer Road	Basic right turn Basic left turn	Channelised right turn Auxillary left turn - short
Gore Highway/Scrubby Road	Basic right turn Basic left turn	Channelised right turn Auxillary left turn - short
Gore Highway/Linthorpe Road	Basic right turn Basic left turn	Channelised right turn Auxillary left turn - short
Gore Highway/Geitz Road	Basic right turn Basic left turn	Channelised right turn Auxillary left turn
Gore Highway/Bushy Lane West	Basic right turn Basic left turn	Channelised right turn Auxillary left turn
Gore Highway/Unnamed Road	Basic left turn	Auxillary left turn - short
Gore Highway/Unnamed Road (2)	Basic right turn	Channelised right turn
Millmerran-Inglewood Road/Paton Road	Basic left turn	Auxillary left turn - short
Millmerran-Inglewood Road/Millwood Road	Basic right turn Basic left turn	Channelised right turn - short Basic left turn
Millmerran-Inglewood Road/Kooroongarra Road	Basic right turn	Channelised right turn - short
Toowoomba-Cecil Plains Road/Brimblecombe Road	Basic right turn	Channelised right turn - short
Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road	Basic right turn	Channelised right turn
Greenwattle Street/Alderley Street	Basic right turn	Channelised right turn

6.3.1 Cunningham Highway/Bybera Road

The Project construction methodology proposes to include a laydown area adjacent to Bybera Road, approximately 3 km north of the Cunningham Highway/Bybera Road intersection, within GRC. Construction vehicles transporting sleepers, quarry materials, concrete, water and workers are expected to access this laydown area via Inglewood by turning right from the Cunningham Highway into Bybera Road. No Project traffic is proposed to enter Bybera Street from the west.

Currently, there flows along Bybera Road of approximately 22 vehicles per day, two-way. It is assumed this equates to 1 vehicle turning right into Bybera Road from the Cunningham Highway during the peak hour. A BAR (basic right turn) treatment is currently provided at this intersection, as shown in Figure 6.2.

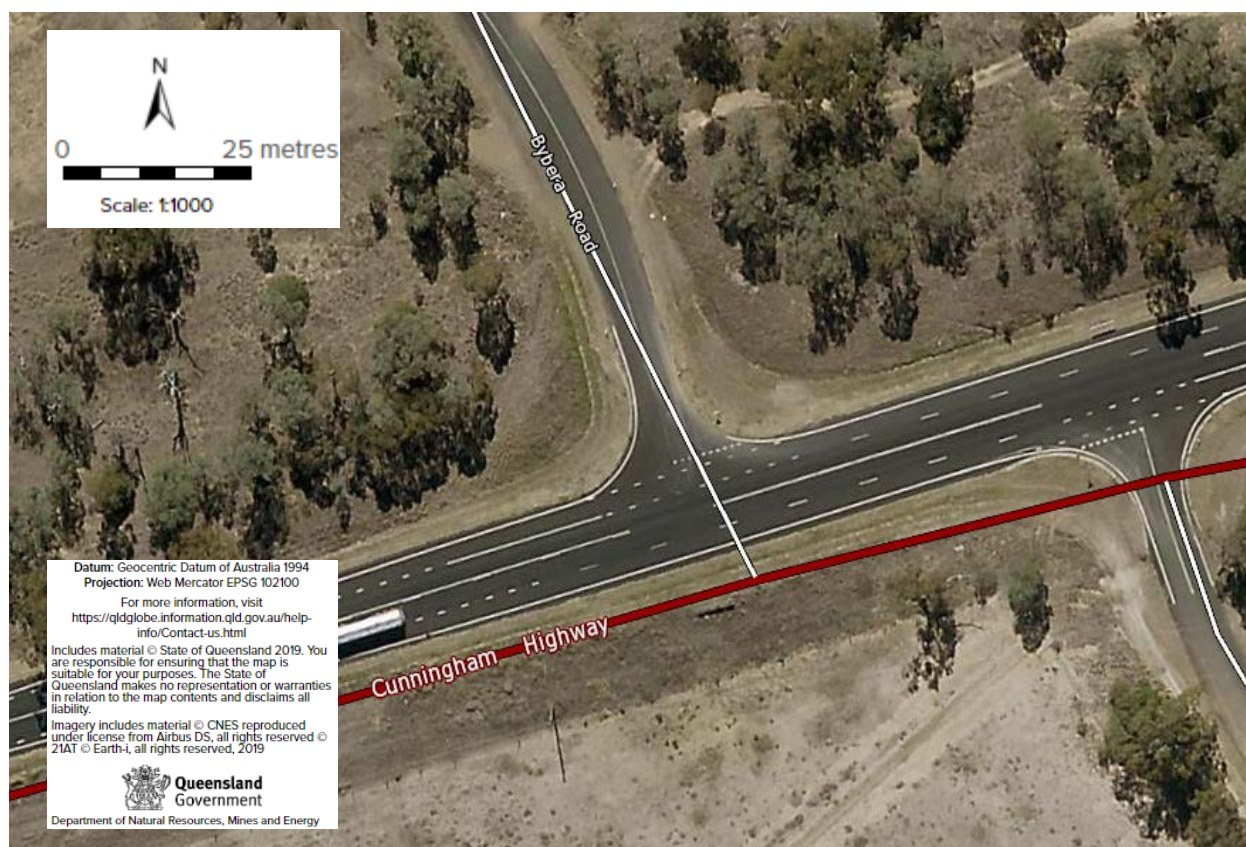


Figure 6.2 Cunningham Highway/Bybera Road existing layout

The Project traffic assessment demonstrates that the turning movements into Bybera Road are expected to peak in 2021, with up to 36 vehicles per hour expected to turn into Bybera Road from the Cunningham Highway. These turning volumes, along with the through movement volumes on the Cunningham Highway are summarised in Table 6.14. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austrroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.3.

Table 6.14 Cunningham Highway/Bybera Road right turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for right turn movement)	Peak hour left turn volume into Bybera Road (Q_R)
Existing Volumes	160	1
Forecast Volumes without Project (2021)	173	1
Project Traffic	64	36
Volumes for Treatment Assessment	237	37

Table notes:

- Numbers may not sum due to rounding.

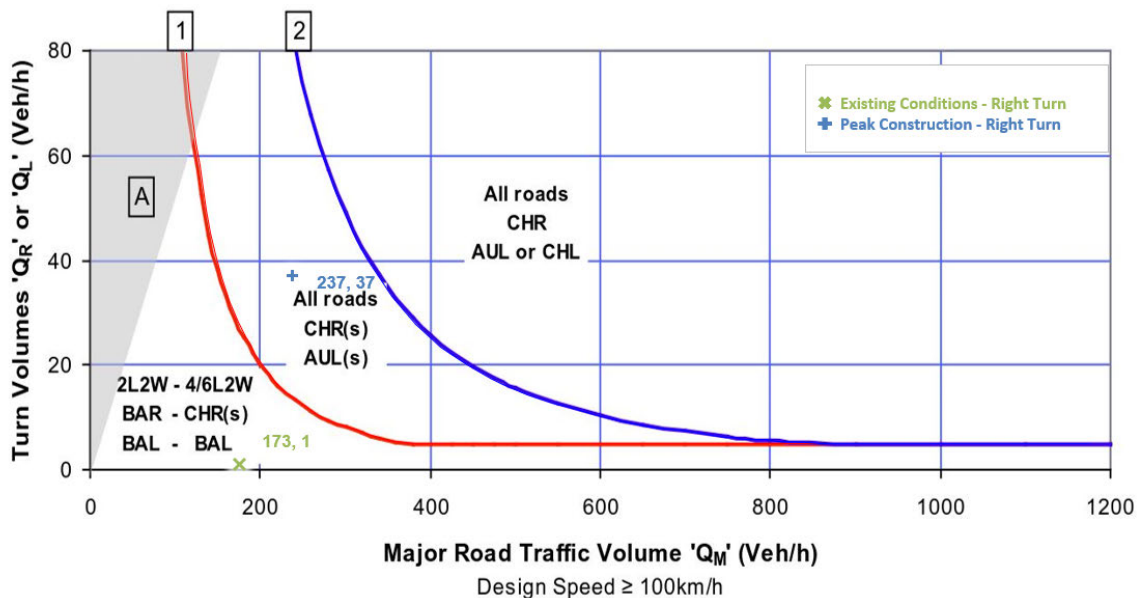


Figure 6.3 Cunningham Highway/Bybera Road turning treatment assessment (2021)

Figure 6.3 demonstrates that as a minimum, a CHR(s) (channelised right turn – short) turning treatment is required to accommodate the turning volumes at the Cunningham Highway/Bybera Road intersection during construction. This 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 Principal Contractor).

It is noted that this treatment is only required during construction, with the requirement no longer necessary post-construction. Any potential intersection upgrades will be developed in consultation with DTMR and GRC. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised by Principal Contractor and agreed with the relevant asset owners.

6.3.2 Cunningham Highway/Yelarbon-Kurumbul Road

The Project construction methodology proposes to utilise the Cunningham Highway/Yelarbon-Kurumbul Road intersection located within GRC. Construction vehicles transporting workers, concrete, plant and tools, sleepers, quarry materials and water are expected to access Yelarbon-Kurumbul Road by turning left and right from the Cunningham Highway into Yelarbon-Kurumbul Road.

Currently, there are flows along Yelarbon-Kurumbul Road of approximately 21 vehicles per day, two-way. It is assumed this equates 2 vehicles turning into Yelarbon-Kurumbul Road from the Cunningham Highway during the peak hour, 1 left turn and 1 right turn. A BAR treatment and a BAL (basic left turn) treatment are currently provided at this intersection, as shown in Figure 6.4.



Figure 6.4 Cunningham Highway/Yelarbon-Kurumbul Road existing layout

The Project traffic assessment demonstrates that the turning movements into Yelarbon-Kurumbul Road are expected to peak in 2022, with up to 32 vehicles per hour expected to turn into Yelarbon-Kurumbul Road from the Cunningham Highway. These turning volumes, along with the through movement volumes on the Cunningham Highway are summarised in Table 6.15 and Table 6.16. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.5.

Table 6.15 Cunningham Highway/Yelarbon-Kurumbul Road left turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Yelarbon-Kurumbul Road (Q_L)
Existing Volumes	162	1
Forecast Volumes without Project (2022)	179	1
Project Traffic	39	32
Volumes for Treatment Assessment	218	33

Table notes:

- Numbers may not sum due to rounding.

Table 6.16 Cunningham Highway/Yelarbon-Kurumbul Road right turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Yelarbon-Kurumbul Road (Q_R)
Existing Volumes	323	1
Forecast Volumes without Project (2022)	357	1
Project Traffic	39	32
Volumes for Treatment Assessment	396	33

Table notes:

- Numbers may not sum due to rounding.

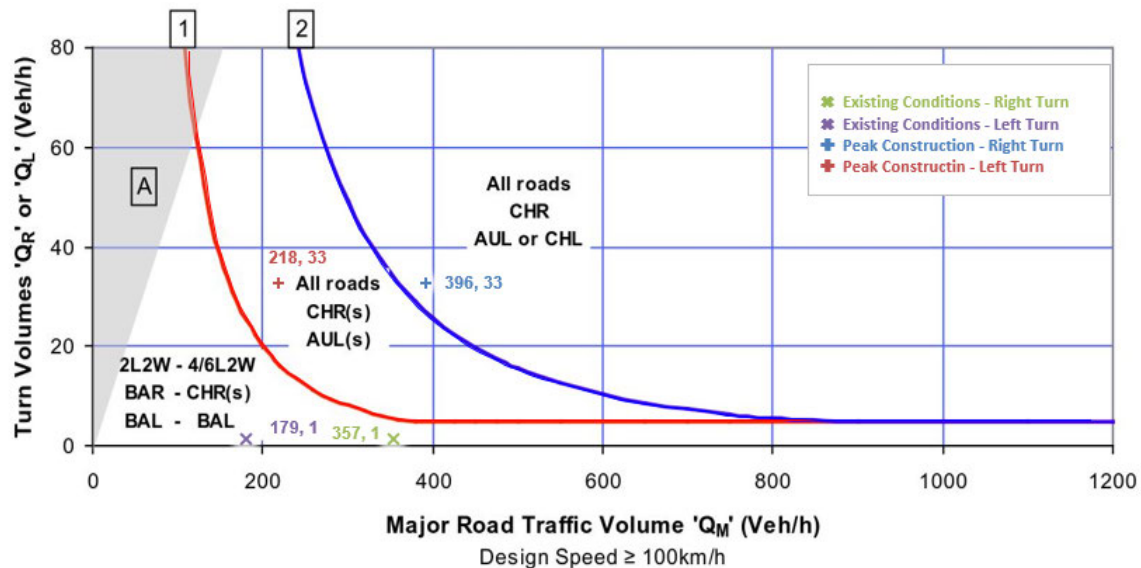


Figure 6.5 Cunningham Highway/Yelarbon-Kurumbul Road turning treatment assessment (2022)

Figure 6.5 demonstrates that as a minimum, a CHR (channelised right turn) and an AUL (s) (auxiliary left turn – short) turning treatments are required to accommodate the turning volumes at the Cunningham Highway/Yelarbon-Kurumbul Road intersection during construction. 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 Principal Contractor).

It is noted that these treatments are only required during construction, with the requirement no longer necessary post-construction. Any potential intersection upgrades will be developed in consultation with DTMR and GRC. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised by Principal Contractor and agreed with the relevant asset owners.

6.3.3 Cunningham Highway/East Sawmill Road

The Project construction methodology proposes to utilise the Cunningham Highway/East Sawmill Road intersection located within GRC. Construction vehicles transporting workers, concrete, general fill, plant and tools, sleepers, quarry materials and water are expected to access East Sawmill Road by turning left and right from the Cunningham Highway into East Sawmill Road.

Currently, there are flows along East Sawmill Road of approximately 4000 vehicles per day, two-way (assumed volume). It is assumed this equates 300 vehicles turning into East Sawmill Road from the Cunningham Highway during the peak hour, 150 left turns and 150 right turns. A BAR treatment and a BAL treatment are currently provided at this intersection, as shown in Figure 6.6.

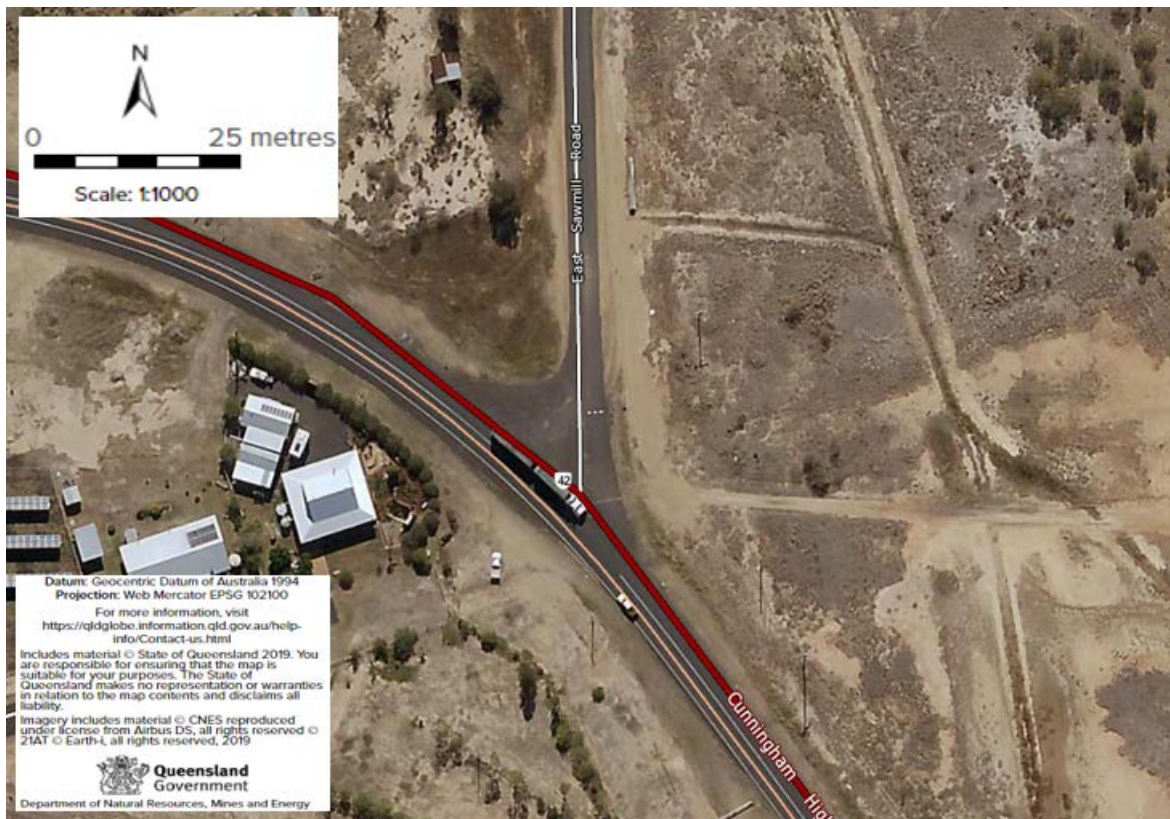


Figure 6.6 Cunningham Highway/East Sawmill Road existing layout

The Project traffic assessment demonstrates that the turning movements into East Sawmill Road are expected to peak in 2021, with up to 21 vehicles per hour expected to turn into East Sawmill Road from the Cunningham Highway. These turning volumes, along with the through movement volumes on the Cunningham Highway are summarised in Table 6.17 and Table 6.18. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austrroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.7.

Table 6.17 Cunningham Highway/East Sawmill Road left turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into East Sawmill Road (Q_L)
Existing Volumes	124	150
Forecast Volumes without Project (2021)	134	156*
Project Traffic	39	21
Volumes for Treatment Assessment	173	177*

Table notes:

Numbers may not sum due to rounding.

* Maximum value on turn warrant graph adopted in place of this value

Table 6.18 Cunningham Highway/East Sawmill Road right turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into East Sawmill Road (Q_R)
Existing Volumes	247	150
Forecast Volumes without Project (2021)	267	156*
Project Traffic	39	21
Volumes for Treatment Assessment	307	177*

Table notes:

Numbers may not sum due to rounding.

* Maximum value on turn warrant graph adopted in place of this value

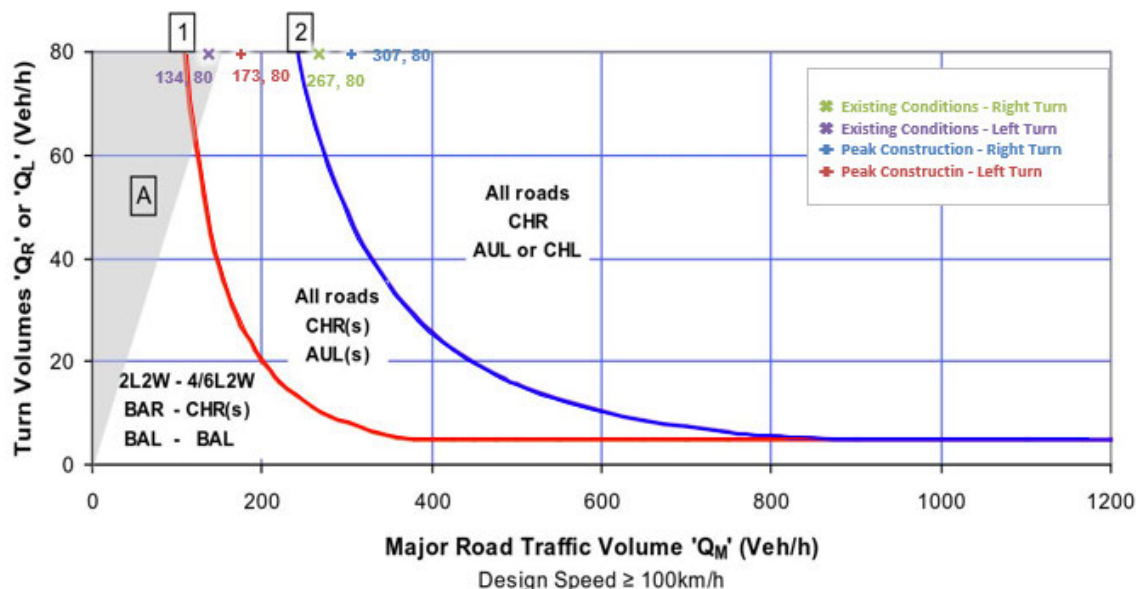


Figure 6.7 Cunningham Highway/East Sawmill Road turning treatment assessment (2021)

Figure 6.7 demonstrates that as a minimum, a CHR and an AUL(s) turning treatment are required to accommodate the turning volumes at the Cunningham Highway/East Sawmill Road intersection during construction. 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 Principal Contractor).

It is noted that these treatments are warranted under existing conditions based on assumed traffic flows through the intersection. Therefore, detailed assessment is required as part of an undated TIA to confirm requirement and agreement is required between the design and Principal Contractor, DTMR and GRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.4 Cunningham Highway/Springborg Road

The Project construction methodology proposes to utilise the Cunningham Highway/Springborg Road intersection located within GRC. Construction vehicles transporting workers, concrete, plant and tools, sleepers, quarry materials and water are expected to access Springborg Road by turning left and right from the Cunningham Highway into Springborg Road.

Currently, there are flows along Springborg Road of approximately 10 vehicles per day, two-way. It is assumed this equates 2 vehicles turning into Springborg Road from the Cunningham Highway during the peak hour, 1 left turn and 1 right turn. A BAR treatment and a BAL treatment are currently provided at this intersection, as shown in Figure 6.8.

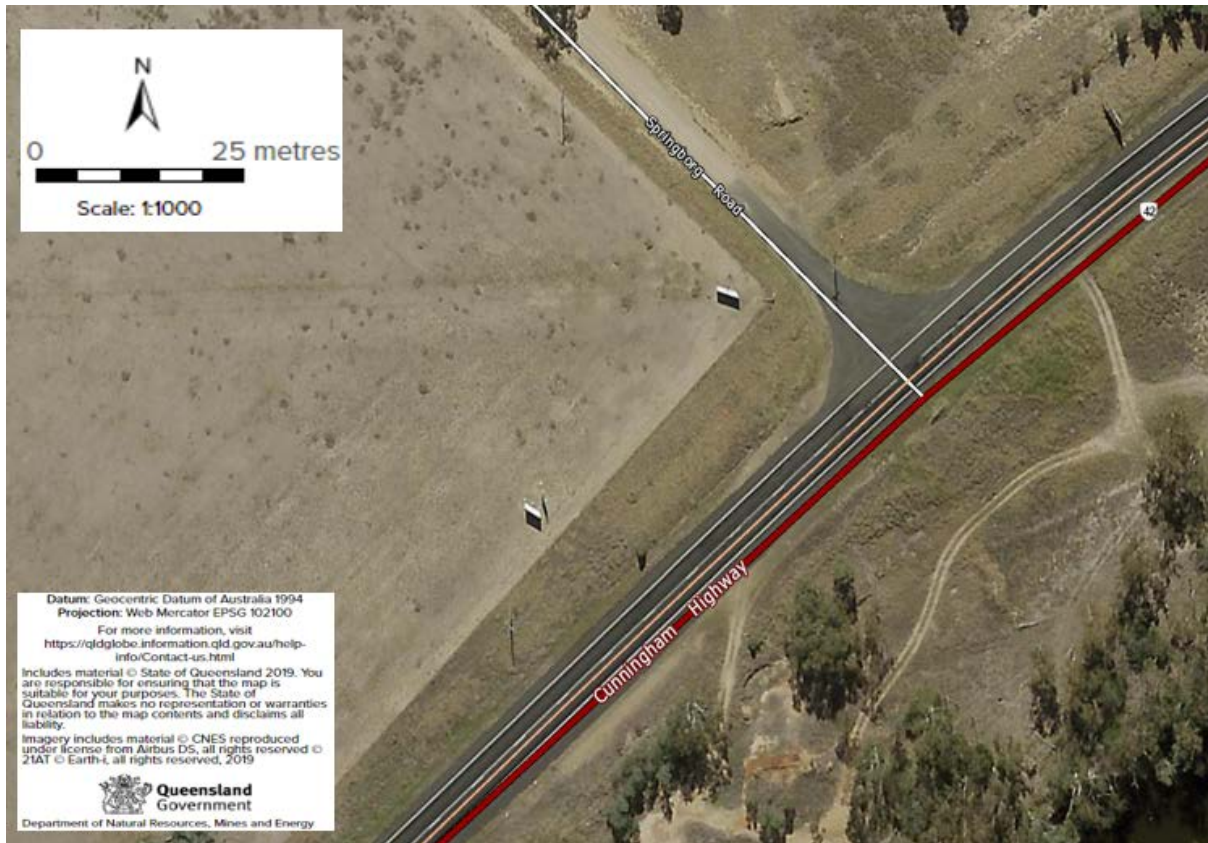


Figure 6.8 Cunningham Highway/Springborg Road existing layout

The Project traffic assessment demonstrates that the turning movements into Springborg Road are expected to peak in 2021, with up to 7 vehicles per hour expected to turn into Springborg Road from the Cunningham Highway. These turning volumes, along with the through movement volumes on the Cunningham Highway are summarised in Table 6.19 and Table 6.20. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austrroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.9.

Table 6.19 Cunningham Highway/Springborg Road left turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Springborg Road (Q_L)
Existing Volumes	120	1
Forecast Volumes without Project (2021)	130	1
Project Traffic	64	7
Volumes for Treatment Assessment	194	7

Table notes:

Numbers may not sum due to rounding.

Table 6.20 Cunningham Highway/Springborg Road right turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Springborg Road (Q_R)
Existing Volumes	239	1
Forecast Volumes without Project (2021)	259	1
Project Traffic	64	7
Volumes for Treatment Assessment	323	7

Table notes:

Numbers may not sum due to rounding.

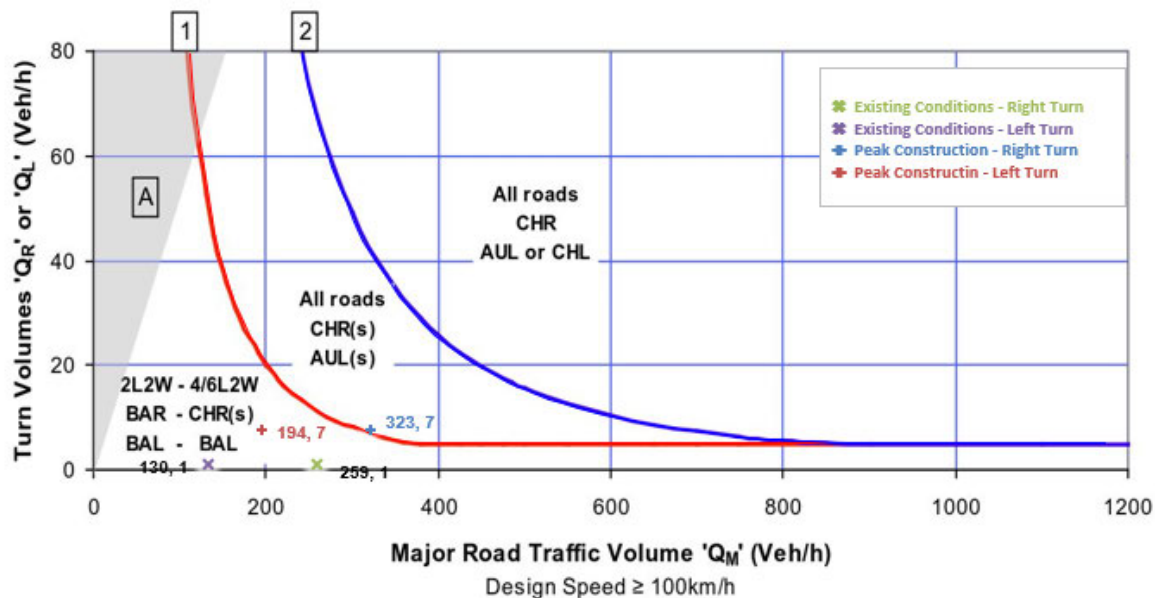


Figure 6.9 Cunningham Highway/Springborg Road turning treatment assessment (2021)

Figure 6.9 demonstrates that as a minimum, a BAL and an CHR(s) turning treatment are required to accommodate the turning volumes at the Cunningham Highway/Springborg Road intersection during construction. The CHR(s) will be designed consistent with the requirements of *Austrroads 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 Principal Contractor).

It is noted that this treatment is only required during construction, with the requirement no longer necessary post-construction. Any potential intersection upgrades will be developed in consultation with DTMR and GRC. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised by Principal Contractor and agreed with the relevant asset owners.

6.3.5 Cunningham Highway/Whetstone Access Road

The Project construction methodology proposes to utilise the Cunningham Highway/Whetstone Access Road intersection located within GRC. Construction vehicles transporting concrete, workers, quarry materials, sleepers and water are expected to access Whetstone Access Road by turning left and right from the Cunningham Highway into Whetstone Access Road.

Currently, there are flows along Whetstone Access Road of approximately 20 vehicles per day, two-way. It is assumed that this equates 2 vehicles turning into Whetstone Access Road from the Cunningham Highway during the peak hour, 1 left turn and 1 right turn. A BAR treatment and a BAL treatment are currently provided at this intersection, as shown in Figure 6.10.

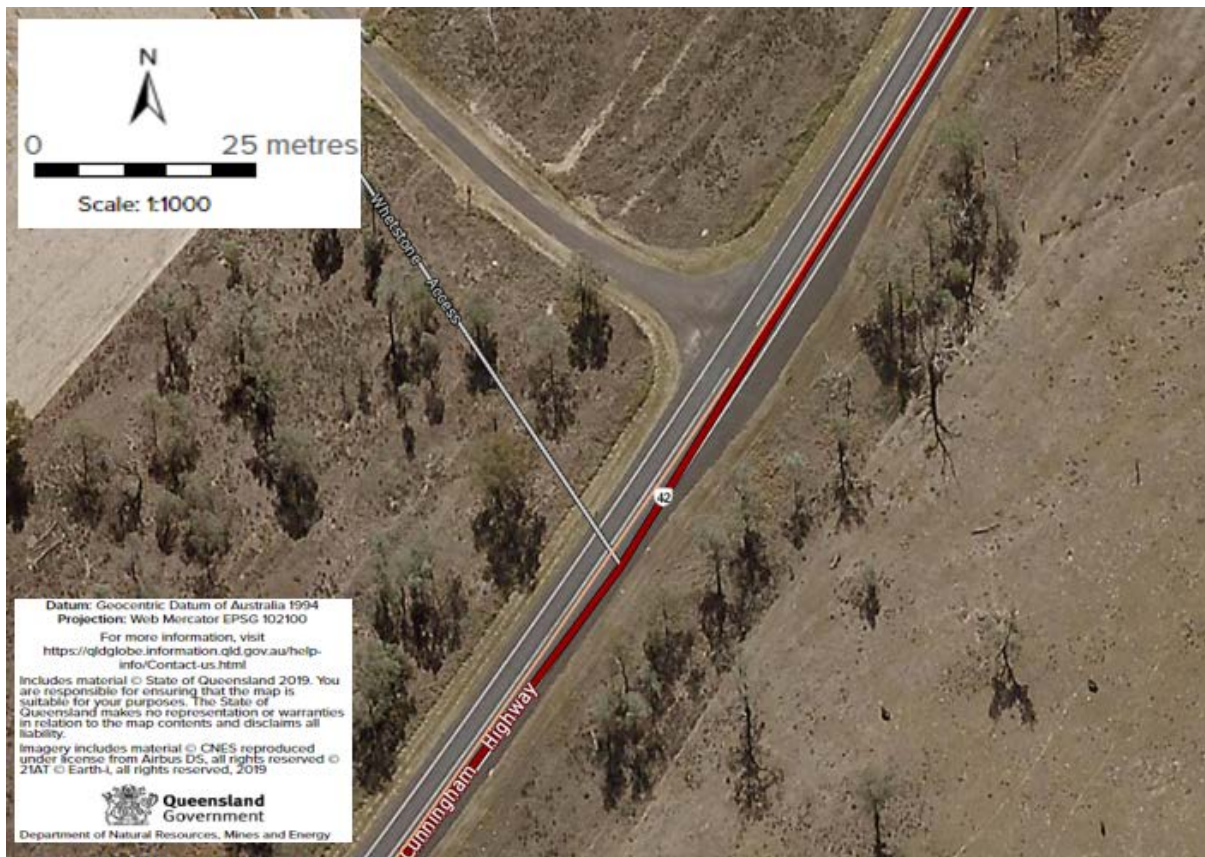


Figure 6.10 Cunningham Highway/Whetstone Access Road existing layout

The Project traffic assessment demonstrates that the turning movements into Whetstone Access Road are expected to peak in 2024, with up to 5 vehicles per hour expected to turn into Whetstone Access Road from the Cunningham Highway. These turning volumes, along with the through movement volumes on the Cunningham Highway are summarised in Table 6.21 and Table 6.22. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.11.

Table 6.21 Cunningham Highway/ Whetstone Access Road left turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Whetstone Access Road (Q_L)
Existing Volumes	120	1
Forecast Volumes without Project (2024)	137	1
Project Traffic	64	5
Volumes for Treatment Assessment	202	6

Table notes:

Numbers may not sum due to rounding.

Table 6.22 Cunningham Highway/Whetstone Access Road right turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Whetstone Access Road (Q_R)
Existing Volumes	239	1
Forecast Volumes without Project (2024)	275	1
Project Traffic	64	5
Volumes for Treatment Assessment	339	6

Table notes:

Numbers may not sum due to rounding.

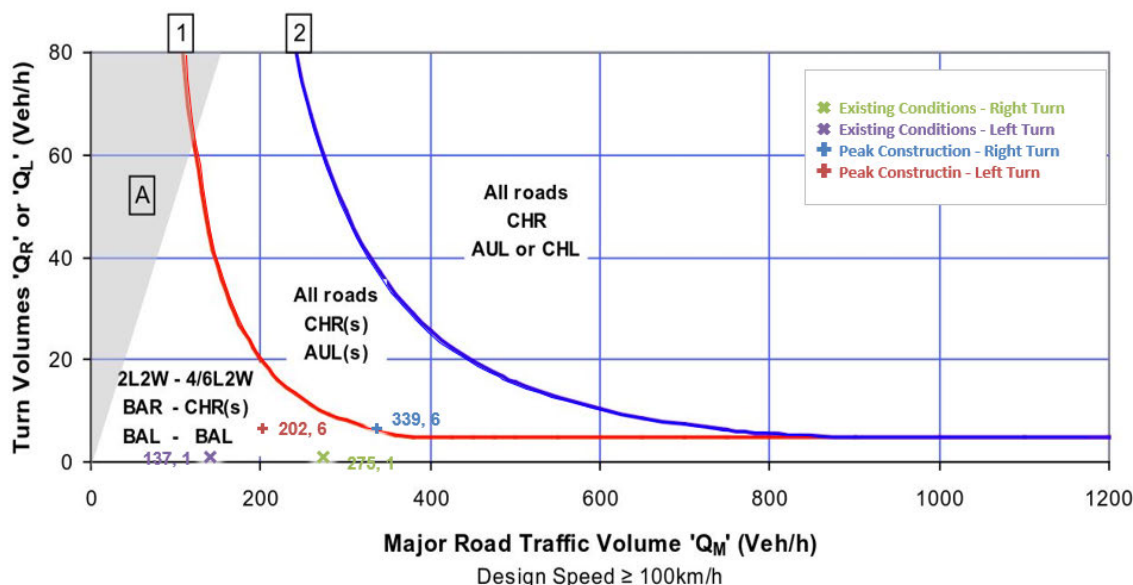


Figure 6.11 Cunningham Highway/Whetstone Access Road turning treatment assessment (2024)

Figure 6.11 demonstrates that as a minimum, a CHR(s) and a BAL turning treatment are required to accommodate the turning volumes at the Cunningham Highway/Whetstone Access Road intersection during construction. The CHR(s) 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 Principal Contractor).

It is noted that this treatment is only required during construction, with the requirement no longer necessary post-construction. Any potential intersection upgrades will be developed in consultation with DTMR and GRC. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised by Principal Contractor and agreed with the relevant asset owners.

6.3.6 Cunningham Highway/McDougalls Crossing Road

The Project construction methodology proposes to utilise the Cunningham Highway/McDougall Street intersection located within GRC. Construction vehicles transporting concrete are expected to access McDougall Street by turning right from the Cunningham Highway into McDougall Street. No construction traffic is proposed to enter McDougall Street from the south.

Currently, there are flows along McDougall Street of approximately 4000 vehicles per day, two-way (assumed volume). It is assumed this equates to 150 vehicles turning right into McDougalls Crossing Road from the Cunningham Highway during the peak hour. A BAR treatment is currently provided at this intersection, as shown in Figure 6.12.

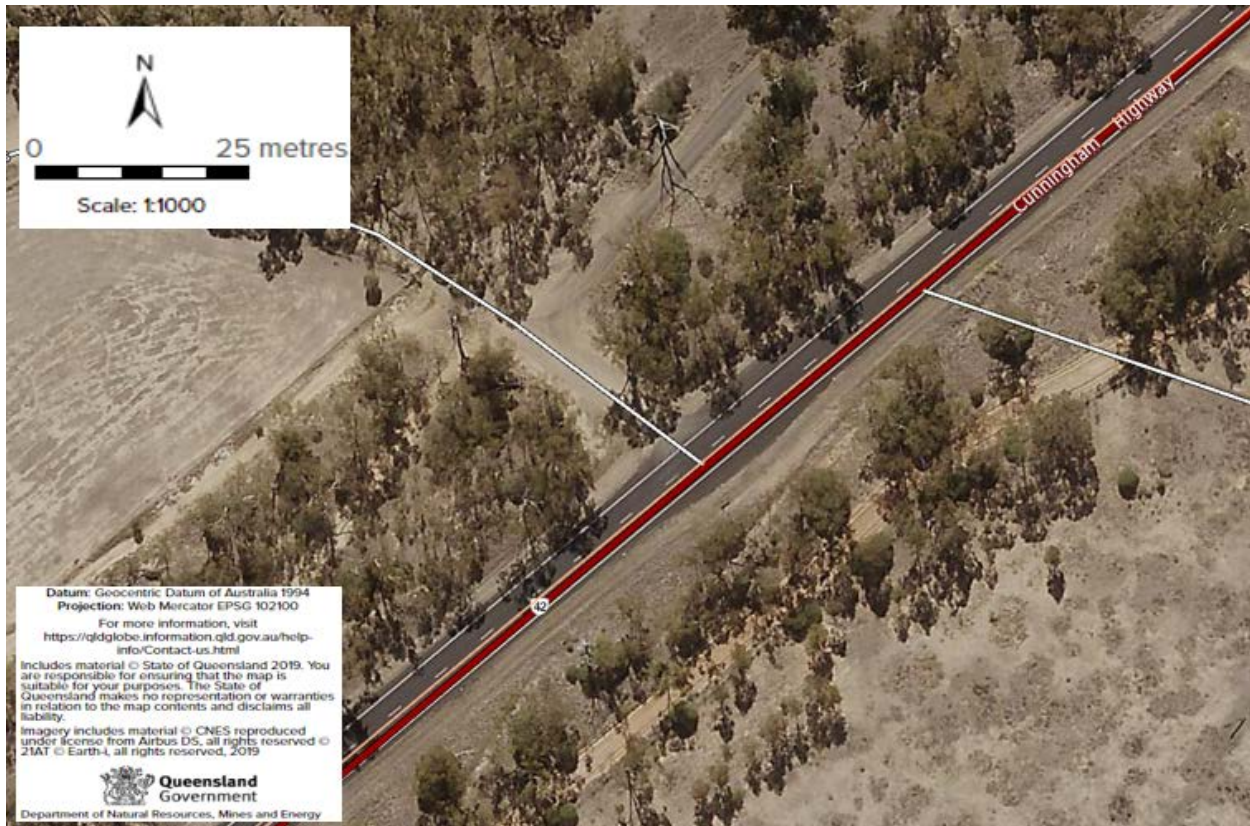


Figure 6.12 Cunningham Highway/McDougalls Crossing Road existing layout

The Project traffic assessment demonstrates that the turning movements into McDougalls Crossing Road are expected to peak in 2021, with up to 7 vehicles per hour expected to turn into McDougalls Crossing Road from the Cunningham Highway. These turning volumes, along with the through movement volumes on the Cunningham Highway are summarised in Table 6.23. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.13.

Table 6.23 Cunningham Highway/McDougalls Crossing Road right turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into McDougalls Crossings Road (Q_R)
Existing Volumes	239	150
Forecast Volumes without Project (2021)	259	156*
Project Traffic	64	7
Volumes for Treatment Assessment	323	163*

Table notes:

Numbers may not sum due to rounding.

* Maximum value on turn warrant graph adopted in place of this value

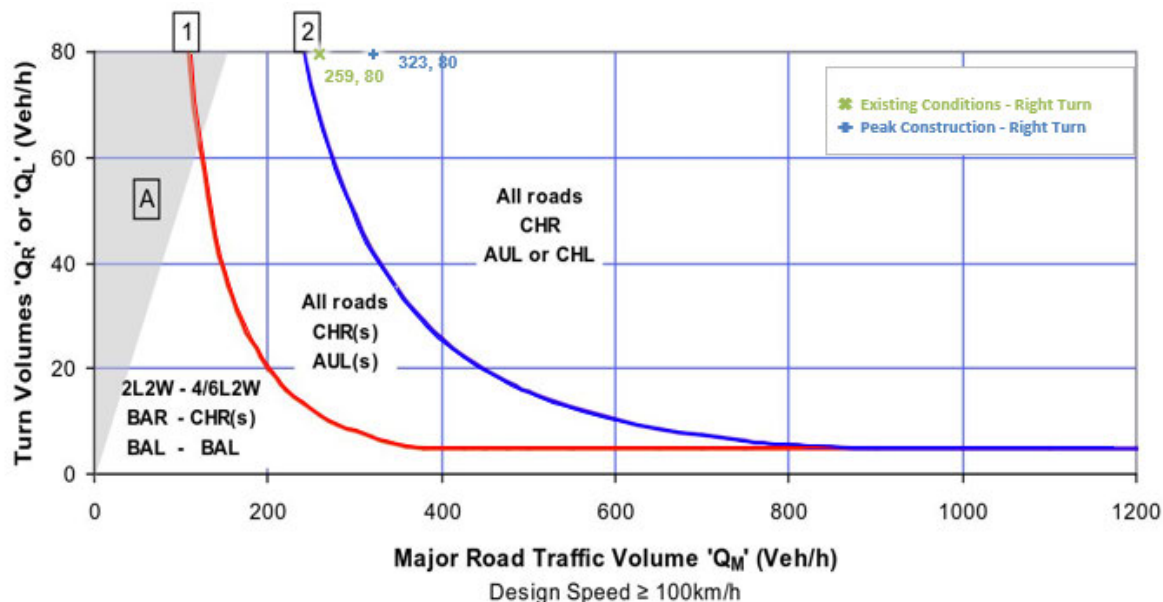


Figure 6.13 Cunningham Highway/McDougalls Crossing Road turning treatment assessment (2021)

Figure 6.13 demonstrates that as a minimum, a CHR turning treatment is required to accommodate the turning volumes at the Cunningham Highway/McDougalls Crossing Road intersection during construction. The CHR 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 Principal Contractor).

It is noted that this treatment is warranted under existing conditions based on assumed traffic flows through the intersection. Therefore, detailed assessment is required as part of an undated TIA to confirm requirement and agreement is required between the design and Principal Contractor, DTMR and GRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.7 Cunningham Highway/Elizabeth Street

The Project construction methodology proposes to utilise Elizabeth Street in Inglewood as a construction route, with laydown areas located along Lovells Crossing Road, further north along Elizabeth Street, approximately 3.2 km north of the Cunningham Highway/Elizabeth Street intersection within GRC. Construction vehicles transporting quarry materials, concrete and workers are expected to utilise these laydown areas, via Inglewood by turning left and right from the Cunningham Highway into Elizabeth Street.

Currently, there are flows along Elizabeth Street of approximately 4000 vehicles per day, two-way (assumed volume). It is assumed this equates 300 vehicles turning into Elizabeth Street from the Cunningham Highway during the peak hour, 150 left turns and 150 right turns. A BAR treatment and a BAL treatment are currently provided at this intersection, as shown in Figure 6.14.

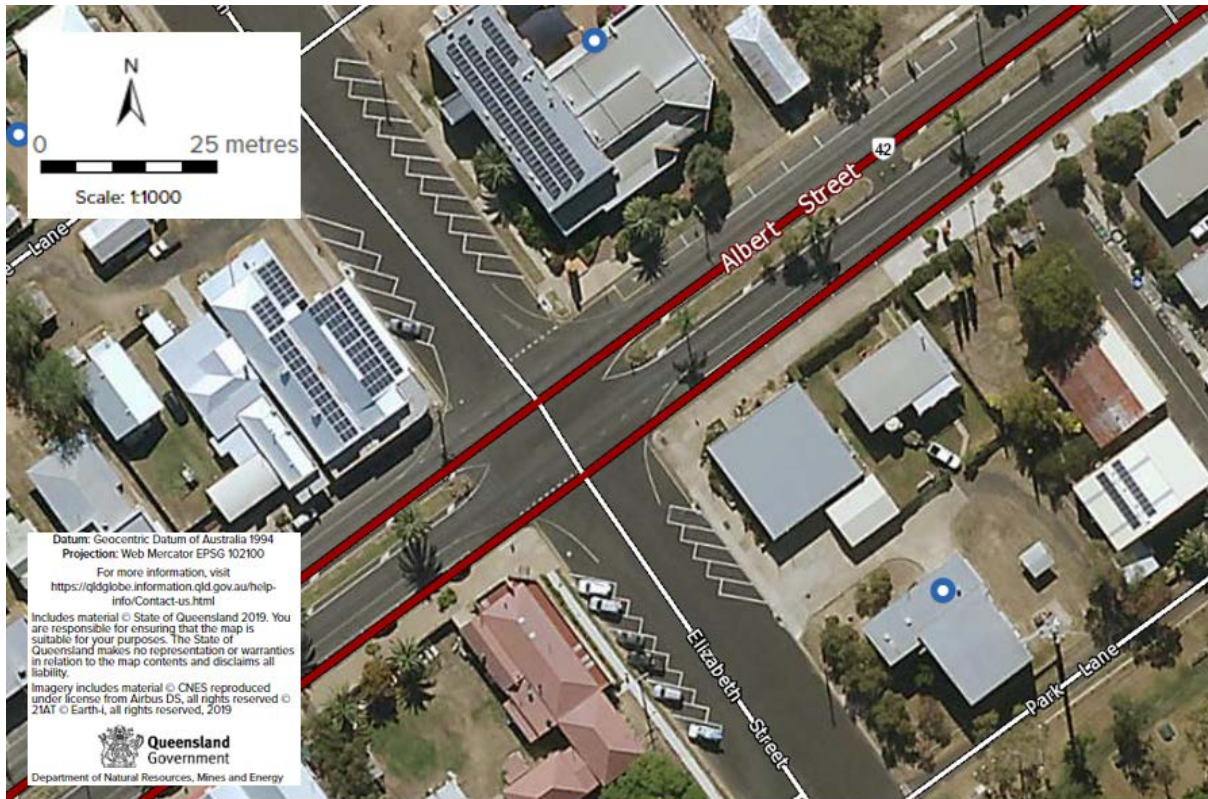


Figure 6.14 Cunningham Highway/Elizabeth Street existing layout

The Project traffic assessment demonstrates that the turning movements into Elizabeth Street are expected to peak in 2024, with up to 42 vehicles per hour expected to turn into Elizabeth Street from the Cunningham Highway. These turning volumes, along with the through movement volumes on the Cunningham Highway are summarised in Table 6.24 and Table 6.25. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.15.

Table 6.24 Cunningham Highway/Elizabeth Street left turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Elizabeth Street (Q_L)
Existing Volumes	109	150
Forecast Volumes without Project (2024)	125	166*
Project Traffic	80	42
Volumes for Treatment Assessment	205	208*

Table notes:

Numbers may not sum due to rounding.

* Maximum value on turn warrant graph adopted in place of this value

Table 6.25 Cunningham Highway/ Elizabeth Street right turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Elizabeth Street (Q_R)
Existing Volumes	218	150
Forecast Volumes without Project (2024)	251	166*
Project Traffic	80	42
Volumes for Treatment Assessment	331	208*

Table notes:

Numbers may not sum due to rounding.

* Maximum value on turn warrant graph adopted in place of this value

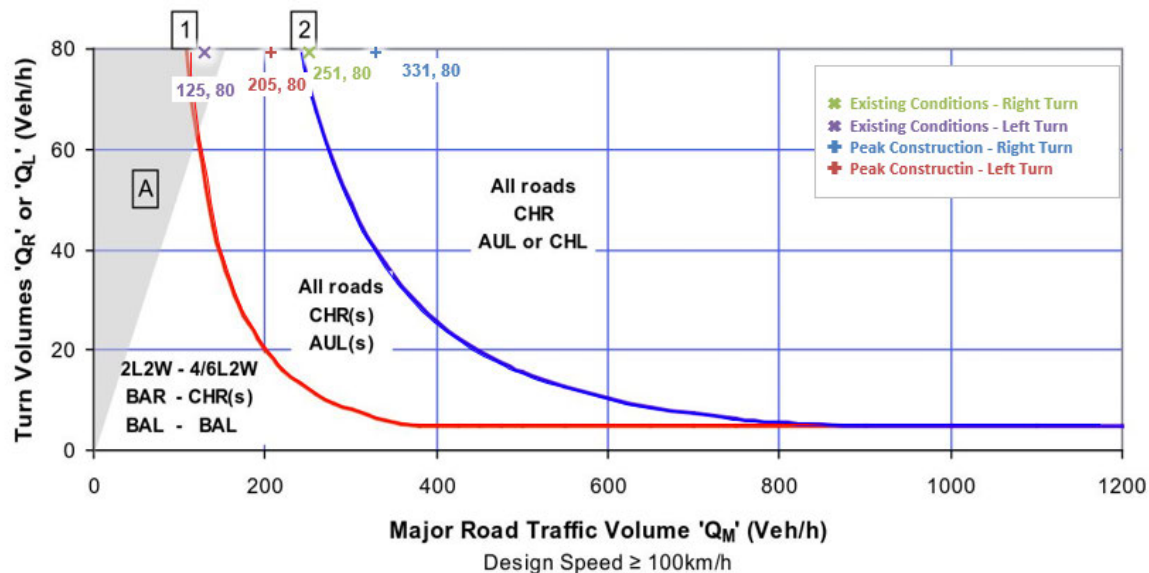


Figure 6.15 Cunningham Highway/Elizabeth Street turning treatment assessment (2024)

Figure 6.15 demonstrates that as a minimum, a CHR and an AUL(s) turning treatment are required to accommodate the turning volumes at the Cunningham Highway/Elizabeth Street intersection during construction. 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 Principal Contractor).

It is noted that these treatments are warranted under existing conditions based on assumed traffic flows through the intersection. Therefore, detailed assessment is required as part of an undated TIA to confirm requirement and agreement is required between the design and Principal Contractor, DTMR and GRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.8 Cunningham Highway/Yelarbon-Keetah Road

The Project construction methodology proposes to utilise the Cunningham Highway/Yelarbon-Keetah Road intersection located within GRC. Construction vehicles transporting concrete, quarry materials and general fill are expected to access Yelarbon-Keetah Road by turning left from the Cunningham Highway into Yelarbon-Keetah Road. No construction traffic is proposed to enter Yelarbon-Keetah Road from the north.

Currently, there are flows along Yelarbon-Keetah Road of approximately 134 vehicles per day, two-way. It is assumed that this equates to 5 vehicles turning left into Yelarbon-Keetah Road from the Cunningham Highway during the peak hour. A BAL treatment is currently provided at this intersection, as shown in Figure 6.16.

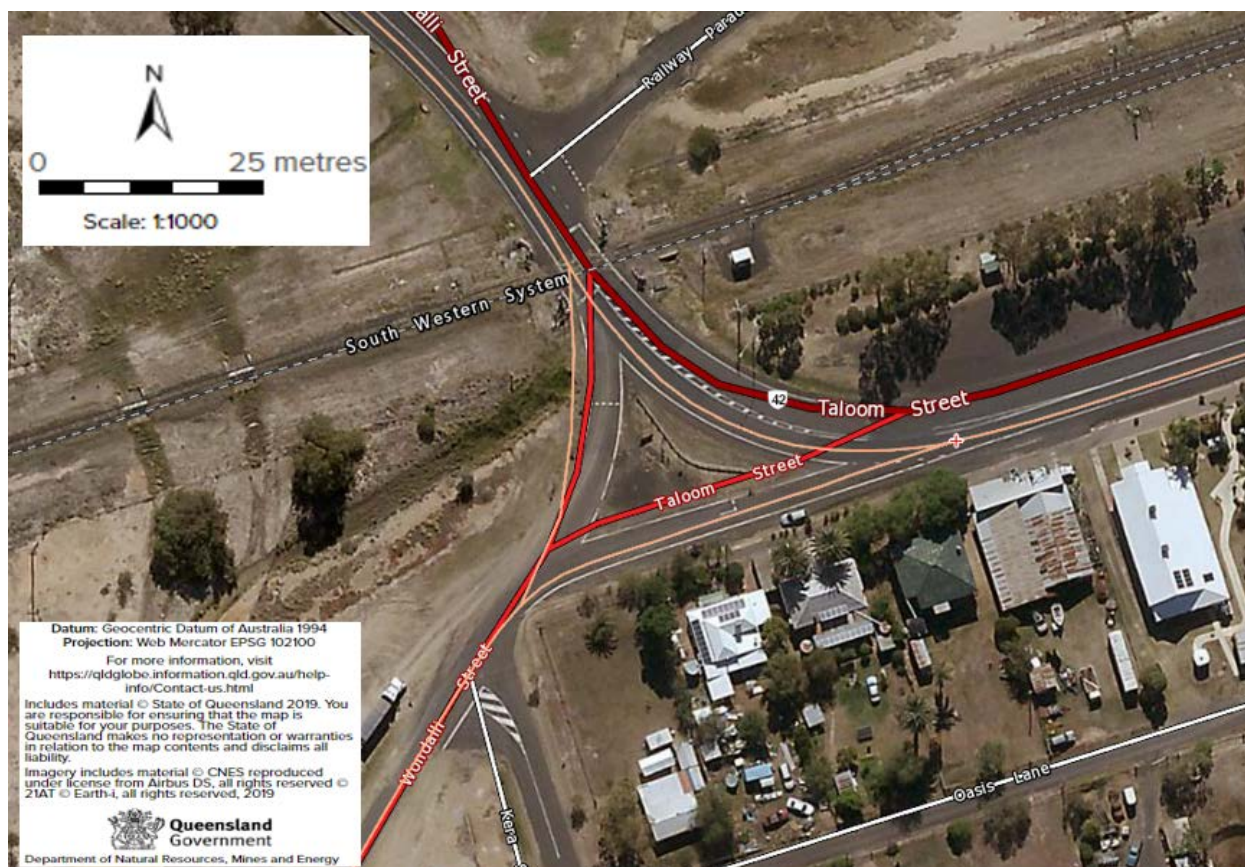


Figure 6.16 Cunningham Highway/Yelarbon-Keetah Road existing layout

Figure note:

Queensland Government mapping shows the Cunningham Highway labelled as Taloom Street and Yelarbon-Keetah Road labelled as Wondalli Street/Taloom Street.

The Project traffic assessment demonstrates that the turning movements into Yelarbon-Keetah Road are expected to peak in 2021, with up to 17 vehicles per hour expected to turn into Yelarbon-Keetah Road from the Cunningham Highway. These turning volumes, along with the through movement volumes on the Cunningham Highway are summarised in Table 6.26. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.17.

Table 6.26 Cunningham Highway/Yelarbon-Keetah Road left turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Yelarbon-Keetah Road (Q_L)
Existing Volumes	162	5
Forecast Volumes without Project (2021)	175	5
Project Traffic	39	17
Volumes for Treatment Assessment	214	23

Table note:

- Numbers may not sum due to rounding.

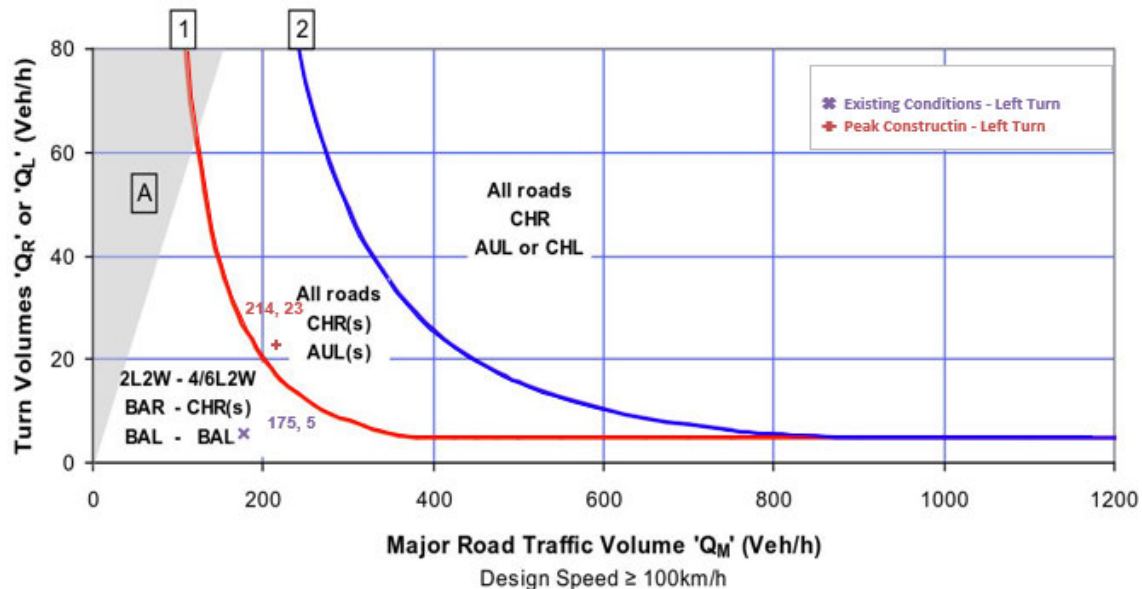


Figure 6.17 Cunningham Highway/ Yelarbon-Keetah Road turning treatment assessment (2021)

Figure 6.17 demonstrates that as a minimum, an AUL (s) turning treatment is required to accommodate the turning volumes at the Cunningham Highway/Cremascos Road intersection during construction. This 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 Principal Contractor).

It is noted that this treatment is only required during construction, with the requirement no longer necessary post-construction. Any potential intersection upgrades will be developed in consultation with DTMR and GRC. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised by Principal Contractor and agreed with the relevant asset owners.

6.3.9 Cunningham Highway/Inglewood Quarry Access Road

The Project construction methodology proposes to utilise the Cunningham Highway/Inglewood Quarry Access Road intersection located within GRC. Construction vehicles transporting quarry materials are expected to access Inglewood Quarry Access Road by turning left and right from the Cunningham Highway into Inglewood Quarry Access Road.

Currently, there are flows along Inglewood Quarry Access Road of approximately 800 vehicles per day, two-way (assumed volume). It is assumed this equates 60 vehicles turning into Inglewood Quarry Access Road from the Cunningham Highway during the peak hour, 30 left turns and 30 right turns. A BAR treatment and an AUL (s) treatment are currently provided at this intersection, as shown in Figure 6.18.

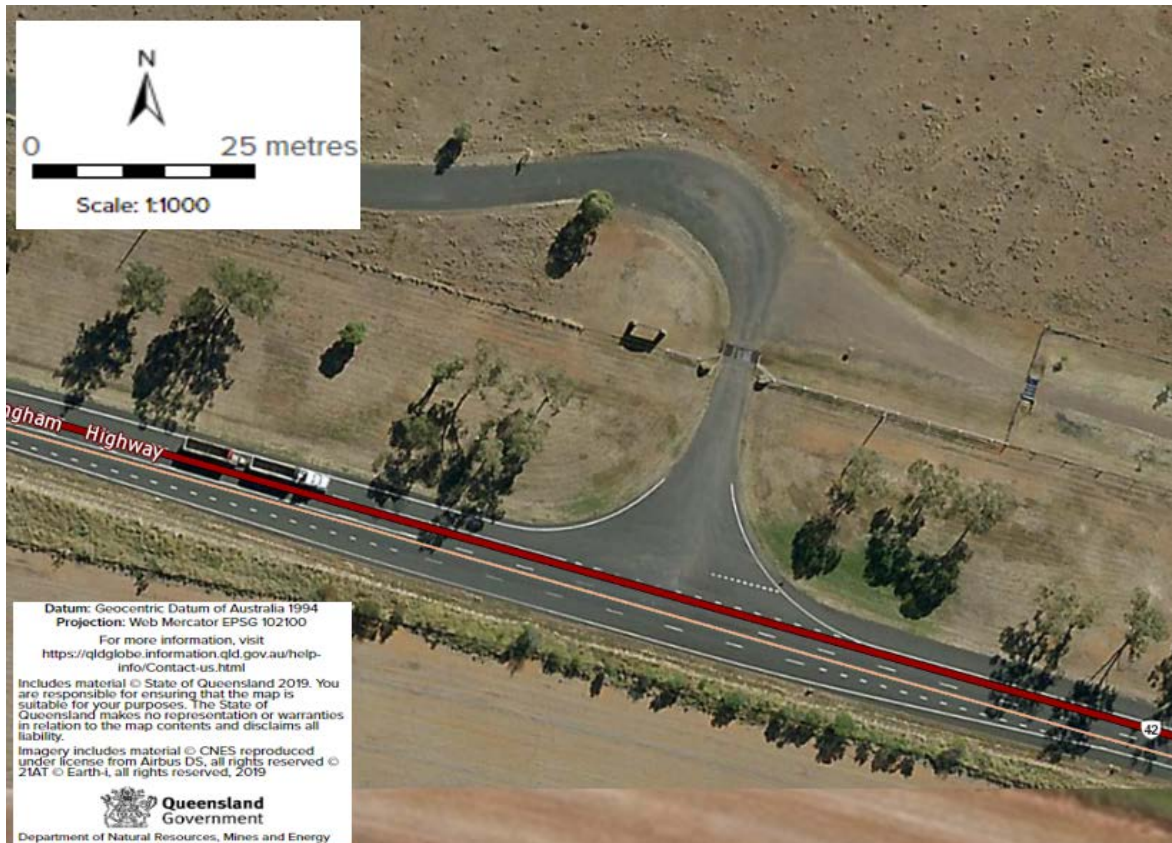


Figure 6.18 Cunningham Highway/Inglewood Quarry Access Road existing layout

The Project traffic assessment demonstrates that the turning movements into Inglewood Quarry Access Road are expected to peak in 2022, with up to 12 vehicles per hour expected to turn into Inglewood Quarry Access Road from the Cunningham Highway. These turning volumes, along with the through movement volumes on the Cunningham Highway are summarised in Table 6.27 and Table 6.28. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.19.

Table 6.27 Cunningham Highway/Inglewood Quarry Access Road left turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Inglewood Quarry Access Road (Q_L)
Existing Volumes	73	30
Forecast Volumes without Project (2022)	80	32
Project Traffic	23	12
Volumes for Treatment Assessment	104	44

Table note:

- Numbers may not sum due to rounding.

Table 6.28 Cunningham Highway/ Inglewood Quarry Access Road right turning treatment volumes

Scenario	Cunningham Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Inglewood Quarry Access Road (Q_R)
Existing Volumes	146	30
Forecast Volumes without Project (2022)	161	32
Project Traffic	23	12
Volumes for Treatment Assessment	184	44

Table note:

1 Numbers may not sum due to rounding.

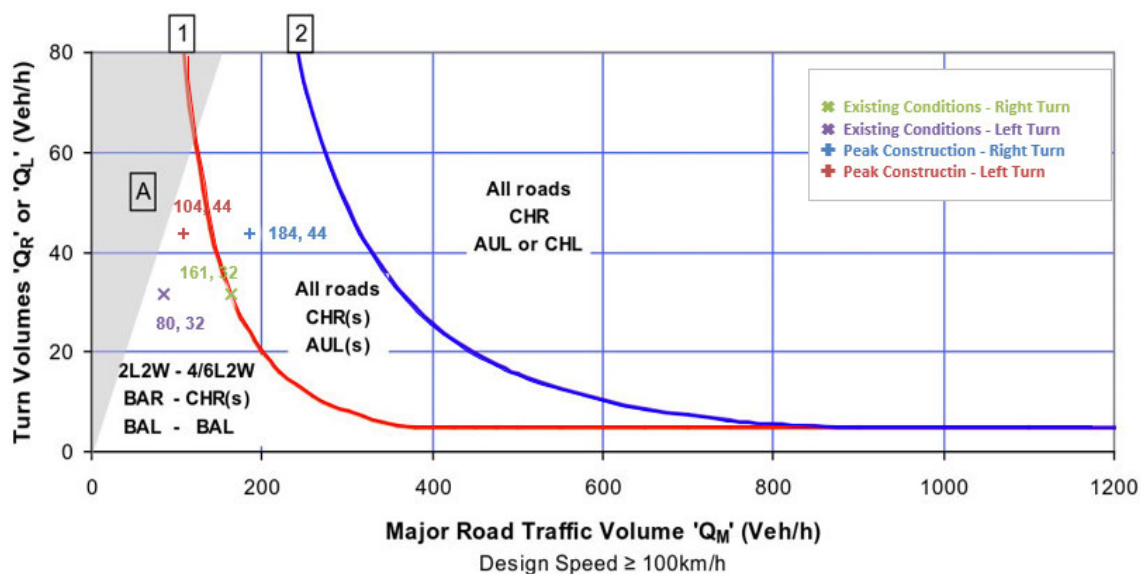


Figure 6.19 Cunningham Highway/Inglewood Quarry Access Road turning treatment assessment (2022)

Figure 6.19 demonstrates that as a minimum, a CHR(s) and a BAL turning treatments are required to accommodate the turning volumes at the Cunningham Highway/Inglewood Quarry Access Road intersection during construction. The required CHR(s) 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 Principal Contractor).

It is noted that the CHR(s) treatment is only required during construction, with the requirement no longer necessary post-construction. Any potential intersection upgrades will be developed in consultation with DTMR and GRC. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised by Principal Contractor and agreed with the relevant asset owners.

6.3.10 East Sawmill Road/Unnamed Road

The Project construction methodology proposes to include a laydown area adjacent to Unnamed Road, approximately 600 m north west of the East Sawmill Road/Unnamed Road intersection within GRC. Construction vehicles transporting cut to spoil material are expected to access this laydown area via by turning left from the East Sawmill Road into Unnamed Road. No Project traffic is proposed to enter Unnamed Road from the east.

Currently, there are flows along Unnamed Road of 800 vehicles per day, two-way (assumed volume). It is assumed this equates to 30 vehicles turning left into Unnamed Road from East Sawmill Road during the peak hour. A BAL treatment is currently provided at this intersection, as shown in Figure 6.20.

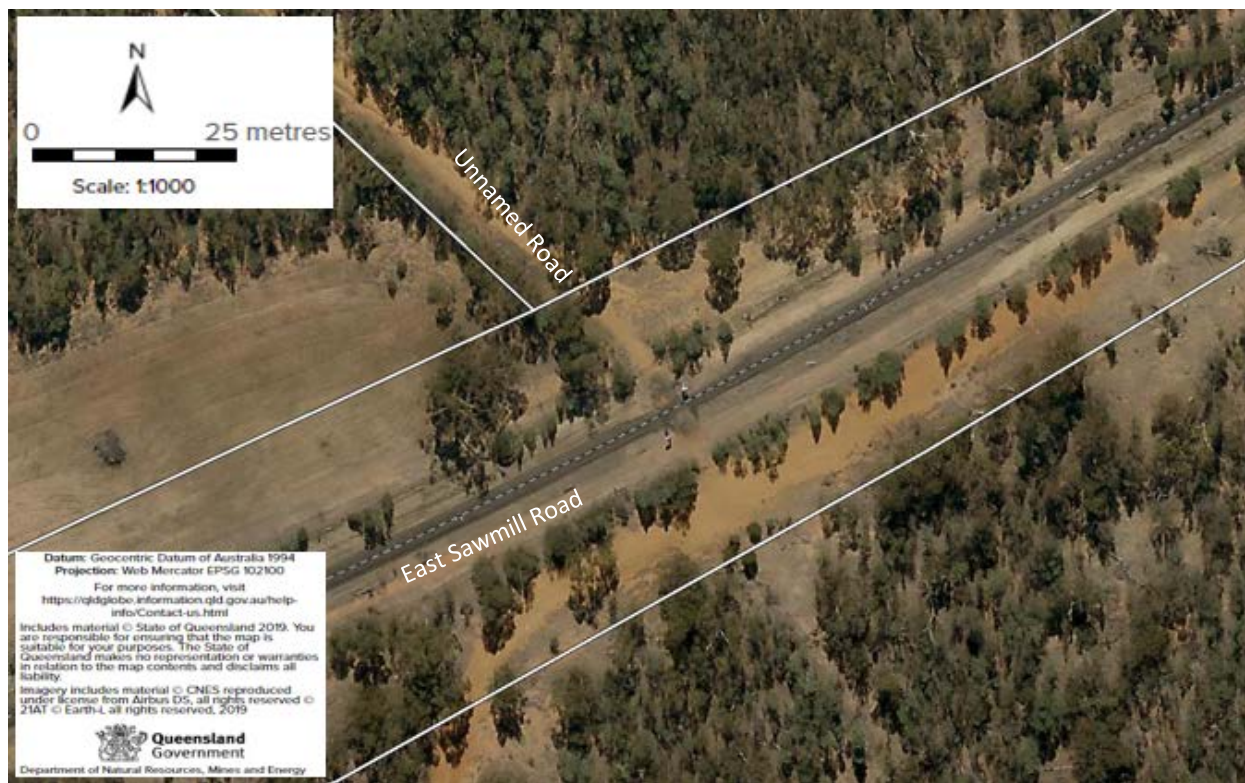


Figure 6.20 East Sawmill Road/Unnamed Road existing layout

The Project traffic assessment demonstrates that the turning movements into Unnamed Road are expected to peak in 2022, with up to 12 vehicles per hour expected to turn into Unnamed Road East Sawmill Road. These turning volumes, along with the through movement volumes on East Sawmill Road are summarised in Table 6.29. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.21.

Table 6.29 East Sawmill Road/Unnamed Road left turning treatment volumes

Scenario	East Sawmill Road peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Unnamed Road (Q_L)
Existing Volumes	300	30
Forecast Volumes without Project (2022)	318	32
Project Traffic	21	12
Volumes for Treatment Assessment	339	44

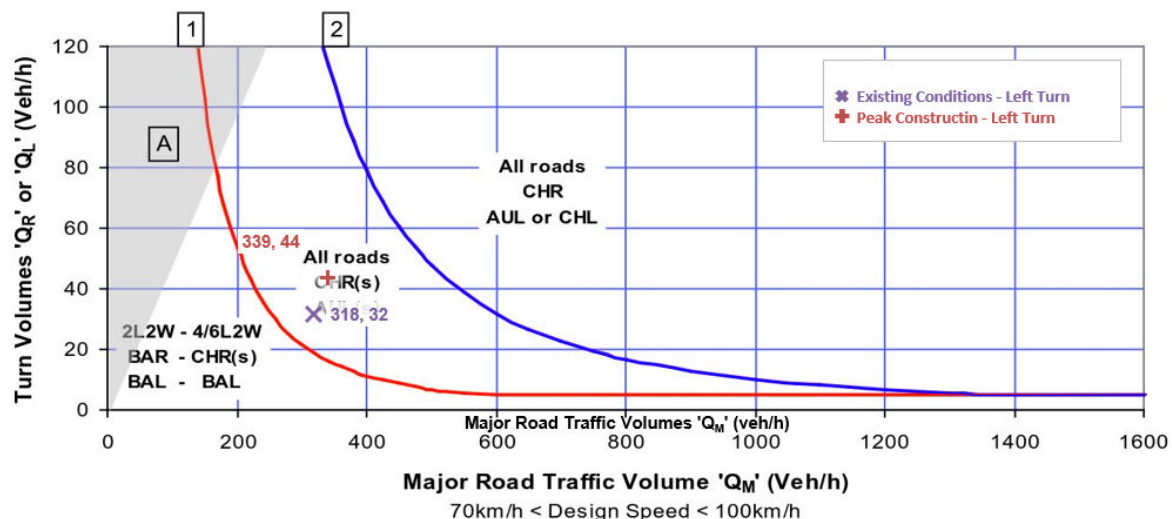


Figure 6.21 East Sawmill Road/Unnamed Road turning treatment assessment (2022)

Figure 6.21 demonstrates that as a minimum, an AUL(s) turning treatment is required to accommodate the turning volumes at the East Sawmill Road/Unnamed Road intersection during construction. This 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 Principal Contractor).

It is noted that these treatments are warranted under existing conditions based on assumed traffic flows through the intersection. Therefore, detailed assessment is required as part of an undated TIA to confirm requirement and agreement is required between the design and Principal Contractor, DTMR and GRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.11 Gore Highway/Athol School Road

The Project construction methodology proposes to include a laydown area adjacent to Athol School Road, approximately 1.0 km west of the Gore Highway/Athol School Road intersection within TRC. Construction vehicles transporting quarry materials, cut to fill material, concrete, plant, tools, sleepers, water and workers are expected to access this laydown area by turning left and right from the Gore Highway into Athol School Road.

Currently, approximately 192 vehicles per day use Athol School Road. It is assumed that this equates to 14 vehicles turning into Athol School Road from the Gore Highway during the peak hour. 7 left turns and 7 right turns. A BAR treatment and an AUL treatment are currently provided at this intersection, as shown in Figure 6.22.



Figure 6.22 Gore Highway/Athol School Road existing layout

The Project traffic assessment demonstrates that the turning movements into Athol School Road are expected to peak in 2023, with up to 5 vehicles per hour expected to turn into Athol School Road from the Gore Highway. These turning volumes, along with the through movement volumes on the Gore Highway are summarised in Table 6.30 and Table 6.31. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.23.

Table 6.30 Gore Highway/Athol School Road left turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Athol School Road (Q_L)
Existing Volumes	241	7
Forecast Volumes without Project (2023)	271	8
Project Traffic	92	5
Volumes for Treatment Assessment	364	14

Table 6.31 Gore Highway/Athol School Road right turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for left turn movement)	Peak hour right turn volume into Athol School Road (Q_R)
Existing Volumes	482	7
Forecast Volumes without Project (2023)	543	8
Project Traffic	92	5
Volumes for Treatment Assessment	635	14

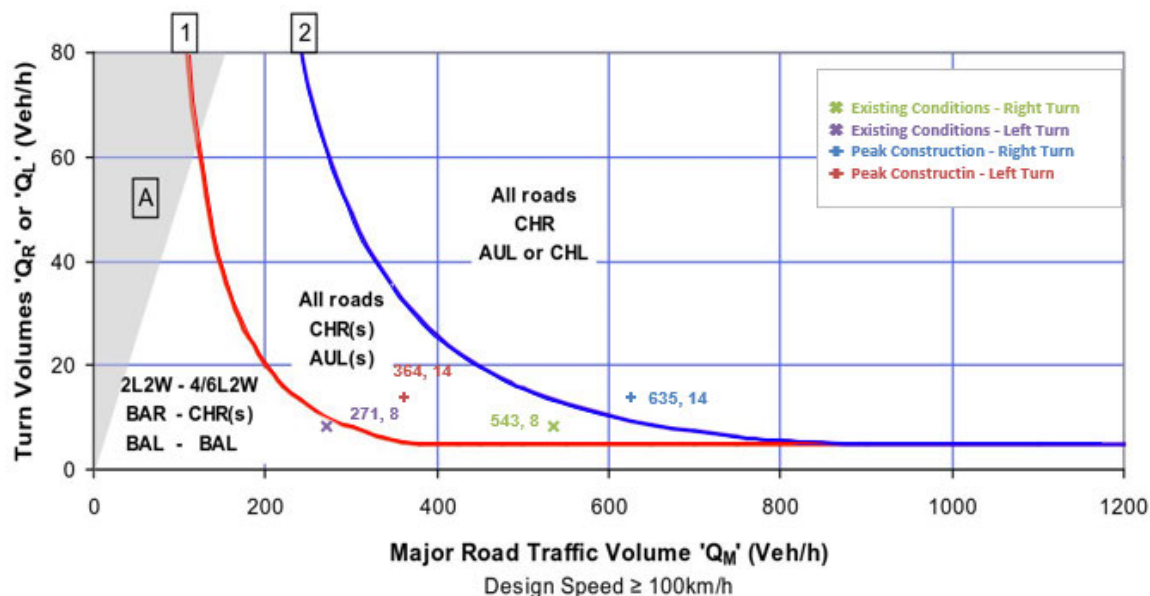


Figure 6.23 Gore Highway/Athol School Road turning treatment assessment (2023)

Figure 6.23 demonstrates that as a minimum, a CHR turning treatment and an AUL (s) turning treatment are required to accommodate the turning volumes at the Gore Highway/Athol School Road intersection during construction. 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 Principal Contractor).

It is noted that a CHR(s) treatment is warranted under existing conditions based on assumed traffic flows through the intersection. Therefore, detailed assessment is required as part of an updated TIA to confirm requirements and agreement is required between the design and Principal Contractor, DTMR and TRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.12 Gore Highway/Yarranlea Road

The Project construction methodology proposes to utilise the Gore Highway/Yarranlea Road intersection located within TRC. Construction vehicles transporting workers, concrete, plant and tools, water, sleepers, and quarry materials are expected to access Yarranlea Road by turning left and right from the Gore Highway into Yarranlea Road.

Currently there are flows along Yarranlea road of approximately 29 vehicles per day, two-way. It is assumed this equates to 2 vehicles turning into Yarranlea Road from the Gore Highway during the peak hour, 1 left turn and 1 right turn. A CHR treatment and a BAL treatment are currently provided at this intersection, as shown in Figure 6.24.



Figure 6.24 Gore Highway/Yarranlea Road existing layout

The Project traffic assessment demonstrates that the turning movements into Yarranlea Road are expected to peak in 2024, with up to 6 vehicles per hour expected to turn into Yarranlea Road from the Gore Highway. These turning volumes, along with the through movement volumes on the Gore Highway are summarised in Table 6.32 and Table 6.33. To determine if turning treatments are required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.25.

Table 6.32 Gore Highway/Yarranlea Road left turning treatment volumes

Scenario	Gore Highway peak hour volume (Q _M for left turn movement)	Peak hour left turn volume into Yarranlea Road (Q _L)
Existing Volumes	212	1
Forecast Volumes without Project (2024)	244	1
Project Traffic	78	6
Volumes for Treatment Assessment	322	7

Table 6.33 Gore Highway/Yarranlea Road right turning treatment volumes

Scenario	Gore Highway peak hour volume (Q _M for right turn movement)	Peak hour right turn volume into Yarranlea Road (Q _R)
Existing Volumes	424	1
Forecast Volumes without Project (2024)	487	1
Project Traffic	78	6
Volumes for Treatment Assessment	565	7

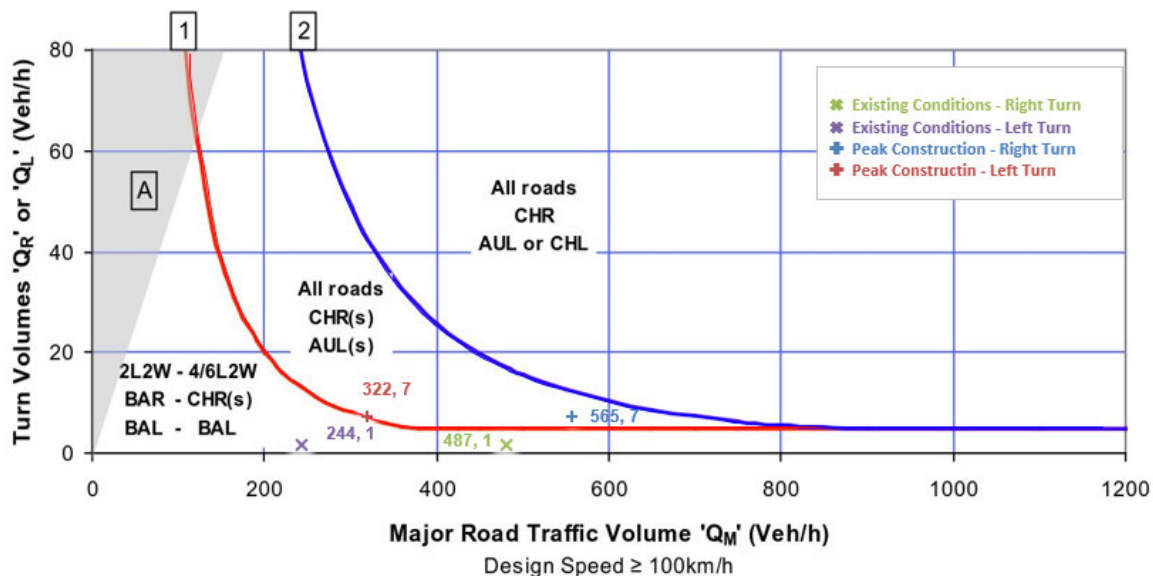


Figure 6.25 Gore Highway/Yarranlea Road turning treatment assessment (2024)

Figure 6.25 demonstrates that as a minimum, a CHR(s) turning treatment and an AUL(s) turning treatment are required to accommodate the turning volumes at the Gore Highway/Yarranlea Road intersection during construction. The AUL (s) treatment 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 Principal Contractor).

It is noted that these treatments are only required during construction, with the requirements no longer necessary post-construction. Any potential intersection upgrades will be developed in consultation with DTMR and TRC. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised by Principal Contractor and agreed with the relevant asset owners.

6.3.13 Gore Highway/Tummaville Road

The Project construction methodology proposes to include a laydown area adjacent to Tummaville Road, approximately 3.5 km south east of the Gore Highway/Tummaville Road intersection within TRC. Construction vehicles transporting quarry materials and cut to spoil material are expected to access this laydown area by turning left and right from the Gore Highway into Tummaville Road.

Currently there are flows along Tummaville road of approximately 98 vehicles per day, two-way. It is assumed this equates to 8 vehicles turning into Tummaville Road from the Gore Highway during the peak hour, 4 left turns and 4 right turns. A BAR treatment and a BAL treatment are currently provided at this intersection, as shown in Figure 6.26.

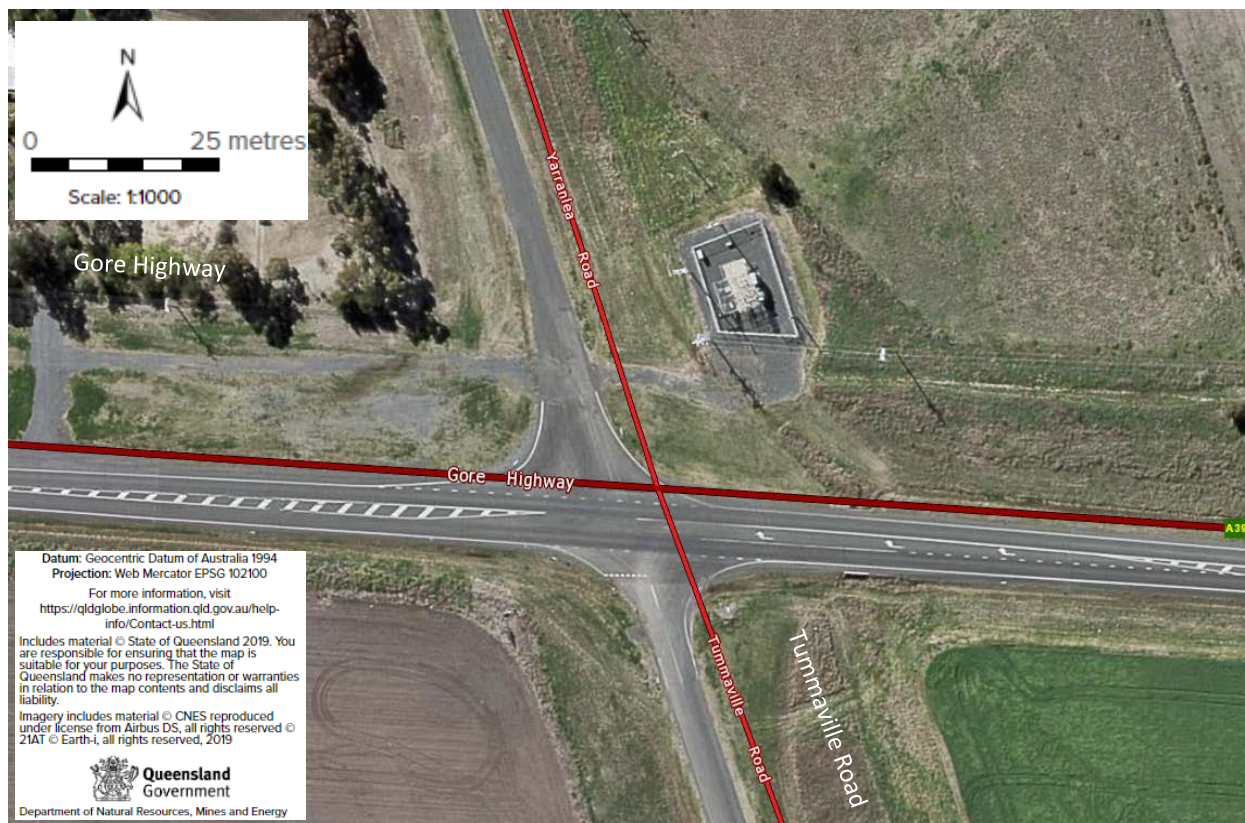


Figure 6.26 Gore Highway/Tummalville Road existing layout

The Project traffic assessment demonstrates that the turning movements into Tummalville Road are expected to peak in 2022, with up to 10 vehicles per hour expected to turn into Tummalville Road from the Gore Highway. These turning volumes, along with the through movement volumes on the Gore Highway are summarised in Table 6.34 and Table 6.35. To determine if turning treatments are required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.27.

Table 6.34 Gore Highway/Tummalville Road left turning treatment volumes

Scenario	Gore Highway peak hour volume (Q _M for left turn movement)	Peak hour left turn volume into Tummalville Road (Q _L)
Existing Volumes	212	4
Forecast Volumes without Project (2022)	234	4
Project Traffic	78	10
Volumes for Treatment Assessment	312	14

Table 6.35 Gore Highway/Tummalville Road right turning treatment volumes

Scenario	Gore Highway peak hour volume (Q _M for right turn movement)	Peak hour right turn volume into Tummalville Road (Q _R)
Existing Volumes	424	4
Forecast Volumes without Project (2022)	468	4
Project Traffic	78	10
Volumes for Treatment Assessment	546	14

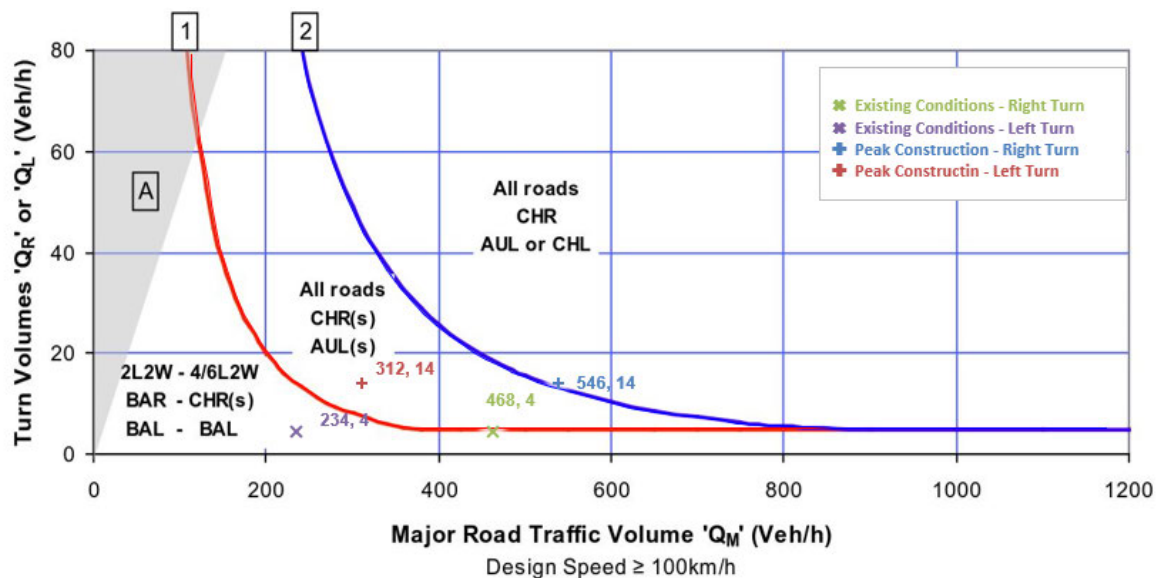


Figure 6.27 Gore Highway/Tummaville Road turning treatment assessment (2022)

Figure 6.27 demonstrates that as a minimum, a CHR turning treatment and an AUL(s) turning treatment are required to accommodate the turning volumes at the Gore Highway/Tummaville Road intersection during construction. 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 Principal Contractor).

It is noted that these treatments are only required during construction, with the requirement no longer necessary post-construction. Any potential intersection upgrades will be developed in consultation with DTMR and TRC. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised by Principal Contractor and agreed with the relevant asset owners.

6.3.14 Gore Highway/Lindenmayer Road

The Project construction methodology proposes to utilise the Gore Highway/Lindenmayer Road intersection located within TRC. Construction vehicles transporting workers, sleepers, and quarry materials are expected to access Lindenmayer Road by turning left and right from the Gore Highway into Lindenmayer Road.

Currently, there are flows along Lindenmayer Road of approximately 4000 vehicles per day, two-way (assumed volume). It is assumed this equates 300 vehicles turning into Lindenmayer Road from the Gore Highway during the peak hour, 150 left turns and 150 right turns. A BAR treatment and a BAL treatment are currently provided at this intersection, as shown in Figure 6.28.

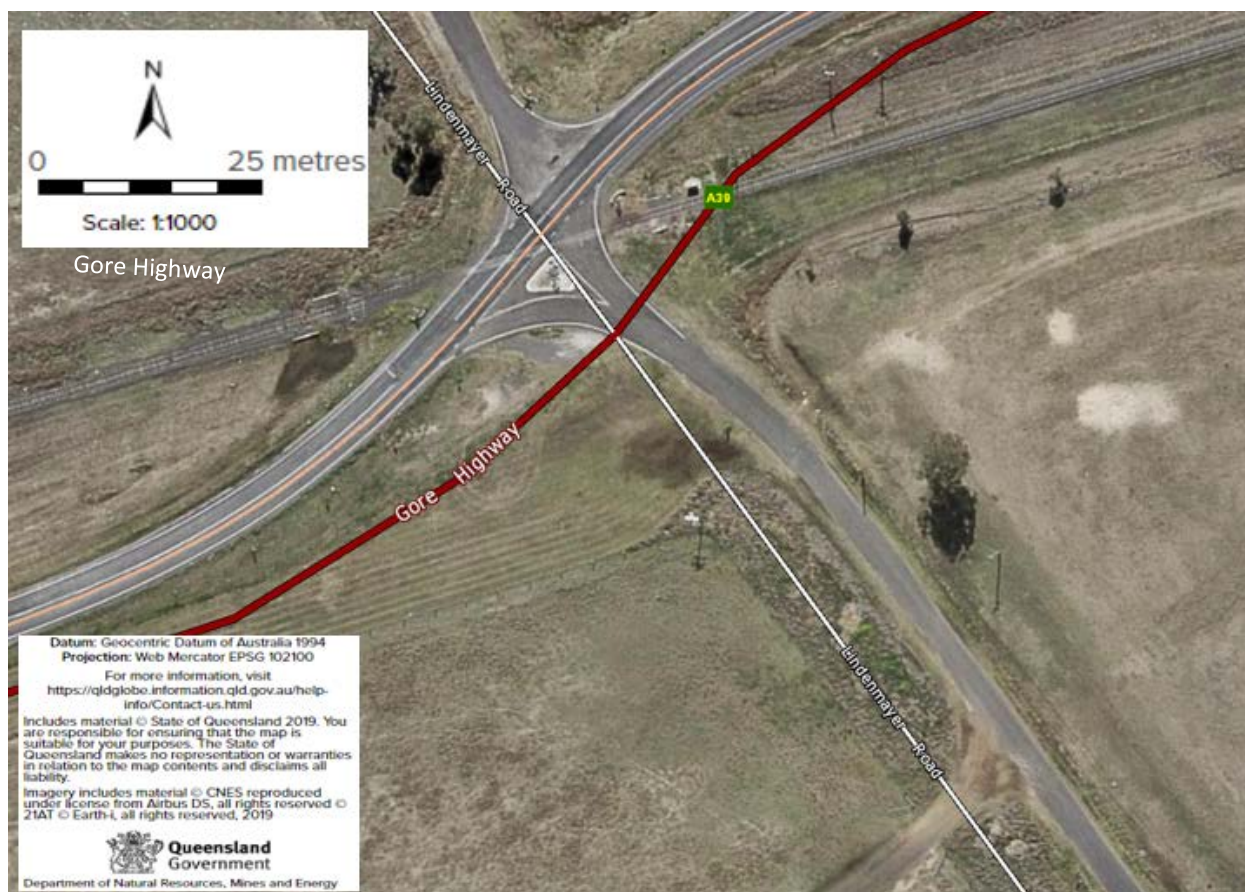


Figure 6.28 Gore Highway/Lindenmayer Road existing layout

The Project traffic assessment demonstrates that the turning movements into Lindenmayer Road are expected to peak in 2025, with up to 9 vehicles per hour expected to turn into Lindenmayer Road from the Gore Highway. These turning volumes, along with the through movement volumes on the Gore Highway are summarised in Table 6.36 and Table 6.37.

To determine if turning treatments are required at the intersection, a turning treatment assessment consistent with the requirements of *Austrroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.29.

Table 6.36 Gore Highway/Lindenmayer Road left turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Lindenmayer Road (Q_L)
Existing Volumes	99	150
Forecast Volumes without Project (2025)	116	169*
Project Traffic	80	9
Volumes for Treatment Assessment	196	178*

Table note:

* Maximum value on turn warrant graph adopted in place of this value

Table 6.37 Gore Highway/Lindenmayer Road right turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Lindenmayer Road (Q_R)
Existing Volumes	198	150
Forecast Volumes without Project (2025)	232	169*
Project Traffic	80	9
Volumes for Treatment Assessment	312	178*

Table note:

* Maximum value on turn warrant graph adopted in place of this value

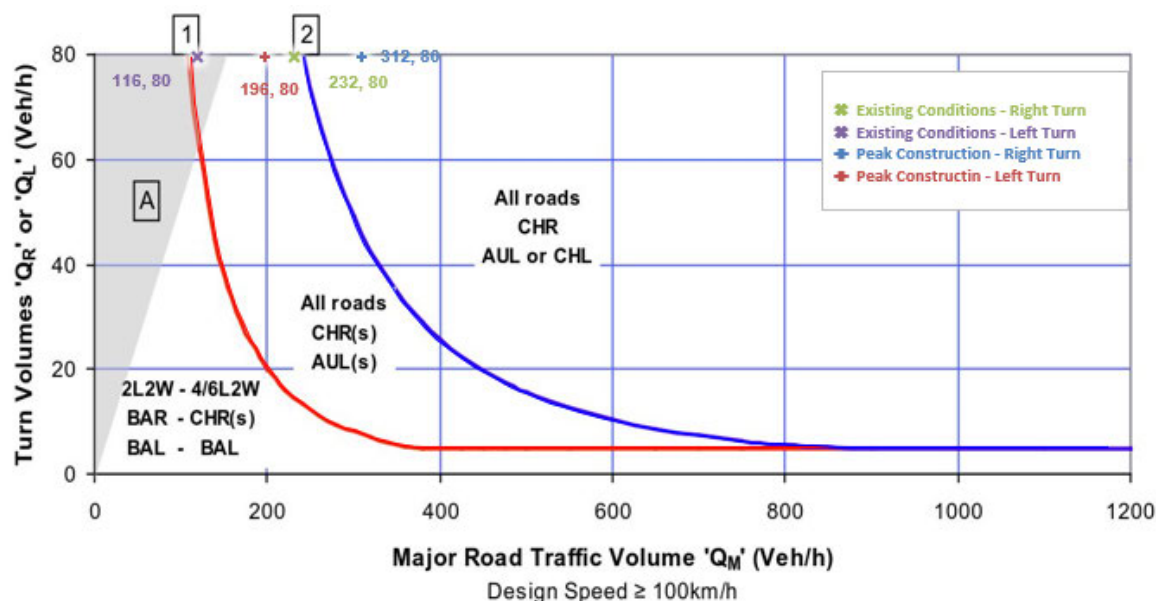


Figure 6.29 Gore Highway/Lindenmayer Road turning treatment assessment (2025)

Figure 6.29 demonstrates that as a minimum, a CHR turning treatment and an AUL(s) turning treatment are required to accommodate the turning volumes at the Gore Highway/Lindenmayer Road intersection during construction. 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 Principal Contractor).

It is noted that these treatments are warranted under existing conditions based on assumed traffic flows through the intersection. Therefore, detailed assessment is required as part of an undated TIA to confirm requirement and agreement is required between the design and Principal Contractor, DTMR and TRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.15 Gore Highway/Scrubby Road

The Project construction methodology proposes to include a laydown area adjacent to Scrubby Road, approximately 1.6 km south east of the Gore Highway/Scrubby Road intersection within TRC. Construction vehicles transporting quarry materials and cut to spoil material are expected to access this laydown area by turning left and right from the Gore Highway into Scrubby Road.

Currently, there are flows along Scrubby Road of approximately 208 vehicles per day two-way. It is assumed this equates to 16 vehicles turning into Scrubby Road from the Gore Highway during the peak hour, 8 left turns and 8 right turns. A BAL treatment and a BAR treatment are currently provided at this intersection, as shown in Figure 6.30.

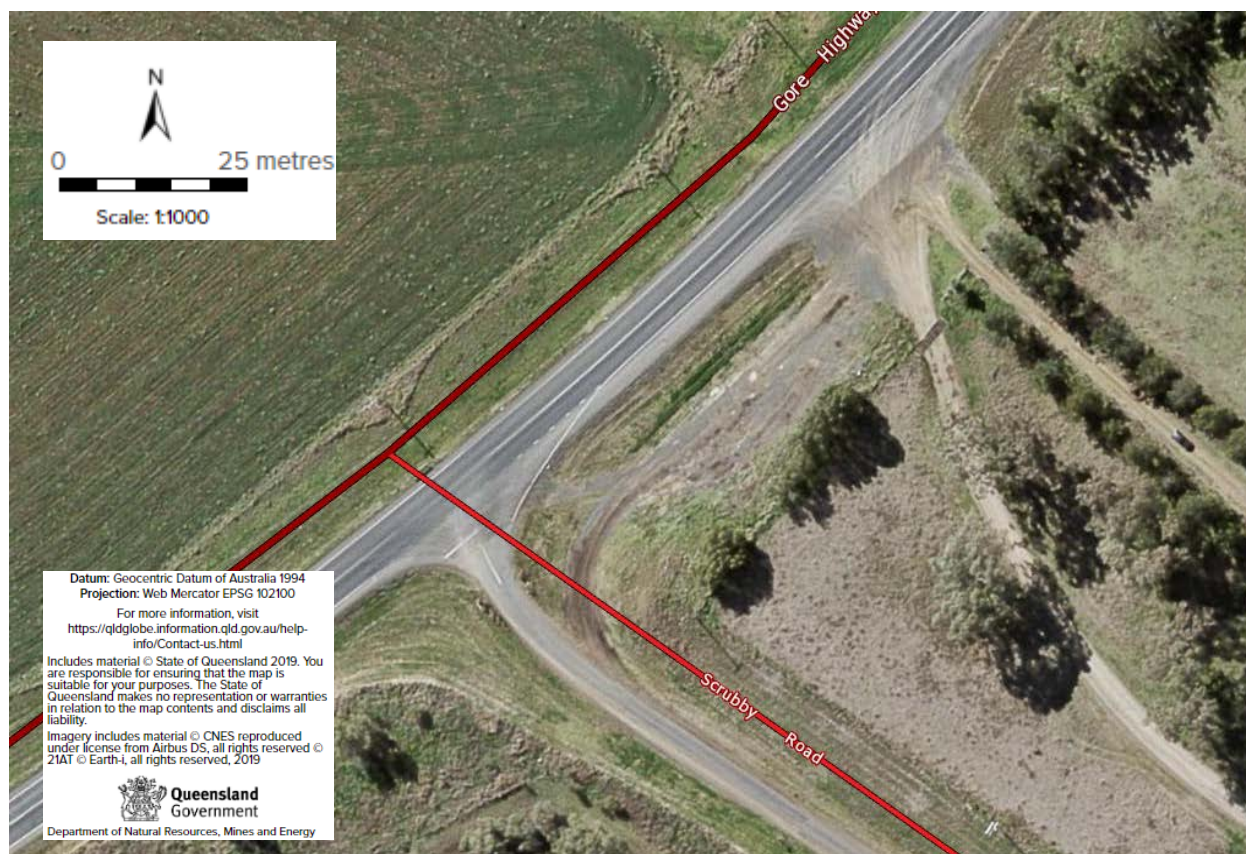


Figure 6.30 Gore Highway/Scrubby Road existing layout

The Project traffic assessment demonstrates that the turning movements into Scrubby Road are expected to peak in 2022, with up to 10 vehicles per hour expected to turn into Scrubby Road from the Gore Highway. These turning volumes, along with the through movement volumes on the Gore Highway are summarised in Table 6.38 and Table 6.39. To determine if turning treatments are required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.31.

Table 6.38 Gore Highway/Scrubby Road left turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Scrubby Road (Q_L)
Existing Volumes	212	8
Forecast Volumes without Project (2022)	234	9
Project Traffic	78	10
Volumes for Treatment Assessment	312	18

Table 6.39 Gore Highway/Scrubby Road right turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Scrubby Road (Q_R)
Existing Volumes	424	8
Forecast Volumes without Project (2022)	468	9
Project Traffic	78	10
Volumes for Treatment Assessment	546	18

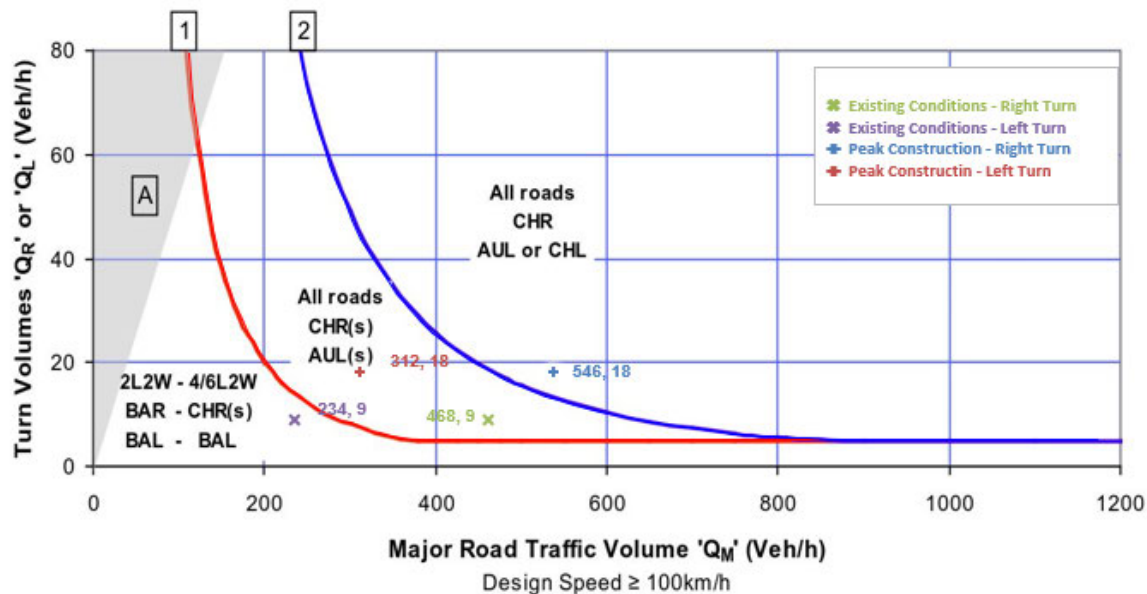


Figure 6.31 Gore Highway/Scrubby Road turning treatment assessment (2022)

Figure 6.31 demonstrates that as a minimum, an AUL (s) turning treatment and a CHR turning treatment are required to accommodate the turning volumes at the Gore Highway/Scrubby Road intersection during construction. 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 Principal Contractor).

It is noted that these treatments are warranted under existing conditions based on assumed traffic flows through the intersection. Therefore, detailed assessment is required as part of an undated TIA to confirm requirement and agreement is required between the design and Principal Contractor, DTMR and TRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.16 Gore Highway/Linthorpe Road

The Project construction methodology proposes to include a laydown area adjacent to Geitz Road, approximately 700 m north of the Gore Highway/Linthorpe Road intersection within TRC. Construction vehicles transporting quarry materials, sleepers, cut to spoil material, water, plant, tools concrete and workers are expected to access this laydown area by turning left and right from the Gore Highway into Linthorpe Road.

Currently there are flows along Linthorpe Road of approximately 183 vehicles per day, two-way. It is assumed this equates to 14 vehicles turning into Linthorpe Road from the Gore Highway during the peak hour, 7 left turns and 7 right turns. A BAR treatment and a BAL treatment are currently provided at this intersection, as shown in Figure 6.32.

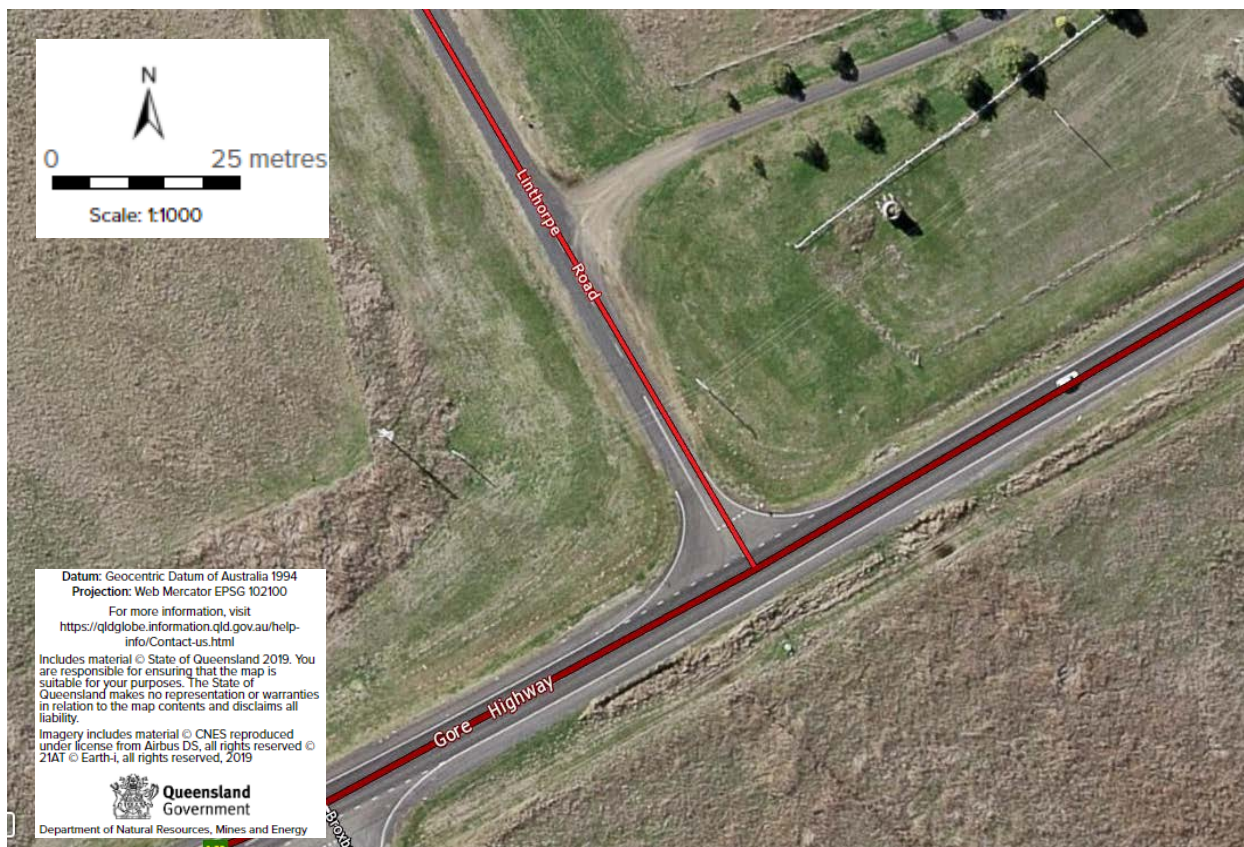


Figure 6.32 Gore Highway/Linthorpe Road existing layout

The Project traffic assessment demonstrates that the turning movements into Linthorpe Road are expected to peak in 2022, with up to 23 vehicles per hour expected to turn into Linthorpe Road from the Gore Highway. These turning volumes, along with the through movement volumes on the Gore Highway are summarised in Table 6.40 and Table 6.41. To determine if turning treatments are required at the intersection, a turning treatment assessment consistent with the requirements of *Austrroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.33.

Table 6.40 Gore Highway/Linthorpe Road left turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Linthorpe Road (Q_L)
Existing Volumes	212	7
Forecast Volumes without Project (2022)	234	8
Project Traffic	92	23
Volumes for Treatment Assessment	326	31

Table 6.41 Gore Highway/Linthorpe Road right turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Linthorpe Road (Q_R)
Existing Volumes	424	7
Forecast Volumes without Project (2022)	468	8
Project Traffic	92	23
Volumes for Treatment Assessment	561	31

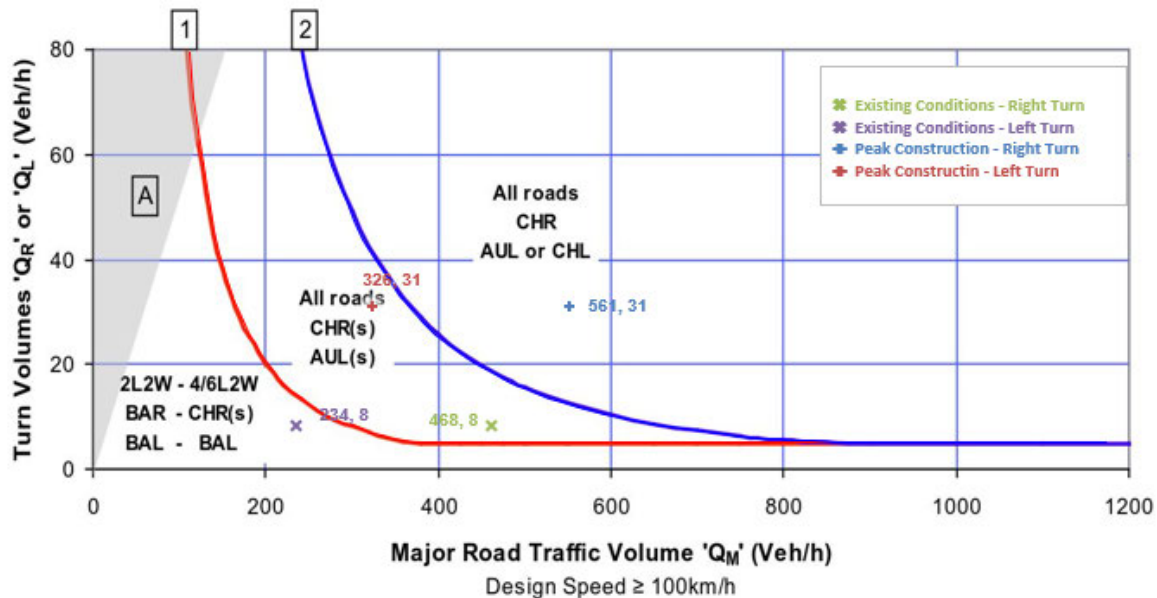


Figure 6.33 Gore Highway/Linthorpe Road turning treatment assessment (2022)

Figure 6.33 demonstrates that as a minimum, a CHR turning treatment and an AUL (s) turning treatment are required to accommodate the turning volumes at the Gore Highway/Linthorpe Road intersection during construction. This 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 Principal Contractor).

It is noted that a CHR(s) treatment is warranted under existing conditions given the assumed flows through the intersection, however a AUL (s) is not. Therefore, detailed assessment is required as part of an updated TIA to confirm this requirement and agreement is required between the design and Principal Contractor and TRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.17 Gore Highway/Geitz Road

The Project construction methodology proposes to include a laydown area adjacent to Geitz Road, approximately 500 m north of the Gore Highway/Geitz Road intersection within TRC. Construction vehicles transporting quarry materials, cut to fill material, concrete and workers are expected to access this laydown area by turning left and right from the Gore Highway into Geitz Road.

Currently there are flows along Geitz Road of 800 vehicles per day, two-way (assumed volume). It is assumed this equates to 60 vehicles turning into Geitz Road from the Gore Highway during the peak hour, 30 left turns and 30 right turns. A BAR treatment and a BAL treatment are currently provided at this intersection, as shown in Figure 6.34.



Figure 6.34 Gore Highway/Geitz Road existing layout

The Project traffic assessment demonstrates that the turning movements into Geitz Road are expected to peak in 2022, with up to 14 vehicles per hour expected to turn into Geitz Road from the Gore Highway. These turning volumes, along with the through movement volumes on the Gore Highway are summarised in Table 6.42 and Table 6.43. To determine if turning treatments are required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated Figure 6.35.

Table 6.42 Gore Highway/Geitz Road left turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Geitz Road (Q_L)
Existing Volumes	362	30
Forecast Volumes without Project (2022)	399	32
Project Traffic	92	14
Volumes for Treatment Assessment	492	46

Table 6.43 Gore Highway/Geitz Road right turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Geitz Road (Q_R)
Existing Volumes	723	30
Forecast Volumes without Project (2022)	798	32
Project Traffic	92	14
Volumes for Treatment Assessment	891	46

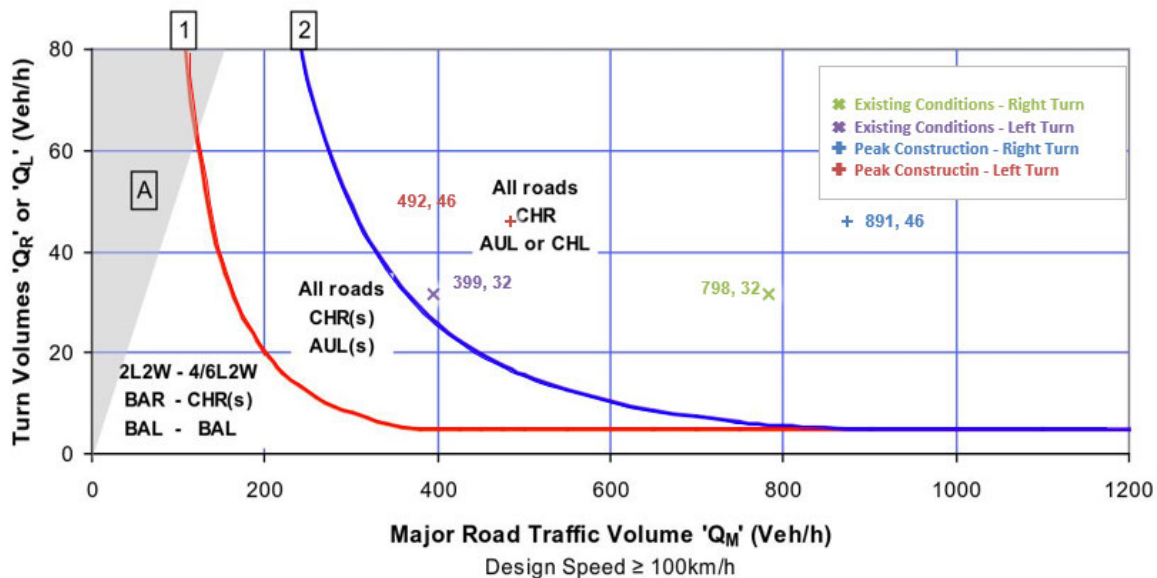


Figure 6.35 Gore Highway/Geitz Road turning treatment assessment (2022)

Figure 6.35 demonstrates that as a minimum, a CHR turning treatment and an AUL turning treatment are required to accommodate the turning volumes at the Gore Highway/Geitz Road intersection during construction. 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 Principal Contractor).

It is noted that these treatments are warranted under existing conditions given the assumed flows through the intersection. Therefore, detailed assessment is required as part of an updated TIA to confirm this requirement and agreement is required between the design and Principal Contractor and TRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.18 Gore Highway/Bushy Lane West

The Project construction methodology proposes to utilise the Gore Highway/Bushy Lane West intersection located within TRC. Construction vehicles transporting quarry materials, workers, concrete, plant and tools and sleepers are expected to access Bushy Lane West by turning left and right from the Gore Highway into Bushy Lane West.

Currently there are flows along Bushy Lane West of 800 vehicles per day, two-way (assumed volume). It is assumed this equates to 60 vehicles turning into Bushy Lane West from the Gore Highway during the peak hour, 30 left turns and 30 right turns. A BAR treatment and a BAL treatment are currently provided at this intersection, as shown in Figure 6.36.



Figure 6.36 Gore Highway/Bushy Lane West existing layout

The Project traffic assessment demonstrates that the turning movements into Bushy Lane West are expected to peak in 2024, with up to 8 vehicles per hour expected to turn into Bushy Lane West from the Gore Highway. These turning volumes, along with the through movement volumes on the Gore Highway are summarised in Table 6.44 and Table 6.45. To determine if turning treatments are required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated Figure 6.37.

Table 6.44 Gore Highway/Bushy Lane West left turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Bushy Lane West (Q_L)
Existing Volumes	241	30
Forecast Volumes without Project (2024)	277	33
Project Traffic	92	8
Volumes for Treatment Assessment	369	41

Table 6.45 Gore Highway/Bushy Lane West right turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Bushy Lane West (Q_R)
Existing Volumes	482	30
Forecast Volumes without Project (2024)	554	33
Project Traffic	92	8
Volumes for Treatment Assessment	646	41

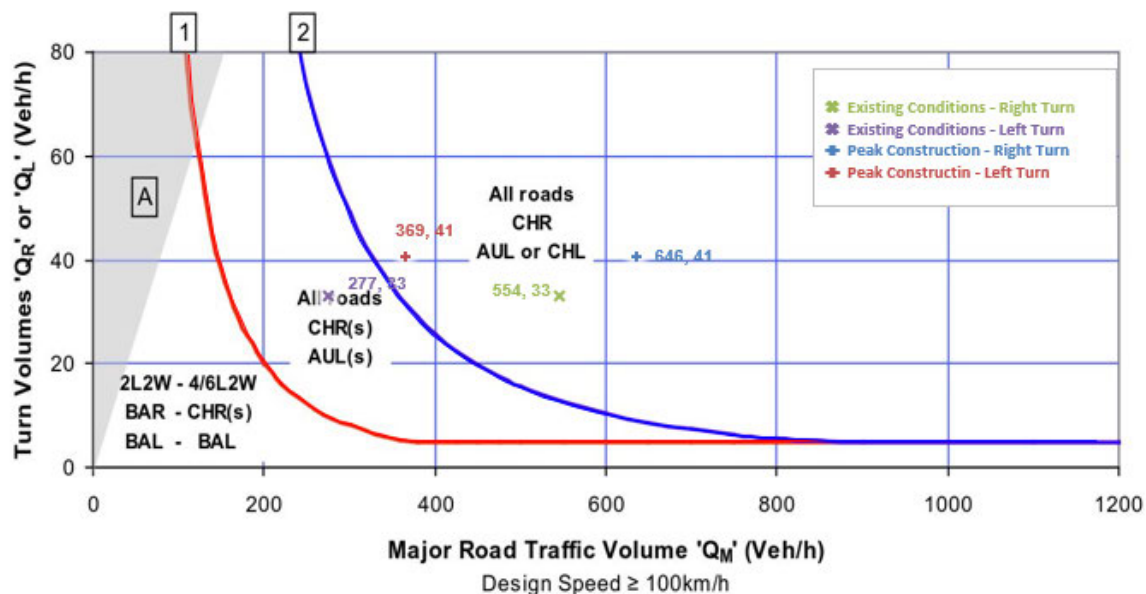


Figure 6.37 Gore Highway/Bushy Lane West turning treatment assessment (2024)

Figure 6.37 demonstrates that as a minimum, a CHR turning treatment and an AUL turning treatment are required to accommodate the turning volumes at the Gore Highway/Bushy Lane West intersection during construction. 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 Principal Contractor).

It is noted that a CHR treatment is warranted under existing conditions given the assumed flows through the intersection, however only an AUL (s) is warranted for left turns. Therefore, detailed assessment is required as part of an updated TIA to confirm this requirement and agreement is required between the design and Principal Contractor and TRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.19 Gore Highway/Unnamed Road

The Project construction methodology proposes to utilise the Gore Highway/Unnamed Road intersection located within TRC. Construction vehicles transporting workers are expected to access Unnamed Road by turning left from the Gore Highway into Unnamed Road. No development traffic is proposed to enter Unnamed Road from the west.

Currently there are flows along Unnamed Road of 4000 vehicles per day, two-way (assumed volume). It is assumed this equates to 150 vehicles turning left into Unnamed Road from the Gore Highway during the peak hour. A BAL treatment is currently provided at this intersection, as shown in Figure 6.38.



Figure 6.38 Gore Highway/Unnamed Road existing layout

Figure note:

Queensland Government mapping labels the Gore Highway as A39 in this figure.

The Project traffic assessment demonstrates that the turning movements into Unnamed Road are expected to peak in 2022, with up to 106 vehicles per hour expected to turn into Unnamed Road from the Gore Highway. These turning volumes, along with the through movement volumes on the Gore Highway are summarised in Table 6.46. To determine if turning treatments are required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated Figure 6.39.

Table 6.46 Gore Highway/Unnamed Road left turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Unnamed Road (Q_L)
Existing Volumes	99	150
Forecast Volumes without Project (2022)	109	159*
Project Traffic	108	106
Volumes for Treatment Assessment	218	265*

Table notes:

* Maximum value on turn warrant graph adopted in place of this value

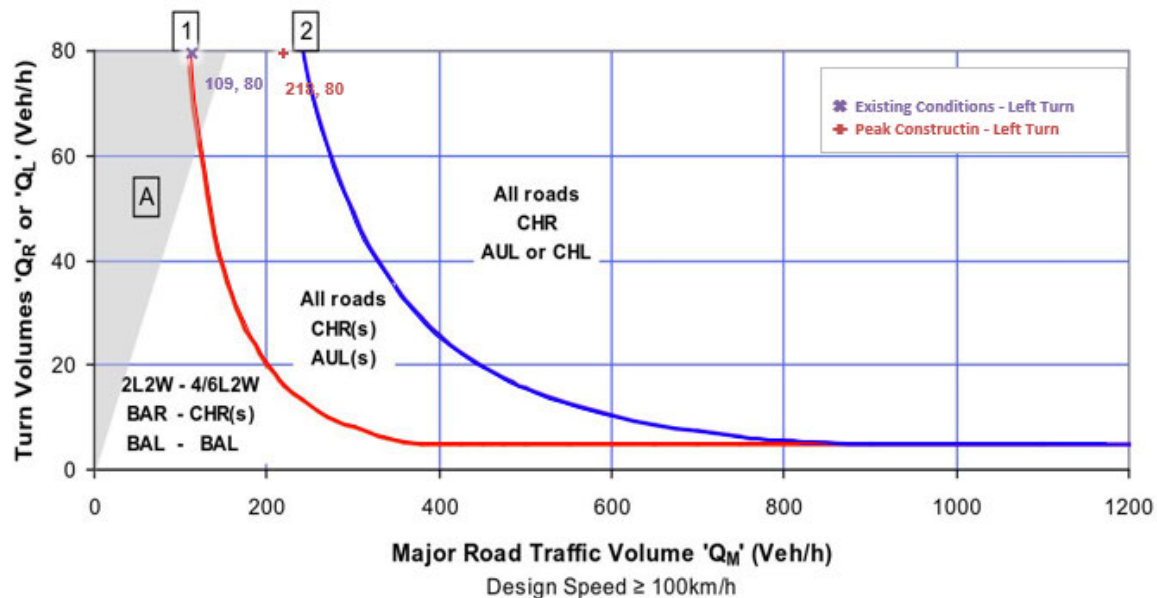


Figure 6.39 Gore Highway/Unnamed Road turning treatment assessment (2022)

Figure 6.39 demonstrates that as a minimum, an AUL (s) turning treatment is required to accommodate the turning volumes at the Gore Highway/Unnamed Road intersection during construction. This 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 Principal Contractor).

It is noted that this treatment is warranted under existing conditions given the assumed flows through the intersection. Therefore, detailed assessment is required as part of an updated TIA to confirm this requirement and agreement is required between the design and Principal Contractor and TRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.20 Gore Highway/Unnamed Road

The Project construction methodology proposes to utilise the Gore Highway/Unnamed Road intersection located within TRC. Construction vehicles transporting concrete are expected to access Unnamed Road by turning right from the Gore Highway into Unnamed Road. No development traffic is proposed to enter Unnamed Road from the south.

Currently there are flows along Unnamed Road of 800 vehicles per day, two-way (assumed volume). It is assumed this equates to 30 vehicles turning right into Unnamed Road from the Gore Highway during the peak hour. A BAR treatment is currently provided at this intersection, as shown in Figure 6.40.



Figure 6.40 Gore Highway/Unnamed Road existing layout

The Project traffic assessment demonstrates that the turning movements into Unnamed Road are expected to peak in 2022, with up to 7 vehicles per hour expected to turn into Unnamed Road from the Gore Highway. These turning volumes, along with the through movement volumes on the Gore Highway are summarised in Table 6.47. To determine if turning treatments are required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated Figure 6.41.

Table 6.47 Gore Highway/Unnamed Road right turning treatment volumes

Scenario	Gore Highway peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Unnamed Road (Q_R)
Existing Volumes	482	30
Forecast Volumes without Project (2022)	532	32
Project Traffic	92	7
Volumes for Treatment Assessment	625	39

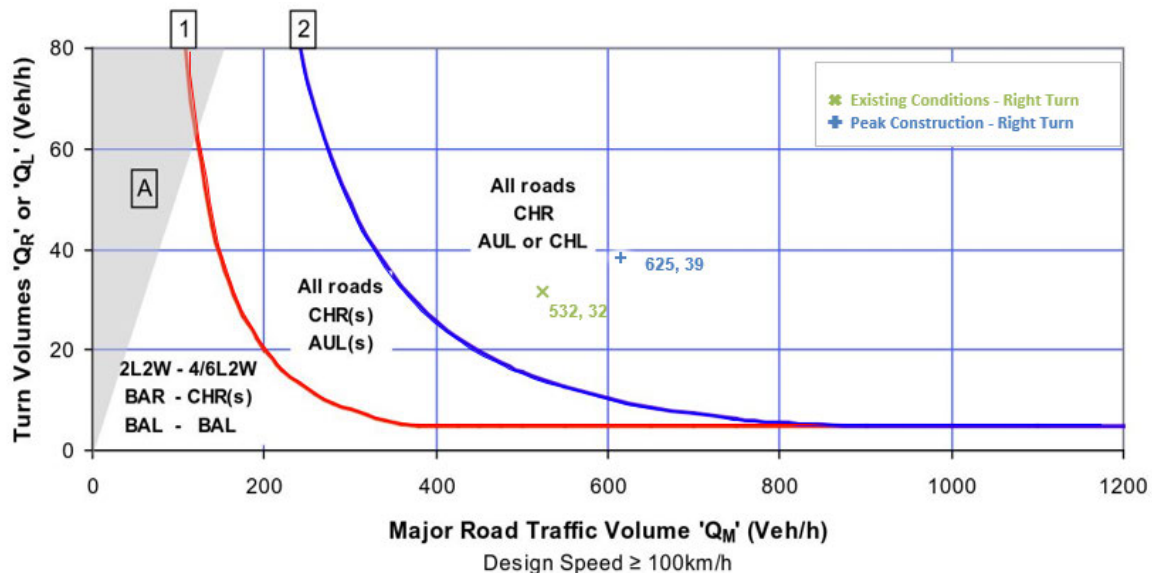


Figure 6.41 Gore Highway/Unnamed Road turning treatment assessment (2022)

Figure 6.41 demonstrates that as a minimum, a CHR turning treatment is required to accommodate the turning volumes at the Gore Highway/Unnamed Road intersection during construction. This 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 Principal Contractor).

It is noted that this treatment is warranted under existing conditions given the assumed flows through the intersection. Therefore, detailed assessment is required as part of an updated TIA to confirm this requirement and agreement is required between the design and Principal Contractor and TRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.21 Millmerran-Inglewood Road/Paton Road

The Project construction methodology proposes to utilise the Millmerran-Inglewood Road/Paton Road intersection located within TRC. Construction vehicles transporting workers, quarry materials, concrete, plant and tools and sleepers are expected to access Paton Road by turning left from Millmerran-Inglewood Road into Paton Road. No development traffic is proposed to enter Paton Road from the south.

Currently there are flows along Paton Road of 800 vehicles per day, two-way (assumed volume). It is assumed this equates to 30 vehicles turning left into Unnamed Road from the Gore Highway during the peak hour. A BAL treatment is currently provided at this intersection, as shown in Figure 6.42.

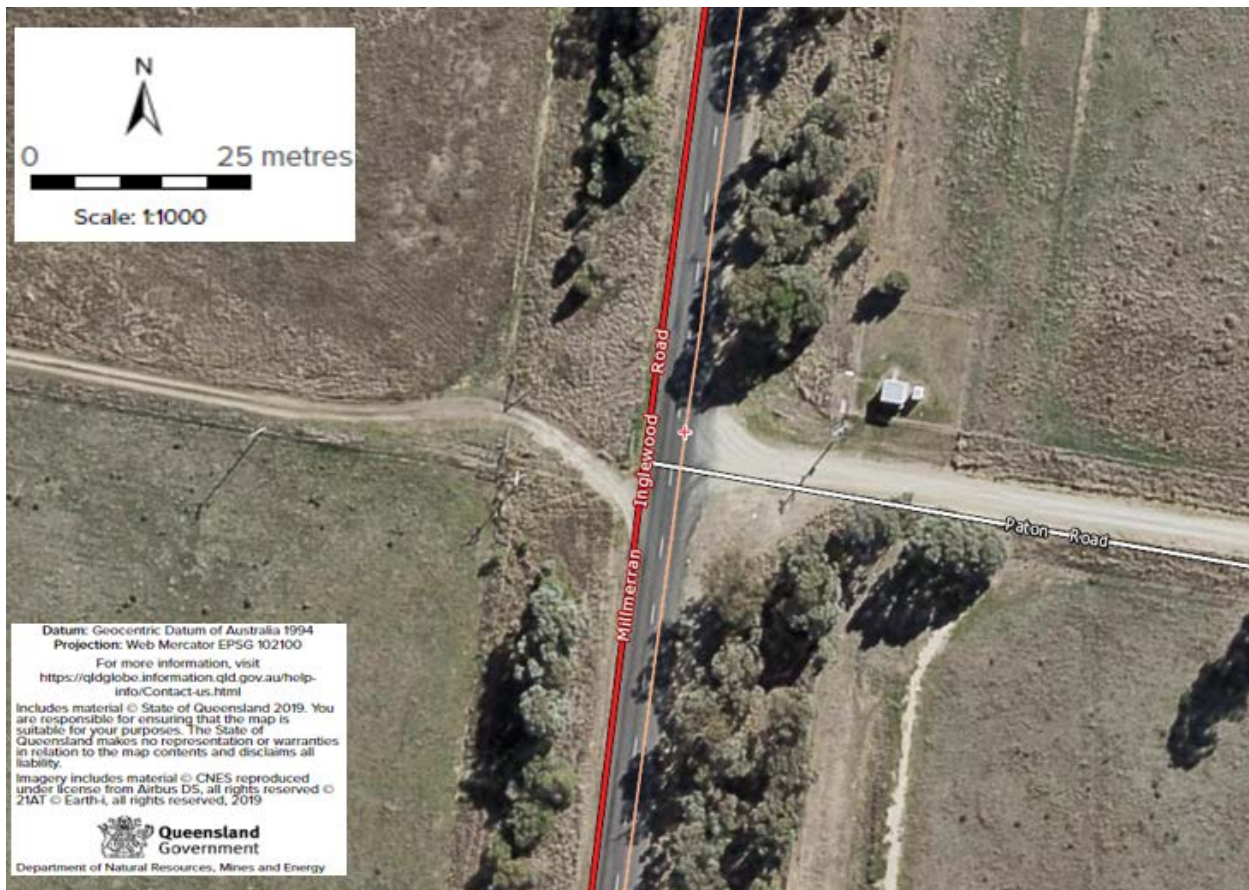


Figure 6.42 Millmerran-Inglewood Road/Paton Road existing layout

The Project traffic assessment demonstrates that the turning movements into Paton Road are expected to peak in 2025, with up to 10 vehicles per hour expected to turn into Paton Road from Millmerran-Inglewood Road. These turning volumes, along with the through movement volumes on Millmerran-Inglewood Road are summarised in Table 6.48. To determine if turning treatments are required at the intersection, a turning treatment assessment consistent with the requirements of *Austrroads Guide to Traffic Management Part 6* is demonstrated Figure 6.43.

Table 6.48 Millmerran-Inglewood Road/Paton Road left turning treatment volumes

Scenario	Millmerran-Inglewood Road peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Paton Road (Q_L)
Existing Volumes	74	30
Forecast Volumes without Project (2025)	87	34
Project Traffic	56	10
Volumes for Treatment Assessment	144	44

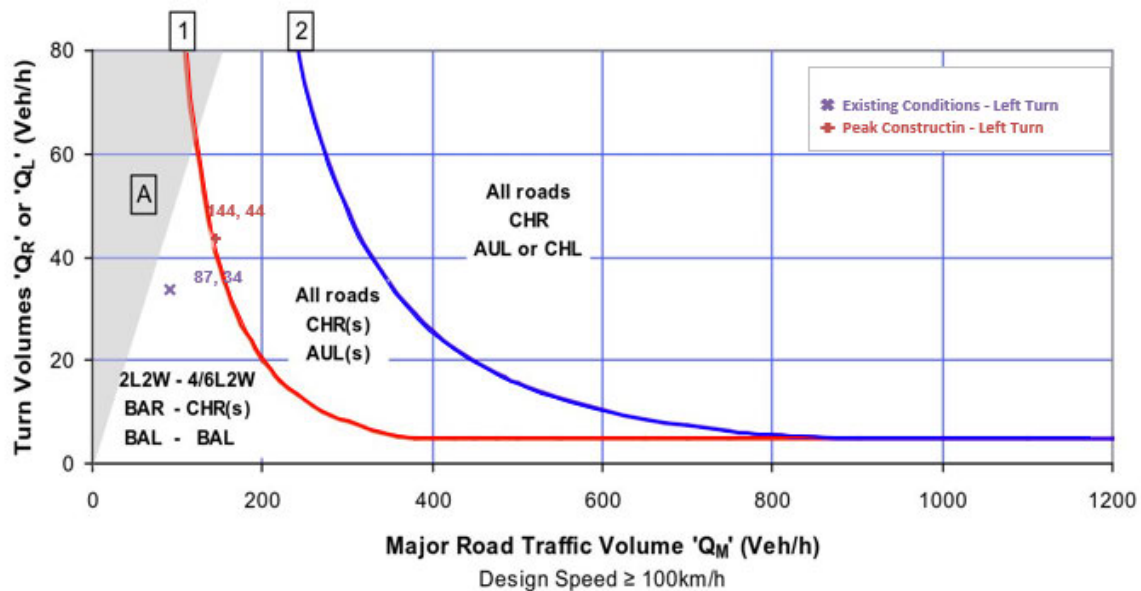


Figure 6.43 Millmerran-Inglewood Road/Paton Road turning treatment assessment (2025)

Figure 6.43 demonstrates that as a minimum, an AUL (s) turning treatment is required to accommodate the turning volumes at the Millmerran-Inglewood Road/Paton Road intersection during construction. This 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 Principal Contractor).

It is noted that this treatment is only required during construction, with the requirement no longer necessary post-construction. Any potential intersection upgrades will be developed in consultation with DTMR and TRC. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised by Principal Contractor and agreed with the relevant asset owners.

6.3.22 Millmerran-Inglewood Road/Millwood Road

The Project construction methodology proposes to utilise the Millmerran-Inglewood Road/Millwood Road intersection located within TRC. Construction vehicles transporting workers, quarry materials, concrete, spoil material, general fill and sleepers are expected to access Millwood Road by turning left and right from Millmerran-Inglewood Road into Paton Road.

Currently there are flows along Millwood Road of 24 vehicles per day, two-way. It is assumed this equates to 2 vehicles turning into Millwood Road from Millmerran-Inglewood Road during the peak hour, 1 left turn and 1 right turn. A BAR treatment and a BAL treatment are currently provided at this intersection, as shown in Figure 6.44.



Figure 6.44 Millmerran-Inglewood Road/Millwood Road existing layout

The Project traffic assessment demonstrates that the turning movements into Millwood Road are expected to peak in 2023, with up to 21 vehicles per hour expected to turn into Millwood Road from Millmerran-Inglewood Road. These turning volumes, along with the through movement volumes on Millmerran-Inglewood Road are summarised in Table 6.49 and Table 6.50. To determine if turning treatments are required at the intersection, a turning treatment assessment consistent with the requirements of *Austrroads Guide to Traffic Management Part 6* is demonstrated Figure 6.45.

Table 6.49 Millmerran-Inglewood Road/Millwood Road left turning treatment volumes

Scenario	Millmerran-Inglewood Road peak hour volume (Q_M for left turn movement)	Peak hour left turn volume into Millwood Road (Q_L)
Existing Volumes	74	1
Forecast Volumes without Project (2023)	84	1
Project Traffic	56	21
Volumes for Treatment Assessment	140	22

Table 6.50 Millmerran-Inglewood Road/Millwood Road right turning treatment volumes

Scenario	Millmerran-Inglewood Road peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Millwood Road (Q_R)
Existing Volumes	149	1
Forecast Volumes without Project (2023)	168	1
Project Traffic	56	21
Volumes for Treatment Assessment	224	22

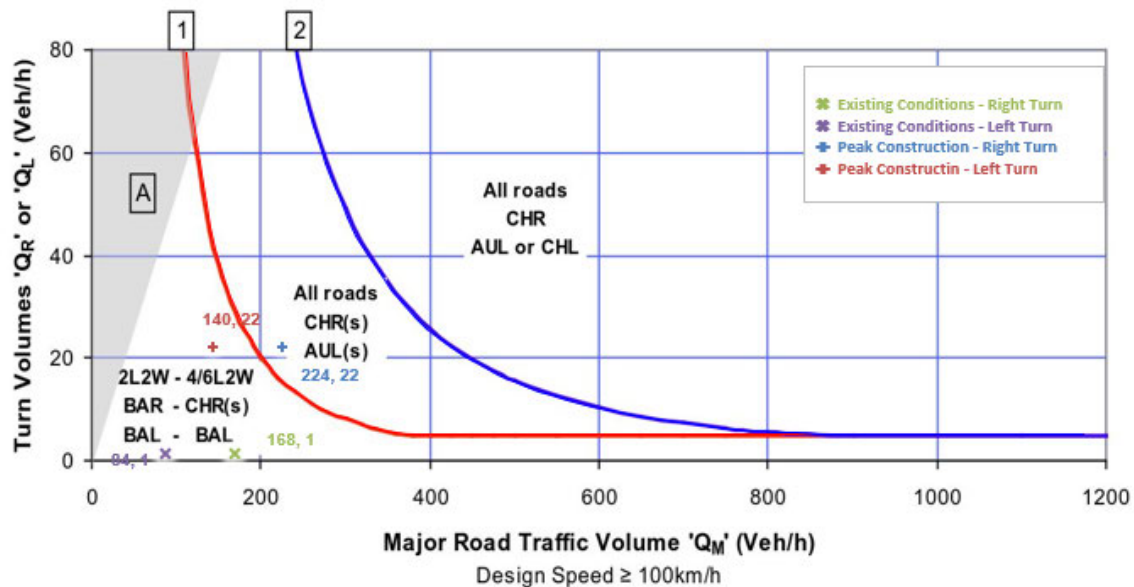


Figure 6.45 Millmerran-Inglewood Road/Millwood Road turning treatment assessment (2023)

Figure 6.45 demonstrates that as a minimum, a CHR(s) turning treatment and a BAL turning treatment are required to accommodate the turning volumes at the Millmerran-Inglewood Road/Millwood Road intersection during construction. The CHR(s) 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 Principal Contractor).

It is noted that this treatment is only required during construction, with the requirements no longer necessary post-construction. Any potential intersection upgrades will be developed in consultation with DTMR and TRC. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised by Principal Contractor and agreed with the relevant asset owners.

6.3.23 Millmerran-Inglewood Road/Kooroongarra Road

The Project construction methodology proposes to utilise the Millmerran-Inglewood Road/Kooroongarra Road intersection located within TRC. Construction vehicles transporting spoil material are expected to access Kooroongarra Road by turning right from Millmerran-Inglewood Road into Kooroongarra Road. No development traffic is proposed to enter Kooroongarra Road from the north.

Currently there are flows along Kooroongarra Road of 993 vehicles per day, two-way. It is assumed this equates to 3 vehicles turning right into Kooroongarra Road from Millmerran-Inglewood Road during the peak hour. A BAR treatment is currently provided at this intersection, as shown in Figure 6.46.

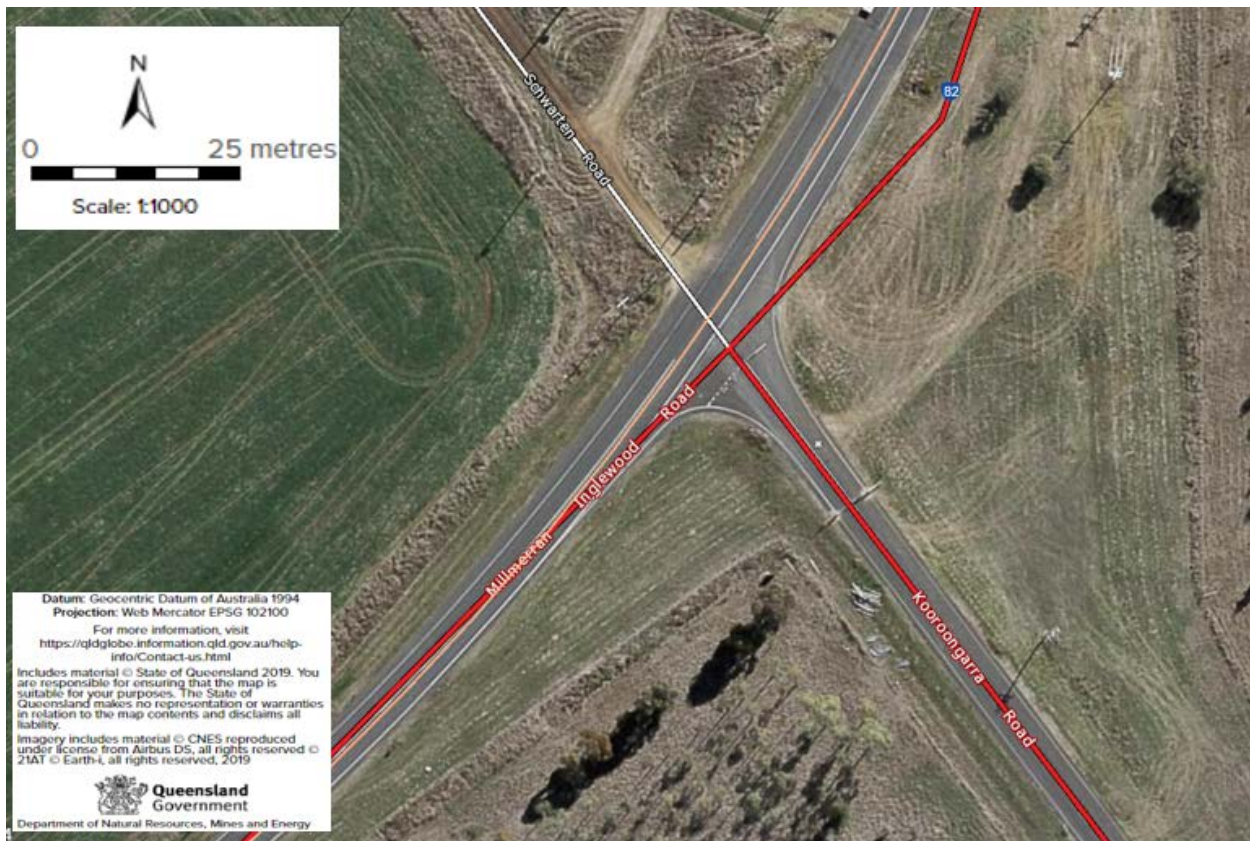


Figure 6.46 Millmerran-Inglewood Road/Kooroongarra Road existing layout

The Project traffic assessment demonstrates that the turning movements into Kooroongarra Road are expected to peak in 2022, with up to 11 vehicles per hour expected to turn into Kooroongarra Road from the Millmerran-Inglewood Road. These turning volumes, along with the through movement volumes on Millmerran-Inglewood Road are summarised in Table 6.51. To determine if turning treatments are required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated Figure 6.47.

Table 6.51 Millmerran-Inglewood Road/Kooroongarra Road right turning treatment volumes

Scenario	Millmerran-Inglewood Road peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Kooroongarra Road (Q_R)
Existing Volumes	149	3
Forecast Volumes without Project (2022)	164	3
Project Traffic	56	11
Volumes for Treatment Assessment	221	14

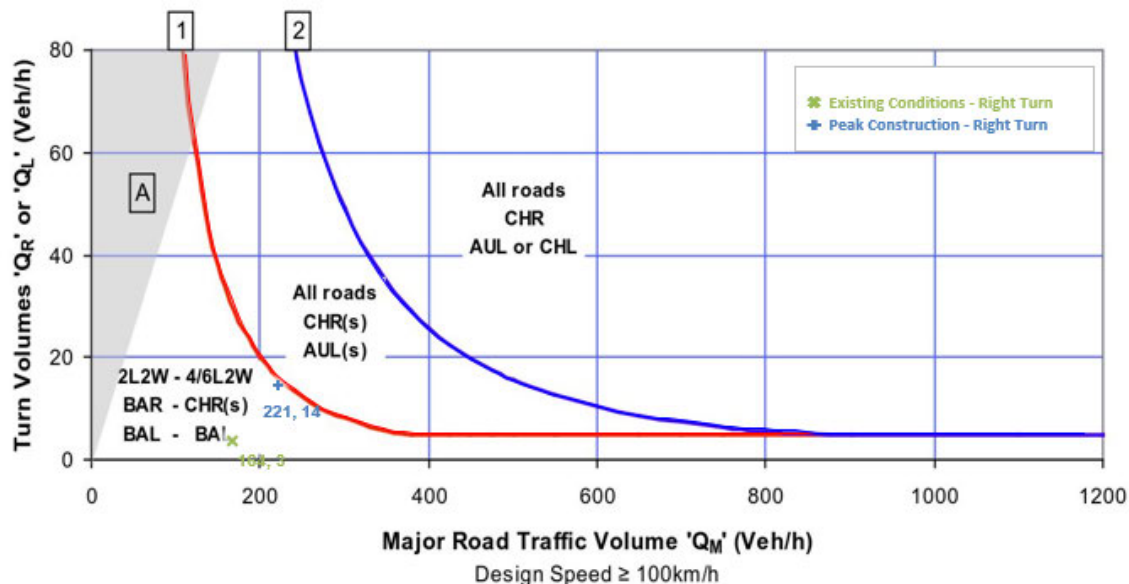


Figure 6.47 Millmerran-Inglewood Road/Kooroongarra Road turning treatment assessment (2022)

Figure 6.47 demonstrates that as a minimum, an CHR(s) turning treatment is required to accommodate the turning volumes at the Millmerran-Inglewood Road/Kooroongarra Road intersection during construction. This 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 Principal Contractor).

It is noted that this treatment is only required during construction, with the requirement no longer necessary post-construction. Any potential intersection upgrades will be developed in consultation with DTMR and TRC. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised by Principal Contractor and agreed with the relevant asset owners.

6.3.24 Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road

The Project construction methodology proposes to include Wellcamp-Westbrook Road, located within TRC, as a main construction route with multiple routes using this road. Construction vehicles transporting quarry materials, water, plant and tools are expected to access this laydown area by turning right from Toowoomba-Cecil Plains Road into Wellcamp-Westbrook Road. No Project traffic is expected to enter Wellcamp-Westbrook Road from the east.

Currently approximately 714 vehicles per day, two-way use Wellcamp-Westbrook Road. It is assumed this equates to 27 vehicles turning right into Wellcamp-Westbrook Road from Toowoomba-Cecil Plains Road during the peak hour. A BAR treatment is currently provided at this intersection, as shown in Figure 6.48.

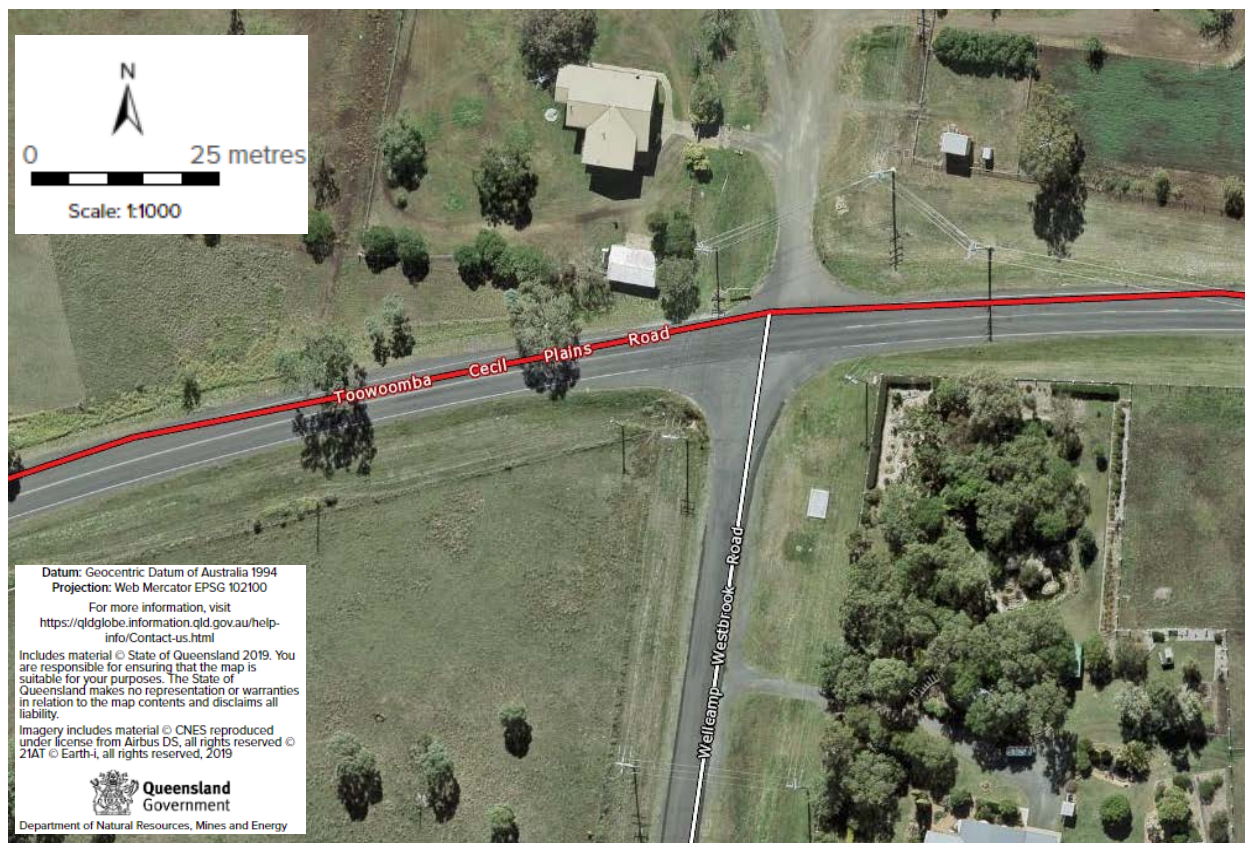


Figure 6.48 Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road existing layout

The Project traffic assessment demonstrates that the turning movements into Wellcamp-Westbrook Road are expected to peak in 2021, with up to 6 vehicles per hour expected to turn into Wellcamp-Westbrook Road from Toowoomba-Cecil Plains Road. These turning volumes, along with the through movement volumes on Toowoomba-Cecil Plains Road are summarised in Table 6.52. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austrroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.49.

Table 6.52 Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road right turning treatment volumes

Scenario	Toowoomba-Cecil Plains Road peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Wellcamp-Westbrook Road (Q_R)
Existing Volumes	821	27
Forecast Volumes without Project (2021)	888	29
Project Traffic	11	6
Volumes for Treatment Assessment	899	35

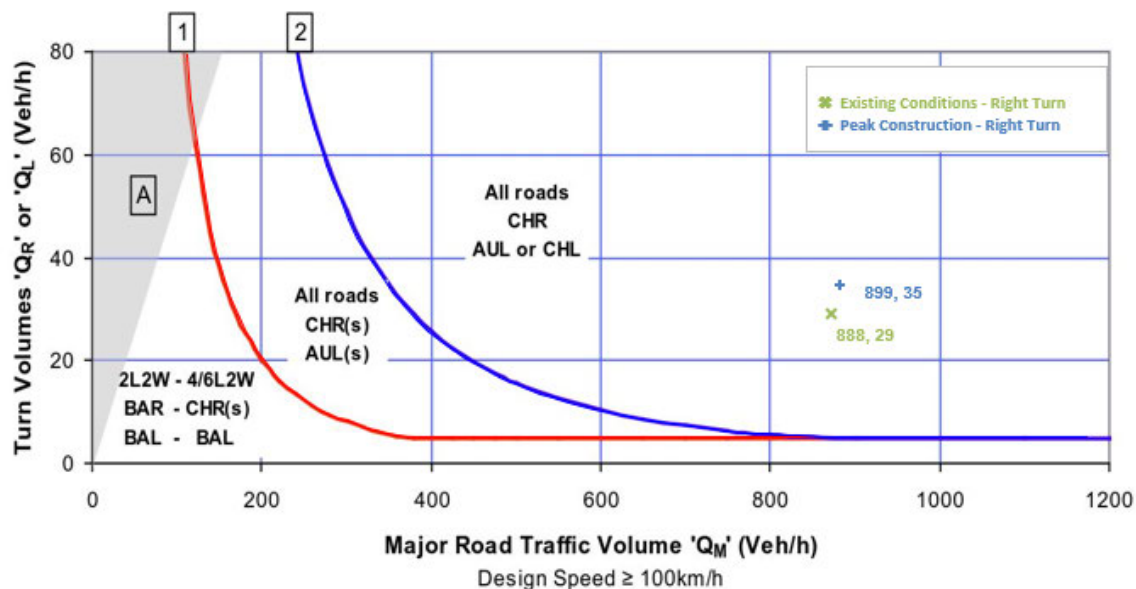


Figure 6.49 Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road turning treatment assessment (2021)

Figure 6.49 demonstrates that as a minimum, a CHR turning treatment is required to accommodate the turning volumes at the Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road intersection during construction. This 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 Principal Contractor).

It is noted that this treatment is warranted under existing conditions given the assumed flows through the intersection. Therefore, detailed assessment is required as part of an updated TIA to confirm this requirement and agreement is required between the design and Principal Contractor and TRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.25 Toowoomba-Cecil Plains Road/Brimblecombe Road

The Project construction methodology proposes to include Brimblecombe Road, located within TRC, as a main construction route, with multiple routes using this road. Construction vehicles transporting concrete, workers and plant and tools are expected to access Brimblecombe Road by turning right from Toowoomba-Cecil Plains Road into Brimblecombe Road. No Project traffic is expected to enter Brimblecombe Road from the west.

Currently approximately 102 vehicles per day, two-way use Brimblecombe Road. It is assumed this equates to 4 vehicles turning right into Brimblecombe Road from Toowoomba-Cecil Plains Road during the peak hour. A BAR treatment is currently provided at this intersection, as shown in Figure 6.50.

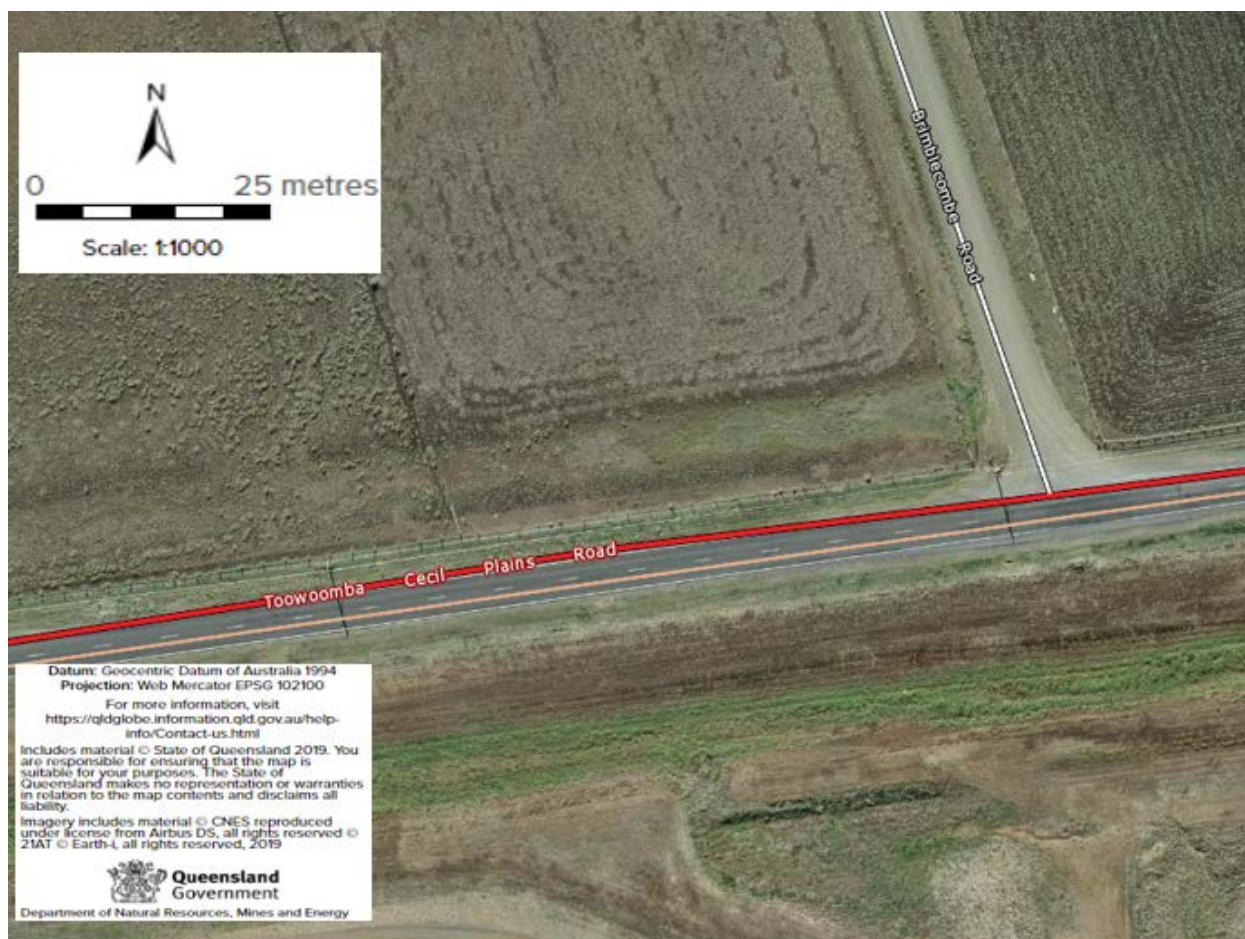


Figure 6.50 Toowoomba-Cecil Plains Road/Brimblecombe Road existing layout

The Project traffic assessment demonstrates that the turning movements into Brimblecombe Road are expected to peak in 2024, with up to 7 vehicles per hour expected to turn into Brimblecombe Road from Toowoomba-Cecil Plains Road. These turning volumes, along with the through movement volumes on Toowoomba-Cecil Plains Road are summarised in Table 6.53. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.51.

Table 6.53 Toowoomba-Cecil Plains Road/Brimblecombe Road right turning treatment volumes

Scenario	Toowoomba-Cecil Plains Road peak hour volume (Q_M for right turn movement)	Peak hour right turn volume into Brimblecombe Road (Q_R)
Existing Volumes	438	4
Forecast Volumes without Project (2024)	503	5
Project Traffic	16	7
Volumes for Treatment Assessment	518	12

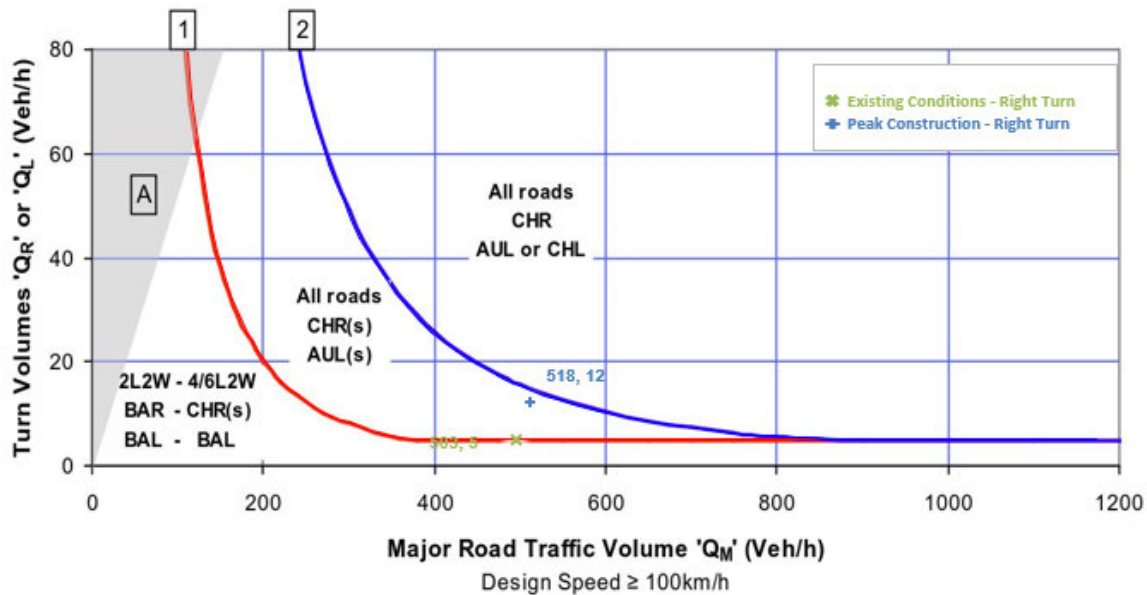


Figure 6.51 Toowoomba-Cecil Plains Road/Brimblecombe Road turning treatment assessment (2024)

Figure 6.51 demonstrates that as a minimum, a CHR(s) turning treatment is required to accommodate the turning volumes at the Toowoomba-Cecil Plains Road/Brimblecombe Road intersection during construction. This will be designed consistent with the requirements of *Austrroads 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 Principal Contractor).

It is noted that this treatment is warranted under existing conditions given the assumed flows through the intersection. Therefore, detailed assessment is required as part of an updated TIA to confirm this requirement and agreement is required between the design and Principal Contractor and TRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.3.26 Greenwattle Street/Alderley Street

The Project construction methodology proposes to utilise the Greenwattle Street/Alderley Street intersection located within TRC. Construction vehicles transporting concrete, water and plant and tools are expected to access Alderley Street by turning right from Greenwattle Street into Alderley Street.

Currently approximately 6234 vehicles per day, two-way use Alderley Street. It is assumed that this equates to 234 vehicles turning right into Alderley Street from Greenwattle Street during the peak hour. A BAR treatment is currently provided at this intersection, as shown in Figure 6.52.

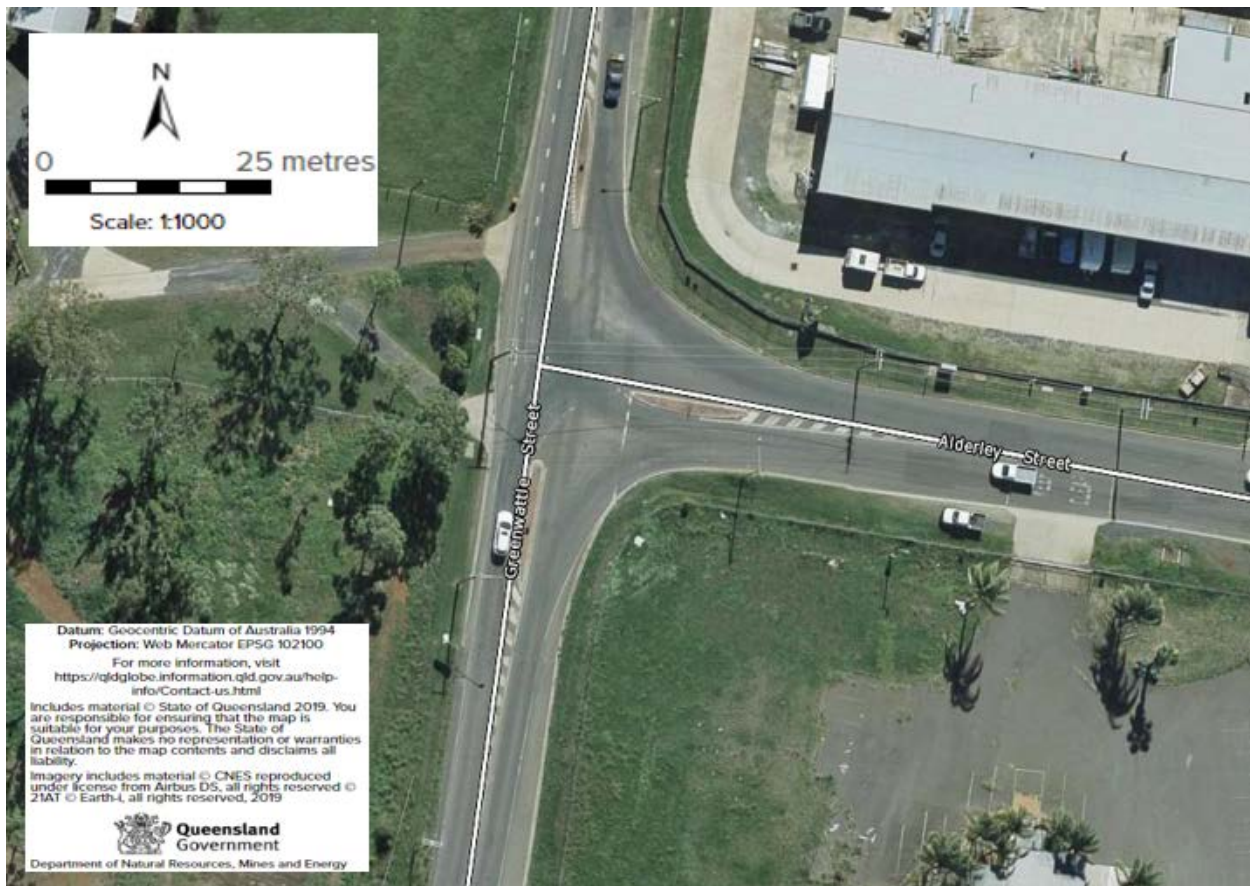


Figure 6.52 Greenwattle Street/Alderley Street existing layout

The Project traffic assessment demonstrates that the turning movements into Alderley Street are expected to peak in 2023, with up to 5 vehicles per hour expected to turn right into Alderley Street from Greenwattle Street. These turning volumes, along with the through movement volumes on Greenwattle Street are summarised in Table 6.54. To determine if a turning treatment is required at the intersection, a turning treatment assessment consistent with the requirements of *Austroads Guide to Traffic Management Part 6* is demonstrated in Figure 6.53.

Table 6.54 Greenwattle Street/Alderley Street right turning treatment volumes

Scenario	Greenwattle Street peak hour volume (Q _M for right turn movement)	Peak hour right turn volume into Alderley Street (Q _R)
Existing Volumes	723	234
Forecast Volumes without Project (2023)	881	280*
Project Traffic	5	5
Volumes for Treatment Assessment	886	285*

Table note:

* Maximum value on turn warrant graph adopted in place of this value

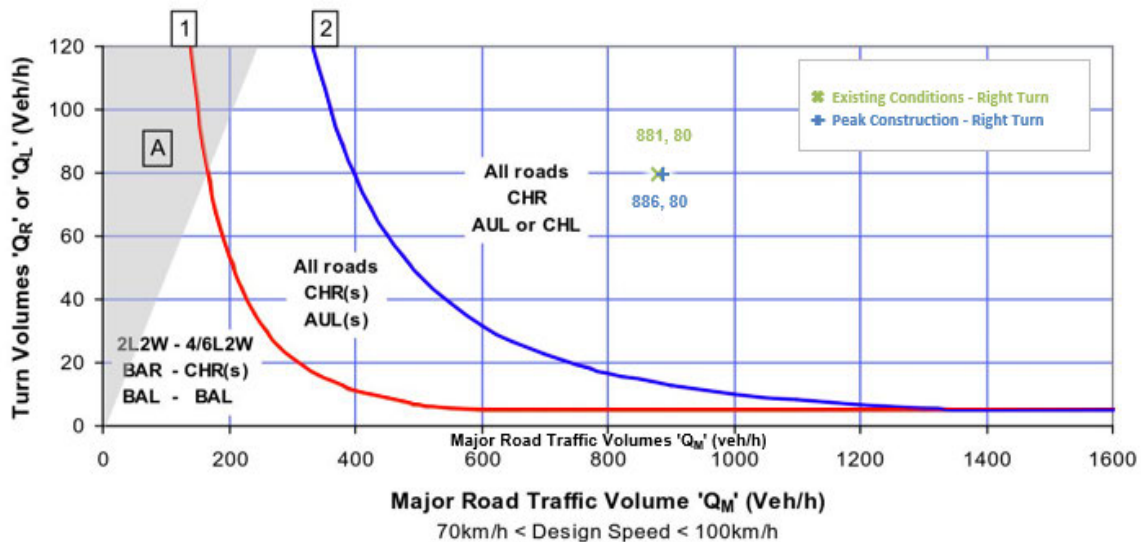


Figure 6.53 Greenwattle Street/Alderley Street turning treatment assessment (2023)

Figure 6.53 demonstrates that a CHR turning treatment is required to accommodate the turning volumes at the Greenwattle Street/Alderley Street intersection during construction. This 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 Principal Contractor).

It is noted that this treatment is warranted under existing conditions based on assumed traffic flows through the intersection. Therefore, detailed assessment is required as part of an undated TIA to confirm requirement and agreement is required between the design and Principal Contractor, DTMR and TRC to determine the responsibility for upgrading this intersection to accommodate the construction traffic. This discussion will be undertaken during the development of the Traffic Management Sub-plan once construction routes are finalised and agreed between the design and Principal Contractor and the asset owners.

6.4 Operation

6.4.1 Workforce

It is anticipated that the ongoing operation and maintenance of the Project will require a workforce of approximately 10 to 15 FTE. The operational workforce will be based at provisioning centres outside the immediate vicinity of the Project.

It is assumed that minimal new trips will be generated as existing trips would be accounted for and the dispersed nature of these trips across the road network would have a minimal impact on road network operational performance. Therefore, a detailed analysis was not considered necessary as part of the TIA.

6.4.2 Maintenance

During the operation phase of the Project, it is anticipated that occasional access to and from the corridor will be required to conduct routine inspection and maintenance works. The existing road network will be used by maintenance crews to travel to the rail corridor. Once in the rail corridor, the RMAR 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 envisaged not to exceed five per cent of base conditions. Therefore, a detailed analysis was not considered necessary as part of the TIA.

6.4.3 Rail crossings

The operational performance of proposed public level rail crossings in the impact assessment area was assessed to provide an understanding of the impacts on performance during operation, also taking into account any potential impact of diverted traffic created by road closures. The rail crossing impact assessment focuses on vehicle delay and queueing analysis, demonstrating how the Project generated traffic impacts on vehicle delays and queueing issues at the rail crossing, and at nearby closely spaced intersections.

Two future year scenarios were analysed; 2026 (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 (only at locations where short stacking might be of impact).

6.4.3.1 Analysis assumptions

Analysis of the level crossings was conducted based on the following inputs:

- The design vehicle (train) considered for the analysis account for a length of 1,800 m in future year 2026 and 1,800 m in year 2040
- Vehicle wait time at passive crossings were calculated by means of using the *Australian Standard 1742.7, Manual of uniform traffic control devices, Part 7: Railway crossings*. The estimated wait time is considered a function of:
 - The distance of the train from the crossing at the point where a driver approaching the rail crossing sights a train, judges a stop is needed, decelerates and stops at a giveaway line
 - The time it takes the train to drive along the distance from where the vehicle sees the train and decides to decelerate
 - The time it takes the train to cross the level crossing
 - Design vehicle consisting of a B-double for input parameters.

The following points describe the assumptions relating to the operation and sequence of operations at active level crossings, vehicle wait times at active level crossings and SIDRA analysis methodology used to determine the traffic impacts of level crossings for the Project.

- Operation of the active level crossings are described as follows:
 - Active level crossings utilise warning devices to warn road users of the approach of a train. The warning devices operate when the approaching train is at a minimum warning time from entering the road-rail interface. The level crossing warning time is defined as the minimum time of operation of the warning equipment for the fastest train from the initiation of the warning sequence until the front of the train reaches the road-rail intersection.
 - For Inland Rail, the minimum warning device protection is defined in the basis of design as being an active level crossing controlled by flashing lights and half boom barriers. The minimum signage, line marking and assembly for this crossings' type is defined in AS 1742.7 and is a RX-5 flashing light assembly and half boom barriers (Note, the standard the term RX-5 is synonymous with the term Type F Highway signal).
 - Operation of this type of crossing requires the warning devices to be initiated and maintained automatically by the detection of a train, using crossing control devices that operate on the approach side of the level crossing. This ensures the correct minimum warning time is obtained.
- Typical active level crossing sequence of operations which were adopted in the assessment are as follows:
 - If no train is approaching the level crossing then the Type F highway signals are extinguished, the half-boom barriers are a fully raised position and no audible warning can be heard

- As a train approaches the level crossing then, at the minimum warning time point ($t=0$), the crossing control devices trigger the Type F highway signals to commence and they continue to flash alternately. At the same time warning bells are also triggered to commence and continue to sound. The minimum warning time in QLD is 25 seconds for Type F lights and boom barrier installations.
- After 11 seconds ($t=11$) time interval the half-boom barriers commence to lower and after an additional 11 to 13 seconds ($t=22-25$) they will reach the fully lowered position and one of the warning bells is silenced. Where there are large articulated vehicles (B triples or Road trains), the delay before the booms commence lowering can be increased by a further 5 seconds to 16 seconds. In this instance the minimum warning time would be increased accordingly.
- After the minimum approach time has expired ($t=25-30$) the front of the approaching train will reach the level crossing
- When the train has cleared the crossing, the booms start to rise to the upright position and the remaining warning bell is silenced. Unless a second train is approaching the level crossing, in the holding section, as the rear of the first train passes clear of the level crossing and there is insufficient time for the half-boom barriers to rise and remain in the fully raised position there set time interval before commencing to lower for the second train, then the boom barriers remain lowered until the rear of the second train has also passed clear of the level crossing.
- After the last train has cleared the level crossing, the booms commence to rise to the upright position and the remaining warning bell will be silenced. The half-boom barriers reach the fully raised position within 10 seconds and the Type F highway signals become extinguished.
- Train speed and train clearance times (s) calculations and assumptions (as obtained from road-rail interface) for the level crossing are as follows:
 - Train clearance times were calculated based on an assumed maximum train speed of 115 km/h
 - Calculation of the freight train acceleration rate
 - Distance of the level crossing from passing loops
 - Distance required to accelerate to maximum turnout speed (50 km/h)
 - Distance travelled while at constant maximum turnout speed
 - Distance required to accelerate to maximum speed after whole train has passed turnout
 - Total distance required to reach maximum speed for train starting from turnout
 - Total vehicle wait time with train length of 1,800 m was estimated to be 104 seconds (including boom closure times).
- Active level crossings were modelled in SIDRA as follows:
 - The railway crossing was represented by a straight road with two phases. A Dummy Movement is specified to represent the train movement in Phase B when vehicle movements are stopped.
 - Phase times have been calculated assuming two trains cross within the peak hour
 - The Minimum Green Time for the Dummy Movement is specified as input so that the road closure time for the train is Minimum Green Time plus the Yellow and All-Red Times for Phase B. The remaining time which is allocated to Phase A which allows vehicles to cross the level crossing.
 - Default SIDRA HV lengths were utilised as the design vehicle, which represents a maximum of medium rigid, heavy truck, articulated truck and bus movements. The average queue space for these vehicles is 13m.
 - Calculated vehicle wait times for each crossing are provided in Table 6.57.
- For the purpose of the analysis it was assumed that there will be two trains per peak hour (i.e. two barrier closures in the peak hour for both existing and with Project traffic scenarios)

- Once operational, the Project will involve an annual average of about 14 train services per day in 2026. 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.

6.4.3.2 Proposed road alteration impacts

The proposed rail crossings result in several road realignments, diversions and closures as discussed in Section 3.3. While these alterations to the external public road network will create permanent diversions, these are not expected to create a significant change to existing traffic patterns and distributions. Associated impacts from road alterations are provided in Table 6.55.

The alterations to the public road network are not expected to be significant at most of these sites as:

- The road network alterations would mainly consist of road realignment whereby existing traffic patterns will be maintained
- Existing geometric lane configurations can be maintained within the newly proposed road realignments.

Table 6.55 Proposed road alterations and associated impacts

Interface ID	Road name	Proposed treatment	Impact
Department Transport and Main Roads			
310-11-E-1	Cunningham Highway (Wondalli Street)	No crossing provided - relocate	Movements using this existing Cunningham Highway (Wondalli Street) interface can use the grade separated crossing proposed to the east of this location (310-11-P-0). Grade Separation consistent with stakeholder consultation feedback. Maintains connectivity with surrounding road network. The stock crossing 310-10-P-1 will be used instead for stock passage.
Goondiwindi Regional Council			
270-12-P-2	Kildonan Road - Stock Reserve	No crossing provided - relocate	No crossing is to be provided at Kildonan Road – Stock Reserve (270-12-P-2), with the relocation of the stock route to the south at proposed grade separated crossing (270-11-P-9a). The bridge for floodplain at this location, approximately 400 m south, provides ideal situation for an alternative path for the stock route.
270-12-P-4	Eukabilla Road	No crossing provided - road divert/re-align	No crossing is to be provided at Eukabilla Road crossing (270-12-P-4), with realignment of Eukabilla Road to the west of the rail alignment to avoid the need for a level crossing. Alternative access is provided at active level crossing at Kildonan Road (270-P-12-1), located approximately 300 m to the south.
270-12-P-6a	Eukabilla Road	No crossing provided - road divert/re-align	No crossing is to be provided at Eukabilla Road crossing (270-12-P-6a), with realignment of Eukabilla Road to the west of the rail alignment to avoid the need for a level crossing. Alternative access is provided at active level crossing at Kildonan Road (270-P-12-1), located approximately 1800 m to the south.
310-14-E-1	Springborg Road	No crossing provided - relocate	Springborg Road to be realigned. This local road provides access from Cunningham Highway to a number of lots north of the rail alignment. Road alterations to the public road network are not expected to create a significant change to existing traffic patterns and distributions. Gate needs to be moved back (on northern side of crossing) by the design vehicle length + an extra 5 m.
310-19-P-8	Unnamed Road	No crossing provided - consolidate	No crossing to be provided at this road-rail interface (310-19-P-8). There is some evidence of informal vehicle passage but no formed track present at this location. This vehicle passage is within a road reserve however topography is not suitable for a crossing. Alternative access provided by the proposed private crossing (310-19-P-5a). This will result in a diversion of approximately 2.2 km.

Interface ID	Road name	Proposed treatment	Impact
310-20-P-7	Unnamed Road	No crossing provided - consolidate	No crossing is to be provided at Unnamed Road (310-20-P-7). This crossing currently provides access to one private property on the northern side of the rail corridor. Alternative access to this lot is provided by 310-20-P-7a level crossing which will require the creation of a public road through 310-20-P-7a from Bybera Road.
310-20-P-12	Bybera Road	No crossing provided - relocate	Bybera Road and Bybera Road crossing (310-20-P-12) services a number of properties, as well as providing the link between the Cunningham Highway and road network to the north-west of the rail alignment. Road network alterations to the public road network are not expected to create a significant change to existing traffic patterns, realigning the road 100 m to the south.
Toowoomba Regional Council			
310-35-P-4a	Heckendorf Road	No crossing provided - road divert/re-align	No crossing is to be provided at Heckendorf Road interface (310-35-P-4a), due to the proposed crossing to the south at Millmerran-Inglewood Road (310-35-P-4). This alternative access will result in a diversion of approximately 800 m.
310-37-P-12	Schwartens Road	No crossing provided - consolidate	No crossing is to be provided at Schwartens Road (310-37-P-12), which has been identified as a stock route. Alternative access to the road reserve to the north is to be achieved through proposed grade separated crossing at Millmerran-Inglewood Road (310-37-P-12a). This alternative access will result in a diversion of approximately 400 m.
310-42-E-1	Fysh Road	No crossing provided - relocate	No crossing is to be provided at Fysh Road interface (310-42-E-1) as the location does not allow sufficient stacking distance for longer vehicles. Alternative access to the Gore Highway is to be provided through the use of (310-42-E-0). This alternative access will result in a diversion of approximately 500 m.
310-46-P-4c	Murlaggan Road	No crossing provided - relocate	No crossing is to be provided at Murlaggan Road (310-46-P-4c). Overhead powerlines run along both sides of Murlaggan Road. Alternative access provided by the proposed new crossing (310-46-P-3), with this alteration resulting in a diversion of approximately 900 m.
310-47-P-1	Kahler Road	No crossing provided - consolidate	No Crossing is to be provided at Kahler Road (310-47-P-1). There is some evidence of informal vehicle passage, but no formed track. Road network alterations to the public road network are not expected to create a significant change to existing traffic patterns.
310-47-P-3	French Road	No crossing provided - road divert/re-align	No crossing is to be provided at French Road (310-47-P-3). Overhead powerline crosses the road at this location. This crossing is to be closed, with French Road realigned and connected to Tip Road, with alternative access provided by the proposed new crossing (310-48-P-1), with this alteration resulting in a diversion of approximately 800 m
310-48-P-9	Quibet Road	No crossing provided - road divert/re-align	No crossing is to be provided at Quibet Road (310-48-P-9), as this road at this location serves solely as an access route for a single property. This crossing is to be closed, with access provided at the grade separated crossing at Oakey-Pittsworth Road (310-48-P-8), with this alteration resulting in a diversion of approximately 800 m.
310-48-P-10	Dallman Road	No crossing provided - road divert/re-align	No crossing is to be provided at Dallman Road (310-48-P-10), as this road at this location serves solely as an access route for a single property. This crossing is to be closed, with access provided at the grade separated crossing at Oakey-Pittsworth Road (310-48-P-8), with this alteration resulting in a diversion of approximately 800 m.

Interface ID	Road name	Proposed treatment	Impact
310-49-P-1	Unnamed Road	No crossing provided - road divert/re-align	No crossing is to be provided at Unnamed Road (310-49-P-1), as the topography does not allow for alignment with the rail at this location. The road is proposed to be realigned with access provided at the grade separated crossing at Lochaber Road (310-49-P-2), with this alteration resulting in a diversion of approximately 400 m.
310-49-P-6	McEwan Lane	No crossing provided - consolidate	No crossing is to be provided at McEwan Lane (310-49-P-6), with the road geometry not ideal for a crossing at this location. Alternative access is maintained via the grade separated crossing at Lochaber Road (310-49-P-2), with this alteration resulting in a diversion of approximately 2000 m.
310-49-P-8	Paint Mine Road	No crossing provided - road divert/re-align	No crossing is to be provided at Paint Mine Road (310-49-P-8). The road is proposed to be realigned with access provided through newly realigned Lochaber Road and grade separated crossing (310-49-P-2), with this alteration resulting in a diversion of approximately 600 m.
310-50-P-5	Geitz Road	No crossing provided - consolidate	No crossing is to be provided at Geitz Road (310-50-P-5), with topography not allowing for an opportunity to provide a level crossing. Consolidation is to be provided at Linthorpe Valley Road crossing (310-50-P-11), with this alternative access resulting in a diversion of approximately 2500 m.
310-51-P-8	Bushy Lane	No crossing provided - road divert/re-align	No crossing is to be provided at Bushy Lane, with road realignment to Biddeston Southbrook Road proposed, and alternative access provided at proposed grade separated crossing Biddeston Southbrook Road (310-51-P-11z). It is not expected that road alterations will result in significant changes to the public road network, with a diversion of approximately 1200 m.
310-52-P-1	Unnamed Road	No crossing provided - road divert/re-align	No crossing is to be provided at Unnamed Road (310-52-P-1), with the road being realigned with proposed grade separated crossing at Biddeston Southbrook Road (310-51-P-11z).
310-53-P-1	Athol School Road	No crossing provided - consolidate	No crossing is to be provided at Athol School Road (310-53-P-1) as the road serves largely as a property access route. The crossing is to be consolidated to passive level crossing at Purcell Road (310-52-P-3), with the road to be realigned to allow for this. It is not expected that road alterations will result in significant changes to the public road network, with a diversion of approximately 1000 m.

6.4.3.3 Site analysed

SIDRA analyses was undertaken at active and passive level crossing locations along the Project alignment to determine the impacts of the operation of the level crossings on the road networks. These analyses were not undertaken at sites which only served low levels of local/occupational volumes.

Table 6.56 provides a summary of the active level crossings and passive level crossings along the Project route. SIDRA analyses were undertaken for all the interfaces in Table 6.56.

Table 6.56 Active/passive level crossing sites (public and formed roads only)

Interface ID ¹	Road name	Proposed treatment
Department Transport and Main Roads		
310-24-P-2	Millmerran-Inglewood Road	Active level crossing
310-40-E-2	Millmerran-Leyburn Road	Active level crossing
Toowoomba Regional Council		
310-30-P-2	Unnamed Road	Passive level crossing

Interface ID ¹	Road name	Proposed treatment
310-31-P-7	Kooroongarra Road	Passive level crossing
310-32-P-4	Paton Road	Passive level crossing
310-33-P-1	Nicol Creek Road	Passive level crossing
310-34-P-1	Millwood Road	Passive level crossing
310-36-P-1	Blackwell Road	Active level crossing
310-36-P-8a	Scraggs Road	Passive level crossing
310-38-P-3	Owens Scrub Road	Active level crossing
310-39-P-1	Lindenmayer Road	Passive level crossing
310-40-E-1	Hall Road	Passive level crossing
310-41-E-6	Gilgai Lane	Passive level crossing
310-42-E-0	Harris Road	Active level crossing
310-43-E-3	Elsden Road	Active level crossing
310-43-E-8	Mann Silo Road	Passive level crossing
310-45-E-1	Longhurst Road	Active level crossing
310-48-P-1	Tip Road	Active level crossing
310-50-P-11	Linthorpe Valley Road	Passive level crossing
310-52-P-3	Purcell Road	Passive level crossing
310-57-P-4	Leesons Road	Active level crossing
Goondiwindi Regional Council		
270-12-P-1	Kildonan Road	Active level crossing
310-4-E-2	South Kurumbul Road	Active level crossing
310-5-P-1	Wondalli-Kurumbul Road	Passive level crossing
310-8-E-0	Unnamed Road	Passive level crossing
310-10-P-1	Unnamed Road	Passive level crossing
310-12-E-1	Suttons Road	Passive level crossing
310-14-E-0	Springborg Road	Passive level crossing
310-16-E-1	Whetstone Access Road	Active level crossing
310-17-P-7a	McDougalls Crossing Road	Active level crossing
310-18-P-8	Cremascos Road	Active level crossing
310-20-P-12z	Bybera Road	Passive level crossing
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
310-28-P-3	Unnamed Road	Active level crossing

Table notes:

1 As shown on Figure 1.2

Analysis results

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 proposed level crossings during a train pass-by have been calculated and are presented in Table 6.57. These wait times have been calculated based on an 1,800 m train moving at 115 km/h.

Table 6.57 Vehicle wait times

Interface ID ¹	Road name	Proposed treatment	Total wait time per closure (seconds)
Department Transport and Main Roads			
310-24-P-2	Millmerran-Inglewood Road	Active level crossing	101
310-40-E-2	Millmerran-Leyburn Road	Active level crossing	91
TRC			
310-30-P-2	Unnamed Road	Passive level crossing	81
310-31-P-7	Kooroongarra Road	Passive level crossing	78
310-32-P-4	Paton Road	Passive level crossing	78
310-33-P-1	Nicol Creek Road	Passive level crossing	78
310-34-P-1	Millwood Road	Passive level crossing	78
310-36-P-1	Blackwell Road	Active level crossing	91
310-36-P-8a	Scraggs Road	Passive level crossing	78
310-38-P-3	Owens Scrub Road	Active level crossing	199
310-39-P-1	Lindenmayer Road	Passive level crossing	126
310-40-E-1	Hall Road	Passive level crossing	78
310-41-E-6	Gilgai Lane	Passive level crossing	78
310-42-E-0	Harris Road	Active level crossing	91
310-43-E-3	Elsden Road	Active level crossing	91
310-43-E-8	Mann Silo Road	Passive level crossing	78
310-45-E-1	Longhurst Road	Active level crossing	91
310-48-P-1	Tip Road	Active level crossing	91
310-50-P-11	Linthorpe Valley Road	Passive level crossing	88
310-52-P-3	Purcell Road	Passive level crossing	78
310-57-P-4	Leesons Road	Active level crossing	91
GRC			
270-12-P-1	Kildonan Road	Active level crossing	97
310-4-E-2	South Kurumbul Road	Active level crossing	101
310-5-P-1	Wondalli-Kurumbul Road	Passive level crossing	78
310-8-E-0	Unnamed Road	Passive level crossing	174
310-10-P-1	Unnamed Road	Passive level crossing	78
310-12-E-1	Suttons Road	Passive level crossing	78
310-14-E-0	Springborg Road	Passive level crossing	78
310-16-E-1	Whetstone Access Road	Active level crossing	104
310-17-P-7a	McDougalls Crossing Road	Active level crossing	190
310-18-P-8	Cremascos Road	Active level crossing	133
310-20-P-12z	Bybera Road	Passive level crossing	78
310-21-P-9	Lovells Crossing Road	Active level crossing	101
310-22-P-9	Thornton Road	Active level crossing	101
310-25-P-3	Grays Road	Passive level crossing	78

Interface ID ¹	Road name	Proposed treatment	Total wait time per closure (seconds)
310-26-P-2	Wongavale-Yugilbar Road	Passive level crossing	78
310-28-P-3	Unnamed Road	Active level crossing	182

Table note:

1 As shown on Figure 1.2

The SIDRA analysis results, which take into account this wait time, have been provided in Table 6.58. The results show the queue and delay associated with the proposed level crossing for the two future year scenarios.

The results indicate that all but two of the level crossings included in the reference design would operate at a LOS A in the AM and PM peak periods in 2026 and 2040. The two remaining level crossings, at Owens Scrub Road and McDougalls Crossing Road, would operate at a LOS B in 2026 and 2040.

The analysis indicates that the length of queueing at each level crossing will be negligible (one car or less) in most instances. Queue lengths will be greatest at Owens Scrub Road where queues of 34.1 m (approximately six light vehicles) in 2026 and 45.5 m (approximately eight light vehicles) in 2040 are predicted.

The analysis indicates that delays at level crossings will, in most instances, be five seconds or less. Owens Scrub Road will have the longest level crossing delays, with 12.1 seconds predicted for 2026 and 12.2 seconds predicted for 2040.

Table 6.58 Proposed level rail crossings – analysis results

Road-rail interface location		Year 2026 (1,800 m train length)				Year 2040 (1,800 m train length)			
		With Project				With Project			
		Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS	Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS
310-24-P-2: Millmerran-Inglewood Road									
AM	Millmerran-Inglewood Road (N)	20	8.8	3.2	A	26	11.6	3.3	A
	Millmerran-Inglewood Road (S)	21	9.7	3.3	A	28	12.8	3.3	A
PM	Millmerran-Inglewood Road (N)	17	7.7	3.2	A	23	10.2	2.7	A
	Millmerran-Inglewood Road (S)	17	7.9	3.2	A	23	10.5	2.7	A
310-40-E-2: Millmerran-Leyburn Road									
AM	Millmerran-Leyburn Road (N)	10	Negligible**	2.7	A	13	Negligible**	2.7	A
	Millmerran-Leyburn Road (S)	11	Negligible**	2.7	A	15	6	2.7	A
PM	Millmerran-Leyburn Road (N)	15	6.3	2.7	A	20	8.3	2.7	A
	Millmerran-Leyburn Road (S)	12	Negligible**	2.7	A	16	6.7	2.7	A
310-30-P-2: Unnamed Road									
AM	Unnamed Road (E)	1	Negligible**	2.6	A	2	Negligible**	2.6	A
	Unnamed Road (W)	1	Negligible**	2.6	A	2	Negligible**	2.6	A
PM	Unnamed Road (E)	1	Negligible**	2.6	A	2	Negligible**	2.6	A
	Unnamed Road (W)	1	Negligible**	2.6	A	2	Negligible**	2.6	A
310-31-P-7: Kooroongarra Road									
AM	Kooroongarra Road (E)	2	Negligible**	2.0	A	3	Negligible**	2.0	A
	Kooroongarra Road (W)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
PM	Kooroongarra Road (E)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Kooroongarra Road (W)	1	Negligible**	2.0	A	2	Negligible**	2.0	A

Road-rail interface location		Year 2026 (1,800 m train length)				Year 2040 (1,800 m train length)			
		With Project				With Project			
		Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS	Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS
310-32-P-4: Paton Road									
AM	Paton Road (E)	5	Negligible**	2.0	A	7	Negligible**	2.0	A
	Paton Road (W)	5	Negligible**	2.0	A	7	Negligible**	2.0	A
PM	Paton Road (E)	2	Negligible**	2.0	A	3	Negligible**	2.0	A
	Paton Road (W)	2	Negligible**	2.0	A	3	Negligible**	2.0	A
310-33-P-1: Nicol Creek Road									
AM	Nicol Creek Road (E)	4	Negligible**	2.0	A	5	Negligible**	2.0	A
	Nicol Creek Road (W)	5	Negligible**	2.0	A	7	Negligible**	2.0	A
PM	Nicol Creek Road (E)	2	Negligible**	2.0	A	3	Negligible**	2.0	A
	Nicol Creek Road (W)	4	Negligible**	2.0	A	5	Negligible**	2.0	A
310-34-P-1: Millwood Road									
AM	Millwood Road (E)	4	Negligible**	2.0	A	5	Negligible**	2.0	A
	Millwood Road (W)	2	Negligible**	2.0	A	3	Negligible**	2.0	A
PM	Millwood Road (E)	2	Negligible**	2.0	A	3	Negligible**	2.0	A
	Millwood Road (W)	4	Negligible**	2.0	A	5	Negligible**	2.0	A
310-36-P-1: Blackwell Road									
AM	Blackwell Road (E)	5	Negligible**	2.6	A	7	Negligible**	2.6	A
	Blackwell Road (W)	1	Negligible**	2.6	A	2	Negligible**	2.6	A
PM	Blackwell Road (E)	1	Negligible**	2.6	A	2	Negligible**	2.6	A
	Blackwell Road (W)	2	Negligible**	2.6	A	3	Negligible**	2.6	A
310-36-P-8a: Scraggs Road									
AM	Scraggs Road N)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Scraggs Road (S)	5	Negligible**	2.0	A	7	Negligible**	2.0	A
PM	Scraggs Road N)	2	Negligible**	2.0	A	3	Negligible**	2.0	A
	Scraggs Road (S)	1	Negligible**	2.0	A	2	Negligible**	2.0	A

Road-rail interface location		Year 2026 (1,800 m train length)				Year 2040 (1,800 m train length)			
		With Project				With Project			
		Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS	Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS
310-38-P-3: Owens Scrub Road									
AM	Owens Scrub Road (N)	43	33.5	12.1	B	57	44.6	12.2	B
	Owens Scrub Road (S)	22	16.4	11.9	B	29	21.7	12.0	B
PM	Owens Scrub Road (N)	33	25.7	12.0	B	44	34.1	12.1	B
	Owens Scrub Road (S)	46	34.1	12.1	B	60	45.5	12.2	B
310-39-P-1: Lindenmayer Road									
AM	Lindenmayer Road (N)	10	Negligible**	4.9	A	13	6.2	4.9	A
	Lindenmayer Road (S)	2	Negligible**	4.9	A	3	Negligible**	4.9	A
PM	Lindenmayer Road (N)	2	Negligible**	4.9	A	3	Negligible**	4.9	A
	Lindenmayer Road (S)	9	Negligible**	4.9	A	11	Negligible**	4.9	A
310-40-E-1: Hall Road									
AM	Hall Road (N)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Hall Road (S)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
PM	Hall Road (N)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Hall Road (S)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
310-41-E-6: Gilgai Lane									
AM	Gilgai Lane (N)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Gilgai Lane (S)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
PM	Gilgai Lane (N)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Gilgai Lane (S)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
310-42-E-0: Harris Road									
AM	Harris Road (N)	7	Negligible**	2.6	A	10	Negligible**	2.7	A
	Harris Road (S)	11	Negligible**	2.7	A	15	Negligible**	2.7	A
PM	Harris Road (N)	9	Negligible**	2.6	A	11	Negligible**	2.7	A
	Harris Road (S)	10	Negligible**	2.7	A	12	Negligible**	2.7	A

Road-rail interface location		Year 2026 (1,800 m train length)				Year 2040 (1,800 m train length)			
		With Project				With Project			
		Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS	Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS
310-43-E-3: Elsdon Road									
AM	Elsden Road (N)	1	Negligible**	2.6	A	2	Negligible**	2.6	A
	Elsden Road (S)	1	Negligible**	2.6	A	2	Negligible**	2.6	A
PM	Elsden Road (N)	2	Negligible**	2.6	A	3	Negligible**	2.6	A
	Elsden Road (S)	1	Negligible**	2.6	A	2	Negligible**	2.6	A
310-43-E-8: Mann Silo Road									
AM	Mann Silo Road (N)	6	Negligible**	2.0	A	8	Negligible**	2.0	A
	Mann Silo Road (S)	4	Negligible**	2.0	A	5	Negligible**	2.0	A
PM	Mann Silo Road (N)	5	Negligible**	2.0	A	7	Negligible**	2.0	A
	Mann Silo Road (S)	5	Negligible**	2.0	A	7	Negligible**	2.0	A
310-45-E-1: Longhurst Road									
AM	Longhurst Road (N)	15	8.0	2.7	A	20	10.6	2.7	A
	Longhurst Road (S)	15	7.9	2.7	A	20	10.5	2.7	A
PM	Longhurst Road (N)	12	6.7	2.7	A	16	8.8	2.7	A
	Longhurst Road (S)	14	7.2	2.7	A	18	9.6	2.7	A
310-48-P-1: Tip Road									
AM	Tip Road (N)	2	Negligible**	2.6	A	3	Negligible**	2.6	A
	Tip Road (S)	4	Negligible**	2.6	A	5	Negligible**	2.6	A
PM	Tip Road (N)	5	Negligible**	2.6	A	7	Negligible**	2.6	A
	Tip Road (S)	4	Negligible**	2.6	A	5	Negligible**	2.6	A
310-50-P-11: Linthorpe Valley Road									
AM	Linthorpe Valley Road (E)	6	Negligible**	2.5	A	8	Negligible**	2.5	A
	Linthorpe Valley Road (W)	6	Negligible**	2.5	A	8	Negligible**	2.5	A
PM	Linthorpe Valley Road (E)	5	Negligible**	2.5	A	6	Negligible**	2.5	A
	Linthorpe Valley Road (W)	7	Negligible**	2.5	A	9	Negligible**	2.5	A

Road-rail interface location		Year 2026 (1,800 m train length)				Year 2040 (1,800 m train length)			
		With Project				With Project			
		Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS	Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS
310-52-P-3: Purcell Road									
AM	Purcell Road (E)	9	Negligible**	2.0	A	11	Negligible**	2.0	A
	Purcell Road (W)	12	Negligible**	2.0	A	16	Negligible**	2.0	A
PM	Purcell Road (E)	12	Negligible**	2.0	A	16	Negligible**	2.0	A
	Purcell Road (W)	10	Negligible**	2.0	A	13	Negligible**	2.0	A
310-57-P-4: Leeson Road									
AM	Leeson Road (N)	6	Negligible**	2.6	A	8	Negligible**	2.6	A
	Leeson Road (S)	2	Negligible**	2.6	A	3	Negligible**	2.6	A
PM	Leeson Road (N)	4	Negligible**	2.6	A	5	Negligible**	2.6	A
	Leeson Road (S)	7	Negligible**	2.6	A	10	Negligible**	2.7	A
270-12-P-1: Kildonan Road									
AM	Kildonan Road (E)	12	Negligible**	3.0	A	16	6.6	3.0	A
	Kildonan Road (W)	12	Negligible**	3.0	A	16	6.8	3.0	A
PM	Kildonan Road (E)	14	Negligible**	3.0	A	16	7.3	3.0	A
	Kildonan Road (W)	14	Negligible**	3.0	A	16	7.5	3.0	A
310-4-E-2: South Kurumbul Road									
AM	South Kurumbul Road (N)	4	Negligible**	3.2	A	5	Negligible**	3.2	A
	South Kurumbul Road (S)	2	Negligible**	3.2	A	3	Negligible**	3.2	A
PM	South Kurumbul Road (N)	4	Negligible**	3.2	A	5	Negligible**	3.2	A
	South Kurumbul Road (S)	6	Negligible**	3.2	A	8	Negligible**	3.2	A
310-5-P-1: Wondali Kurumbul Road									
AM	Wondali Kurumbul Road (N)	4	Negligible**	2.0	A	5	Negligible**	2.0	A
	Wondali Kurumbul Road (S)	2	Negligible**	2.0	A	3	Negligible**	2.0	A
PM	Wondali Kurumbul Road (N)	4	Negligible**	2.0	A	5	Negligible**	2.0	A
	Wondali Kurumbul Road (S)	6	Negligible**	2.0	A	8	Negligible**	2.0	A

Road-rail interface location		Year 2026 (1,800 m train length)				Year 2040 (1,800 m train length)			
		With Project				With Project			
		Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS	Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS
310-8-E-0: Unnamed Road									
AM	Unnamed Road (N)	4	Negligible**	9.1	A	5	Negligible**	9.1	A
	Unnamed Road (S)	2	Negligible**	9.1	A	3	Negligible**	9.1	A
PM	Unnamed Road (N)	4	Negligible**	9.1	A	5	Negligible**	9.1	A
	Unnamed Road (S)	6	Negligible**	9.1	A	8	Negligible**	9.1	A
310-10-P-1: Unnamed Road									
AM	Unnamed Road (N)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Unnamed Road (S)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
PM	Unnamed Road (N)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Unnamed Road (S)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
310-12-E-1: Suttons Road									
AM	Suttons Road (N)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Suttons Road (S)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
PM	Suttons Road (N)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Suttons Road (S)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
310-14-E-0: Springborg Road									
AM	Springborg Road (N)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Springborg Road (S)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
PM	Springborg Road (N)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Springborg Road (S)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
310-16-E-1: Whetstone Access Road									
AM	Whetstone Access Road (E)	2	Negligible**	3.4	A	3	Negligible**	3.4	A
	Whetstone Access Road (W)	1	Negligible**	3.4	A	2	Negligible**	3.4	A
PM	Whetstone Access Road (E)	1	Negligible**	3.4	A	2	Negligible**	3.4	A
	Whetstone Access Road (W)	2	Negligible**	3.4	A	3	Negligible**	3.4	A

Road-rail interface location		Year 2026 (1,800 m train length)				Year 2040 (1,800 m train length)			
		With Project				With Project			
		Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS	Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS
310-17-P-7a: McDougalls Crossing Road									
AM	McDougalls Crossing Road (N)	2	Negligible**	10.8	B	3	Negligible**	10.8	B
	McDougalls Crossing Road (S)	1	Negligible**	10.8	B	2	Negligible**	10.8	B
PM	McDougalls Crossing Road (N)	1	Negligible**	10.8	B	2	Negligible**	10.8	B
	McDougalls Crossing Road (S)	2	Negligible**	10.8	B	3	Negligible**	10.8	B
310-18-P-8: Cremascos Road									
AM	Cremascos Road (N)	25	14.4	5.5	A	33	19.1	5.5	A
	Cremascos Road (S)	5	Negligible**	5.4	A	7	Negligible**	5.4	A
PM	Cremascos Road (N)	5	Negligible**	5.4	A	7	Negligible**	5.4	A
	Cremascos Road (S)	16	9.3	5.5	A	21	12.4	5.5	A
310-20-P-12z: Bybera Road									
AM	Bybera Road (N)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Bybera Road (S)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
PM	Bybera Road (N)	2	Negligible**	2.0	A	3	Negligible**	2.0	A
	Bybera Road (S)	2	Negligible**	2.0	A	4	Negligible**	2.0	A
310-21-P-9: Lovells Crossing Road									
AM	Lovells Crossing Road (N)	1	Negligible**	3.2	A	2	Negligible**	3.2	A
	Lovells Crossing Road (S)	1	Negligible**	3.2	A	2	Negligible**	3.2	A
PM	Lovells Crossing Road (N)	1	Negligible**	3.2	A	2	Negligible**	3.2	A
	Lovells Crossing Road (S)	1	Negligible**	3.2	A	2	Negligible**	3.2	A
310-22-P-9: Thornton Road									
AM	Thornton Road (N)	1	Negligible**	3.2	A	2	Negligible**	3.2	A
	Thornton Road (S)	1	Negligible**	3.2	A	2	Negligible**	3.2	A
PM	Thornton Road (N)	1	Negligible**	3.2	A	2	Negligible**	3.2	A
	Thornton Road (S)	1	Negligible**	3.2	A	2	Negligible**	3.2	A

Road-rail interface location		Year 2026 (1,800 m train length)				Year 2040 (1,800 m train length)			
		With Project				With Project			
		Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS	Volume* (veh/h)	Queue (m)	Delays (seconds)	LOS
310-25-P-3: Grays Road									
AM	Grays Road (E)	2	Negligible**	2.0	A	3	Negligible**	2.0	A
	Grays Road (W)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
PM	Grays Road (E)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Grays Road (W)	2	Negligible**	2.0	A	3	Negligible**	2.0	A
310-26-P-2: Wongavale-Yugilbar Road									
AM	Wongavale-Yugilbar Road (E)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Wongavale-Yugilbar Road (W)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
PM	Wongavale-Yugilbar Road (E)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
	Wongavale-Yugilbar Road (W)	1	Negligible**	2.0	A	2	Negligible**	2.0	A
310-28-P-3: Unnamed Road									
AM	Unnamed Road (E)	1	Negligible**	9.9	A	2	Negligible**	9.9	A
	Unnamed Road (W)	1	Negligible**	9.9	A	2	Negligible**	9.9	A
PM	Unnamed Road (E)	1	Negligible**	9.9	A	2	Negligible**	9.9	A
	Unnamed Road (W)	1	Negligible**	9.9	A	2	Negligible**	9.9	A

Table notes:

* SIDRA modelled volumes may differ slightly from inputs due to rounding

** Queue length less than one car length (6m)

The following proposed public road-rail interfaces are those in Table 6.58 which exhibited queue lengths greater than one vehicle (6 m) in 2026 or 2040 scenarios. These interfaces have been discussed with regards to the queuing implications for the road crossing and the surrounding area, including any short stacking issues.

Millmerran-Inglewood Road (310-24-P-2)

The results of the analysis indicate that the proposed level crossing along Millmerran-Inglewood Road (310-24-P-2) would operate at LOS A in the AM and PM peak in the year 2026 and 2040 with some minor impacts to queueing and delays in each of these scenarios. SIDRA analyses indicate that queues along the south approach would be at most two vehicles in the years 2026 and 2040 AM and PM peaks, with maximum queue lengths reaching 11.6 m on the north approach and 12.8 m on the south approach in the year 2040 AM peak. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

Millmerran-Leyburn Road (310-40-E-2)

The results of the analysis indicate that the proposed level crossing along Millmerran-Leyburn Road (310-40-E-2) would operate at LOS A in the AM and PM peak in the year 2026 and 2040 with minimal impacts to queueing and delays in each of these scenarios. SIDRA analyses indicate that queues along the south approach would be negligible in the year 2026 and 2040 AM and PM peaks, with maximum queue length along the north approach being 8.3 m in the year 2040 PM peak. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

Owens Scrub Road (310-38-P-3)

The results of the analysis indicate that the proposed level crossing along Owens Scrub Road (310-38-P-3) would operate at LOS B in the AM and PM peak in the year 2026 and 2040 with some impacts to queueing and delays in each of these scenarios. The operational LOS calculated is primarily due to the 199 second level crossing closure time, rather than the traffic volumes. SIDRA analysis indicates that queues along the north approach would be at greater in the AM peak, being 33.5m in the year 2026 AM and 44.6m in the year 2040 AM. However, the south approach would have a greater queue length in the PM peak, being 34.1 m in the year 2026 PM peak and 45.5 m in the year 2040. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

Lindenmayer Road (310-39-P-1)

The results of the analysis indicate that the proposed level crossing along Lindenmayer Road (310-39-P-1) would operate at LOS A in the AM and PM peak in the year 2026 and 2040 with minimal impacts to queueing and delays in each of these scenarios. SIDRA analyses indicate that queues along the south approach would be negligible in the year 2026 and 2040 AM and PM peaks, with maximum queue length along the north approach being 6.2 m in the year 2040 AM peak. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

Longhurst Road (310-45-E-1)

The results of the analysis indicate that the proposed level crossing along Longhurst Road (310-45-E-1) would operate at LOS A in the AM and PM peak in the year 2026 and 2040 with minimal impacts to queueing and delays in each of these scenarios. SIDRA analyses indicate that a maximum queue lengths along the south and north approach would occur in the AM peak of 2040, being 10.5m and 10.6m respectively. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

Kildonan Road (270-12-P-1)

The results of the analysis indicate that the proposed level crossing along Kildonan Road (270-12-P-1) would operate at LOS A in the AM and PM peaks in the year 2026 and 2040 with minimal impacts to queueing and delays in each of these scenarios. SIDRA analysis indicates that the maximum queue length along the east approach of the crossing would be 7.3m in the 2040 PM peak, with maximum queue length along the west approach being 7.5m in the 2040 PM peak. These modelled queue lengths do not have an impact on any existing adjacent intersections with the closest intersection being the Kildonan Road/Eukabilla Road intersection located approximately 160 m west of the site. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

McDougalls Crossing Road (310-17-P-7a)

The results of the analysis indicate that the proposed level crossing along McDougalls Crossing Road (310-17-P-7a) would operate at LOS B in the AM and PM peak in the year 2026 and 2040 with minimal impacts to queueing and delays in each of these scenarios. The operational LOS calculated is primarily due to the 190 second level crossing closure time, rather than the traffic volumes. SIDRA analysis indicates that queues along the south and north approaches would be negligible in the year 2026 and 2040 AM and PM peaks. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

Cremascos Road (310-18-P-8)

The results of the analysis indicate that the proposed level crossing Cremascos Road (310-18-P-8) would operate at LOS A in the AM and PM peak in the year 2026 and 2040 with minimal impacts to queueing and delays in each of these scenarios. SIDRA analyses indicate that queues along the north approach would be negligible in the year 2026 and 2040 PM peaks, with maximum queue length in the AM peak of 2040 being 19.1 m. The south approach queue length would be negligible in the year 2026 and 2040 AM peak, with maximum queue length in the PM peak of 2040 being 12.4 m. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

For all road-rail interfaces, with the Project represents worst case scenario. Results indicate that existing crossings would operate at LOS A or B with the Project. This will also be the case without the Project.

6.5 Other road impacts

As part of the TIA, Project impacts other than those affecting the existing road network were considered. These other impacts include impacts on stock routes, cycling and pedestrian networks, public transport networks, accesses and operation of emergency services.

6.5.1 Impacts on emergency services

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

- Increased journey times on road linkages utilised by construction traffic
- Increased waiting time at intersections utilised by construction traffic
- Temporarily altered driving conditions in proximity to construction areas, such as reduced speed limits, mobile traffic lights and lane reconfigurations.

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

During construction and operation, response times for emergency services may be delayed if they encounter significant roadworks or passing trains at level crossings. ARTC will work with the relevant emergency services 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.

The QFES, QAS and QPS will all be consulted in order to identify suitable emergency access points to the rail corridor.

6.5.2 Stock routes impacts

The 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 6.59.

Connectivity of the local stock route network, with and without the Project, is shown in figures included in Chapter 5: Project description.

Table 6.59 Potential impacts to stock routes within the Project footprint

Location and Project interface point (approximate chainage)	Stock route ID, type, status and class	Proposed treatment
Kildonan Road Ch 33.1 km (NS2B)	ID: 005GWND Type: Road Status: Open Class: Primary	A rail-over-road crossing of Kurumbul Road will be provided, allowing stock movement to pass under the railway at the same location.
Rainbow Reserve and Eukabilla Road Ch 33.4 km (NS2B)	ID: RAINBOW RESERVE Type: Reserve Status: Open Class: Primary	Eukabilla Road will be realigned to run parallel to 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.
Wondalli-Kurumbul Road and Yelarbon-Kurumbul Road Ch 7.2 km	ID: 081GWND Type: Road Status: Open Class: Secondary	A passive level crossing will be provided, allowing stock movement across the railway at the same location.
Yelarbon Ch 25.4 km	ID: 811GWND Type: Road Status: Open Class: Minor and unused	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.
East of Sawmill Road Ch 27.0 km	ID: RESERVE Type: Reserve Status: Open Class: Minor and unused	The usability of this stock reserve is not expected to be impacted by the Project. Therefore no treatment is proposed.
Lovells Crossing Road Ch 65.8 km	ID: 813GWD Type: Road Status: Open Class: Minor and unused	A rail-over-road crossing of Lovells Crossing Road will be provided, allowing stock movement to pass under the railway at the same location.
Millmerran-Inglewood Road (Inglewood) Ch 73.1 km to Ch 76.5 km	ID: 820GWD Type: Road Status: Open Class: Minor and unused	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.

Location and Project interface point (approximate chainage)	Stock route ID, type, status and class	Proposed treatment
Millmerran-Inglewood Road (Inglewood) Ch 84.2 km	ID: 820GWD Type: Road Status: Open Class: Minor and unused	An underpass through the railway embankment will be provided to ensure continued connectivity for stock movement along Millmerran-Inglewood Road.
Koorongarra-Anderson Road Ch 96.1 km	ID: 856TOOW Type: Road Status: Open Class: Minor and unused	A passive level crossing will be provided, allowing stock movement across the railway at the same location.
Millmerran-Inglewood Road (near Heckendorfs Road) Ch 115.5 km	ID: 820TOOW Type: Road Status: Open Class: Minor and unused	A rail-over-road grade separated crossing will be provided, allowing continuation of existing stock movements along Millmerran-Inglewood Road at this location.
Koorongarra Road (Commodore Mine) Ch 127.2 km	ID: 820TOOW Type: Road Status: Open Class: Minor and unused	A rail-over-road grade separated crossing will be provided, allowing continuation of existing stock movements along Millmerran-Koorongarra Road and Millmerran-Inglewood Road at this location.
Warrego Highway Ch 203.01 km	ID: No ID – Unused Type: Road Status: Open Class: Minor and unused	A rail-over-road grade separated crossing will be provided, allowing continuation of existing stock movements along the Warrego Highway at this location.

Consultation with GRC, TRC, DNRME 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 detail design phase and as the construction approach is confirmed to further ensure that potential impacts are appropriately managed. For example, construction activities for the Project may result in temporary disruption to the connectivity of the stock route network, particularly in and around the rail-road interface locations.

In addition to the State stock route network, there may also be private stock routes which are used to transfer stock to various grazing paddocks and holding yards within or across the Project footprint. Consultation is ongoing with individual landowners within the Project footprint to identify property-specific impacts, if any, to private stock routes.

Any required works are to be identified in the ongoing RUMP prepared to support the Project.

6.5.3 Impacts on existing rail facilities

6.5.3.1 Works in existing rail corridor

The Project utilises approximately 46.8 km of the existing rail corridor for the South Western Line and approximately 24.4 km of the existing rail corridor for the Millmerran Branch Line.

The South Western System 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.

Poorly timed track closures and inadequate consultation and communication could have significant adverse impacts (cost and potentially reputational) for Queensland stakeholders in international supply chains currently reliant on the South Western System.

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 would require agreement with QR, in the form of an interface agreement, and would result in short to medium-term 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.

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 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 need to 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 TI Act, 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, then 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 detail design and construction planning regarding the identification of an acceptable construction method within existing rail corridor.

6.5.3.2 Existing sidings and loops

The Project will provide for continued connectivity to existing sidings and loops. As a consequence, impacts to these features is expected to be confined to the construction phase of the Project whilst 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 whilst 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.

6.5.3.3 Rail deliveries

Approximately 37,260 tonnes of rail are required for the Project. It is assumed that rail will be supplied by a single source and will be distributed via the existing QR rail network (Western Line, Millmerran Branch and the South Western Line) to designated laydown areas along the Project alignment. Where further transportation is required to distribute rail to designated areas along the Project alignment, road networks will be utilised to achieve this.

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 (six of the twelve months). Based on the total numbers and monthly variance of train movements on both of these existing rail lines (refer Sections 2.3.1 and 2.3.2), it is anticipated that if rail deliveries to site are via existing rail network, that the additional rail movements would be within the operational capacity of the networks utilised 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 (detail design phase). 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.

6.5.4 Public transport impacts

The existing public transport services that have potential to be impacted by the Project have been identified in Section 2.2.3.

Generally, temporary traffic controls (e.g. reduced speed limits, temporary traffic lights, etc.) and/or an increase in construction traffic, particularly HV traffic, have the potential to impact the operation of public transport services. Eleven public transport services have been identified with routes that are proposed to be used, in part, by construction traffic for the Project. None of the 11 public transport routes traverse, or are in proximity to, the Project footprint. 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. Whilst roads used by the 11 identified services may be utilised by construction vehicles, the roads will not require temporary traffic controls. Therefore, driving conditions on roads used by public transport services will remain unchanged.

A five per cent traffic comparison analysis was undertaken for all roads proposed to be used by construction traffic for the Project (refer Section 6.2.1). None of the roads used by the 11 public transport routes are projected to experience an increase in vehicle movements of five per cent or more. Therefore, 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.

TransLink will be consulted as part of the detail design and construction planning phase of the Project to identify public transport service constraints on the local road network. Other service operators would be consulted, as required.

6.5.5 School bus service impacts

The increase in construction traffic, particularly HV traffic, has the potential to impact the journey time and safety of school bus routes. The school bus services detailed below are likely to be impacted by the proposed rail alignment. 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 6.60.

Table 6.60 Potential impacts to school bus services due to upgraded or new road-rail intersection

School bus service	Potential impact
P1883 AM and PM Service Athol to Bunker's Hill State School	There is one new road-rail interface in the reference design for the Project that is located on the route for this bus service. The interface, 310-53-P-1 Athol School Road, will not have a rail crossing provided. Instead, traffic will be re-directed to use the passive level crossing provided at Purcell Road (310-52-P-3). This is a diversion of approximately 1 km, which may add a few minutes to travel time for this bus service.
P473 Yuraraba to Inglewood State School	There is one new road-rail interface in the reference design for the Project that is located on the route for this bus service. The interface, 310-24-P-2 Millmerran-Inglewood Road, has an active level crossing provided in the reference design. A wait time of approximately 101 seconds is expected at this crossing during a train pass-by (refer Table 6.57).
P510 Southbrook North to Southbrook Central State School	There are two new road-rail intersections in the reference design for the Project that are located on the route for this bus service, being 310-50-P-11 Linthorpe Valley Road and 310-51-P-11z Biddeston-Southbrook Road. 310-50-P-11 Linthorpe Valley Road has a passive level crossing provided in the reference design. A wait time of approximately 88 seconds is expected at this crossing during a train pass-by (refer Table 6.57). A rail-over-road grade separation is proposed at 310-51-P-11z Biddeston-Southbrook Road. Impacts to services passing through this location will be confined to construction of the Project. Once operational vehicular movements at this location are expected to be unimpeded.
P522 Mt Emlyn area to Millmerran State School	There is one new road-rail interface in the reference design for the Project that is located on the route for this bus service, being 310-37-P-12a Millmerran-Inglewood Road. A rail-over-road grade separation is proposed at 310-37-P-12a Millmerran-Inglewood Road. Impacts to services passing through this location will be confined to construction of the Project. Once operational, vehicular movements at this location are expected to be unimpeded.

School bus service	Potential impact
P772 AM and PM Service Tumaville to Millmerran State School	There are two existing rail crossings that are located on the route for this bus service, being 310-40-E-2 Millmerran-Leyburn Road and 310-42-E-1 Fysh Road. It is proposed that 310-40-E-2 Millmerran-Leyburn Road be upgraded from a passive level crossing to an active level crossing for the Project. Minor, temporary delays may be encountered at this location during construction as formation, track and signalling upgrades occur. During operation, impacts experienced at this location will be as a result of re-commenced rail operations along this section of rail corridor and the need to wait during train pass-bys. The network at this location has been non-operational since being damaged by floods in 2011. A rail crossing is not provided in the reference design at 310-42-E-1 Fysh Road. Instead, traffic will be re-directed to use the active level crossing provided at Harris Road (310-42-E-0). This is a diversion of approximately 500 m, which may add a few minutes to travel time for this bus service.
P938 Bringalily to Millmerran State School	There are two new road-rail intersections in the reference design for the Project that are located on the route for this bus service, being 310-35-P-4 Millmerran-Inglewood Road and 310-37-P-12a Millmerran-Inglewood Road. Rail-over-road grade separations are proposed at both of these intersection locations. Impacts to services passing through these locations will be confined to construction of the Project. Once operational, vehicular movements at these locations are expected to be unimpeded.
P957 AM and PM Service Ivanhoe to Millmerran State School	There are two new road-rail intersections in the reference design for the Project that are located on the route for this bus service, being 310-37-P-12a Millmerran-Inglewood Road and 310-38-P-3 Owens Road. A rail-over-road grade separation is proposed at 310-37-P-12a Millmerran-Inglewood Road. Impacts to services passing through this location will be confined to construction of the Project. Once operational, vehicular movements at this location are expected to be unimpeded. 310-38-P-3 Owens Road has an active level crossing provided in the reference design. A wait time of approximately 199 seconds is expected at this crossing during a train pass-by (refer Table 6.57).
S118 AM and PM Service Pittsworth to Brookstead Area	There are two road-rail intersections in the reference design for the Project that are located on the route for this bus service, one existing crossing (310-44-E-2 Gore Highway) and one new (310-46-E-1 Yarranlea Road). Rail-over-road grade separations are proposed at both of these locations in the reference design. Impacts to services passing through these locations will be confined to construction of the Project. Once operational, vehicular movements at these locations are expected to be unimpeded.
S178 Kingsthorpe Secondary to Harristown State High School	There is one new road-rail interface in the reference design for the Project that is located on the route for this bus service, being 310-56-P-2 Warrego Highway. A rail-over-road grade separation is proposed at 310-56-P-2 Warrego Highway. Impacts to services passing through this location will be confined to construction of the Project. Once operational, vehicular movements at this location are expected to be unimpeded.
S577 Kingsthorpe/Wellcamp to Harristown State High School	There is one new road-rail interface in the reference design for the Project that is located on the route for this bus service, being 310-56-P-2 Warrego Highway. A rail-over-road grade separation is proposed at 310-56-P-2 Warrego Highway. Impacts to services passing through this location will be confined to construction of the Project. 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	There are two road-rail intersections in the reference design for the Project that are located on the route for this bus service, one existing crossing (310-44-E-2 Gore Highway) and one new (310-46-E-1 Yarranlea Road). Rail-over-road grade separations are proposed at both of these locations in the reference design. Impacts to services passing through these locations will be confined to construction of the Project. Once operational, vehicular movements at these locations are expected to be unimpeded.

6.5.6 State strategic touring routes

Although some strategic touring routes utilise roads that have been identified for use by construction traffic, the short term nature of the construction phase would result in only temporary impacts to these routes.

6.5.7 Access and egress

Construction vehicle access to the proposed rail corridor is proposed to be via the existing road network in conjunction with access tracks within the rail corridor. These access points must be chosen such that adequate sight distance and 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 detail design stages.

The following laydown areas will have to be accessed directly off a DTMR road (Cunningham Highway, Millmerran-Inglewood Road, Gore Highway, Warrego Highway, Pittsworth-Tummalville Road).

Each construction site access location along the Project alignment requiring access directly off/onto a DTMR road will need to be negotiated with and approved by DTMR.

In particular, the proposed access points off the Cunningham Highway, Millmerran-Inglewood Road, Gore Highway, Warrego Highway, Pittsworth-Tummalville will be investigated in further detail, and approved by DTMR prior to construction commencing. Further details have been provided in Section 5.6.11.

All construction access points will be designed in accordance with Australian Standards with adequate sight lines to ensure they operate in a safe and efficient manner. In addition, where possible, access will be provided from secondary roads to minimise the potential disruptions to the nearby arterial road network.

Where the proposed rail line is in proximity to the arterials with limited alternative access routes, specific traffic management will be put in place reflecting the prevailing conditions. Where possible, access will be along the rail corridor from a nearby secondary road. Encroachment of construction works into existing road reserves is not anticipated.

6.5.8 Cycling and pedestrian network

Construction of the Project has the potential to result in the following impacts to existing active transport networks within the impact assessment 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 HV movements through these locations may adversely impact pedestrian movements. However, most of these routes are currently facilitating a high proportion of HV movements. Therefore, the addition of construction traffic to these routes is unlikely to result in a significant increase in risk to pedestrians.

6.5.8.1 Operation

Several existing cycleways have been identified within the impact assessment area (refer Section 2.4). Of these networks only one along the Warrego Highway, (between Tor Street and Kingsthorpe-Haden Road, Charlton/Gowrie Mountain) is directly intersected by the Project alignment. A grade separated, rail-over-road crossing is provided in the reference design at this location. Therefore, there will be no connectivity impacts to this cycleway.

There are no dedicated pedestrian level crossings of the rail corridor included in the reference design.

7 Pavement impact assessment

A preliminary desktop pavement impact assessment was undertaken on all envisaged affected DTMR and RMS SCRs based on the existing background traffic data available for the relevant road sections. The HV component of the AADT was calculated for the construction period by adopting the background HV percentages from the traffic data.

All base pavement loading SAR were calculated as granular pavement with thin bituminous surfacing with a load damage unit equivalent to ESA/SAR4 and load damage exponent 4, irrespective of pavements containing one or more bound layers for both DTMR and RMS roads. This is because raw road asset data from DTMR does not capture loaded and unloaded HV movements which do not make it feasible to calculate SAR5 and SAR12 (load damage units applicable to pavements with one or more boundary layers). For Project purposes all generated traffic pavement loading also accounts for SAR4 irrespective of pavement type.

The SAR for the background HV component was calculated based on the HV splits for the relevant road sections. Where the number of SAR of the additional Project related traffic equals or exceeds the existing pavement life, the pavement is considered to be impacted and further assessment (detail design) separate to the TIA is required.

Pavement impact assessments were not conducted for affected LGRs as the GTIA applies to SCR. Alternative mitigation measures will be developed such as road visual condition assessments prior, during and post construction and returning the road to original condition once construction is finished. Such mitigation measures will be developed through consultation with relevant Councils prior to the commencement of construction.

The pavement impact assessment is for use in this report only and is not proposed to be used for pavement design. It is based on assumed feasibility construction routes and will be revised with an updated TIA when construction routes are finalised.

An updated version of the GTIA was released in December 2018, after the ToR for the Project were released. This updated version included requirements to provide additional clarification on the pavement impact assessment. This TIA has been undertaken consistent with the 2017 GTIA, consistent with the ToR, which is also generally in accordance with the 2018 GTIA (and with no material implications to assessment outcomes). Irrespective of the GTIA version, a detailed pavement impact assessment is not feasible at this point in the Project development and planning, as construction traffic routes remain subject to confirmation. As per the GTIA, the TIA will need to be finalised when Principal Contractor is appointed, and the final traffic generation is clearer. Future revisions to the TIA, specifically the pavement impact assessment, will be in accordance with the 2018 GTIA, and the associated Pavement Impact Assessment Practice Note.

7.1 Methodology

The pavement assessment as part of the TIA process has been undertaken for SCR road links where the Project generated traffic SAR exceeds five per cent of the base traffic SAR in either direction on the link in the year of analyses. The impacts on pavements have been identified and mitigation measures proposed to avoid, reduce or mitigate the effects on pavement life from Project traffic.

An increase in the total vehicle and HV movements on the existing road network has the potential to result in the accelerated degradation of the trafficable surface. Construction activities are likely to involve intensive, short-term haulage and the pavement impacts of this haulage over the construction period were also assessed.

The following approach was adopted for the preliminary desktop pavement impact assessment for affected State-controlled roads:

- 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 SARs based on the assumed number of SARs per vehicle
- A five per cent impact comparison of the background SARs (as calculated in Section 4.3) and Project generated SARs was conducted for each road link identified to be most likely impacted by the Project.

The construction routes assumed as a part of this assessment are routes which the Principal Contractor may use. However, ultimately, the determination of the final construction and HV routes will be subject to consultation between DTMR, the relevant Councils, ARTC and the Principal Contractor prior to the commencement of construction. The below analysis will be undertaken as a part of an updated TIA when the final construction routes are confirmed by the Principal Contractor:

- Determine if the Project-generated SAR pavement loading will consume the remaining design life pavement capacity during the impact mitigation period on any section of the road network. Project generated SAR will be applied to base SAR and compared to existing allowable SAR capacities. This will graphically be represented for each link over a 20-year design life.
- Where the remaining SAR capacity is consumed, undertake a pavement design for that section of pavement to return the pavement to its pre-Project SAR capacity at the end of the impact mitigation period. The pavement design is separate to a Traffic Impact Assessment and considered to be dealt with as part of the detail design and construction. The TIA will indicate whether the remaining SAR capacity will be consumed and if a pavement design will be required.
- For marginal SAR impacts, defined as cases where the remaining pavement SAR capacity will not be consumed during the impact mitigation period, the relevant marginal cost rate per SAR-km from DTMR's marginal cost database (as detailed following) for each SCR section in the impact assessment area will be identified. As per the GTIA, the contribution required to offset pavement impacts is calculated using the following formula:

$$\text{Pavement Contribution} = \sum_{i=1}^n ((C + O)_i \times MC_i \times L_i)$$

Where:

- I is each road segment triggered
- C is construction period SARs
- O is operational period SARs for the impact mitigation period
- MC is the relevant marginal cost (per SAR-km) prescribed in the department's database for each road segment
- L is the length of road section in km
- N is the number of road segments triggered in the impact assessment area.

7.2 Assumptions

Table 7.1 shows the Austroads vehicle types by construction activity that have been adopted for the assessment.

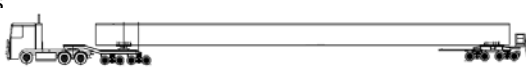
Table 7.1 Vehicle types by construction activity

Construction activity	Vehicle class
Sleepers	Austroads Class 10
Quarry	Austroads Class 10
Precast concrete - culverts	Austroads Class 9
Precast concrete – bridges	OSOM vehicle
In situ concrete	Austroads Class 5

Construction activity	Vehicle class
Water	Austrroads Class 7
Spoil	Austrroads Class 10
Workforce movement	Austrroads Class 1

The SAR parameters used for the construction vehicles are provided in Table 7.2. To ensure no underestimation of SARs in any direction, fully loaded vehicles have been assumed in both directions. This is considered a conservative assumption and will be confirmed by the Principal Contractor.

Table 7.2 Project traffic SAR parameters (SAR per heavy vehicle)

Vehicle classes		Total fully loaded SAR/HV
Class 5 4 Axle Rigid Truck (27.5 tonne)		4.087
Class 7 4 Axle Semitrailer (31.5 tonnes)		5.019
Class 9 6 Axle Semitrailer (42.5 tonne)		4.93
Class 10 7 Axle B-Double (55.5 tonne)		7.72
Assumed OSOM for Precast concrete bridges Unloaded Class 3 Rigid Truck with 4 Axle Dolly and 4 Axle Jinker (70t payload)		12.21

The SAR4/HV values in Table 7.2 were sourced from DTMR's *Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment*. The SAR4/HV for the OSOM vehicle to transport the 29 metre Super-T precast concrete bridge elements was calculated consistent with *Austrroads Guide to Pavement Technology Part 2: Pavement Structural Design*.

7.3 Analysis and findings

The pavement analysis provides a five per cent comparison of the background traffic SAR and Project generated SAR for each SCR link that is proposed to be used by construction traffic. The outputs of this analysis is presented in Table 7.3.

Table 7.3 Five per cent standard axle repetitions comparison

Road Name	Road Section	2021	2022	2023	2024	2025	2026
State Controlled Roads: Transport and Main Roads							
Barwon Highway	31A - Between Leichhardt Highway and Town Common Road	0.3%	1.3%	0.1%	0.0%	0.0%	0.0%
Charlton Connection Road	320 - Between Toowoomba-Cecil Plains Road and Jordan Court	0.0%	0.5%	0.4%	0.5%	0.0%	0.0%
	320 - Between Jordan Court and Warrego Highway	0.0%	0.5%	0.4%	0.5%	0.0%	0.0%
Cunningham Highway	17D - Between NSW/QLD Border and Leichhardt Highway	1.6%	0.5%	0.2%	0.2%	0.1%	0.0%
	17D - Between Leichhardt Highway and Wyaga Road	0.2%	1.0%	0.1%	0.0%	0.0%	0.0%
	17D - Between Wyaga Road and Yelarbon-Keetah Road	10.6%	13.7%	3.6%	1.2%	4.2%	0.0%
	17D - Between Yelarbon-Keetah Road and Texas-Yelarbon Road	51.9%	35.2%	7.8%	4.3%	7.3%	0.1%
	17D - Between Texas-Yelarbon Road and Inglewood-Texas Road	91.4%	70.2%	13.5%	17.4%	13.8%	0.2%
	17C - Between Inglewood-Texas Road and Millmerran-Inglewood Road	88.2%	72.5%	10.6%	18.6%	14.6%	0.2%
	17C - Between Millmerran-Inglewood Road and Inglewood Quarry Access Road	32.5%	98.8%	12.2%	27.1%	17.4%	0.0%
	17C - Between Inglewood Quarry Access Road and Coolmunda Dam Access	10.0%	14.1%	5.1%	7.1%	2.4%	0.0%
Gore Highway	28A - Between Blackwell Road and Saleyards Road	0.0%	0.0%	0.0%	0.9%	9.6%	0.0%
	28A - Between Saleyards Road and West Street	0.0%	0.3%	0.1%	0.4%	4.5%	0.0%
	28A - Between West Street and Millmerran-Inglewood Road	0.0%	1.2%	2.3%	0.7%	4.5%	0.0%
	28A - Between Millmerran-Inglewood Road and Millmerran-Leyburn Road	4.8%	13.6%	71.8%	18.2%	9.2%	0.5%
	28A - Between Millmerran-Leyburn Road and Pampas-Horrane Road	3.8%	11.3%	58.6%	16.8%	3.8%	0.4%
	28A - Between Pampas-Horrane Road and Brookstead-Norwin Road	3.1%	49.5%	57.4%	23.7%	7.9%	0.4%
	28A - Between Brookstead-Norwin Road and Tummaville Road	3.9%	59.8%	64.6%	25.2%	10.0%	0.6%
	28A - Between Tummaville Road and Vines Street	15.5%	169.7%	55.4%	21.4%	8.8%	0.5%
	28A - Between Vines Street and Toowoomba Bypass	17.9%	186.9%	14.4%	12.8%	12.0%	0.7%
	28A - Between Toowoomba Bypass and Westbrook Road	4.7%	11.7%	9.1%	5.4%	4.1%	0.5%
	28A - Between Westbrook Road and Warrego Highway	3.6%	8.8%	7.0%	4.1%	3.2%	0.4%
Inglewood-Texas Road	231 - Between Cunningham Highway and Greenup Limevale Road	0.0%	0.0%	0.0%	4.3%	16.8%	1.4%
	231 - Between Greenup Limevale Road and Texas-Yelarbon Road	0.0%	0.0%	0.0%	4.3%	16.8%	1.4%

Road Name	Road Section	2021	2022	2023	2024	2025	2026
	231 - Between Texas-Yelarbon Road and Stanthorpe-Texas Road	0.0%	0.0%	0.0%	2.8%	10.9%	0.9%
	231 - Between Stanthorpe-Texas Road and Old Texas-Yelarbon Road	0.0%	0.0%	0.0%	2.9%	11.5%	0.9%
	231 - Between Old Texas-Yelarbon Road and NSW/QLD Border	0.0%	0.0%	0.0%	5.2%	20.3%	1.7%
Ipswich Motorway	17A - Between Cunningham Highway and Logan Motorway	0.0%	0.0%	0.0%	0.2%	0.7%	0.1%
Leichhardt Highway	26C - Between Cunningham Highway and Hunt Street	0.1%	0.5%	0.0%	0.0%	0.0%	0.0%
	26C - Between Hunt Street and Barwon Highway	0.1%	0.5%	0.0%	0.0%	0.0%	0.0%
Logan Motorway	210A - Between Ipswich Motorway and Pacific Motorway	0.0%	0.0%	0.0%	0.2%	0.6%	0.0%
Millmerran-Inglewood Road	337 - Between Cunningham Highway and Thornton Road	146.0%	145.7%	13.8%	28.8%	17.5%	0.5%
	337 - Between Thornton Road and Council Boundary	177.3%	140.5%	41.7%	46.6%	25.6%	0.7%
	337 - Between Council Boundary and Kooroongarra Road	7.8%	33.8%	46.8%	30.7%	11.4%	0.7%
	337 - Between Kooroongarra Road and Blackwell Road	8.8%	102.0%	379.2%	71.7%	42.8%	0.9%
	337 - Between Blackwell Road and Campbell Street	20.4%	418.8%	1089.3%	87.9%	16.8%	2.2%
	337 - Between Campbell Street and Gore Highway	22.5%	57.5%	345.8%	88.2%	46.3%	2.1%
Millmerran-Leyburn Road	335 - Between Gore Highway and Reiche Road	0.3%	8.1%	9.9%	0.0%	0.0%	0.0%
Oakey-Pittsworth Road	323 - Between Gore Highway and Quibet Road	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%
Pacific Motorway	12A - Between Logan Highway and NSW/QLD border	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%
Pampas-Horrane Road	327 - Between Gore Highway and Bostock Road	13.5%	59.9%	88.6%	39.0%	11.3%	0.0%
Pittsworth-Felton Road	332 - Between Golf Course Road and Short Street	1.0%	5.0%	4.2%	1.2%	0.8%	0.0%
Texas-Yelarbon Road	2322 - Between Cunningham Highway and Old Texas-Yelarbon Road	24.3%	13.6%	0.0%	0.7%	2.7%	0.2%
Toowoomba-Cecil Plains Road	324 - Between Warrego Highway and McDougall Street	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	324 - Between McDougall Street and Boundary Street	1.7%	10.4%	4.6%	1.0%	0.1%	0.0%
	324 - Between Boundary Street and Charlton Connection Road	9.1%	57.1%	25.2%	5.5%	0.3%	0.0%
	324 - Between Charlton Connection Road and Hursley Road	0.3%	1.9%	0.8%	0.1%	0.0%	0.0%
	324 - Between Hursley Road and Hanrahans Road	2.3%	9.2%	8.9%	3.8%	3.6%	0.1%
	324 - Between Hanrahans Road and 2 km west of Brimblecombe Rd	0.5%	2.6%	2.1%	1.0%	2.7%	0.0%

Road Name	Road Section	2021	2022	2023	2024	2025	2026
Toowoomba Bypass	319 - Between Gore Highway and Toowoomba-Cecil Plains Road	9.2%	86.8%	1.3%	0.9%	4.3%	0.2%
	319 - Between Toowoomba-Cecil Plains Road and New England Highway	4.1%	39.8%	0.0%	0.3%	1.1%	0.1%
	319 - Between New England Highway and Warrego Highway	0.0%	0.0%	0.0%	0.3%	1.1%	0.1%
Warrego Highway	18B - Between Kingsthorpe Haden Road and Toowoomba Bypass	7.0%	63.1%	12.1%	2.6%	1.2%	0.0%
	18B - Between Toowoomba Bypass and Charlton Connection Road	0.4%	1.0%	2.1%	1.2%	0.5%	0.0%
	18B - Between Charlton Connection Road and McDougall Street	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	18B - Between McDougall Street and Bridge Street	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	18B - Between Bridge Street and Toowoomba-Cecil Plains Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	18B - Between Toowoomba-Cecil Plains Road and Karrool Street	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	18B - Between Karrool Street and Gore Highway	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	18B - Between Gore Highway and Fifth Avenue	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	18A - Between Toowoomba Bypass and Gatton-Helidon Road	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%
	18A - Between Gatton-Helidon Road and Gatton-Esk Road	0.0%	0.0%	0.0%	0.3%	1.0%	0.1%
	18A - Between Gatton-Esk Road and Laidley-Plainland Road	0.0%	0.0%	0.0%	0.2%	0.9%	0.1%
	18A - Between Laidley-Plainland Road and Tallegalla Two Tree Hill Road	0.0%	0.0%	0.0%	0.1%	0.6%	0.0%
	18A - Between Tallegalla Two Tree Hill Road and Haigslea Amberley Road	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%
	18A - Between Haigslea Amberley Road and Brisbane Valley Highway	0.0%	0.0%	0.0%	0.5%	1.8%	0.1%
	18A - Between Brisbane Valley Road and Mount Crosby Road	0.0%	0.0%	0.0%	0.2%	0.7%	0.1%
	18A - Between Mount Crosby Road and Cunningham Highway	0.0%	0.0%	0.0%	0.1%	0.6%	0.0%
Yelarbon-Keetah Road	241 - Between Cunningham Highway and Old Warwick Road	773.4%	351.7%	27.8%	38.7%	0.0%	0.0%
State-Controlled Roads: Roads and Maritime Services							
Bruxner Highway	Between New England Highway and Summerland Way	0.0%	0.0%	0.0%	5.7%	22.4%	1.8%
Gwydir Highway	Between Stephens Road and Delungra Road	0.0%	0.0%	0.0%	1.1%	4.3%	0.4%
	Between Delungra Road and Delungra Bypass Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Delungra Bypass Road and Copeton Dam Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Copeton Dam Road and Bannockburn Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%

Road Name	Road Section	2021	2022	2023	2024	2025	2026
	Between Bannockburn Road and Campbell Street	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Campbell Street and Tingha Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Tingha Road and Elsmore Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Elsmore Road and Woodstock Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Woodstock Road and Waterloo Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Waterloo Road and Coronation Avenue	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Coronation Avenue and New England Highway	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between New England Highway and Shannon Vale Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Shannon Vale Road and Bald Nob Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Bald Nob Road and Old Grafton Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Old Grafton Road and Coombadjha Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Coombadjha Road and Old Glen Innes Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Old Glen Innes Road and Rogan Bridge Road	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Rogan Bridge Road and Bent Street	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
New England Highway	Between Bruxner Way and Bruxner Highway	0.0%	0.0%	0.5%	0.5%	0.0%	0.0%
	Between Gwydir Highway and Gwydir Highway	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%
Newell Highway	Between NSW/QLD Border and Bruxner Way	1.4%	0.5%	0.2%	0.2%	0.1%	0.0%
Pacific Motorway	Between NSW/QLD border and Gwydir Highway	0.0%	0.0%	0.0%	0.2%	0.7%	0.1%
Summerland Way	Between Bruxner Highway and Red Lane	0.0%	0.0%	0.0%	0.5%	1.9%	0.2%
	Between Trenayr Road and Turf Street	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%

The analysis indicates that the majority of SCR road segments would have a minimal pavement impact given the duration of construction activities and pavement loading. However, it was found that the five per cent threshold would be exceeded for the following road sections:

- Cunningham Highway – Between Wyaga Road and Yelarbon-Keetah Road
- Cunningham Highway – Between Yelarbon-Keetah Road and Texas-Yelarbon Road
- Cunningham Highway – Between Texas-Yelarbon Road and Inglewood-Texas Road
- Cunningham Highway – Between Inglewood-Texas Road and Millmerran-Inglewood Road
- Cunningham Highway – Between Millmerran-Inglewood Road and Inglewood Quarry Access Road
- Cunningham Highway – Between Inglewood Quarry Access Road and Coolmunda Dam Access
- Gore Highway – Between Blackwell Road and Saleyards Road
- Gore Highway – Between Millmerran-Inglewood Road and Millmerran-Leyburn Road
- Gore Highway – Between Millmerran-Leyburn Road and Pampas-Horrane Road
- Gore Highway – Between Pampas-Horrane Road and Brookstead-Norwin Road
- Gore Highway – Between Brookstead-Norwin Road and Tumnaville Road
- Gore Highway – Between Tumnaville Road and Vines Street
- Gore Highway – Between Vines Street and Toowoomba Bypass
- Gore Highway – Between Toowoomba Bypass and Westbrook Road
- Gore Highway – Between Toowoomba Westbrook Road and Warrego Highway
- Inglewood-Texas Road – Between Cunningham Highway and Greenup Limevale Road
- Inglewood-Texas Road – Between Greenup Limevale Road and Texas-Yelarbon Road
- Inglewood-Texas Road – Between Texas-Yelarbon Road and Stanthorpe-Texas Road
- Inglewood-Texas Road – Between Stanthorpe-Texas Road and Old Texas-Yelarbon Road
- Inglewood-Texas Road – Between Old Texas-Yelarbon Road and NSW/QLD Border
- Millmerran-Inglewood Road – Between Cunningham Highway and Thornton Road
- Millmerran-Inglewood Road – Between Thornton Road and Council Boundary
- Millmerran-Inglewood Road – Between Council Boundary and Kooroongarra Road
- Millmerran-Inglewood Road – Between Kooroongarra Road and Blackwell Road
- Millmerran-Inglewood Road – Between Blackwell Road and Campbell Street
- Millmerran-Inglewood Road – Between Campbell Street and Gore Highway
- Millmerran-Leyburn Road – Between Gore Highway and Reiche Road
- Pampas-Horrane Road – Between Gore Highway and Bostock Road
- Pittsworth-Felton Road – Between Gold Course Road and Short Street
- Texas-Yelarbon Road – Between Cunningham Highway and Old Texas-Yelarbon Road
- Toowoomba-Cecil Plains Road – Between McDougall Street and Boundary Street
- Toowoomba-Cecil Plains Road – Between Boundary Street and Charlton Connection Road
- Toowoomba-Cecil Plains Road – Between Hursley Road and Hanrahans Road
- Toowoomba Bypass – Between Gore Highway and Toowoomba-Cecil Plains Road
- Toowoomba Bypass – Between Toowoomba-Cecil Plains Road and New England Highway
- Warrego Highway – Between Kingsthorpe Haden Road and Toowoomba Bypass

- Yelarbon-Keetah Road – Between Cunningham Highway and Old Warwick Road
- Bruxner Highway – Between New England Highway and Summerland Way.

Detailed analysis outputs and results of these road segments are provided in Appendix D.

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 phase 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.

8 Safety assessment

8.1 Methodology

The road safety impact assessment has been undertaken as per the framework laid out in Part C of the GTIA. This framework relies on the principle that a road's safety is not significantly worsened as a result of the Project, and that any pre-existing or Project -introduced unacceptable safety risk is addressed. The GTIA acknowledges that safety is not readily quantifiable and may require scoring based on expert opinion on the changes to likelihood and/or consequence of a risk being realised.

With this in mind, the road safety assessment process undertaken in the following sections includes:

- Establishing the existing safety risks relevant to the Project impact assessment area. It is proposed that existing safety issues will be obtained from consultation with the road controlling authorities and a desktop review of relevant available data and information including published crash histories
- Identifying the likely new risks or modified risks resulting from the Project
- Completing a risk assessment of the likelihood and consequence of safety risks being increased as a consequence of Project traffic and at Project access points
- Recommending management and mitigation works to ensure the existing safety risk rating for the road is not worsened as a result of the Project and that any unacceptable safety risk is addressed.

This process has been utilised to determine safety risks along the Project construction traffic routes and project road-rail interface locations.

8.2 Existing safety issues

The existing safety issues along construction traffic routes and road-rail interface locations has been assessed and provided in Section 4.5.1 and 4.5.2 above. These existing safety issues, namely the number of reported crashes and crash severities for each construction traffic route and road-rail interface location have been used to inform the consequence classifications provided in the sections below.

8.3 Risk assessment

A safety risk assessment based on existing crash history has been undertaken along the Project construction traffic routes and road-rail interface locations for the following scenarios:

- Without Project
- With Project
- With Project and with mitigation measures (*required only if the score in the 'with Project' situation is higher than in the 'without Project' situation, or if the 'without Project' score is in the 'high' category*).

As per Part C of the GTIA, road safety risk is considered in terms of changes in:

- Likelihood: how often an event or situation is expected to take place, and
- Consequence: the effect, result, or outcome of something occurring.

Classifications for likelihood and consequence that have been used in this risk assessment have been provided in Table 8.1 and Table 8.2 respectively. The resulting risk ratings have been provided in Table 8.3. These risk ratings are reflective of those provided in Table 9.3.2(a) of the GTIA.

Table 8.1 Consequence classification – based on five-year reported crash data

Consequence	Safety risk classification
Extreme	One or more reported fatalities
Major	One or more reported crashes resulting in hospitalisation
Moderate	One or more reported crashes resulting in medical treatment
Minor	One or more reported crashes resulting in minor injuries treatment
Not significant	No crashes

Table 8.2 Risk likelihood description

Likelihood	Description
Almost certain	Crash severity occurs more than ten times per year
Likely	Crash severity occurs or would potentially occur about five times or more per year
Possible	Crash severity occurs or is likely to occur about once per year
Unlikely	Crash severity occurs or is likely to occur about once every five years
Rare	Crash severity occurs or is likely to occur less frequently than once every five years

Table 8.3 Risk rating

Likelihood	Consequence				
	Not significant	Minor	Moderate	Major	Extreme
Almost certain	Medium	Medium	High	High	High
Likely	Medium	Medium	Medium	High	High
Possible	Low	Medium	Medium	Medium	High
Unlikely	Low	Low	Medium	Medium	Medium
Rare	Low	Low	Low	Medium	Medium

The resulting identified risks for the 'with' and 'without Project' scenarios associated with construction traffic have been provided in Table 8.4. The consequence for the 'without Project' scenario has been based on the highest reported crash severity for each construction traffic route, and the likelihood has been based on the frequency at which this crash severity occurred over the five-year period.

The consequence in the 'with Project' scenario has been taken to be the same as in the 'without Project', and the likelihood of occurrence has been determined based on the likely changes to road safety as a result of construction related traffic. The likelihood of an event occurring has been increased to 'Possible' in the 'with Project' scenario in order to provide a conservative assessment and ensure mitigation measures are implemented effectively. Because of this, several road segments have been assigned a risk rating of 'High' in the 'with Project' scenario. This change in change in risk rating is regarded as conservative, as mitigation is therefore required for the road segment.

This table identifies that the following construction traffic routes may require safety mitigation measures:

- Cunningham Highway (DTMR)
- Gore Highway (DTMR)
- Logan Motorway (DTMR) (managed by Transurban)
- Millmerran-Inglewood Road (DTMR)
- Toowoomba-Cecil Plains Road (DTMR)
- Warrego Highway (DTMR)
- Bruxner Way (RMS)

- Gwydir Highway (RMS)
- New England Highway (RMS)
- Newell Highway (RMS)
- Pacific Motorway (RMS)
- Summerland Way (RMS)
- Bruxner Way (ISC).

Table 8.5 provides the 'with Project' and 'with Project mitigation measures' safety risk assessment for the routes that have been identified to require safety mitigation measures. This table shows that following the provision of appropriate mitigation measures, all risk scores are either returned back to 'without Project' levels or below the 'high' level.

The construction routes assumed as a part of this assessment are routes which the Principal Contractor may use. However, the determination of the final construction and HV routes will be subject to consultation between DTMR, the local government authority and the Principal Contractor. The above analysis will be undertaken again as a part of the design and construction when the final construction routes are finalised by the Principal Contractor. Additionally, the safety assessment of the intersections used by construction traffic will be undertaken when the construction routes are finalised.

Identified safety risks for the 'with' and 'without Project' scenarios associated with road-rail interface locations have been provided in Table 8.6. The 'without Project' risk assessment was completed by analysing crashes within a 200 m zone from the proposed crossing. The consequence for the 'without Project' scenario has been based on the highest reported crash severity for each buffer zone, and the likelihood has been based on the frequency at which this crash severity occurred over the five-year period.

The 'with Project' scenario has been assigned a consequence of 'extreme' in the safety assessment as any incident at a road rail crossing is likely to be of a high consequence. Without appropriate mitigation measures, it is reasonable to expect that such an event may occur a few times a year. As a result, the likelihood has been assigned as 'likely' resulting in all road-rail interface locations being 'high' and requiring safety mitigation measures.

Table 8.6 provides the 'with Project' and 'with Project mitigation measures' safety risk assessment. This table shows that following the provision of appropriate mitigation measures, the likelihood of an extreme incident has been rated as being 'unlikely' resulting in all risk scores being below the 'high' level.

The safety assessment of construction routes and road-rail interface locations will be updated during detail design when construction routes and design are finalised, consistent with the requirements of the GTIA. This may include road safety assessments and/or road safety audits.

Table 8.4 Safety risk assessment: project primary construction routes (without and with Project)

Road name	Without Project			With Project			Mitigation required
	Consequence	Likelihood	Risk rating	Consequence	Likelihood	Risk rating	
State Controlled Roads: Department of Transport Main Roads							
Barwon Highway	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Charlton Connection Road	Major	Unlikely	Medium	Major	Possible	Medium	
Cunningham Highway	Extreme	Unlikely	Medium	Extreme	Possible	High	Required
Gore Highway	Extreme	Unlikely	Medium	Extreme	Possible	High	Required
Inglewood-Texas Road	Major	Unlikely	Medium	Major	Possible	Medium	
Ipswich Motorway	Major	Unlikely	Medium	Major	Possible	Medium	
Leichhardt Highway	Major	Unlikely	Medium	Major	Possible	Medium	
Logan Motorway (managed by Transurban)	Extreme	Unlikely	Medium	Extreme	Possible	High	Required
Millmerran-Inglewood Road	Extreme	Unlikely	Medium	Extreme	Possible	High	Required
Millmerran-Leyburn Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Oakey-Pittsworth Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Pittsworth-Felton Road	Major	Unlikely	Medium	Major	Possible	Medium	
Pampas-Horrane Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Texas-Yelarbon Road	Major	Unlikely	Medium	Major	Possible	Medium	
Toowoomba-Cecil Plains Road	Extreme	Unlikely	Medium	Extreme	Possible	High	Required
Toowoomba Bypass	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Warrego Highway	Extreme	Unlikely	Medium	Extreme	Possible	High	Required
Yelarbon-Keetah Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
State Controlled Roads: Roads and Maritime Services							
Bruxner Highway	Extreme	Unlikely	Medium	Extreme	Possible	High	Required
Gwydir Highway	Extreme	Possible	High	Extreme	Possible	High	Required
New England Highway	Minor	Unlikely	Low	Minor	Possible	Medium	Required
Newell Highway	Extreme	Possible	High	Extreme	Possible	High	Required
Pacific Motorway	Extreme	Unlikely	Medium	Extreme	Possible	High	Required

Road name	Without Project			With Project			Mitigation required
	Consequence	Likelihood	Risk rating	Consequence	Likelihood	Risk rating	
Summerland Way	Extreme	Unlikely	Medium	Extreme	Possible	High	Required
Local Government Roads: Clarence Valley Council							
Bent Street	Major	Unlikely	Medium	Major	Possible	Medium	
Charles Street	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Clarence Street	Moderate	Unlikely	Medium	Moderate	Possible	Medium	
Clark Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Craig Street	Major	Unlikely	Medium	Major	Possible	Medium	
Dobie Street	Moderate	Possible	Medium	Moderate	Possible	Medium	
Fry Street	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Mary Street	Moderate	Unlikely	Medium	Moderate	Possible	Medium	
Oliver Street	Major	Unlikely	Medium	Major	Possible	Medium	
Red Lane	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Trenayr Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Villers Street	Major	Unlikely	Medium	Major	Possible	Medium	
Local Government Roads: Goondiwindi Regional Council							
Boodle Street	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Bybera Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Cemetery Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Coolmunda Dam Access	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Cremascos Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
East Sawmill Road	Moderate	Unlikely	Medium	Moderate	Possible	Medium	
Elizabeth Street	Moderate	Unlikely	Medium	Moderate	Possible	Medium	
Eukabilla Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Fosters Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Grays Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Inglewood Quarry Access Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	

Road name	Without Project			With Project			Mitigation required
	Consequence	Likelihood	Risk rating	Consequence	Likelihood	Risk rating	
Lovells Crossing Road	Major	Unlikely	Medium	Major	Possible	Medium	
Kildonan Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
McDougalls Crossings Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Moorroobie Lane	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Mosquito Creek Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Old Texas-Yelarbon Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Queen Street South	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Springborg Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Suttons Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Thornton Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Town Commons Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Unnamed Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Whetstone Access Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Wondalli-Kurumbul Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Woodcocks Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Yelarbon-Kurumbul Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Local Government Roads: Gwydir Shire Council							
Edwards Street	Not Significant	Rare	Low	Not Significant	Possible	Low	
Forest Creek Road	Not Significant	Rare	Low	Not Significant	Possible	Low	
North Star Road	Major	Unlikely	Medium	Major	Possible	Medium	
Stephen Street	Not Significant	Rare	Low	Not Significant	Possible	Low	
Warialda Road	Major	Possible	Medium	Major	Possible	Medium	
Local Government Roads: Inverell Shire Council							
Bruxner Way	Major	Unlikely	Medium	Major	Possible	Medium	
Campbell Street	Not Significant	Rare	Low	Not Significant	Possible	Low	
Texas Bridge Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	

Road name	Without Project			With Project			Mitigation required
	Consequence	Likelihood	Risk rating	Consequence	Likelihood	Risk rating	
Local Government Roads: Moree Plains Shire Council							
Bruxner Way	Minor	Unlikely	Low	Minor	Possible	Medium	Required
North Star Road	Major	Unlikely	Medium	Major	Possible	Medium	
River Road	Not Significant	Rare	Low	Not Significant	Possible	Low	
Local Government Roads: Toowoomba Regional Council							
Airport Quarry Wellcamp Access Road (Privately owned road)	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Alderley Street	Moderate	Unlikely	Medium	Moderate	Possible	Medium	
Athol School Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Biddeston Southbrook Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Blackwell Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Blackwell Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Bligh Street	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Bostock Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Brimblecombe Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Bunkers Hill School Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Bushy Lane West	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Campbell Street	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Chamberlain Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Commodore Peak Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Condamine Street	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Dieckmann Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Draper Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Drayton Wellcamp Road	Major	Unlikely	Medium	Major	Possible	Medium	
Euston Road	Major	Unlikely	Medium	Major	Possible	Medium	
Filmers Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Forestry Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	

Road name	Without Project			With Project			Mitigation required
	Consequence	Likelihood	Risk rating	Consequence	Likelihood	Risk rating	
Fysh Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Gap Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Geitz Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Gilgal Lane	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Greenwattle Street	Major	Unlikely	Medium	Major	Possible	Medium	
Grevillea Street	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Hall Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Heckendorf Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Kahler Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Kooroongarra Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Leesons Road	Major	Unlikely	Medium	Major	Possible	Medium	
Lindenmayer Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Linthorpe Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Lochaber Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Macauley Street	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
McDougall Street	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Millwood Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Murlaggan Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Omara Road	Moderate	Unlikely	Medium	Moderate	Possible	Medium	
Owens Scrub Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Paint Mine Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Paton Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Railway Street	Moderate	Unlikely	Medium	Moderate	Possible	Medium	
Roche Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Saleyards Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Scrubby Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	

Road name	Without Project			With Project			Mitigation required
	Consequence	Likelihood	Risk rating	Consequence	Likelihood	Risk rating	
Short Street	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Six Mile Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Steger Road	Moderate	Unlikely	Medium	Moderate	Possible	Medium	
Toowoomba Road	Major	Unlikely	Medium	Major	Possible	Medium	
Tummalville Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Ware Street	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Wellcamp-Westbrook Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
West Street	Not Significant	Unlikely	Low	Not Significant	Possible	Low	
Yarranlea Road	Not Significant	Unlikely	Low	Not Significant	Possible	Low	

Table 8.5 Safety risk assessment: project primary construction routes (with Project and with mitigation measures)

Road name	With Project			With Project – with mitigation ¹		
	Consequence	Likelihood	Risk Rating	Consequence	Likelihood	Risk Rating
Cunningham Highway	Extreme	Possible	High	Extreme	Unlikely	Medium
Gore Highway	Extreme	Possible	High	Extreme	Unlikely	Medium
Logan Motorway (managed by Transurban)	Extreme	Possible	High	Extreme	Unlikely	Medium
Millmerran-Inglewood Road	Extreme	Possible	High	Major	Unlikely	Medium
Toowoomba-Cecil Plains Road	Major	Likely	High	Major	Possible	Medium
Warrego Highway	Extreme	Possible	High	Extreme	Unlikely	Medium
Bruxner Highway	Extreme	Possible	High	Extreme	Unlikely	Medium
New England Highway	Major	Likely	High	Major	Possible	Medium
Gwydir Highway	Major	Likely	High	Major	Possible	Medium
Bruxner Way	Major	Possible	Medium	Major	Possible	Low
Pacific Motorway	Major	Likely	High	Major	Possible	Medium
Summerland Way	Extreme	Possible	High	Extreme	Unlikely	Medium
Bruxner Way	Major	Possible	Medium	Major	Possible	Low

Table notes:

1 Refer Section 9.2 for mitigation measures

Table 8.6 Safety risk assessment: road-rail interface (without and with Project)

Interface ID	Road name	Proposed treatment	Without Project			With Project		
			Consequence	Likelihood	Risk rating	Consequence	Likelihood	Risk rating
310-24-P-2	Millmerran – Inglewood Road	Active level crossing	Proposed Crossing			Extreme	Likely	High
310-40-E-2	Millmerran-Leyburn Road	Active level crossing	Extreme	Rare	Medium	Extreme	Likely	High
310-30-P-2	Kooroongarra Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-31-P-7	Kooroongarra Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-32-P-4	Paton Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-33-P-1	Nicol Creek Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-34-P-1	Millwood Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-36-P-1	Blackwell Road	Active level crossing	Proposed Crossing			Extreme	Likely	High
310-36-P-8a	Scraggs Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-38-P-3	Owens Scrub Road	Active level crossing	Proposed Crossing			Extreme	Likely	High
310-39-P-1	Lindenmayer Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-40-E-1	Hall Road	Passive level crossing	Extreme	Rare	Medium	Extreme	Likely	High
310-41-E-6	Gilgai Lane	Passive level crossing	Extreme	Rare	Medium	Extreme	Likely	High
310-42-E-0	Harris Road	Active level crossing	Extreme	Rare	Medium	Extreme	Likely	High
310-43-E-3	Elsden Road	Active level crossing	Extreme	Rare	Medium	Extreme	Likely	High
310-43-E-8	Mann Silo Road	Passive level crossing	Extreme	Rare	Medium	Extreme	Likely	High
310-45-E-1	Longhurst Road	Active level crossing	Extreme	Rare	Medium	Extreme	Likely	High
310-48-P-1	Tip Road	Active level crossing	Proposed Crossing			Extreme	Likely	High
310-50-P-11	Linthorpe Valley Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-52-P-3	Purcell Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-57-P-4	Leesons Road	Active level crossing	Proposed Crossing			Extreme	Likely	High
270-12-P-1	Kildonan Road	Active level crossing	Proposed Crossing			Extreme	Likely	High
310-4-E-2	South Kurumbul Road	Active level crossing	Extreme	Rare	Medium	Extreme	Likely	High
310-5-P-1	Wondalli-Kurumbul Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High

Interface ID	Road name	Proposed treatment	Without Project			With Project		
			Consequence	Likelihood	Risk rating	Consequence	Likelihood	Risk rating
310-8-E-0	Unnamed Road	Passive level crossing	Extreme	Rare	Medium	Extreme	Likely	High
310-10-P-1	Unnamed Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-12-E-1	Suttons Road	Passive level crossing	Extreme	Rare	Medium	Extreme	Likely	High
310-14-E-0	Springborg Road	Passive level crossing	Extreme	Rare	Medium	Extreme	Likely	High
310-16-E-1	Whetstone Access Road	Active level crossing	Extreme	Rare	Medium	Extreme	Likely	High
310-17-P-7a	McDougalls Crossing Road	Active level crossing	Proposed Crossing			Extreme	Likely	High
310-18-P-8	Cremascos Road	Active level crossing	Proposed Crossing			Extreme	Likely	High
310-20-P-12z	Bybera Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-21-P-9	Lovells Crossing Road	Active level crossing	Proposed Crossing			Extreme	Likely	High
310-22-P-9	Thornton Road	Active level crossing	Proposed Crossing			Extreme	Likely	High
310-25-P-3	Grays Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-26-P-2	Wongavale-Yugilbar Road	Passive level crossing	Proposed Crossing			Extreme	Likely	High
310-28-P-3	Unnamed Road	Active level crossing	Proposed Crossing			Extreme	Likely	High

Table 8.7 Safety risk assessment: road-rail interface (with Project and with mitigation measures)

Interface ID	With Project			With Project – with mitigation ¹		
	Consequence	Likelihood	Risk rating	Consequence	Likelihood	Risk rating
310-24-P-2	Extreme	Likely	High	Extreme	Unlikely	Medium
310-40-E-2	Extreme	Likely	High	Extreme	Unlikely	Medium
310-30-P-2	Extreme	Likely	High	Extreme	Unlikely	Medium
310-31-P-7	Extreme	Likely	High	Extreme	Unlikely	Medium
310-32-P-4	Extreme	Likely	High	Extreme	Unlikely	Medium
310-33-P-1	Extreme	Likely	High	Extreme	Unlikely	Medium
310-34-P-1	Extreme	Likely	High	Extreme	Unlikely	Medium
310-36-P-1	Extreme	Likely	High	Extreme	Unlikely	Medium
310-36-P-8a	Extreme	Likely	High	Extreme	Unlikely	Medium
310-38-P-3	Extreme	Likely	High	Extreme	Unlikely	Medium
310-39-P-1	Extreme	Likely	High	Extreme	Unlikely	Medium
310-40-E-1	Extreme	Likely	High	Extreme	Unlikely	Medium
310-41-E-6	Extreme	Likely	High	Extreme	Unlikely	Medium
310-42-E-0	Extreme	Likely	High	Extreme	Unlikely	Medium
310-43-E-3	Extreme	Likely	High	Extreme	Unlikely	Medium
310-43-E-8	Extreme	Likely	High	Extreme	Unlikely	Medium
310-45-E-1	Extreme	Likely	High	Extreme	Unlikely	Medium
310-48-P-1	Extreme	Likely	High	Extreme	Unlikely	Medium
310-50-P-11	Extreme	Likely	High	Extreme	Unlikely	Medium
310-52-P-3	Extreme	Likely	High	Extreme	Unlikely	Medium
310-57-P-4	Extreme	Likely	High	Extreme	Unlikely	Medium
270-12-P-1	Extreme	Likely	High	Extreme	Unlikely	Medium
310-4-E-2	Extreme	Likely	High	Extreme	Unlikely	Medium
310-5-P-1	Extreme	Likely	High	Extreme	Unlikely	Medium
310-8-E-0	Extreme	Likely	High	Extreme	Unlikely	Medium

Interface ID	With Project			With Project – with mitigation ¹		
	Consequence	Likelihood	Risk rating	Consequence	Likelihood	Risk rating
310-10-P-1	Extreme	Likely	High	Extreme	Unlikely	Medium
310-12-E-1	Extreme	Likely	High	Extreme	Unlikely	Medium
310-14-E-0	Extreme	Likely	High	Extreme	Unlikely	Medium
310-16-E-1	Extreme	Likely	High	Extreme	Unlikely	Medium
310-17-P-7a	Extreme	Likely	High	Extreme	Unlikely	Medium
310-18-P-8	Extreme	Likely	High	Extreme	Unlikely	Medium
310-20-P-12z	Extreme	Likely	High	Extreme	Unlikely	Medium
310-21-P-9	Extreme	Likely	High	Extreme	Unlikely	Medium
310-22-P-9	Extreme	Likely	High	Extreme	Unlikely	Medium
310-25-P-3	Extreme	Likely	High	Extreme	Unlikely	Medium
310-26-P-2	Extreme	Likely	High	Extreme	Unlikely	Medium
310-28-P-3	Extreme	Likely	High	Extreme	Unlikely	Medium

Table notes:

1 Refer Section 9.2 for mitigation measures

9 Mitigation measures

This section provides discussion of mitigation measures and controls that have been incorporated into the reference design development process, as appropriate and where possible (refer Section 9.1), as well as those measures that are proposed to be adopted for future phases of Project delivery (refer Section 9.2).

9.1 Mitigation through the reference design phase

Development of the reference design for the Project has progressed in parallel with the impact assessment process. As a consequence, design solutions for avoiding, minimising or mitigating impacts have been incorporated into the reference design as appropriate and where possible.

Mitigation measures and controls that have been factored into the design, or otherwise implemented during the reference design phase for the Project, are summarised in Table 9.1.

Table 9.1 Initial mitigation measures of relevance to traffic

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 reference design has been developed to minimise the potential for permanent alterations to the road configurations and traffic flow patterns ■ 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 ■ Construction traffic routes have been proposed that provide the shortest journey time between origin and destination. 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.
Rail incidents as a result of development of the Project	■ The rail 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: – 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 – Initial train lengths of 1,800 m, with potential to increase up to 3,600 m ■ The 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 roads have been adopted instead of level crossings, where possible. 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 ■ Where grade separation has not been feasible, the design has been developed in accordance with the ARTC <i>Engineering Code of Practice – Level Crossings</i> (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)

Aspect	Initial mitigation measures
	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 2015a), Manual of Uniform Traffic Control Devices Part 7: Railway Crossings (DTMR, 2019e) and ARTC <i>Engineering Code of Practice – Level Crossings</i>.
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 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 design - Bridge clearances have been established in consultation with the owners of existing assets over which the bridge structures span (i.e. DTMR, local councils and private landowners).

9.2 Proposed mitigation measures

9.2.1 Proposed mitigation measures

In order to further manage and mitigate Project risks, several mitigation measures have been proposed for implementation in future phases of Project delivery, as presented in Table 9.2. These proposed mitigation measures have been identified to address Project specific issues and opportunities, including legislative requirements and accepted government plans, policy and practices.

Table 9.2 identifies the relevant Project phase, the aspect to be managed and the proposed mitigation measure.

The mitigation measures presented in Table 9.2 have then been factored into the assessment of residual risk, as documented in Table 10.1.

9.2.2 Additional considerations

The NHVR regulates all vehicles over 4.5T GVM and coordinates road access permits for these vehicles. Any new permits required as part of the Project construction or operation will be made through the NHVR. It is a requirement for these permits to be reviewed and approved by the relevant asset owner.

No detailed assessment has currently been undertaken with regards to load limited bridges. An assessment will need to be undertaken during detail design once construction routes are confirmed, to include inspections of existing structures. Outcomes of this further assessment may establish that rectification works may be required to existing bridges for construction purposes.

Table 9.2 Additional mitigation measures proposed for future phases of Project delivery

Delivery phase	Aspect	Proposed mitigation measures
Detail design	Road safety	■ A safety assessment of the detail design and proposed construction traffic routes will be required, in accordance with the GTIA. The safety assessment will determine the locations where road safety audits are required. As a minimum, road safety audits will be undertaken for all public level crossings included in the detail design to confirm: – The safety measures proposed by the detail design are appropriate – The detail design is appropriate for the traffic conditions – The crossing is designed to provide suitable stacking and sight distance ■ Road safety audits will be undertaken by an accredited road safety auditor, in accordance with the Austroads Guide to Traffic Management. ■ Consultation with relevant councils, DTMR and emergency service providers (e.g. QFES, QAS, QPS) will continue through the detail design and construction planning process to ensure that safety concerns and issues are considered in detail design and the construction methodology ■ 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 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).
	Road network	■ The TIA will be updated and finalised, in accordance with the process specified in the GTIA (refer Figure 1.5), to reflect the detail design, construction method (including material sources and quantities) and the finalised construction traffic routes ■ A travel demand management awareness campaign will be developed to inform the public on the proposed construction works and its potential effect on local road network operations. The purpose of this awareness campaign would be to relieve congestion by encouraging travel outside of peaks and increase public awareness of planned construction works ■ A Traffic Management Sub-plan will be prepared prior to the commencement of construction, as a component of the CEMP, as a joint effort between the Principal Contractor, ARTC, DTMR, local councils and an accredited road safety auditor once preferred construction routes are confirmed. This plan will reflect the finalised TIA and will: – Outline: ■ Traffic demand ■ Routing ■ Controls ■ Special vehicle requirements ■ How works to accommodate these are integrated into the operation of the road network – Detail measures to: ■ Safely manage traffic when undertaking works in a road reserve ■ Minimise traffic delays resulting from the development/construction ■ Manage construction vehicles accessing and leaving the site ■ Manage road intersections that experience increased usage due to construction vehicle movements ■ Maintain property access ■ Minimise disruption to adjacent properties ■ Minimise disturbance to the environment

Delivery phase	Aspect	Proposed mitigation measures
		■ Meet the requirements of legislation and codes of practice regarding traffic management ■ Cater for special events, e.g. Millmerran Camp Oven Festival and regional cycling events – Acknowledge and consider: ■ Designated construction routes ■ Approaches to seasonality, including usage of 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 operations (e.g. public transport, school buses, long distance services) ■ Workforce transportation ■ Workforce parking, with the provision of on-site tool storage where practicable. – Identify secondary, alternative construction routes, in the event of the primary route is blocked off by an emergency/accident – Be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices: Part 3: Traffic control for works on roads (DTMR, 2019a) ■ Works identified within the Traffic Management Sub-plan may require the preparation of Traffic Control Plans (TCPs), also referred to as Traffic Guidance Schemes. Specific TCPs are required for each separate element of the works identified to be undertaken within the Traffic Management Sub-plan. TCPs detail the traffic control signs, devices and measures to be applied at work sites to warn traffic and guide it through, or past, a work area or temporary hazard. This includes plans/diagrams that illustrate the arrangement of signage and devices used to manage traffic. Highlight the temporary signage, markings, speed zones, barriers and works with the aim to: – Warn drivers of the changes to the usual conditions – Inform drivers about the changing conditions – Guide drivers through the work sties – Ensure safety of works and external road users. ■ A Road Use Management Plan (RUMP) will be prepared for the Project in accordance with the GTIA to support works to the existing road network. The purpose of developing the RUMP for the Project will be to: – Identify, where required, appropriate traffic and transport management strategies for the use of the State-controlled roads and local government roads for each of the construction stages of the Project – Minimise the impact on the efficiency of road networks – Minimise safety impacts from construction vehicles entering and leaving construction sites. The RUMP will: – Summarise updated Project traffic information on which the updated road impact assessment and proposed mitigation strategies are based – Briefly list roles and responsibilities for RUMP implementation – Detail finalised impact mitigation strategies, focusing on controls-based or road-use management strategies. Road-use management strategies include: ■ Use of variable message signs

Delivery phase	Aspect	Proposed mitigation measures
		■ Travel demand management ■ Use of shuttle buses to transport workers – Avoiding peak hour traffic, especially near schools/bus routes ■ The RUMP will be developed in consultation with DTMR, local councils and emergency service providers and will be finalised prior to the commencement of construction ■ The locations on construction traffic routes where turning treatments are required will be confirmed through assessment in accordance with the requirements of Austroads <i>Guide to Traffic Management Part 6</i>. Initial turning treatments have been identified in Table 6.13. ■ Where required, turning treatments will be design in consultation with the relevant road controlling authority and in accordance with the requirements of Austroads <i>Guide to Road Design Part 4A</i>. Turning treatments will be documented in the RUMP.
	Access	■ The detail design will be developed to ensure that legal access for private properties is maintained ■ ARTC will continue to consult with potentially impacted landowners through the detail design and construction planning process to develop and implement property-specific measures to avoid or minimise impacts which could affect property access ■ The construction and operational phase provision of suitable private property access 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. ■ Consultation with Toowoomba and Goondiwindi Local Disaster Management Groups, in addition to QPS, QAS and QPWS will continue through the detail design process to ensure that appropriate access and egress solutions are incorporated into the detail design to enable movements across the rail corridor. ■ Consultation with the Department of Education to ensure that mitigation measures required to be implemented to maintain the current levels of access and operation of Brookstead State School, Southbrook Central State School and Yelarbon State School are incorporated into the detail design and/or construction planning. ■ Safe corridor access and vehicle turnaround points will be provided for maintenance work to ensure sufficient setback while working adjacent to live railway. Maintenance and emergency access roads will be designed such that it will allow separation to prevent interaction between trains and vehicles without impeding escape or rescue activities. ■ Traffic management arrangements for construction sites, laydown areas or non-resident workforce accommodation camps requiring access directly off/onto a State-controlled road will need to be negotiated with and approved by DTMR. ■ All construction access points will be designed in accordance with Australian Standards with: – Appropriate sighting distances in both the vertical and horizontal – Deceleration lanes for trucks – Acceleration lanes for re-entering construction traffic – Appropriate signage and line marking. ■ Where possible, access will be provided from secondary roads to minimise the potential disruptions to the nearby arterial road network.
	Interface with existing QR network	■ Detail design will be developed in accordance with the requirements of the Basis of Design ■ The interoperability of the ATMS with QR's network will be confirmed through consultation with QR, with compatibility requirements incorporated into the detail design for the Project

Delivery phase	Aspect	Proposed mitigation measures
		- Track design will incorporate trackside monitoring systems, which will detect faults in train wheel set and monitor rail wheel condition and defects. The locations for trackside monitoring systems will be confirmed and incorporated into the detail design. - 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 who are reliant on access to these operational rail lines (e.g. GrainCorp). This consultation will be used to inform: - The programming of construction activities requiring track possessions - Effective communication strategies with QR and other stakeholders. - The agreed construction approach within the existing rail corridor for the South Western Line and the Millmerran Branch Line will be formulated in a wayleave agreement, or similar, between ARTC and QR.
	Road-rail interfaces	- The design of road-rail intersections will continue to be developed in accordance with the principles established in ONRSR Policy: Level Crossings (ONRSR, 2019), and in reference to the ONRSR Guideline: Meaning of duty to ensure safety so far as is reasonably practicable - SFARIP (ONRSR, 2016b) and the Queensland Level Crossing Safety Strategy 2012-2021 (DTMR, 2012) - Physical controls such as boom gates and/or warning lights will be incorporated into the design at active level crossing locations in accordance with the Guide to Development in a Transport Environment: Rail (DTMR 2015a), Manual of Uniform Traffic Control Devices Part 7: Railway Crossings (DTMR, 2019b) and ARTC <i>Engineering Code of Practice – Level Crossings</i>. - Detail design of appropriate exclusion fencing is required near roads or where trespass is likely to occur. Specific fencing requirements are to be agreed through discussion with adjoining landowners and asset owners. Agreed fencing requirements will be documented in a revised fencing strategy for the Project.
	Pavement	- A detailed pavement impact assessment will be undertaken during the detail design phase on State-controlled roads that will be used by construction traffic. The assessment will be in accordance with the GTIA, once the Principal Contractor has been appointed and construction routes have been confirmed. The detailed pavement impact assessment will identify measures to avoid, reduce or mitigate effects on the pavement life of State-controlled roads that will be used by the Project, such as: - Provide a payment contribution for future pavement works - Provide extra pavement width (e.g. to prevent edge degradation) - Provide additional pavement thickness - Seal an unsealed pavement - Provide maintenance during construction - Undertake pavement rehabilitation. - For sealed local government roads, a condition assessment will be conducted (e.g. National Association of Australian State Road Authorities roughness count) prior and post construction activities, as well as at annual intervals during construction. - For unsealed local government roads, a visual condition will be conducted (either manual or vehicle mounted high speed condition survey) prior to and post construction activities. The scope for pavement assessments of unsealed local government roads will be agreed with relevant Councils before construction commences. - The scope and frequency of pavement condition assessments that are to be required during the construction period will be documented in the RUMP

Delivery phase	Aspect	Proposed mitigation measures
	Consultation	■ The detail design and construction method for the Project will be developed in combination with continued consultation with relevant councils, DTMR and emergency service providers (e.g. QFES, QAS and QPS). ■ Continued consultation will be necessary with QR to confirm: – Interconnectivity and interoperability details of the Inland Rail network with the existing railway network – Construction approach for the Project within existing rail corridor. The agreed construction approach in these locations will require a wayleave agreement, or similar, between ARTC and QR ■ Continued consultation with Toowoomba Wellcamp Airport will be required to ensure that the detail design and construction methodology for the Project do not impact on the current and planned future operations of the airport.
Pre-construction and construction ¹	Road network	■ Construction works cannot commence within a State-controlled road corridor without written approval from DTMR. This will be required to be obtained through consultation with DTMR during the detail design phase of the Project ■ The Traffic Management Sub-plan will be implemented and reviewed annually for effectiveness, including review by relevant road controlling authorities ■ Implement the travel demand management awareness campaign (refer above) to notify relevant local councils, DTMR, emergency service providers and community members of the construction activities occurring in support of the Project, temporary alternations to the existing road network and potential impacts on journey time ■ Use directional signage and line marking around construction sites and the surrounding network, including using Variable Message Signs (VMS), if appropriate ■ Develop and implement specific traffic management plans for special events (e.g. Australian Camp Oven Festival in Millmerran, regional road cycling events), to be developed in conjunction DTMR, relevant local councils and event organisers
	Road safety	■ Construction traffic on known school bus routes will be restricted to only essential movements during pick-up and set-down times on school days. ■ 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 in advance prior to the movement of all hazardous/dangerous or oversize construction material and equipment. Temporary traffic management to be implemented, for example road signs stipulating reduced speed limits ■ All Oversize Overmass and Restricted Access Vehicles will comply with Guideline for Excess Dimension Vehicles in Queensland (DTMR, 2013e) in terms of transport safety ■ 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 council and documented in the Traffic Management Sub-plan within the CEMP. ■ Licensed transporters operating in compliance with <i>Australian Code for the Transport of Dangerous Goods by Road and Rail</i> (Commonwealth of Australia, 2018b) will be utilised for the transportation of dangerous goods ■ A 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 roads be required ■ Temporary road works, including diversion and signage, will be in accordance with the Manual of Uniform Traffic Control Devices: Part 3 – Traffic control for works on roads (DTMR, 2019a).

Delivery phase	Aspect	Proposed mitigation measures
	Road-rail interface	Level crossings that are under possession of the constructing authority will be provided with warning signage, line marking, and other relevant controls, in accordance with the Guide to Development in a Transport Environment: Rail (DTMR 2015a), Manual of Uniform Traffic Control Devices Part 7: Railway Crossings (DTMR, 2019b) and with the Traffic Management Sub-plan and RUMP procedures
	Interface with existing QR network	- In accordance with Section 255 of the <i>Transport Infrastructure Act 1994</i>, works cannot 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 existing rail corridor is completed during a temporary possession of the rail corridor, then 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)
	Pavement	- Install shaker grids or rumble pads at entry/exit points from all laydown areas - Pavement condition assessments during and at the conclusion of construction will be carried out at the frequency specified in the RUMP. - Local government and DTMR approved maintenance contractors will be used for construction, modification or rectification of roads. This may entail works such as crack sealing, pothole patching, edge repairs, resealing and grading (of gravel roads), etc.
Operation	Road network	Develop a protocol 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).
	Road-rail interface	- ARTC will conduct routine inspections of crossing infrastructure in accordance with ARTC's <i>engineering codes of practice</i>, and will regularly review crossing performance and incident information to identify opportunities for improved performance and further reduction in risk - 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.
	Access	The rail maintenance access roads will be available for use by emergency vehicles in the event of an incident.

Table notes:

1 Combined, as there is no distinction between mitigation measures applicable for pre-construction and construction phases of the Project

10 Impact assessment summary

Potential impacts to traffic and transport associated with the Project in the construction and operation phases are summarised in Table 10.1. These impacts have been subjected to significance assessment as per the methodology in Section 1.6.2.6.

The initial risk assessment assumes that the design considerations (or initial mitigations) factored into the reference design phase (refer Section 9.1) have been implemented.

Additional mitigation and management measures were then applied as appropriate to the phase of the Project to reduce the level of potential impact (refer Section 9.2). The residual risk level of the potential impacts was then reassessed.

The pre-mitigated risk levels are presented next to the residual risk levels in Table 10.1 to assess the effectiveness of the mitigation and management measures.

Table 10.1 Risk assessment summary for traffic and transport

Aspect	Potential impacts	Phase	Initial risk ¹			Residual risk ²		
			Likelihood	Consequence	Risk	Likelihood	Consequence	Risk
Road network	Operational efficiency	Pre-construction and construction	Likely	Moderate	High	Possible	Minor	Low
		Operation	Likely	Moderate	High	Possible	Minor	Low
Intersections	Operational efficiency	Pre-construction and construction	Possible	Moderate	Medium	Unlikely	Minor	Low
Road-rail interface	Safety	Pre-construction and construction	Possible	Extreme	High	Rare	Major	Low
		Operation	Possible	Extreme	High	Rare	Major	Low
Pavements	Operational efficiency	Pre-construction and construction	Likely	Minor	Low	Possible	Not significant	Low
Access	Safety	Pre-construction and construction	Possible	Moderate	Medium	Unlikely	Major	Medium
Road network	Safety	Pre-construction and construction	Possible	Extreme	High	Unlikely	Major	Medium
Interface with existing QR network	Safety	Pre-construction and construction	Unlikely	Extreme	Medium	Rare	Major	Low
		Operation	Unlikely	Extreme	Medium	Rare	Major	Low

Table notes:

- 1 Includes implementation of initial mitigation measures specified in Section 9.1
- 2 Assessment of residual risk once the mitigation measures identified in Section 9.2 have been applied

11 Cumulative impacts

11.1 Approach

It is a requirement of the ToR for this Project that the potential cumulative impacts be considered. This section provides a discussion on the potential for cumulative impacts in relation to traffic and transport.

The approach used to identify and assess potential construction phase cumulative impacts of the Project is as follows:

- A review of the potential impacts identified within the assessment. The environment at the time of the ToR is the baseline, prior impacts from past land use has not be considered.
- A preliminary list of projects for consideration in the cumulative impact assessment was collated with timelines to demonstrate the temporal relationship between projects. This preliminary list of projects was compiled through consideration of the following:
 - Projects subject to assessment under the EP Act or SDPWO Act, with an Initial Advice Statement published by DES or Department of State Development, Tourism and Innovation (DSDTI)
 - Projects listed in GRC and TRC development application databases
 - Development within Priority Development Areas and State Development Areas
 - Economic Development Queensland development projects
 - Community Infrastructure Designation projects
 - Projects within the public register of environmental authorities
 - DTMR infrastructure projects
 - Private infrastructure facilities
 - Development in accordance with Regional Planning Interests
 - The Inland Rail projects immediately adjacent to the Project, being the North Star to NSW/QLD Border and Gowrie to Helidon projects
- The preliminary list of projects was assessed to identify those that meet one of the following criteria:
 - Projects that have been approved but where construction has not commenced
 - Projects that have commenced construction subsequent to issuance of the ToR for the Project, but have potential for overlap in construction activities with the Border to Gowrie Project
 - Projects that have been completed subsequent to issuance of the ToR for the Project
 - Are operational developments that have future plans for expansion
- Projects that were excluded from further assessment were:
 - Existing projects, with no known plans for expansion. Such projects are typically considered part of the 'existing environment' and have been accounted for in the impact assessment of each specific matter.
 - Proposed projects that have not been developed to the point that details of their scale, size, location and core activities would be publicly available.
- Where there is a potential overlap in impacts (either spatially or temporally), a cumulative impact assessment was undertaken to determine the nature of the cumulative impact. Where possible, the assessment method was quantitative in nature however qualitative assessment has also been undertaken.

- An assessment matrix method has been used to determine the significance of cumulative impacts with respect to beneficial or detrimental effects. This approach requires relevance factors to be established for four aspects (probability, duration, magnitude/intensity and sensitivity of receptors) in relation to each project considered and each potential impact (refer Table 11.1). Relevance factor scores are combined to derive an impact significance score and rating (refer Table 11.2).
- Where cumulative impacts are deemed to be of 'medium' or 'high' significance, additional mitigation measures are proposed, beyond those already proposed by the relevant technical impact assessments.

The significance of construction phase cumulative impacts has been determined by using professional judgement to select the most appropriate relevance factor for each aspect in Table 11.1. The sum of the relevance factors determines the impact significance and consequence which are summarised in Table 11.2. For example if an environmental value (such as traffic) is considered to have a probability of impact of 2, duration of impact of 3, magnitude/intensity of impact of 1 and a sensitivity of receiving environment of 1 the significance of impact would be Medium ($2+3+1+1 = 7$).

Table 11.1 Relevance factor

Aspect	Relevance factor		
	Low	Medium	High
Probability of Impact	1	2	3
Duration of Impact	1	2	3
Magnitude/Intensity of Impact	1	2	3
Sensitivity of Receiving Environment	1	2	3

Table 11.2 Impact significance

Impact significance	Sum of relevant factors	Consequence
Low	1-6	Negative impacts need to be managed by standard environmental management practices. Monitoring to be part of general project monitoring program.
Medium	7-9	Mitigation measures likely to be necessary and specific management practices to be applied. Targeted monitoring program required where appropriate.
High	10-12	Alternative actions should be considered and/or mitigation measures applied to demonstrate improvement. Targeted monitoring program necessary where appropriate.

11.2 Cumulative impact assessment

Twenty-three projects were initially identified as having potential to contribute to cumulative impacts in combination with the Border to Gowrie Project. These projects are either currently operational, expected to undergo future expansion or are currently going through an approval process. A full list of the 23 projects, with a description of each, is presented in Table 11.3.

For the purpose of traffic, transport and access, projects that will have a temporal overlap in construction or expansion activities and may result in traffic usage of the same road network as the Border to Gowrie Project are considered to have potential to result in cumulative impacts. Only nine of the initial 23 projects identified meet these criteria. The projects considered applicable to the traffic and transport cumulative impact assessment are:

- New Acland Coal Mine Stage 3
- Australia Pacific LNG Project
- InterLinkSQ
- Asterion Medicinal Cannabis Facility

- Commodore Mine and Millmerran Power Station
- Wyemo Piggery
- Goondiwindi Abattoir
- North Star to Border (Inland Rail)
- Gowrie to Helidon (Inland Rail).

If construction transportation tasks for the above-mentioned projects occur simultaneously to transportation tasks for the Border to Gowrie Project, then a cumulative increase in traffic volumes on the local road network may occur. 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 utilised by construction traffic
- Reduced level of service on road links used by construction traffic
- Increased waiting time at intersections utilised by construction traffic
- Accelerated degradation of road pavements due to increased volume of traffic and greater axle load.

A qualitative assessment of cumulative impacts that may arise from these projects in combination with the Project is presented in Table 11.4, with a summary of how potential cumulative impacts would be managed. This assessment has concluded that the cumulative traffic and transport impacts of the Project are expected to be up to a **Medium Significance**. The following factors contributed to this determination:

- The assessment has only considered the potential for cumulative impacts above and beyond those that have already been factored into the TIA for the Project. A linear growth rate of two per cent was applied to the annual average daily traffic volumes of roads nominated for use by construction traffic to determine future background traffic volumes for the TIA. This means that the addition of Project construction traffic has already been assessed against a future background traffic scenario that includes allowance for growth in road usage.
- When establishing the scale of the construction task for the Project, buffer factors were applied to derive vehicle movement numbers for each of the foreseeable construction transportation activities. These buffer factors allow for additional journeys that may be required to deliver the Project. However, these factors also provide contingency in the TIA for the addition of background traffic volumes that may be marginally greater than the forecast future scenario.

The TIA will be updated and finalised during the detail design phase, in accordance with the process specified in the Guideline to Traffic Impact Assessment, December 2018 (DTMR, 2018b), to reflect the detail design, construction method (including material sources and quantities) and the finalised construction traffic routes. Other developments and activities in the region that may contribute to background traffic volumes over the construction period for the Border Gowrie Project will be identified and confirmed in consultation with Goondiwindi and Toowoomba Regional Councils and DTMR. These volumes will be incorporated into the revised TIA.

This revised TIA will be used to develop a Traffic Management Sub-plan and a RUMP for the Project, for implementation during construction.

Table 11.3 Projects initially considered for cumulative impact assessment

Projects	Location	Description	Status	Construction dates
Wetalla Water Pipeline	From the Wetalla Wastewater Reclamation Facility in Toowoomba to the New Acland coal mine, 35 km northwest of the city Adjacent to north of the Project footprint	A 45 km underground water pipeline to supply up to 5,500 megalitres of treated waste water to the New Acland coal mine	EIS approved with conditions in 2008 The Wetalla Water Pipeline is completed and operational	2010 to 2013
New Acland Coal Mine Stage 3	35 km northwest of Toowoomba 18 km north of the Project footprint	Expansion of the existing New Acland open-cut coal mine to up to 7.5 Mtpa	EIS approved with conditions in 2014, but currently subject to legal challenge	The mine is operational. Stage 3 expansion works will proceed if legal proceeding end favourably for New Acland Coal.
Australia Pacific LNG Project	Walloons gas fields (approximately 20 km west of Millmerran) 13 km west of the Project footprint	Integrated LNG project. The Walloons gas fields, located to the west of the Project, supplies Coal Seam Gas to support the LNG Facility on Curtis Island.	EIS approved with conditions in 2011	Project started operation in 2015, but subject to continual gas field development
Toowoomba Bypass (formerly the Toowoomba Second Range Crossing)	The 41 km-long bypass route extends from the Warrego Highway at Helidon Spa in the east to the Gore Highway at Athol in the west, via Charlton. 1 km to south and east of the Project footprint	This bypass takes heavy vehicle through-traffic around the north of Toowoomba	Opened in September 2019	2015 to 2019
InterLinkSQ	13 km west of Toowoomba Adjacent to south of the Project footprint	A 200 ha transport, logistics and business hub. Located on the narrow gauge regional rail network and interstate network. Located at the junction of the Gore, Warrego and New England Highways.	Under construction	2018 to unknown Assumed to continue development until Inland Rail is operational
Toowoomba Wellcamp Airport	Wellcamp, QLD 1 km east of the Project footprint	Airport servicing Toowoomba, promoting interstate, intrastate and international connection for the Darling Downs, Granite Belt, Surat Basin and Southern Downs regions	Operational	2013 to 2014
Wellcamp Business Park	Wellcamp, QLD 1.5 km east of the Project footprint	A 500 ha industrial and commercial park that forms part of the Toowoomba Enterprise Hub. The Business Park is located in close proximity to the Toowoomba Wellcamp Airport and other major transportation infrastructure.	Operational	2013 to 2014

Projects	Location	Description	Status	Construction dates
Witmack Industry Park and Charlton Logistics Park	Wellcamp, QLD 3 km southeast of the Project footprint (Witmack Industry Park) Charlton, QLD 3 km south of the Project footprint (Charlton Logistics Park)	The Witmack Industry Park is a large industrial land development that offers large size industrial land parcels. Businesses situated within the Witmack Industrial Park include the Toowoomba Pulse Data Centre. The Charlton Logistics Park is part of the Toowoomba Enterprise Hub and provides fully serviced 2 ha sites and is well situated for potential transport and logistics operators due to its proximity to transport infrastructure.	Operational	2016 to 2018
Asterion Medicinal Cannabis Facility	Wellcamp, QLD Adjoins the Project footprint 1 km south of Toowoomba-Cecil Plains Road	A high-tech medicinal cannabis cultivation, research and manufacturing facility. The project involves construction of a 40 ha glasshouse to produce 20,000 plants per day at full capacity. Medicinal grade cannabis grown at the facility will be manufactured into a range of medicinal products, including single patient packs, cannabis oils, gels, salts and related products, destined solely for the medicinal market. This facility is anticipated to be the largest facility of its kind in the world.	Under construction	2020 to 2021
Commodore Mine and Millmerran Power Station	Domville, QLD Intersects the Project footprint, located primarily to the east	The Commodore Mine is an open cut coal mine which provides coal for the 850 MW Millmerran Power Station. The Millmerran Power Station is a coal-fired power station that supplies enough electricity to power approximately 1.1 million homes.	Operational	2001 to 2003 Subject to annual maintenance shutdown and continual pit expansion. Also potential for coal reserves to be accessed beyond the current footprint
Pittsworth Industrial Precinct and Enabling Project	Pittsworth, QLD 500 m to the south of the Project footprint	Road and sewerage upgrades at the Pittsworth Industrial Precinct to allow for industrial land for industries servicing agriculture and the wider region	Operational	2017 to 2019
Doug Hall Poultry	Millmerran, QLD Intersects the Project footprint, located primarily to northwest	Poultry farming operation with capacity of approximately 20,000 chickens. Operations include egg grading, a feedmill with output of 1,500 tonnes per week, piggery, cropping and solar farm.	Operational	N/A
Yarranbrook Feedlot	Whetstone, QLD Intersects the Project footprint, located predominantly to north	Cattle feedlot licenced for 25,000 head	Operational	N/A
Sapphire Feedlot	Kildonan, QLD Adjacent to the south of the Project footprint	Cattle feedlot which currently has a 6,000 head capacity, with plans to expand to 8,700 and in the future	Operational	N/A
Wyemo Piggery	Glenarvon, QLD 8 km south of the Project footprint	Piggery with approval for 55,000 pig units	Approved with conditions by GRC	Unknown

Projects	Location	Description	Status	Construction dates
Yarranlea Solar	Yarranlea, QLD Intersects the Project footprint, generally extends equally to north and south	Solar Farm which will have a generation capacity of up to 100 MW once completed	Operational	2018 to 2019
Goondiwindi Abattoir	Goondiwindi, QLD 13 km north of the Project footprint	A new beef Abattoir located on the outskirts of Goondiwindi with beef processing of up to 72,000 tonnes per year	Approved with conditions by GRC	Unknown
North Star to NSW/QLD Border (Inland Rail)	Rail alignment from North Star, NSW to the NSW/QLD border Adjoins the Project footprint to the south	New 37 km rail corridor to connect North Star (NSW) to the QR South West Rail Line just north of the NSW/QLD border	Reference design and draft EIS	2021 to 2024
Gowrie to Helidon Project (Inland Rail)	Rail alignment from Gowrie to Helidon, QLD Adjoins the Project footprint to the north	New 26 km dual gauge track between Gowrie (north-west of Toowoomba) and Helidon (east of Toowoomba), extending through the LGAs of Toowoomba and Lockyer Valley. The project includes a 6.38 km tunnel to create an efficient route through the steep terrain of the Toowoomba Range.	Reference design and draft EIS	2021 to 2025
Helidon to Calvert (Inland Rail)	Rail alignment from Helidon to Calvert, QLD 26 km to the east of the Project footprint	New 47 km dual gauge rail line connecting Helidon (east of Toowoomba) with Calvert (near Ipswich), via Placid Hills, Gatton, Forest Hill, Laidley and Grandchester, extending through the LGAs of Lockyer Valley and Ipswich City. The project includes a 1.1 km tunnel to create an efficient route through the steep terrain of the Little Liverpool Range.	Reference design and draft EIS	2021 to 2025
Calvert to Kagaru (Inland Rail)	Rail alignment from Calvert to Kagaru, QLD 70 km to the southeast of the Project footprint	New 53 km dual gauge track from Calvert to Kagaru to provide convenient access for freight to major proposed industrial developments at Ebenezer in the City of Ipswich, and at Bromelton near Beaudesert in the Scenic Rim Region. The project includes a 1.1 km tunnel through the Teviot Range.	Reference design and draft EIS	2021 to 2025
Kagaru to Acacia Ridge (Inland Rail)	Rail alignment from Kagaru to Acacia Ridge, QLD 113 km to the southeast of the Project footprint	Enhancements to, as well as commissioning of, dual gauge operations along the existing interstate track between Kagaru and Acacia Ridge. The project involves 49 km of existing track to be enhanced enabling double-stacking capability along the existing interstate route both south from Kagaru to Bromelton and north from Kagaru to Brisbane's major intermodal terminal at Acacia Ridge. It extends across three LGAs of Scenic Rim, Logan and Brisbane.	Reference design and EIS	2021 to 2025
Cross River Rail	Brisbane, QLD 120 km to the east of the Project footprint	New 10.2 km passenger rail line from Dutton Park to Bowen Hills, which includes 5.9 km of tunnel under the Brisbane River and the CBD. The Project will include four new underground stations at Boggo Road, Woolloongabba, Albert Street and Roma Street, and upgrades to Dutton Park and Exhibition stations.	Construction	2019 to 2024

Table 11.4 Qualitative cumulative impact assessment for traffic

Project	Potential cumulative impact	Impact characteristic	Relevance factor	Sum of relevance factors	Impact significance	Comments and mitigation measures
New Acland Coal Mine Stage 3	Increase traffic volumes on local road network	Probability of the impact	Low (1)	5	Low	The potential for cumulative traffic impacts to arise due to New Acland Coal Mine Stage 3 is considered to be low due to the separation distance between the two projects (18 km north of the Project footprint). The potential for the Project to contribute to increased traffic volumes on the local road network will be managed through: - Development and implementation of a RUMP and Traffic Management Sub-plan - Consultation with DTMR and TRC through the detail design and construction phases of the Project to identify newly occurring issues and risks to the road network that will be used by Project traffic.
		Duration of the impact	Low (1)			
		Magnitude/intensity of the impact	Low (1)			
		Sensitivity of the receiving environment	Medium (2)			
Australia Pacific LNG Project	Increase traffic volumes on local road network	Probability of the impact	Low (1)	5	Low	The potential for cumulative traffic impacts to arise due to the Australia Pacific LNG Project is considered to be low due to the separation distance between the two projects (13 km north of the Project footprint). The potential for the Project to contribute to increased traffic volumes on the local road network will be managed through: - Development and implementation of a RUMP and Traffic Management Sub-plan - Consultation with DTMR and TRC through the detail design and construction phases of the Project to identify newly occurring issues and risks to the road network that will be used by Project traffic.
		Duration of the impact	Low (1)			
		Magnitude/intensity of the impact	Low (1)			
		Sensitivity of the receiving environment	Medium (2)			
InterLinkSQ	Increase traffic volumes on local road network	Probability of the impact	Medium (2)	8	Medium	Both projects are expected to be reliant on use of roads north of the Warrego Highway. The shared use of these roads could occur for a large portion of the construction period for the Project. The potential for the Project to contribute to increased traffic volumes on the local road network will be managed through: - Development and implementation of a RUMP and Traffic Management Sub-plan - Consultation with DTMR and TRC through the construction planning and construction phases of the Project to identify newly occurring issues and risks to the road network used by Project traffic
		Duration of the impact	Medium (2)			
		Magnitude/intensity of the impact	Medium (2)			
		Sensitivity of the receiving environment	Medium (2)			

Project	Potential cumulative impact	Impact characteristic	Relevance factor	Sum of relevance factors	Impact significance	Comments and mitigation measures
						■ Consultation with the developers and operators of InterLinkSQ, throughout construction to understand the scheduling of activities for that Project and enable time periods where cumulative traffic impacts may arise to be identified ■ Where new potential for cumulative impacts are identified through the construction period, additional mitigation measures will be developed in consultation with DTMR, TRC and InterLinkSQ and documented in the Traffic Management Sub-plan and RUMP, as appropriate.
Asterion Medicinal Cannabis Facility	Increase traffic volumes on local road network	Probability of the impact	Medium (2)	6	Low	The potential for cumulative traffic impacts to arise due to the Asterion Medicinal Cannabis Facility is considered to be low due to the short duration of overlap in construction time periods and the likely advanced status of construction of the Medicinal Cannabis Facility by the time peak construction activities for the project occur in the area. The potential for the Project to contribute to increased traffic volumes on the local road network will be managed through: ■ Development and implementation of a RUMP and Traffic Management Sub-plan ■ Consultation with DTMR and TRC through the detail design and construction phases of the Project to identify newly occurring issues and risks to the road network that will be used by Project traffic.
		Duration of the impact	Low (1)			
		Magnitude/intensity of the impact	Low (1)			
		Sensitivity of the receiving environment	Medium (2)			
Commodore Mine and Millmerran Power Station	Increase traffic volumes on local road network	Probability of the impact	High (3)	9	Medium	Both projects are expected to be reliant on use of Millmerran-Inglewood Road in the Millmerran and Clontarf areas. The shared use of this road could occur for a large portion of the construction period for the Project. The potential for the Project to contribute to increased traffic volumes on the local road network will be managed through: ■ Development and implementation of a RUMP and Traffic Management Sub-plan ■ Consultation with DTMR and TRC through the construction planning and construction phases of the Project to identify newly occurring issues and risks to the road network used by Project traffic ■ Consultation with the operators of Commodore Mine, Intergen, throughout construction to understand the scheduling of expansion activities for that Project and enable time periods where cumulative traffic impacts may arise to be identified
		Duration of the impact	Medium (2)			
		Magnitude/intensity of the impact	Medium (2)			
		Sensitivity of the receiving environment	Medium (2)			

Project	Potential cumulative impact	Impact characteristic	Relevance factor	Sum of relevance factors	Impact significance	Comments and mitigation measures
						Where new potential for cumulative impacts are identified through the construction period, additional mitigation measures will be developed in consultation with DTMR, TRC and Interger and documented in the Traffic Management Sub-plan and RUMP, as appropriate.
Wyemo Piggery	Increase traffic volumes on local road network	Probability of the impact	Low (1)	5	Low	The potential for cumulative traffic impacts to arise due to the Wyemo Piggery is considered to be low due to the separation distance between the two projects (8 km north of the Project footprint). The potential for the Project to contribute to increased traffic volumes on the local road network will be managed through: - Development and implementation of a RUMP and Traffic Management Sub-plan - Consultation with relevant road controlling authorities through the detail design and construction phases of the Project to identify newly occurring issues and risks to the road network that will be used by Project traffic.
		Duration of the impact	Low (1)			
		Magnitude/intensity of the impact	Low (1)			
		Sensitivity of the receiving environment	Medium (2)			
Goondiwindi Abattoir	Increase traffic volumes on local road network	Probability of the impact	Low (1)	6	Low	The potential for cumulative traffic impacts to arise due to the Goondiwindi Abattoir is considered to be low due to the separation distance between the two projects (13 km north of the Project footprint). The potential for the Project to contribute to increased traffic volumes on the local road network will be managed through: - Development and implementation of a RUMP and Traffic Management Sub-plan - Consultation with relevant road controlling authorities through the detail design and construction phases of the Project to identify newly occurring issues and risks to the road network that will be used by Project traffic.
		Duration of the impact	Medium (2)			
		Magnitude/intensity of the impact	Low (1)			
		Sensitivity of the receiving environment	Medium (2)			
North Star to Border (Inland Rail)	Increase traffic volumes on local road network	Probability of the impact	Medium (2)	8	Medium	There is potential for construction traffic for both projects to use roads on the Queensland side of the Macintyre River (e.g. Kildonan Road, Wondalli-Kurumbul Road). The potential for the Project to contribute to increased traffic volumes on the local road network will be managed through: - Development and implementation of a RUMP and Traffic Management Sub-plan - Consultation with road network asset managers through the construction planning and construction phases of the Project to identify newly occurring issues and risks to the road network used by Project traffic
		Duration of the impact	Medium (2)			
		Magnitude/intensity of the impact	Medium (2)			
		Sensitivity of the receiving environment	Medium (2)			

Project	Potential cumulative impact	Impact characteristic	Relevance factor	Sum of relevance factors	Impact significance	Comments and mitigation measures
						Subject to construction contract arrangements, investigate opportunities to nominate laydown locations that can be shared between this project and the Border to Gowrie Project. This would enable optimisation of the number of delivery movements and routes to/from the construction sites for both projects.
Gowrie to Helidon (Inland Rail)	Increase traffic volumes on local road network	Probability of the impact	Medium (2)	8	Medium	Both projects are expected to be reliant on use of roads north of the Warrego Highway. The shared use of these roads could occur for a large portion of the construction period for the Project. The potential for the Project to contribute to increased traffic volumes on the local road network will be managed through: - Development and implementation of a RUMP and Traffic Management Sub-plan - Consultation with DTMR and TRC through the construction planning and construction phases of the Project to identify newly occurring issues and risks to the road network used by Project traffic - Subject to construction contract arrangements, investigate opportunities to nominate laydown locations that can be shared between this project and the Border to Gowrie Project. This would enable optimisation of the number of delivery movements and routes to/from the construction sites for both projects.
		Duration of the impact	Medium (2)			
		Magnitude/intensity of the impact	Medium (2)			
		Sensitivity of the receiving environment	Medium (2)			

Table notes:

Relevance factors between 1 and 3 were determined using professional judgement to select most appropriate relevance factor for each aspect and summing the relevance factors.

Sum of relevant factors definition:

- Low (1-6): Negative impacts need to be managed by standard environmental management practices. Monitoring to be part of general project monitoring program.
- Medium (7-9): Mitigation measure likely to be necessary and specific management practices to be applied. Targeted monitoring program required, where appropriate.
- High (10-12): Alternative actions should be considered and/or mitigation measures applied to demonstrate improvement. Targeted monitoring program necessary, where appropriate.

12 Summary of findings

This TIA has been prepared to address Section 11.107 to 11.116 of the ToR. In doing so, the assessment has evaluated a comprehensive range of issues encompassing potential impacts of the construction and operation phases of the Project on the surrounding transport infrastructure and its users. The TIA has 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.

Key findings of this assessment are summarised below.

12.1 Traffic impacts – link roads

The results of the LOS comparison between the “with” and “without” Project scenarios indicated that the Project may potentially cause a minor change in LOS for some road sections during various years of construction. Road sections considered to have a moderate change in LOS during construction include:

- Department Transport and Main Roads
 - Cunningham Highway, between Wyaga Road and Yelarbon-Keetah Road (LOS A to LOS B, gazetted direction only)
 - Gore Highway, between Millmerran-Inglewood Road and Millmerran-Leyburn Road (LOS A to LOS B)
 - Gore Highway, between Vines Street and Toowoomba Bypass (LOS B to LOS C)
 - Millmerran-Inglewood Road, between Kooroongarra Road and Blackwell Road (LOS A to LOS B)
 - Millmerran-Inglewood Road, between Blackwell Road and Campbell Street (LOS A to LOS B)
- Goondiwindi Regional Council:
 - East Sawmill Road, between Cunningham Highway and Springborg Road (LOS A to LOS B)
 - Elizabeth Street, between Cunningham Highway and Callandoon Street (LOS B to LOS C).

Although there is a change in operational LOS, the expected operational LOS B and LOS C is considered acceptable given the short duration of the construction activities. Therefore, during construction, apart from the identified road sections and the explanations provided above; the operational LOS of the overall road network will be no worse as a result of the Project. In addition, the operational performance of the road would also return to base conditions after construction is complete.

Hence, based on the LOS comparison, it is not expected that the Project would generate the need to upgrade the road network for such a short duration of impact, but adequate traffic and road use management strategies would be required.

12.2 Traffic impacts – intersections

Intersections which may potentially experience operational impacts during the construction period have been outlined in Section 6.3, including mitigation measures.

The intersections within GRC include:

- Cunningham Highway/Bybera Road

- Cunningham Highway/Yelarbon-Kurumbul Road
- Cunningham Highway/East Sawmill Road
- Cunningham Highway/Springborg Road
- Cunningham Highway/Whetstone Access Road
- Cunningham Highway/McDougalls Crossing Road
- Cunningham Highway/Elizabeth Street
- Cunningham Highway/Yelarbon-Keetah Road
- Cunningham Highway/Inglewood Quarry Access Road
- East Sawmill Road/Unnamed Road

The key intersections within TRC include:

- Gore Highway/Athol School Road
- Gore Highway/Yarranlea Road
- Gore Highway/Tummaville Road
- Gore Highway/Lindenmayer Road
- Gore Highway/Scrubby Road
- Gore Highway/Linthorpe Road
- Gore Highway/Geitz Road
- Gore Highway/Bushy Lane West
- Gore Highway/Unnamed Road
- Gore Highway/Unnamed Road (2)
- Millmerran-Inglewood Road/Paton Road
- Millmerran-Inglewood Road/Millwood Road
- Millmerran-Inglewood Road/Kooroongarra Road
- Millmerran-Inglewood Road/ Owens Scrub Road
- Toowoomba-Cecil Plains Road/Wellcamp-Westbrook Road
- Greenwattle Street/Alderley Street

All intersections impacted by construction traffic will be considered through the development of the Traffic Management Sub-plan.

12.3 Traffic impacts – pavements

A preliminary desktop pavement impact assessment was undertaken on all envisaged affected DTMR and RMS SCR roads based on the existing background traffic data available for the relevant road sections. The analysis included a five per cent comparison of the background traffic SAR (as calculated in Section 7.3) and project generated SAR for each link identified to be most likely impacted by the proposed Project.

The analysis indicates that the majority of SCR road segments would have a minimal pavement impact given the duration of construction activities and pavement loading. It was found that fourteen SCR roads would exceed the five per cent threshold which consists of:

- Cunningham Highway – Between Wyaga Road and Yelarbon-Keetah Road
- Cunningham Highway – Between Yelarbon-Keetah Road and Texas-Yelarbon Road
- Cunningham Highway – Between Texas-Yelarbon Road and Inglewood-Texas Road

- Cunningham Highway – Between Inglewood-Texas Road and Millmerran-Inglewood Road
- Cunningham Highway – Between Millmerran-Inglewood Road and Inglewood Quarry Access Road
- Cunningham Highway – Between Inglewood Quarry Access Road and Coolmunda Dam Access
- Gore Highway – Between Blackwell Road and Saleyards Road
- Gore Highway – Between Millmerran-Inglewood Road and Millmerran-Leyburn Road
- Gore Highway – Between Millmerran-Leyburn Road and Pampas-Horrane Road
- Gore Highway – Between Pampas-Horrane Road and Brookstead-Norwin Road
- Gore Highway – Between Brookstead-Norwin Road and Tummalville Road
- Gore Highway – Between Tummalville Road and Vines Street
- Gore Highway – Between Vines Street and Toowoomba Bypass
- Gore Highway – Between Toowoomba Bypass and Westbrook Road
- Gore Highway – Between Toowoomba Westbrook Road and Warrego Highway
- Inglewood-Texas Road – Between Cunningham Highway and Greenup Limevale Road
- Inglewood-Texas Road – Between Greenup Limevale Road and Texas-Yelarbon Road
- Inglewood-Texas Road – Between Texas-Yelarbon Road and Stanthorpe-Texas Road
- Inglewood-Texas Road – Between Stanthorpe-Texas Road and Old Texas-Yelarbon Road
- Inglewood-Texas Road – Between Old Texas-Yelarbon Road and NSW/QLD Border
- Millmerran-Inglewood Road – Between Cunningham Highway and Thornton Road
- Millmerran-Inglewood Road – Between Thornton Road and Council Boundary
- Millmerran-Inglewood Road – Between Council Boundary and Kooroongarra Road
- Millmerran-Inglewood Road – Between Kooroongarra Road and Blackwell Road
- Millmerran-Inglewood Road – Between Blackwell Road and Campbell Street
- Millmerran-Inglewood Road – Between Campbell Street and Gore Highway
- Millmerran-Leyburn Road – Between Gore Highway and Reiche Road
- Pampas-Horrane Road – Between Gore Highway and Bostock Road
- Pittsworth-Felton Road – Between Gold Course Road and Short Street
- Texas-Yelarbon Road – Between Cunningham Highway and Old Texas-Yelarbon Road
- Toowoomba-Cecil Plains Road – Between McDougall Street and Boundary Street
- Toowoomba-Cecil Plains Road – Between Boundary Street and Charlton Connection Road
- Toowoomba-Cecil Plains Road – Between Hursley Road and Hanrahans Road
- Toowoomba Bypass – Between Gore Highway and Toowoomba-Cecil Plains Road
- Toowoomba Bypass – Between Toowoomba-Cecil Plains Road and New England Highway
- Warrego Highway – Between Kingsthorpe Haden Road and Toowoomba Bypass
- Yelarbon-Keetah Road – Between Cunningham Highway and Old Warwick Road.

The analysis indicates that the majority of RMS road segments would have a minimal pavement impact given the duration of construction activities and pavement loading. It was found that one RMS road would exceed the five per cent threshold:

- Bruxner Highway – Between New England Highway and Summerland Way.

In the absence of detailed existing pavement life information along RMS roads, more detailed pavement impact assessment will be carried out prior to construction and in consultation with RMS. This will form part of the RUMP to be developed prior to construction. This will assist with further discussions with RMS to identify potential contribution towards the maintenance costs for the affected road sections which should be dealt with post EIS.

A pavement impact assessment was not conducted for envisaged affected LGRs as the guidelines apply to SCRs. Appropriate mitigation measures were developed and provided in Section 9.2 to be applied to both SCR and LGRs. Such mitigation measures will be finalised through consultation with relevant Councils in the next phase of the Project.

12.4 Traffic impacts – road-rail interface

The operational performance of the proposed public level rail crossings in the impact assessment area was assessed to provide an understanding of the impacts on performance during operation stages. The rail crossing impact assessment focuses on vehicle delay and queueing analysis, demonstrating how the Project generated traffic impacts on vehicle delays and queueing issues at the rail crossing, and at nearby closely spaced intersections.

Two future year scenarios were analysed; 2026 (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 analyses results indicate that acceptable Levels of Service would prevail with minimal impact to vehicle queueing and delay should the proposed level crossings be implemented.

The results for the SIDRA analyses for the following Road Rail Interfaces indicated that the proposed level crossing would operate at a LOS A in the AM and PM peak in the year 2026 and 2040 with minimal impacts to queueing (less than 1 vehicle) and delays in each of these scenarios.

- Unnamed Road (310-30-P-2)
- Kooroongarra Road (310-31-P-7)
- Paton Road (310-32-P-4)
- Nicol Creek Road (310-33-P-1)
- Millwood Road (310-34-P-1)
- Blackwell Road (310-36-P-1)
- Scraggs Road (310-36-P-8a)
- Hall Road (310-40-E-1)
- Gilgai Lane (310-41-E-6)
- Harris Road (310-42-E-0)
- Elsdon Road (310-43-E-3)
- Mann Silo Road (310-43-E-8)
- Tip Road (310-48-P-1)
- Linthorpe Valley Road (310-50-P-11)
- Purcell Road (310-52-P-3)
- Leeson Road (310-57-P-4)
- South Kurumbul Road (310-4-E-2)
- Wondali Kurumbul Road (310-5-P-1)

- Kildonan Road (270-12-P-1)
- Unnamed Road (310-8-E-0)
- Unnamed Road (310-10-P-1)
- Suttons Road (310-12-E-1)
- Springborg Road (310-14-E-0)
- Whetstone Access Road (310-16-E-1)
- Bybera Road (310-20-P-12z)
- Lovells Crossing Road (310-21-P-9)
- Thornton Road (310-22-P-9)
- Grays Road (310-25-P-3)
- Wongavale-Yugilbar Road (310-26-P-2)
- Unnamed Road (310-28-P-3).

12.4.1 Millmerran-Inglewood Road (310-24-P-2)

The results of the analysis indicate that the proposed level crossing along Millmerran-Inglewood Road (310-24-P-2) would operate at LOS A in the AM and PM peak in the year 2026 and 2040 with some minor impacts to queueing and delays in each of these scenarios. SIDRA analyses indicate that queues along the south approach would be at most two vehicles in the years 2026 and 2040 AM and PM peaks, with maximum queue lengths reaching 11.6 m on the north approach and 12.8 m on the south approach in the year 2040 AM peak. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

12.4.2 Millmerran-Leyburn Road (310-40-E-2)

The results of the analysis indicate that the proposed level crossing along Millmerran-Leyburn Road (330-40-E-2) would operate at LOS A in the AM and PM peak in the year 2026 and 2040 with minimal impacts to queueing and delays in each of these scenarios. SIDRA analyses indicate that queues along the south approach would be negligible in the year 2026 and 2040 AM and PM peaks, with maximum queue length along the north approach being 8.3 m in the year 2040 PM peak. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

12.4.3 Owens Scrub Road (310-38-P-3)

The results of the analysis indicate that the proposed level crossing along Owens Scrub Road (310-38-P-3) would operate at LOS B in the AM and PM peak in the year 2026 and 2040 with some impacts to queueing and delays in each of these scenarios. The operational LOS calculated is primarily due to the 199 second level crossing closure time, rather than the traffic volumes. SIDRA analysis indicates that queues along the north approach would be at greater in the AM peak, being 33.5m in the year 2026 AM and 44.6m in the year 2040 AM. However, the south approach would have a greater queue length in the PM peak, being 34.1 m in the year 2026 PM peak and 45.5 m in the year 2040. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

12.4.4 Lindenmayer Road (310-39-P-1)

The results of the analysis indicate that the proposed level crossing along Lindenmayer Road (310-39-P-1) would operate at LOS A in the AM and PM peak in the year 2026 and 2040 with minimal impacts to queueing and delays in each of these scenarios. SIDRA analyses indicate that queues along the south approach would be negligible in the year 2026 and 2040 AM and PM peaks, with maximum queue length along the north approach being 6.2 m in the year 2040 AM peak. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

12.4.5 Longhurst Road (310-45-E-1)

The results of the analysis indicate that the proposed level crossing along Longhurst Road (310-45-E-1) would operate at LOS A in the AM and PM peak in the year 2026 and 2040 with minimal impacts to queueing and delays in each of these scenarios. SIDRA analyses indicate that a maximum queue lengths along the south and north approach would occur in the AM peak of 2040, being 10.5m and 10.6m respectively. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

12.4.6 Kildonan Road (270-12-P-1)

The results of the analysis indicate that the proposed level crossing along Kildonan Road (270-12-P-1) would operate at LOS A in the AM and PM peaks in the year 2026 and 2040 with minimal impacts to queueing and delays in each of these scenarios. SIDRA analysis indicates that the maximum queue length along the east approach of the crossing would be 7.3m in the 2040 PM peak, with maximum queue length along the west approach being 7.5m in the 2040 PM peak. These modelled queue lengths do not have an impact on any existing adjacent intersections with the closest intersection being the Kildonan Road/Eukabilla Road intersection located approximately 160 m west of the site. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

12.4.7 McDougalls Crossing Road (310-17-P-7a)

The results of the analysis indicate that the proposed level crossing along McDougalls Crossing Road (310-17-P-7a) would operate at LOS B in the AM and PM peak in the year 2026 and 2040 with minimal impacts to queueing and delays in each of these scenarios. The operational LOS calculated is primarily due to the 190 second level crossing closure time, rather than the traffic volumes. SIDRA analysis indicates that queues along the south and north approaches would be negligible in the year 2026 and 2040 AM and PM peaks. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

12.4.8 Cremascos Road (310-18-P-8)

The results of the analysis indicate that the proposed level crossing Cremascos Road (310-18-P-8) would operate at LOS A in the AM and PM peak in the year 2026 and 2040 with minimal impacts to queueing and delays in each of these scenarios. SIDRA analyses indicate that queues along the north approach would be negligible in the year 2026 and 2040 PM peaks, with maximum queue length in the AM peak of 2040 being 19.1 m. The south approach queue length would be negligible in the year 2026 and 2040 AM peak, with maximum queue length in the PM peak of 2040 being 12.4 m. These modelled queue lengths do not have an impact on any existing adjacent intersections, with no resulting no short stacking issues.

For all road-rail interfaces, with the Project represents worst case scenario. Results indicate that existing crossings would operate at LOS A or B with the Project. This will also be the case without the Project.

12.5 Traffic impacts – active travel

Seventeen cycle routes are identified in Queensland and NSW 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 HV movements through these locations may adversely impact pedestrian movements, the majority of these routes currently facilitate a high proportion of HV movements.

As mentioned in Section 2.4, there are no existing pedestrian interfaces with the proposed rail alignment.

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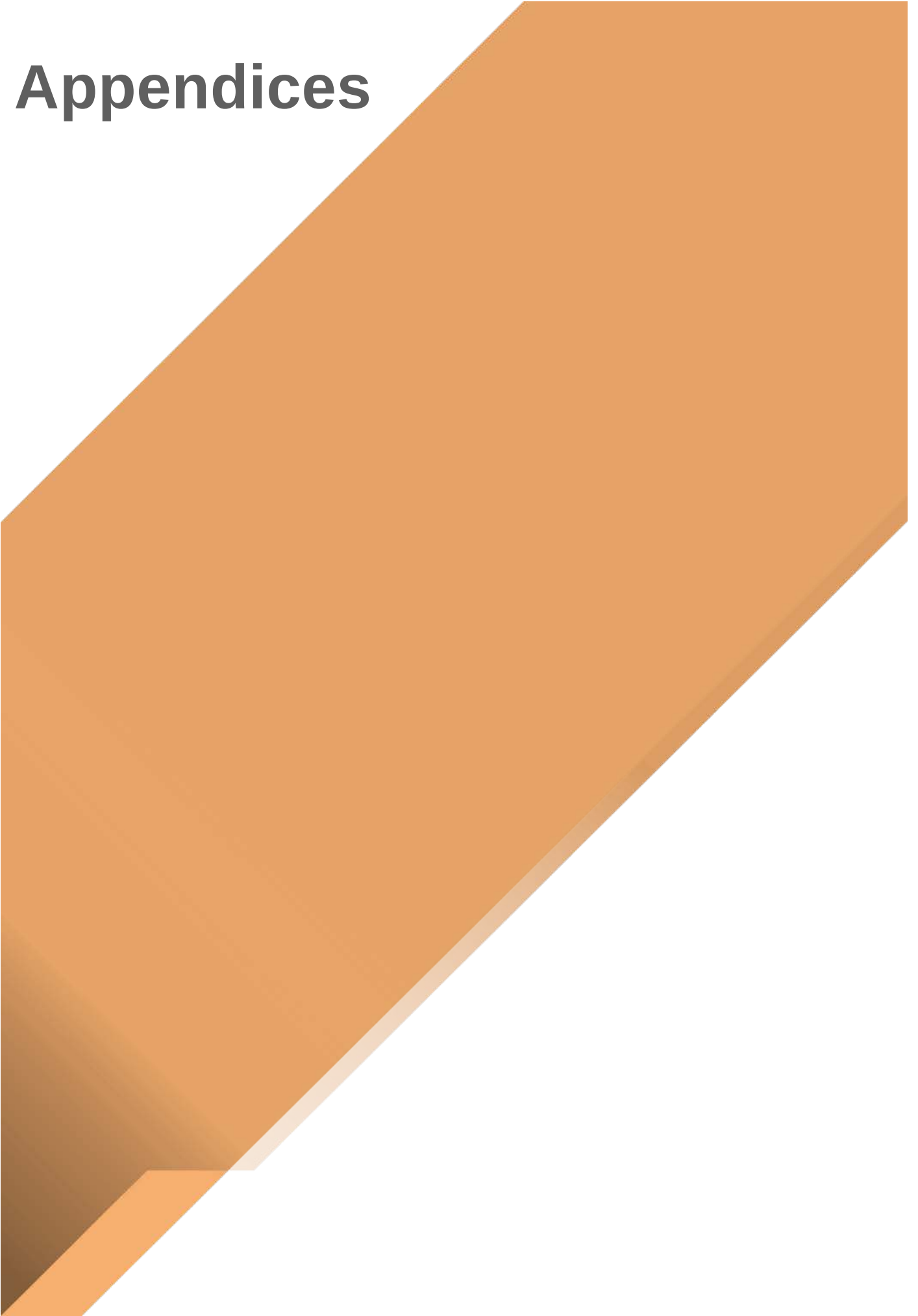
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Appendices



APPENDIX

X

Traffic Impact Assessment

Appendix A Department of Transport and Main Roads Traffic Growth Rates

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

Appendix A

Department of Transport and Main Roads traffic growth rates

Location & Year				Annual Average Daily Traffic (AADT) growth rates										Heavy Vehicles (HV) percent projections													
Segment	Station	Lanes	Year	Annual Average Daily Traffic	Projected AADT	Linear Growth Rate per year and equation used for projections (y=a*x+b)			Equivalent Exponential Growth Rate per year	Final Growth Rate	Total (all lanes) by vehicle type			Projected HV	Linear Growth Rate per year and equation used for projections (y=a*x+b)			Equivalent Exponential Growth Rate per year	Heavy vehicles Estimated HV Projected HV Linear (Heavy vehicles)					Final Growth Rate	Projected HV	Percent of HV	Final Percent of HV
				Historic AADT	Estimated AADT	%	a	b	%		Historic AADT	Light vehicles	Heavy vehicles	Estimated HV	%	a	b	%		Estimated HV	%	Average %					
Inglewood Texas Road	50775 Approx 10km South of 2011		2010																								
			2011																								
			2012	244		2.09%																		25	10.24%		
			2013	186		2.74%																		27	14.64%	11.24%	
			2014	204		2.50%																		21	10.40%		
			2015	255		2.00%																		25	9.67%		
			2016																								
			2018		245		5.1	-10,046.60		1.91%					21		-0.7	1,435.99							21	8.71%	
			2028		296					1.75%					14				-3.9%						14	4.85%	5.45%
			2038		347										7				-5.2%						10	2.78%	
Inglewood Texas Road	50266 200m South of Gree		2010																								
			2011																								
			2012	428																							
			2013	394		1.78%																			23	5.95%	4.92%
			2014	443		1.58%																			18	4.09%	
			2015	435																					21	4.71%	
			2016																								
			2018		457		7.0	-13,669.50		1.44%		457	457		28		2.4	-4,775.19							28	6.06%	
			2028		527					1.35%					51				6.4%						51	9.77%	10.63%
			2038		597										75				5.1%						96	16.05%	
Inglewood Texas Road	55435 2 Approx 20m South of 2011		2010																								
			2011																								
			2012	633		-2.35%																			8	1.26%	
			2013	489		-3.05%																			8	1.62%	1.62%
			2014	493		-3.02%																			8	1.68%	
			2015	582		-2.56%																			11	2.10%	
			2016	520		-2.87%																			11	2.32%	
			2018		482		-14.9	30,550.40		-3.63%		482			11		0.6	-1,254.09							17	5.24%	7.45%
			2028		333					-4.70%					17				4.5%						17	5.24%	
			2038		184										24				3.8%						27	14.79%	
Cunnigham Highway(Inglewood-Goondiwindi)	50027 North End of McIn		2010																								
			2011																								
			2012	2,884		0.92%																			44	1.53%	
			2013	2,880		0.92%																			42	1.47%	1.48%
			2014	2,919		0.90%																			44	1.50%	
			2015	2,959		0.89%																			43	1.46%	
			2016	2,966		0.89%																			42	1.39%	
			2018		3,029		26.4	-50,245.90		0.84%		3,029			42		-0.3	621.16							42	1.39%	
			2028		3,293					0.81%					39				-0.7%						39	1.19%	1.20%
			2038		3,557										36				-0.7%						36	1.02%	
Cunnigham Highway(Inglewood-Goondiwindi)	50574 1.5km North of Go		2010																								
			2011																								
			2012	3,588		-2.02%																			41	1.15%	
			2013	3,432		-2.11%																			44	1.28%	1.18%
			2014	3,562		-2.04%																			39	1.09%	
			2015	3,303		-2.19%																			40	1.21%	
			2016	3,454		-2.10%																			40	1.16%	
			2018		3,145		-72.5	149,450.00		-2.59%		3,145			38		-0.6	1,206.90							38	1.22%	
			2028		2,420					-3.04%					33				-1.6%						33	1.35%	1.40%
			2038		1,695										27				-1.8%						28	1.64%	
Leichhardt Highway (Boundary Road)	55438 Approx 650m West		2010																								
			2011																								
			2012	3,328		-1.43%																			34	1.03%	
			2013	3,015		-1.58%																			29	0.96%	1.08%
			2014	3,170		-1.50%																			33	1.03%	
			2015	3,118		-1.52%																			31	1.00%	
			2016	2,715		-1.75%																			38	1.38%	
			2018		2,944		-47.5	98,799.00		-1.74%		2,944			36		0.9	-1,737.44							36	1.24%	
			2028		2,469					-1.93%					45				2.2%						45	1.83%	1.96%
			2038		1,994										54				2.0%						56	2.81%	
Cunnigham Highway(Inglewood-Goondiwindi)	50091 1km Nth of Bounda		2010																								
			2011																								
			2012	2,355		-1.39%																			33	1.39%	
			2013	2,745		-1.19%																			37	1.36%	1.37%
			2014	2,465		-1.33%																			32	1.29%	
			2015	2,411		-1.36%																			34	1.43%	
			2016	2,358		-1.39%																			33	1.40%	
			2018		2,336		-32.8	68,526.00		-1.50%		2,336			33		-0.3	549.45							33	1.41%	
2028		2,008					-1.64%					30				-0.8%						30	1.51%	1.53%			
2038		1,680										28										28	1.66%				
Cunnigham Highway(Inglewood-Goondiwindi)	50023 Approx 700m West		2010																								
			2011																								
			2012	1,293		1.59%																			50	3.90%	
			2013	1,739																							

Location & Year				Annual Average Daily Traffic (AADT) growth rates							Heavy Vehicles (HV) percent projections										
Segment	Station	Lanes	Year	Annual Average Daily Traffic	Projected AADT	Linear Growth Rate per year and equation used for projections (y=a*x+b)		Equivalent Exponential Growth Rate per year	Final Growth Rate	Total (all lanes) by vehicle type			Projected HV	Linear Growth Rate per year and equation used for projections (y=a*x+b)		Equivalent Exponential Growth Rate per year	Heavy Vehicles (HV) percent projections				
				Historic AADT	Estimated AADT	%	a	b		%	Historic AADT	Light vehicles	Heavy vehicles	Estimated HV	%	a	b	%	Final Growth Rate	Projected HV	Percent of HV
Cunningham Highway(Inglewood-Goondivindi)	50008 5km east of Yelarbon		2010																		
			2011																		
			2012	↓	1,407	-2.66%				1,407	1,358	49		-5.4%					49	3.51%	
			2013	↑	1,958	-1.91%				1,958	1,908	50		-5.3%					50	2.54%	3.01%
			2014	↓	1,422	-2.63%				1,422	1,378	44		-6.0%					44	3.09%	
			2015	↓	1,461	-2.56%				1,461	1,419	42		-6.3%					42	2.91%	
			2016																		
			2018							1,394			34		-2.7	5,390.21			34	2.47%	
			2028							1,020			8						8	0.77%	1.18%
			2038							646			-19						2	0.28%	
Cunningham Highway(Inglewood-Goondivindi)	50772 Approx 200m West		2010																		
			2011																		
			2012	↑	1,329					1,329	1,278	51		0.0%					51	3.81%	
			2013																	3.81%	
			2014																		
			2015																		
			2016																		
			2018						0.00%												
			2028																		
			2038																	3.81%	
Cunningham Highway(Inglewood-Goondivindi)	50773 Approx 2.5km west of		2010																		
			2011																		
			2012	↓	1,480	-1.40%				1,480	1,433	47		-3.1%					47	3.18%	
			2013	↑	1,914	-1.08%				1,914	1,866	48		-3.0%					48	2.52%	2.81%
			2014	↓	1,562	-1.33%				1,562	1,516	46		-3.1%					46	2.96%	
			2015	↓	1,591	-1.30%				1,591	1,550	41		-3.6%					41	2.55%	
			2016	↓	1,538	-1.35%				1,538	1,494	44		-3.3%					44	2.84%	
			2018							1,534			39		-1.4	2,957.43			39	2.57%	
			2028							1,327			25						25	1.88%	1.95%
			2038							1,120			10						16	1.41%	
Cunningham Highway(Inglewood-Goondivindi)	55420 Approx 100m West		2010																		
			2011																		
			2012	↓	2,400	3.58%				2,400	2,375	25		4.6%					25	1.05%	#DIV/0!
			2013	↑	2,486	3.46%				2,486	2,457	29		3.9%					29	1.18%	
			2014																33	#DIV/0!	
			2015																33	#DIV/0!	
			2016																23	#DIV/0!	
			2018						2.62%	2,916			34		1.2	-2,307.35			34	1.15%	
			2028							3,776			45						45	1.20%	1.22%
			2038							4,636			57						61	1.31%	
Cunningham Highway(Inglewood-Goondivindi)	51840 200m East of McIntyre		2010																		
			2011																		
			2012	↓	2,127	-1.58%				2,127	2,090	37		-1.1%					37	1.74%	
			2013	↑	2,340	-1.44%				2,340	2,300	40		-1.0%					40	1.71%	1.72%
			2014	↓	2,106	-1.60%				2,106	2,072	34		-1.2%					34	1.61%	
			2015	↓	2,036	-1.65%				2,036	2,000	36		-1.2%					36	1.78%	
			2016	↓	2,111	-1.59%				2,111	2,074	37		-1.1%					37	1.74%	
			2018							2,010			35		-0.4	876.63			35	1.75%	
			2028							1,674			31						32	1.94%	1.97%
			2038							1,338			27						30	2.24%	
Cunningham Highway(Inglewood-Goondivindi)	51836 1km West of Fosters		2010																		
			2011																		
			2012	↑	1,507					1,507	1,461	46		0.0%					46	3.07%	
			2013																	3.07%	
			2014																		
			2015																		
			2016																		
			2018						0.00%												
			2028																		
			2038																	3.07%	
Millmerran Inglewood Road	50024 Approx 5km north of		2010																		
			2011																		
			2012	↓	274	3.65%				274	244	30		2.3%					30	10.77%	
			2013	↓	231	4.33%				231	200	31		2.2%					31	13.21%	11.55%
			2014	↓	256	3.91%				256	227	29		2.3%					29	11.52%	
			2015	↓	273	3.66%				273	241	32		2.1%					32	11.62%	
			2016	↑	303	3.30%				303	271	32		2.1%					32	10.65%	
			2018							307			33		0.7	-1,320.69			33	10.86%	
			2028							407			40						40	9.84%	10.06%
			2038							507			47						48	9.49%	
Millmerran Inglewood Road	32040 Approx 1.5km South of		2010	↑	256					256									29		
			2011																26		
			2012																		
			2013																		
			2014																		
			2015																		
			2016																		
			2018						0.00%												
			2028																		
			2038																		
Millmerran Inglewood Road	32562 500m South of Camp		2010																		
			2011																		
			2012	↓	847	5.23%				847	827	20		4.9%					20	2.34%	
			2013	↓	767	5.78%				767	745	22		4.4%					22	2.87%	2.53%
			2014	↓	855	5.18%				855	834	21		4.5%					21	2.51%	
			2015	↓	864	5.13%				864	843	21		4.6%					21	2.48%	
			2016	↑	1,020	4.34%				1,020	995	25		3.9%					25	2.44%	
2018							1,048			26		1.0	-1,945.75			26	2.47%				
2028							1,491			36						36	2.39%	2.46%			
2038							1,934			45						49	2.54%				
Millmerran Inglewood Road	32644 Approx 3km From Go		2010																		
			2011																		

Location & Year				Annual Average Daily Traffic (AADT) growth rates										Heavy Vehicles (HV) percent projections											
Segment	Station	Lanes	Year	Annual Average Daily Traffic	Projected AADT	Linear Growth Rate per year and equation used for projections (y=a*x+b)				Equivalent Exponential Growth Rate per year	Final Growth Rate	Total (all lanes) by vehicle type			Projected HV	Linear Growth Rate per year and equation used for projections (y=a*x+b)				Equivalent Exponential Growth Rate per year	Final Growth Rate	Projected HV	Percent of HV	Final Percent of HV	
				Historic AADT	Estimated AADT	%	a	b	%	Historic AADT		Light vehicles	Heavy vehicles	Estimated HV	%	a	b	%	Estimated HV	%		Average %			
Millmerran Leyburn Road	32032 Approx 2.6km East of Millmerran	2	2010																						
			2011																						
			2012	↓	171				7.84%														21	12.40%	
			2013	↓	171				7.84%														21	12.40%	13.22%
			2014	↓	193				6.94%														26	13.69%	
			2015	↓	193				6.94%														26	13.69%	
			2016	↑	227				5.90%														32	13.91%	
			2018			245																	36	14.61%	
			2028			379			13.4		-26,796.60	4.47%											62	16.30%	17.23%
			2038			513					3.77%												106	20.77%	
Gore Highway	30024 300m West of Pampaloo	2	2010																						
			2011																						
			2012	↓	2,573				1.32%														33	1.27%	
			2013	↓	2,387				1.42%														30	1.26%	1.20%
			2014	↓	2,489				1.36%														30	1.19%	
			2015	↓	2,540				1.33%														29	1.13%	
			2016	↑	2,666				1.27%														30	1.13%	
			2018			2,667																	28	1.03%	
			2028			3,006					1.20%												21	0.69%	0.73%
			2038			3,345					1.14%												16	0.47%	
Gore Highway	30042 WIM Site 450m East of Warragamba	2	2010																						
			2011																						
			2012	↓	4,064				4.45%														20	0.49%	
			2013	↓	3,358				5.38%														19	0.56%	0.47%
			2014	↓	3,888				4.65%														18	0.46%	
			2015	↓	4,288				4.22%														18	0.43%	
			2016	↑	4,503				4.02%														19	0.43%	
			2018			4,743																	18	0.38%	
			2028			6,551					3.28%												17	0.25%	0.27%
			2038			8,359					2.87%												15	0.18%	
Toowoomba Cecil Plains Road	32062 324-200m East of Berambai Rd	2	2010																						
			2011																						
			2012	↓	1,887				1.05%														16	0.84%	
			2013	↓	1,887				1.05%														16	0.82%	0.67%
			2014	↓	1,972				1.01%														16	0.82%	
			2015	↓	1,972				1.01%														17	0.89%	
			2016	↑	1,944				1.02%														20	0.92%	0.93%
			2018			2,012																	17	0.87%	
			2028			2,211					0.95%												20	0.92%	
			2038			2,410					0.91%												24	0.99%	
Toowoomba Cecil Plains Road	32664 324-800m West of Oakey Road	2	2010																						
			2011																						
			2012	↓	2,330				11.59%														22	0.96%	
			2013	↓	2,330				11.59%														22	0.96%	0.76%
			2014	↓	3,456				7.81%														22	0.65%	
			2015	↓	3,456				7.81%														22	0.65%	
			2016	↑	3,117				8.66%														18	0.59%	
			2018			4,018																	18	0.46%	
			2028			6,718					5.27%												11	0.16%	0.23%
			2038			9,418					4.35%												6	0.06%	
Toowoomba Cecil Plains Road	32014 324-500m West of M80	2	2010																						
			2011																						
			2012	↓	5,111				2.72%														30	0.58%	
			2013	↓	5,111				2.72%														30	0.58%	0.56%
			2014	↓	5,362				2.59%														32	0.61%	
			2015	↓	5,777				2.40%														30	0.52%	
			2016	↑	5,472				2.54%														27	0.50%	
			2018			5,922																	28	0.47%	
			2028			7,310					2.13%												23	0.32%	0.34%
			2038			8,698					1.94%												19	0.22%	
Charlton Connection Road	32074 300m South of Grahame Crn	2	2010																						
			2011																						
			2012	↓	3,823				2.40%														26	0.68%	
			2013	↓	3,823				2.40%														27	0.68%	0.66%
			2014	↓	4,322				2.12%														27	0.62%	
			2015	↓	4,477				2.05%														28	0.62%	
			2016	↓	3,955				2.32%														28	0.70%	
			2018			4,447																	29	0.65%	
			2028			5,365					1.89%												34	0.63%	0.64%
			2038			6,283					1.74%												40	0.64%	
Warrego Highway	30025 Approx 300m East of Warrego Crn	2	2010																						
			2011																						
			2012	↑	12,884				-2.26%														19	0.14%	
			2013	↑	13,244				-2.20%														18	0.14%	0.14%
			2014	↓	12,975				-2.25%														16	0.12%	
			2015	↓	12,066				-2.42%														18	0.15%	
			2016	↓	12,015				-2.43%														17	0.14%	
			2018			11,470																	17	0.14%	

Location & Year				Annual Average Daily Traffic (AADT) growth rates						Heavy Vehicles (HV) percent projections													
Segment	Station	Lanes	Year	Annual Average Daily Traffic	Projected AADT	Linear Growth Rate per year and equation used for projections (y=a*x+b)			Equivalent Exponential Growth Rate per year	Final Growth Rate	Total (all lanes) by vehicle type				Projected HV	Linear Growth Rate per year and equation used for projections (y=a*x+b)			Equivalent Exponential Growth Rate per year	Final Growth Rate	Projected HV	Percent of HV	Final Percent of HV
				Historic AADT	Estimated AADT	%	a	b	%		Historic AADT	Light vehicles	Heavy vehicles	Estimated HV	%	a	b	%	Estimated HV		%	Average %	
Cunningham Highway	50574		2010	3,506		0.54%				0.51%	3,506	2,275	1,231		1.6%				1.3%	1,231			
			2011	3,462		0.55%					3,462	1,953	1,509		1.3%					1,509			
			2012	3,588		0.53%					3,588	2,113	1,475		1.3%					1,475	41.10%		
			2013	3,432		0.55%					3,432	1,929	1,503		1.3%					1,503	43.80%	41.15%	
			2014	3,562		0.53%					3,562	2,184	1,378		1.4%					1,378	38.70%		
			2015	3,303		0.57%					3,303	1,949	1,354		1.4%					1,354	41.00%		
			2016	3,454		0.55%					3,454	2,068	1,386		1.4%					1,386	40.13%		
			2017	3,842		0.49%						3,842	2,221	1,621		1.2%							
			2018		3,598							3,598	2,143		1,455		19.4	-37,693.91			1,455	40.45%	
			2028		3,787				0.51%				3,787			1,649					1,649	43.55%	43.67%
			2038		3,976				0.50%				3,976			1,843					1,869	47.01%	
Cunningham Highway	50023		2010	1,259						1.65%	1,259	790	469		5.2%				2.8%	469			
			2011	1,245							1,245	657	588		4.2%					588			
			2012	1,293		2.10%					1,293	641	652		3.8%					652	50.40%		
			2013	1,739		1.56%					1,739	873	866		2.8%					866	49.80%	48.74%	
			2014	1,398		1.94%					1,398	747	651		3.8%					651	46.60%		
			2015	1,475		1.84%					1,475	751	724		3.4%					724	49.10%		
			2016	1,385		1.96%					1,385	723	662		3.7%					662	47.80%		
			2017	1,456							1,456	747	709		3.5%					767	50.19%		
			2018		1,528						1,528			767		24.5	-48,674.30			767	50.19%		
			2028		1,800				1.65%				1,800			1,012					1,012	56.22%	56.95%
			2038		2,071				1.53%				2,071			1,257					1,335	64.45%	
Cunningham Highway	50773		2010	1,439		1.59%				1.29%	1,439	950	489		4.2%				2.4%	489			
			2011	1,369		1.67%					1,369	789	580		3.6%					580			
			2012	1,480		1.55%					1,480	783	697		3.0%					697	47.10%		
			2013	1,914		1.20%					1,914	991	923		2.3%					923	48.20%	45.14%	
			2014	1,562		1.47%					1,562	840	722		2.9%					722	46.20%		
			2015	1,591		1.44%					1,591	947	644		3.2%					644	40.50%		
			2016	1,538		1.49%					1,538	866	672		3.1%					672	43.70%		
			2017	1,596							1,596	871	725		2.9%					773	46.27%		
			2018		1,671						1,671	898		773		20.8	-41,181.05			773	46.27%		
			2028		1,900				1.29%				1,900			981					981	51.63%	52.12%
			2038		2,129				1.22%				2,129			1,189					1,245	58.46%	
Cunningham Highway	51840		2010	1,915		0.98%				0.82%	1,915	1,264	651		2.7%				1.9%	651			
			2011	2,033		0.92%					2,033	1,330	703		2.5%					703			
			2012	2,127		0.88%					2,127	1,340	787		2.3%					787	37.00%		
			2013	2,340		0.80%					2,340	1,404	936		1.9%					936	40.00%	36.76%	
			2014	2,106		0.89%					2,106	1,392	714		2.5%					714	33.90%		
			2015	2,036		0.92%					2,036	1,299	737		2.4%					737	36.20%		
			2016	2,111		0.89%					2,111	1,336	775		2.3%					775	36.70%		
			2017	2,156							2,156	1,289	867		2.1%					841	38.48%		
			2018		2,186						2,186	1,345		841		17.8	-35,038.83			841	38.48%		
			2028		2,373				0.82%				2,373			1,019					1,019	42.94%	43.21%
			2038		2,560				0.79%				2,560			1,197					1,234	48.22%	
Cunningham Highway	50005		2010	1,475		1.42%				1.12%	1,475	882	593		1.8%				1.4%	593			
			2011	1,425		1.47%					1,425	829	596		1.8%					596			
			2012	1,622		1.29%					1,622	925	697		1.6%					697	43.00%		
			2013	2,211		0.95%					2,211	1,309	902		1.2%					902	40.80%	39.82%	
			2014	1,698		1.23%					1,698	1,095	603		1.8%					603	35.50%		
			2015	1,664		1.26%					1,664	1,048	616		1.8%					616	37.00%		
			2016	1,613		1.30%					1,613	923	690		1.6%					690	42.80%		
			2017	1,647							1,647	914	733		1.5%					732	41.35%		
			2018		1,770						1,770	1,038		732		10.8	-21,102.71			732	41.35%		
			2028		1,979				1.12%				1,979			840					840	42.45%	42.62%
			2038		2,189				1.07%				2,189			948					964	44.07%	
Leichardt Highway	55438		2010	3,073		-2.41%				-3.13%	3,073	1,936	1,137		-0.9%				-1.0%	1,137			
			2011	3,275		-2.26%					3,275	2,076	1,199		-0.8%					1,199			
			2012	3,328		-2.23%					3,328	2,263	1,065		-0.9%					1,065	32.00%		
			2013	3,015		-2.46%					3,015	2,147	868		-1.1%					868	28.80%	32.38%	
			2014	3,170		-2.34%					3,170	2,140	1,030		-0.9%					1,030	32.50%		
			2015	3,118		-2.38%					3,118	2,148	970		-1.0%					970	31.10%		
			2016	2,715		-2.73%					2,715	1,697	1,018		-1.0%					1,018	37.50%		
			2017	2,651							2,651	1,485	1,166							1,088	37.06%		
			2018		2,719						2,719	1,711		1,008		-9.8	20,723.57		1,008	37.06%			
2028		1,978				-3.13%			1,978			910				910	46.02%	49.85%					
2038		1,236				-3.87%			1,236			812				822	66.49%						
Cunningham Highway	55420		2010	2,180		-1.58%				-1.97%	2,180		507		5.0%				3.1%				
			2011	1,903		-1.81%					1,903		547		4.6%								
			2012	2,400		-1.44%					2,400		610		4.2%								
			2013	2,486		-1.39%					2,486	1,755	731		3.5%					731	29.40%	29.79%	
			2014	1,891		-1.82%					1,891	1,276	615		4.1%					615	32.50%		
			2015	1,791		-1.93%					1,791	1,377	414		6.1%					414	23.10%		
			2016	2,032		-1.70%					2,032	1,338	694		3.7%					694	34.17%		
			2017	2,020							2,020	1,213	807		3.1%								
			2018		1,909						1,909	1,909		724		25.4	-50,492.94			724	37.93%		
			2028		1,564				-1.97%				1,564			978					978	62.52%	69.60%
			2038		1,219				-2.22%				1,219			1,231					1,320	108.35%	
Leichardt Highway	50019		2010	2,283		-0.48%				-0.57%	2,283	1,560	723		-2.4%				-3.1%	723			
			2011	2,151		-0.51%					2,151	1,314	837		-2.1%					837			
			2012	2,226		-0.49%					2,226	1,337											

APPENDIX

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Traffic Impact Assessment

Appendix B Roads and Maritime Services Traffic Growth Rates

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

Appendix B

Roads and Maritime Services traffic growth rates

[illegible]

Location & Year				Annual Average Daily Traffic (AADT) growth rates										Heavy Vehicles (HV) percent projections									
Segment	Station	Lanes	Year	Annual Average Daily Traffic	Projected AADT	Linear Growth Rate per year and equation used for projections (y=a*x+b)			Equivalent Exponential Growth Rate per year	Final Growth Rate	Total (all lanes) by vehicle type				Linear Growth Rate per year and equation used for projections (y=a*x+b)			Equivalent Exponential Growth Rate per year	Final Growth Rate	Projected HV	Percent of HV	Final Percent of HV	
				Historic AADT	Estimated AADT	%	a	b			%	Historic AADT	Light vehicles	Heavy vehicles	Estimated HV	%	a						b
Gwydir Highway	6133 Between Warialda		2011																				
			2012																				
			2013																				
			2014																				
			2015	1,067		4.12%						1,067	838	229		20.5%							
			2016	525		8.38%						525	400	125		37.6%							
			2017	1,155		3.81%						1,155	832	323		14.6%							
			2018		1,004		44.0	-87,788.33	3.70%		1,004			320		47.0	-94,526.33	9.5%					
			2028		1,444						1,444			790									
			2038		1,884				3.20%		1,884			1,260									
Newell Highway	BGBSTC		2010	2,536		1.75%					2,465	1,318	1,147										
			2011	2,465		1.78%					2,499	1,314	1,185		3.1%								
			2012	2,499		1.72%					2,584	1,409	1,175		3.1%								
			2013	2,584							2,584	1,321	1,263		2.9%								
			2014																				
			2015	2,724		1.60%					2,724	1,397	1,327										
			2018		2,777		44.4	-86,862.57	1.49%		2,777			1,350		36.9	-73,033.81	2.4%					
			2028		3,221				1.40%		3,221			1,718									
			2038		3,665						3,665			2,087									
			Summerland Way	T0260		2011																	
2012																							
2013																							
2014																							
2015	2,800					0.77%					2,800	2,341	459		6.0%								
2016	1,437					1.50%					1,437	1,203	234		11.8%								
2017	2,843					0.76%					2,843	2,329	514		5.4%								
2018		2,403					21.5	-40,984.00	0.86%		2,403			457		27.5	-55,037.67	4.8%					
2028		2,618							0.83%		2,618			732									
2038		2,833									2,833			1,007									

APPENDIX

X

Traffic Impact Assessment

Appendix C Construction Routes— Road Hierarchy

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

Appendix C

Construction Routes - Road hierarchy



Map by: LUCIMEF\LS Z\GIS\GIS_310_B2\GIS\GIS_310-ITR-201903071702_AppC_Construction_Routes_Road_Hierarchy_rev4.mxd Date: 20/05/2020 18:18

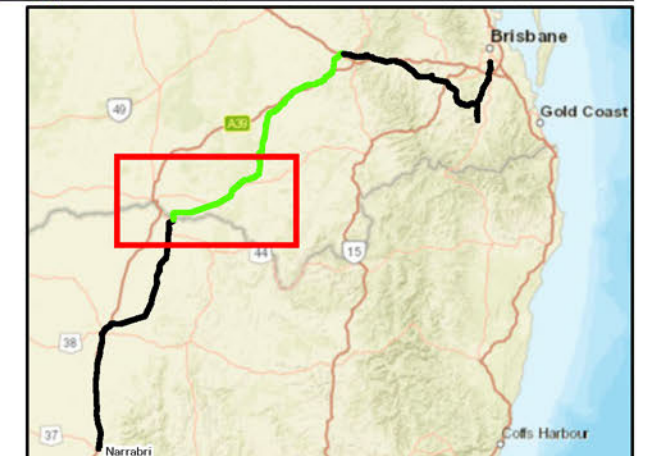
Legend

- 5 Chainage (km)
- Localities
- Existing rail (operational)
- North Star to NSW/QLD border alignment
- Border to Gowrie alignment

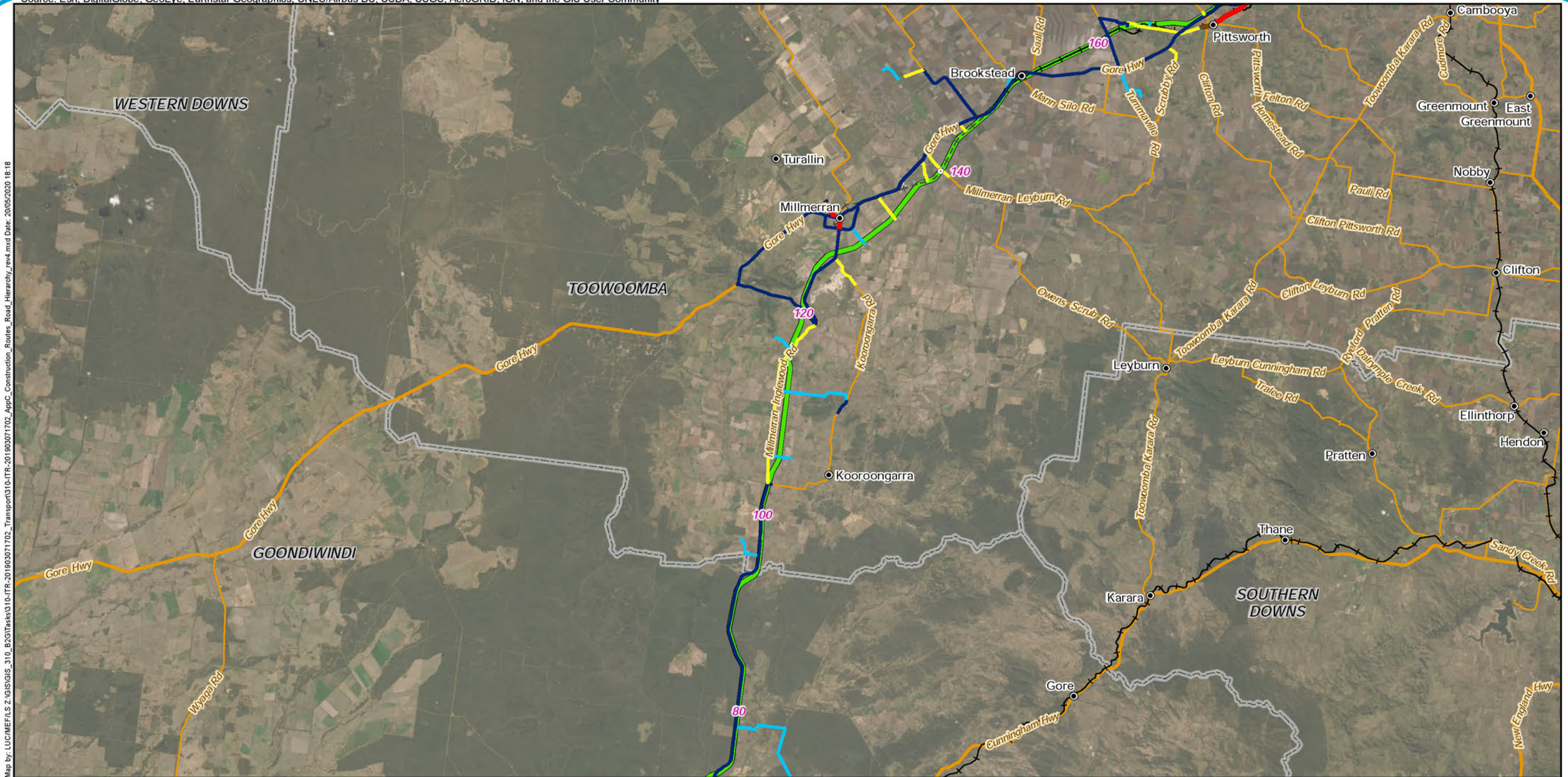
- Major roads
- Minor roads
- NSW/QLD border
- Local Government Areas

Road Hierarchy

- Rural Arterial
- Rural Collector
- Rural Local
- Urban Collector
- Urban Local

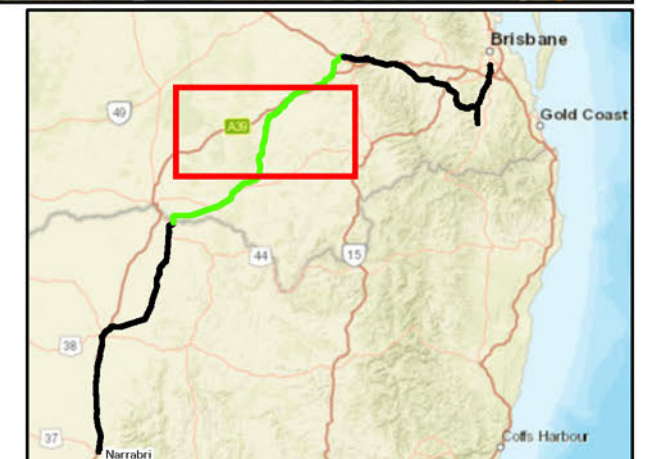


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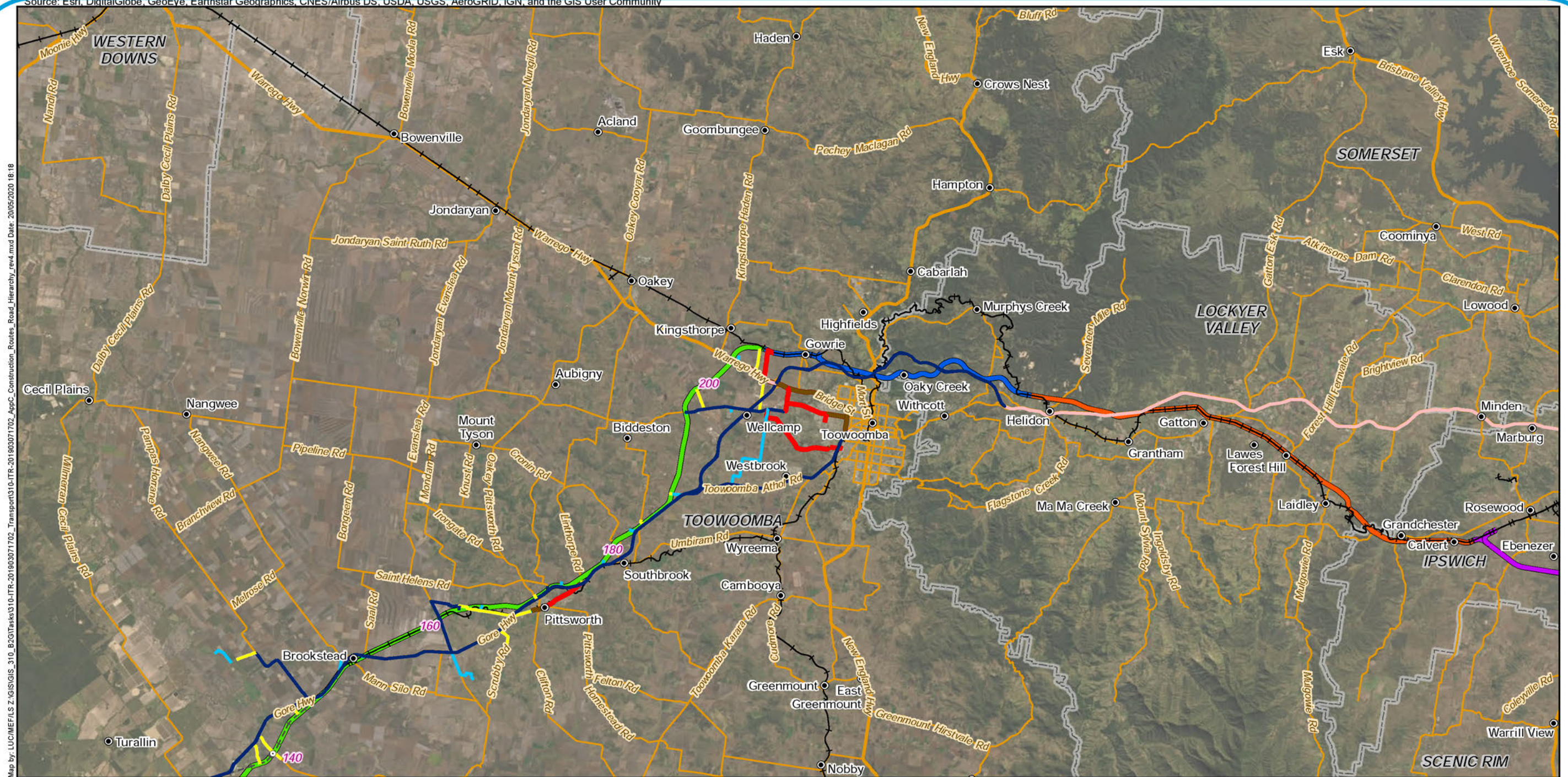


Legend

- | | | |
|---------------------------------|------------------------|---|
| 5 Chainage (km) | Major roads | Road Hierarchy
Rural Arterial
Rural Collector
Rural Local
Urban Arterial
Urban Collector
Urban Local |
| Localities | Minor roads | |
| Existing rail (operational) | Local Government Areas | |
| Existing rail (non-operational) | | |
| Border to Gowrie alignment | | |
| | | |



A3 scale: 1:400,000
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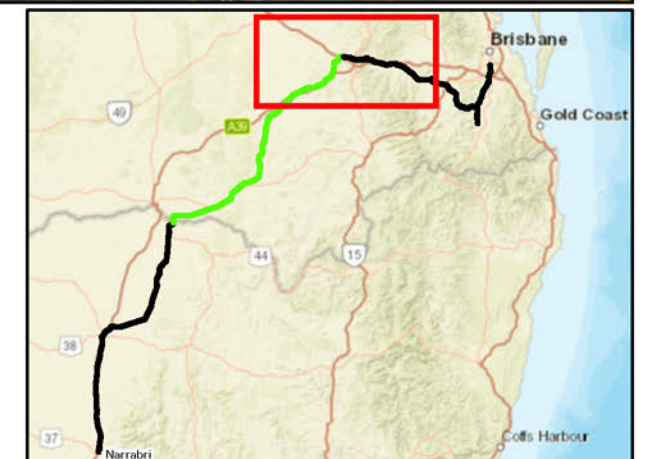
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- 5 Chainage (km)
- Localities
- Existing rail (operational)
- - - Existing rail (non-operational)
- Border to Gowrie alignment
- Gowrie to Helidon alignment
- Helidon to Calvert alignment
- Calvert to Kagaru alignment

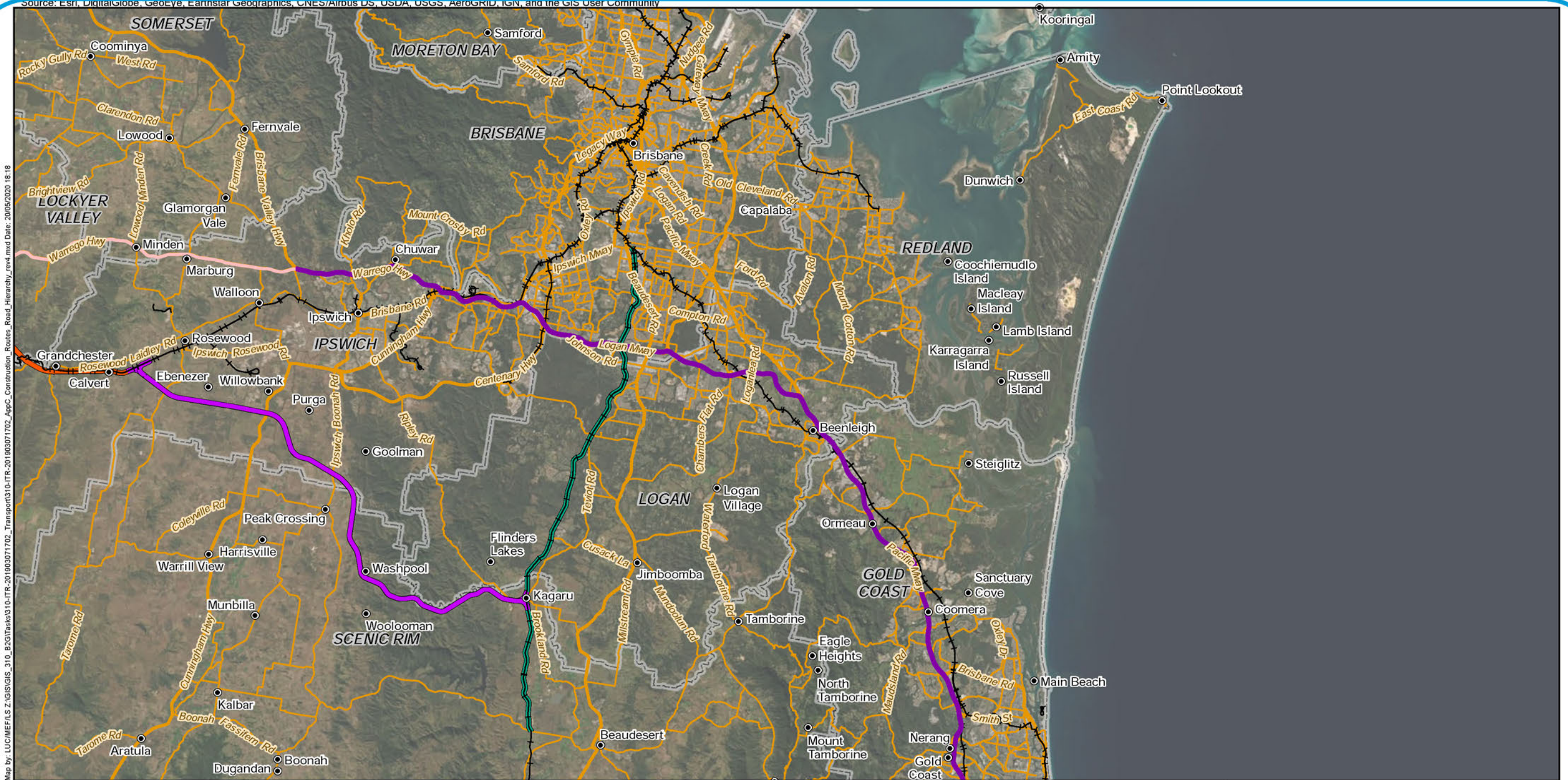
- Major roads
- Minor roads
- Local Government Areas

Road Hierarchy

- Rural Arterial
- Rural Collector
- Rural Local
- Rural Motorway
- Urban Arterial
- Urban Collector



A3 scale: 1:400,000
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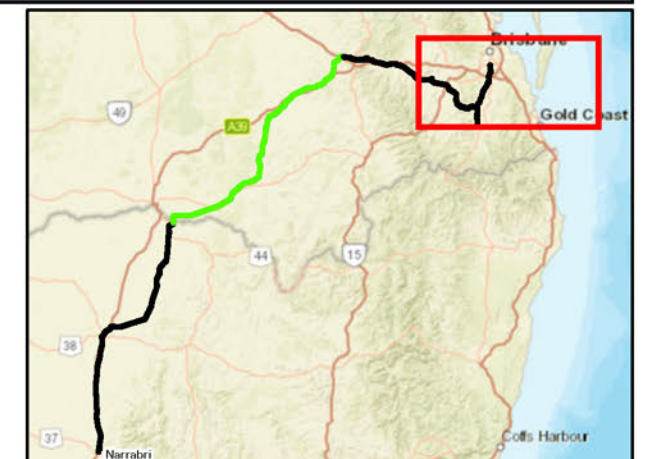


Legend

- 5 Chainage (km)
- Localities
- Existing rail (operational)
- Helidon to Calvert alignment
- Calvert to Kagaru alignment
- Kagaru to Acacia Ridge/Bromelton alignment

- Major roads
- Minor roads
- Local Government Areas

- #### Road Hierarchy
- Rural Motorway
 - Urban Motorway

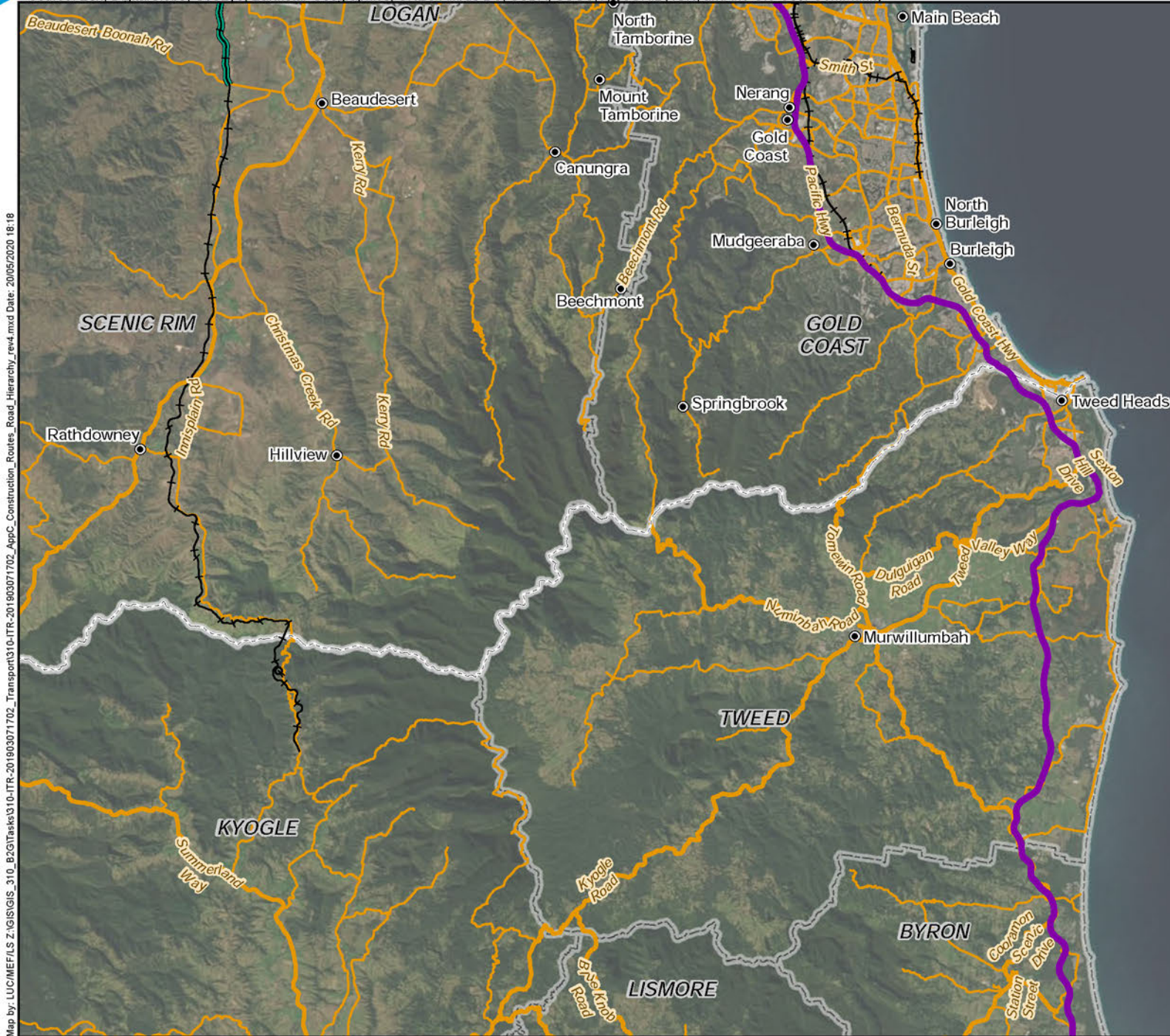


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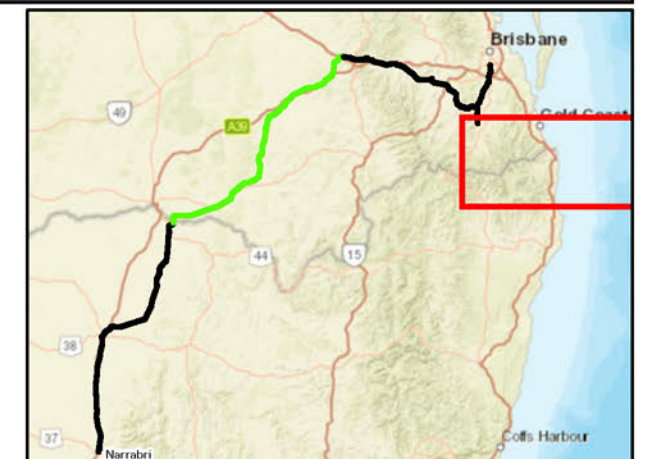
Future Freight
 Integrating Community, Environment and Engineering

Issue date: 19/05/2020 Version: 3
 Coordinate System: GDA 1994 MGA Zone 56

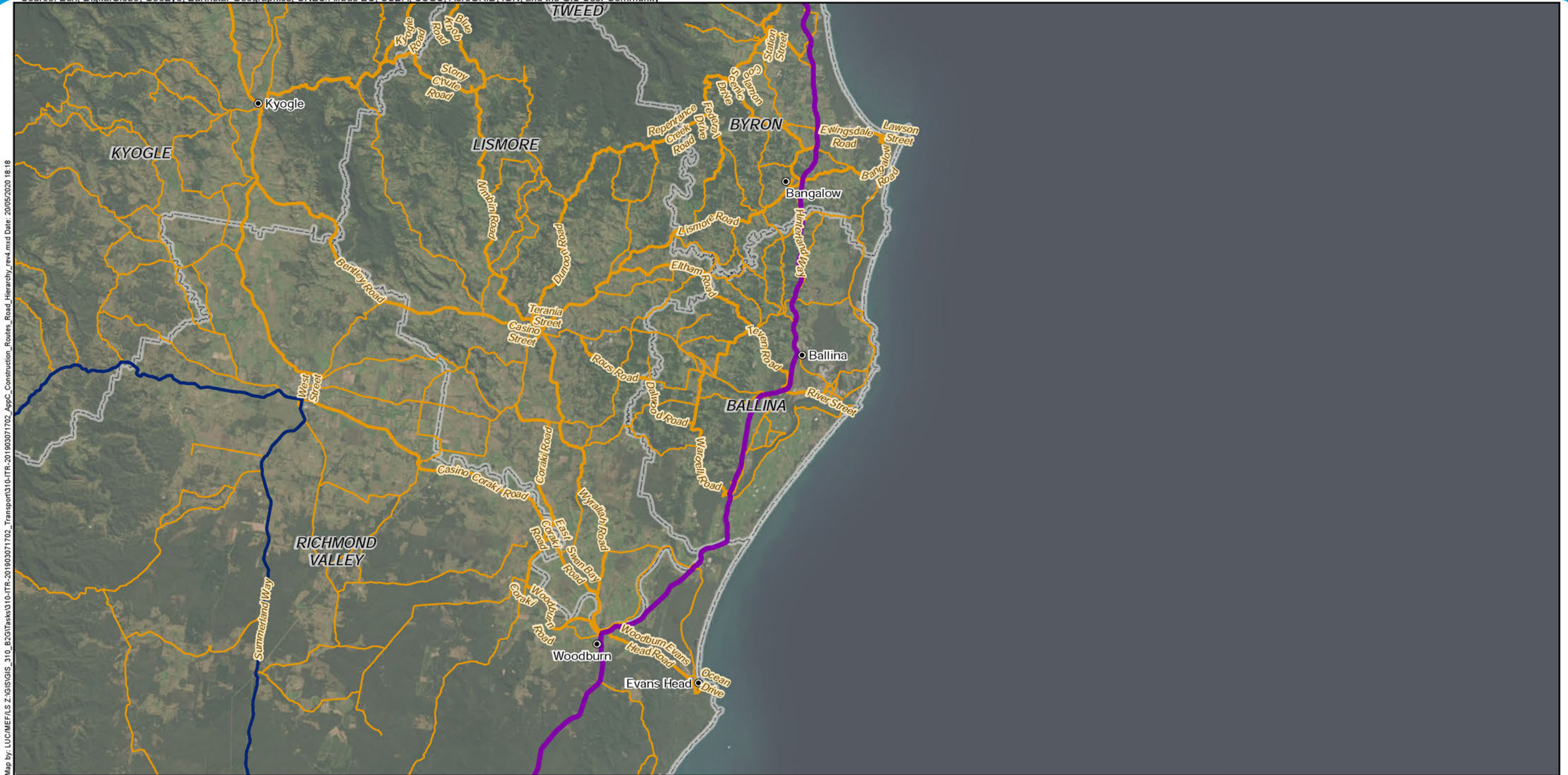


Legend

- | | | |
|--|------------------------|----------------|
| 5 Chainage (km) | Major roads | Road Hierarchy |
| Localities | Minor roads | Urban Motorway |
| Existing rail (operational) | NSW/QLD border | |
| Kagaru to Acacia Ridge/Bromelton alignment | Local Government Areas | |

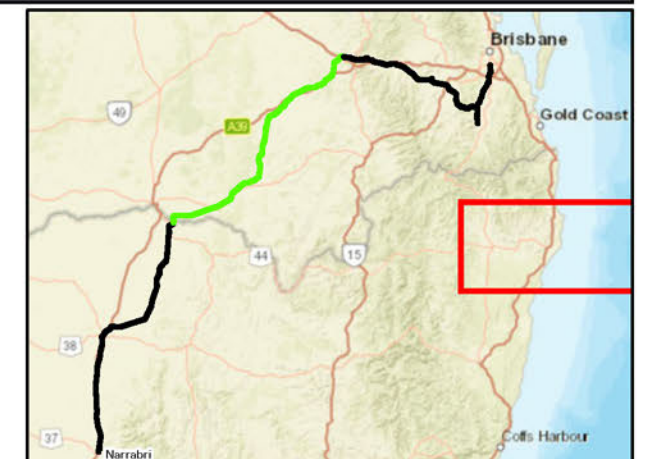


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Legend

- | | | |
|-----------------|------------------------|----------------|
| 5 Chainage (km) | Major roads | Road Hierarchy |
| Localities | Minor roads | |
| | Local Government Areas | |
| | | Rural Arterial |
| | | Urban Motorway |

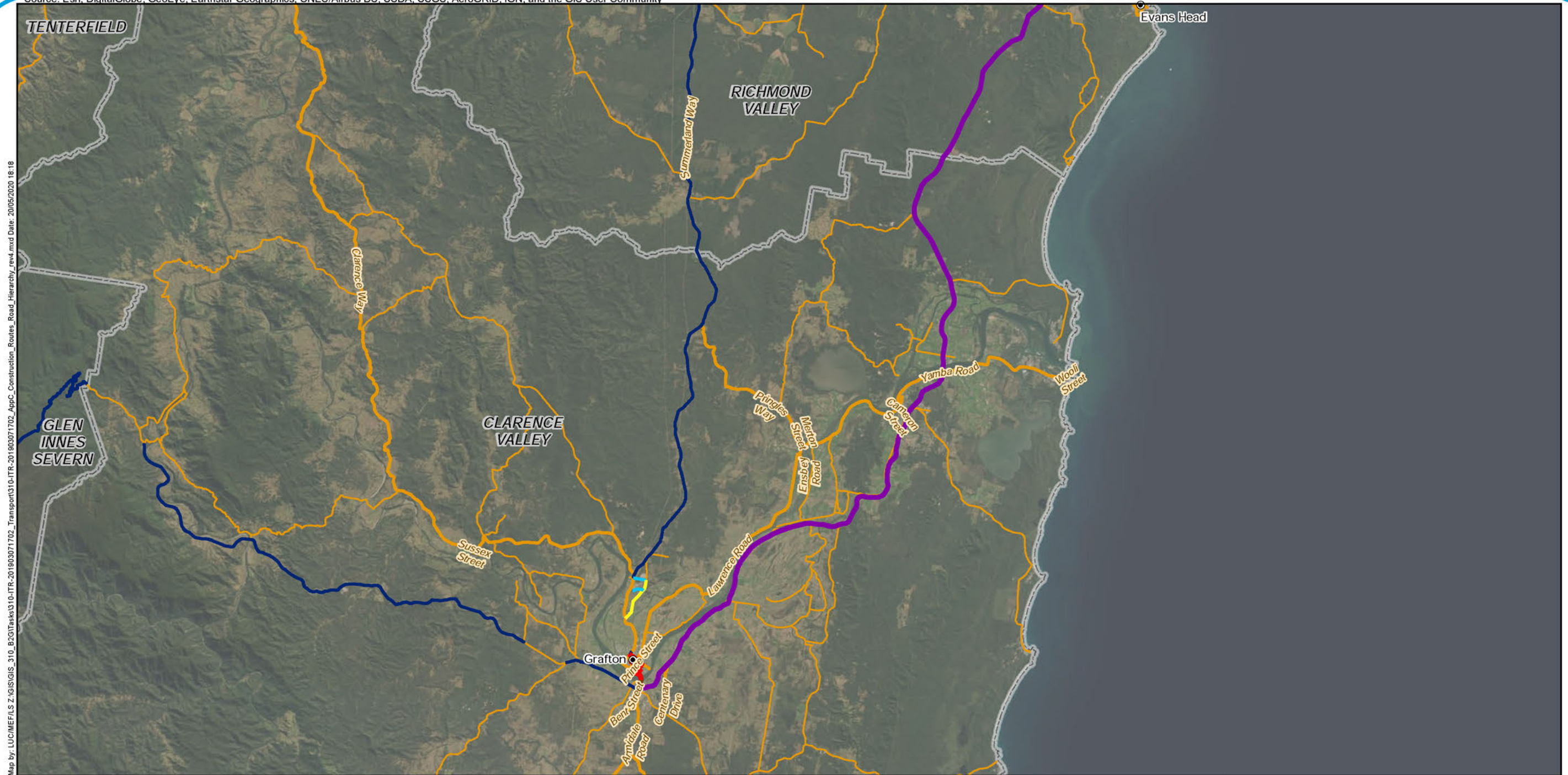


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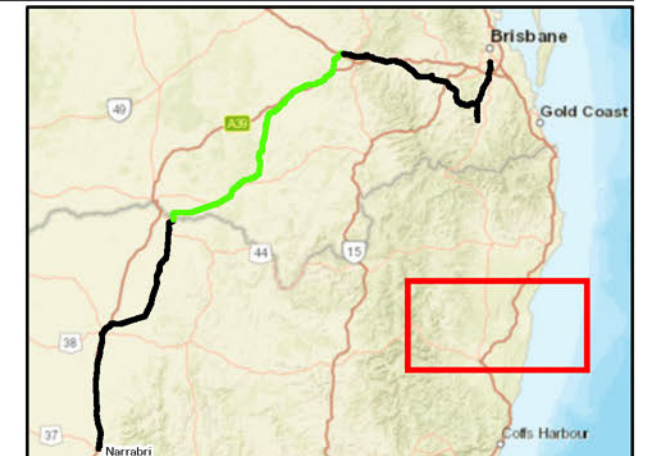
Legend

- 5 Chainage (km)
- Localities

- Major roads
- Minor roads
- Local Government Areas

Road Hierarchy

- Rural Arterial
- Rural Collector
- Rural Local
- Urban Arterial
- Urban Collector
- Urban Motorway



A3 scale: 1:400,000
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Future Freight
 Integrating Community, Environment and Engineering

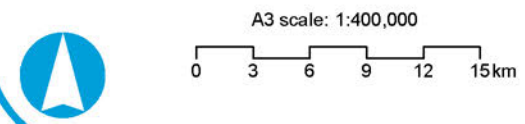
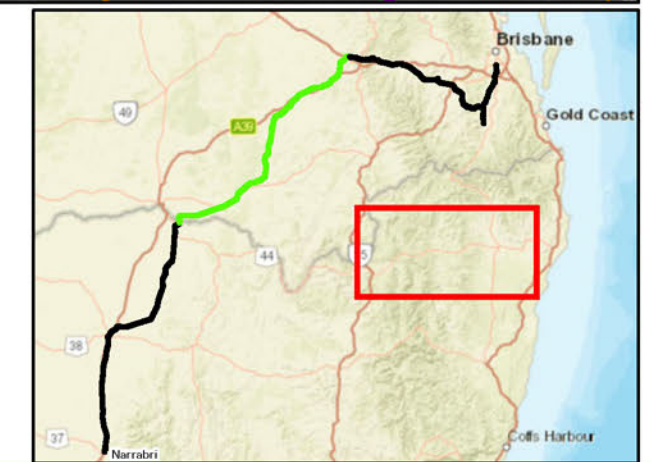
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Border to Gowrie

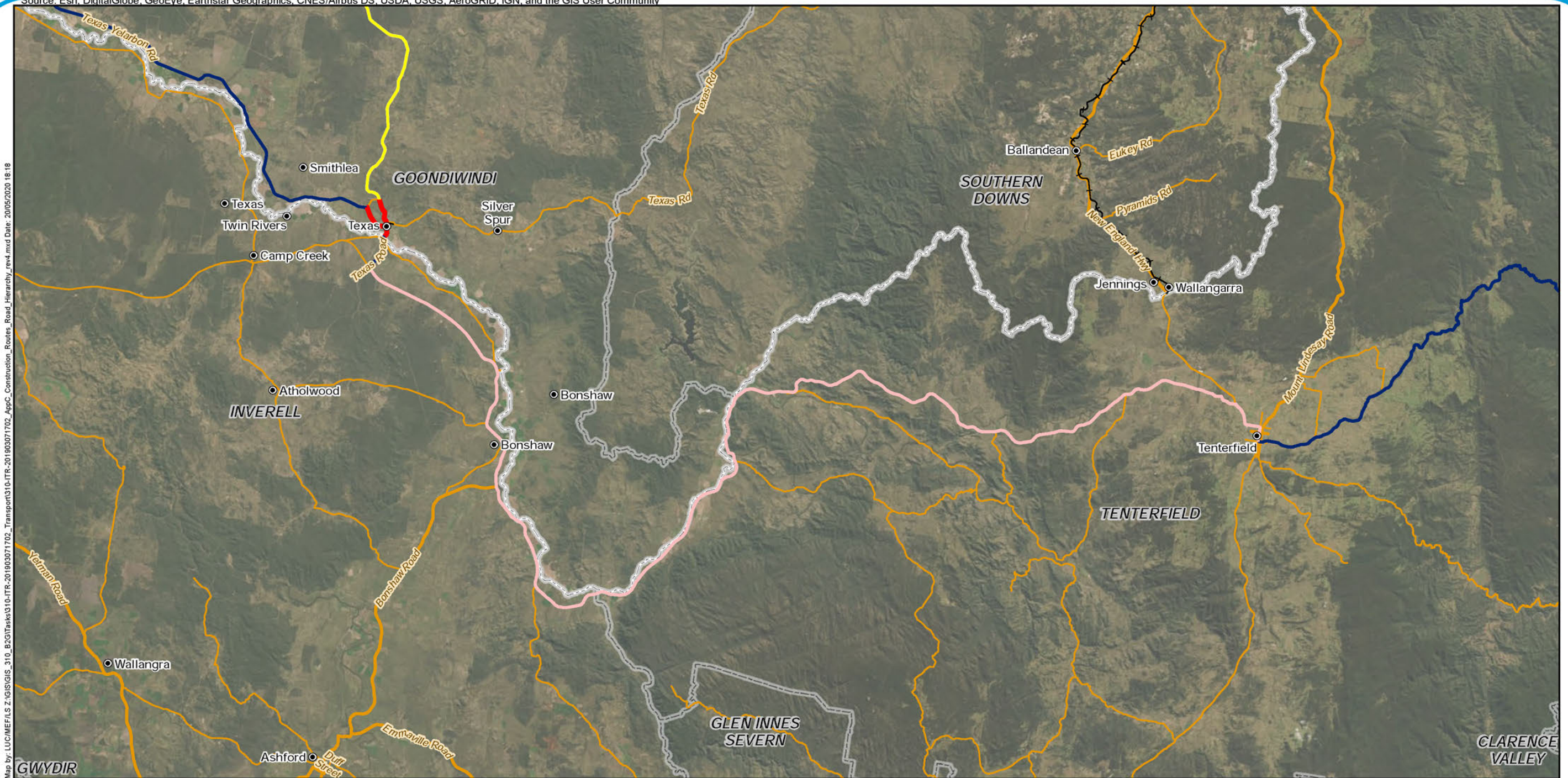
Appendix C7: Construction Routes - Road Hierarchy



- Legend**
- 5 Chainage (km)
 - Localities
 - Existing rail (operational)
 - Major roads
 - Minor roads
 - NSW/QLD border
 - Local Government Areas
 - Road Hierarchy**
 - Rural Arterial
 - Rural Motorway
 - Urban Motorway

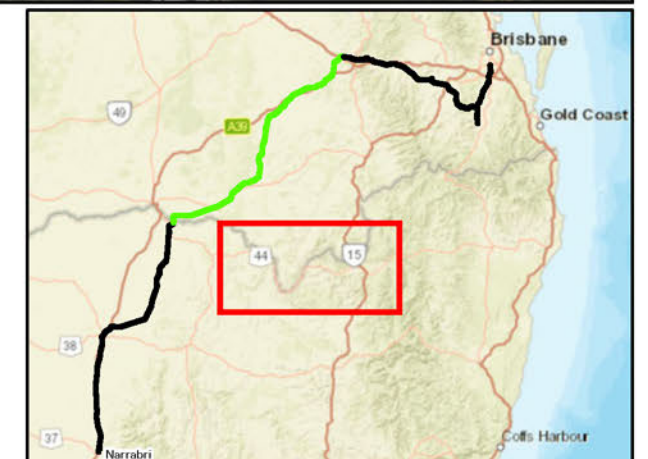


Map by: LUCIMEF\LS_Z\GIS\GIS_310_B2\GIS\GIS_310-ITR-201903071702_Transport\310-ITR-201903071702_AppC_Construction_Routes_Road_Hierarchy_rev4.mxd Date: 20/05/2020 18:18



Legend

- | | | |
|-------------------------------|------------------------|---|
| 5 Chainage (km) | Major roads | Road Hierarchy
Rural Arterial
Rural Collector
Rural Motorway
Urban Collector |
| ● Localities | Minor roads | |
| — Existing rail (operational) | NSW/QLD border | |
| | Local Government Areas | |
| | | |



A3 scale: 1:400,000
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Future Freight
 Integrating Community, Environment and Engineering

Issue date: 19/05/2020 Version: 3
 Coordinate System: GDA 1994 MGA Zone 56

APPENDIX

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Traffic Impact Assessment

Appendix D Existing Standard Axle Repetitions and Pavement Impact Analysis

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

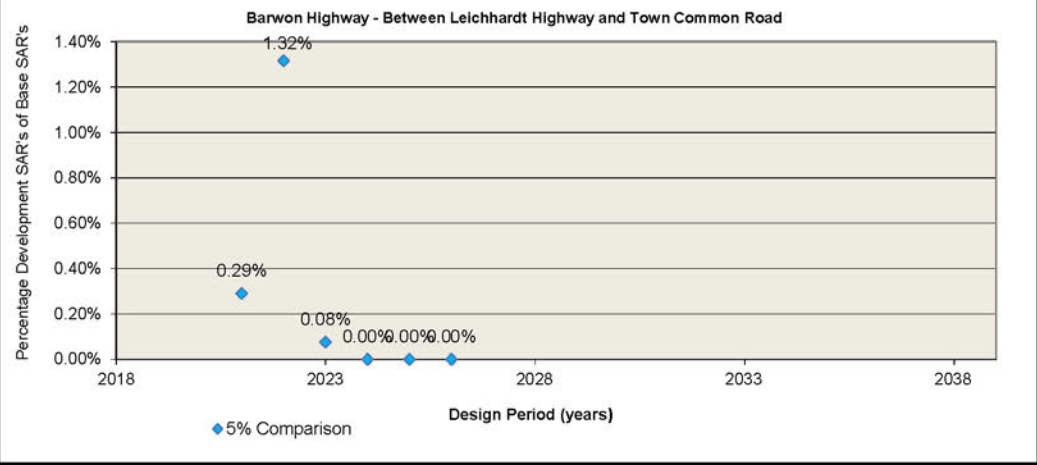
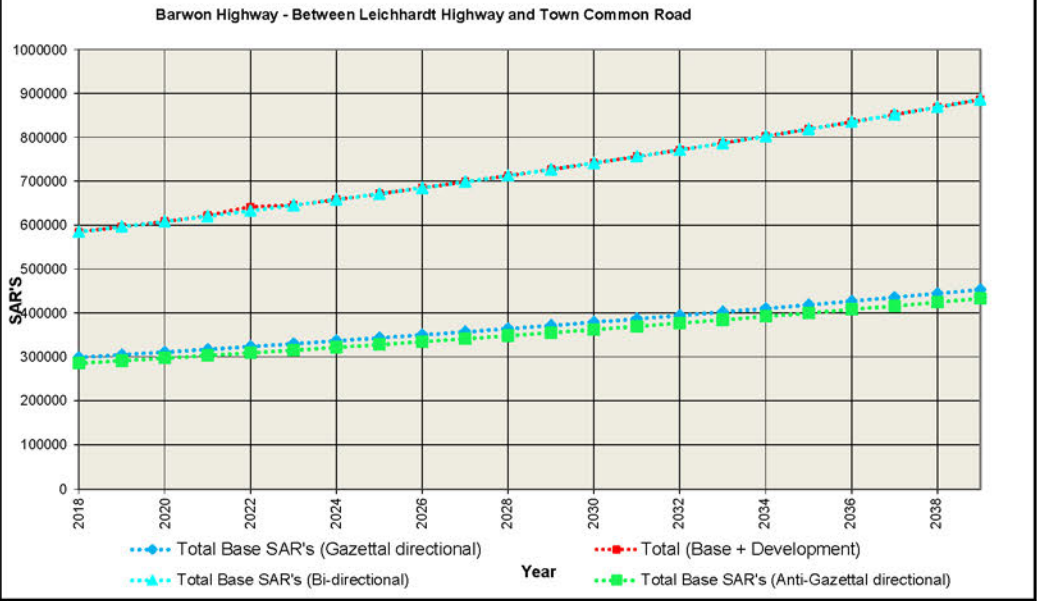
Appendix D

Existing standard axle repetitions and pavement impact analysis

Barwon Highway - Between Leichhardt Highway and Town Common Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

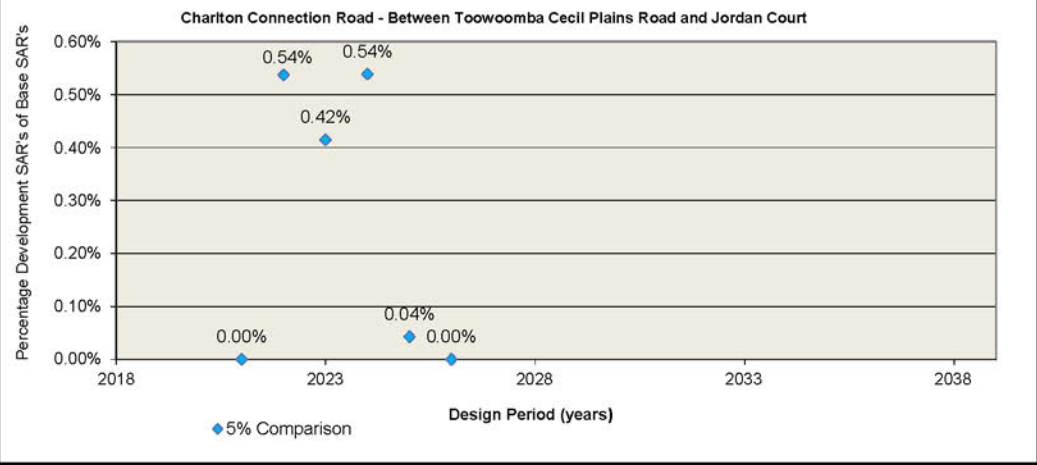
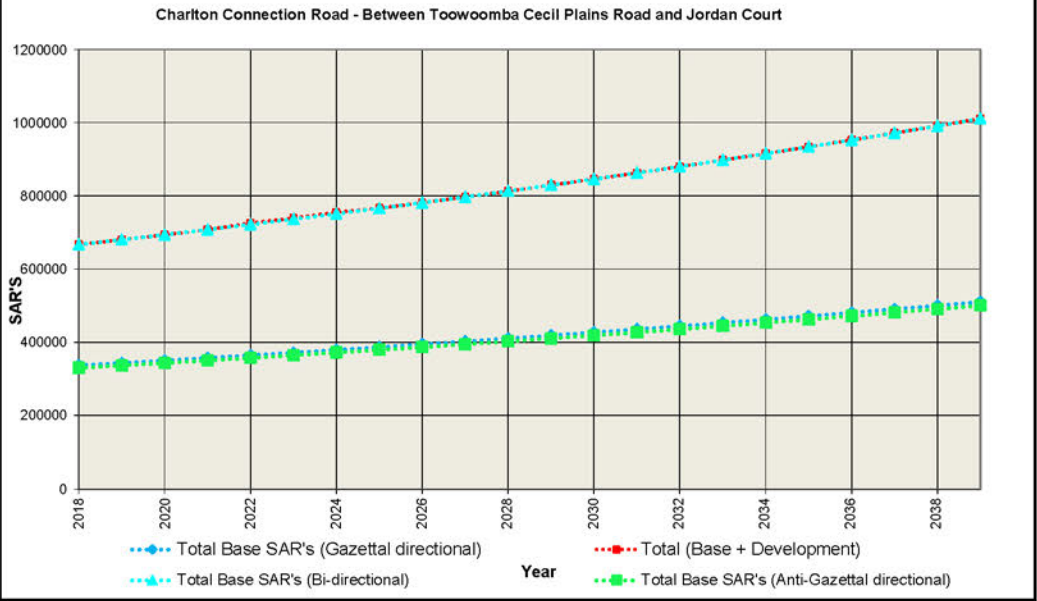
Barwon Highway			Between Leichhardt Highway and Town Common Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	285690	298951			584641	
2019	291404	304930			596334	
2020	297232	311028	0	0	608261	
2021	303177	317249	900	900	622227	0.29%
2022	309240	323594	4165	4165	641164	1.32%
2023	315425	330066	247	247	645986	0.08%
2024	321734	336667	0	0	658401	0.00%
2025	328168	343401	0	0	671569	0.00%
2026	334732	350269	0	0	685000	0.00%
2027	341426	357274			698700	
2028	348255	364419			712674	
2029	355220	371708			726928	
2030	362324	379142			741466	
2031	369571	386725			756296	
2032	376962	394459			771421	
2033	384501	402349			786850	
2034	392191	410395			802587	
2035	400035	418603			818639	
2036	408036	426975			835011	
2037	416197	435515			851712	
2038	424521	444225			868746	
2039	433011	453110			886121	



Charlton Connection Road - Between Toowoomba Cecil Plains Road and Jordan Court

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

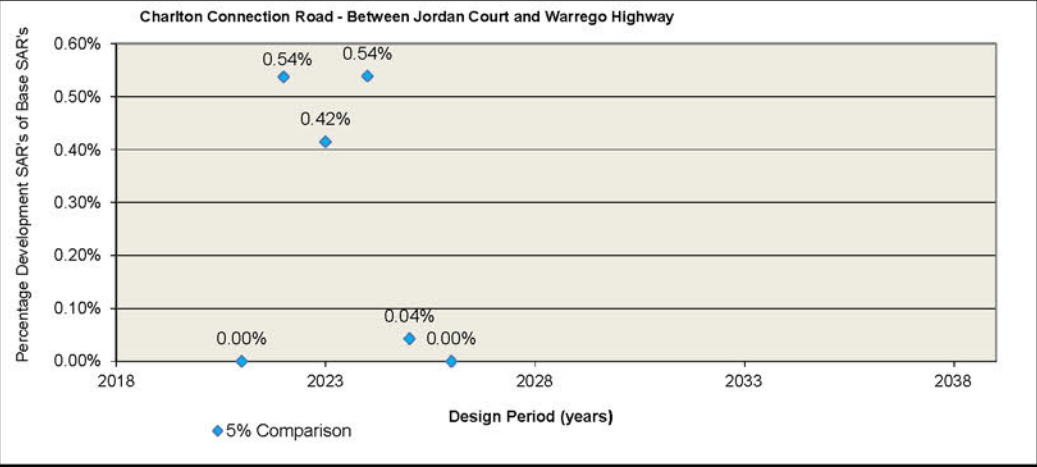
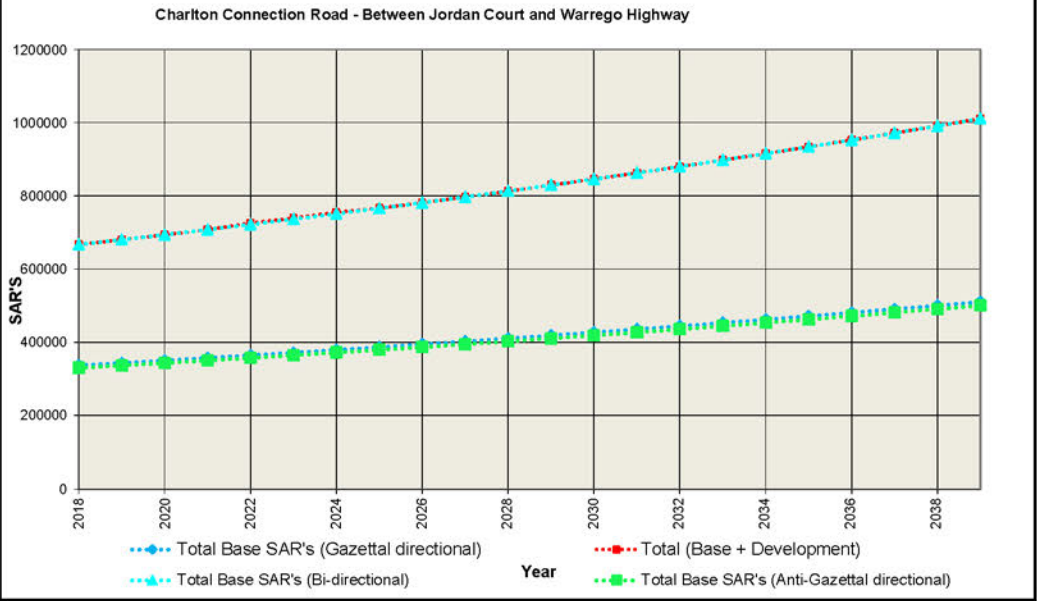
Charlton Connection Road			Between Toowoomba Cecil Plains Road and Jordan Court			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	330286	336763			667049	
2019	336892	343499			680390	
2020	343629	350368	0	0	693998	
2021	350502	357376	0	0	707878	0.00%
2022	357512	364523	1939	1939	725914	0.54%
2023	364662	371814	1529	1529	739534	0.42%
2024	371955	379250	2025	2025	755256	0.54%
2025	379395	386835	164	164	766558	0.04%
2026	386982	394572	0	0	781554	0.00%
2027	394722	402463			797185	
2028	402617	410513			813129	
2029	410669	418723			829392	
2030	418882	427097			845979	
2031	427260	435639			862899	
2032	435805	444352			880157	
2033	444521	453239			897760	
2034	453412	462304			915715	
2035	462480	471550			934030	
2036	471729	480981			952710	
2037	481164	490600			971765	
2038	490787	500412			991200	
2039	500603	510421			1011024	



Charlton Connection Road - Between Jordan Court and Warrego Highway

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

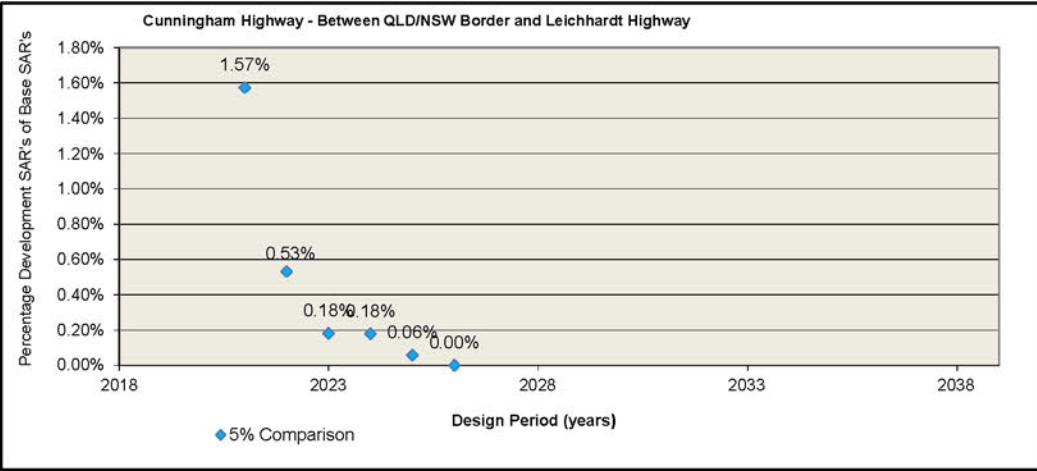
Charlton Connection Road			Between Jordan Court and Warrego Highway			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	330286	336763			667049	
2019	336892	343499			680390	
2020	343629	350368	0	0	693998	
2021	350502	357376	0	0	707878	0.00%
2022	357512	364523	1939	1939	725914	0.54%
2023	364662	371814	1529	1529	739534	0.42%
2024	371955	379250	2025	2025	755256	0.54%
2025	379395	386835	164	164	766558	0.04%
2026	386982	394572	0	0	781554	0.00%
2027	394722	402463			797185	
2028	402617	410513			813129	
2029	410669	418723			829392	
2030	418882	427097			845979	
2031	427260	435639			862899	
2032	435805	444352			880157	
2033	444521	453239			897760	
2034	453412	462304			915715	
2035	462480	471550			934030	
2036	471729	480981			952710	
2037	481164	490600			971765	
2038	490787	500412			991200	
2039	500603	510421			1011024	



Cunningham Highway - Between QLD/NSW Border and Leichhardt Highway

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

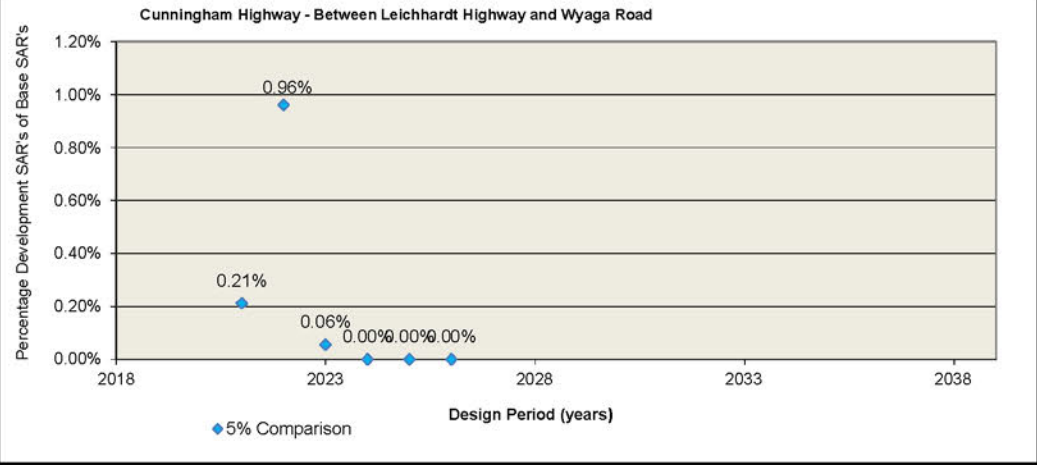
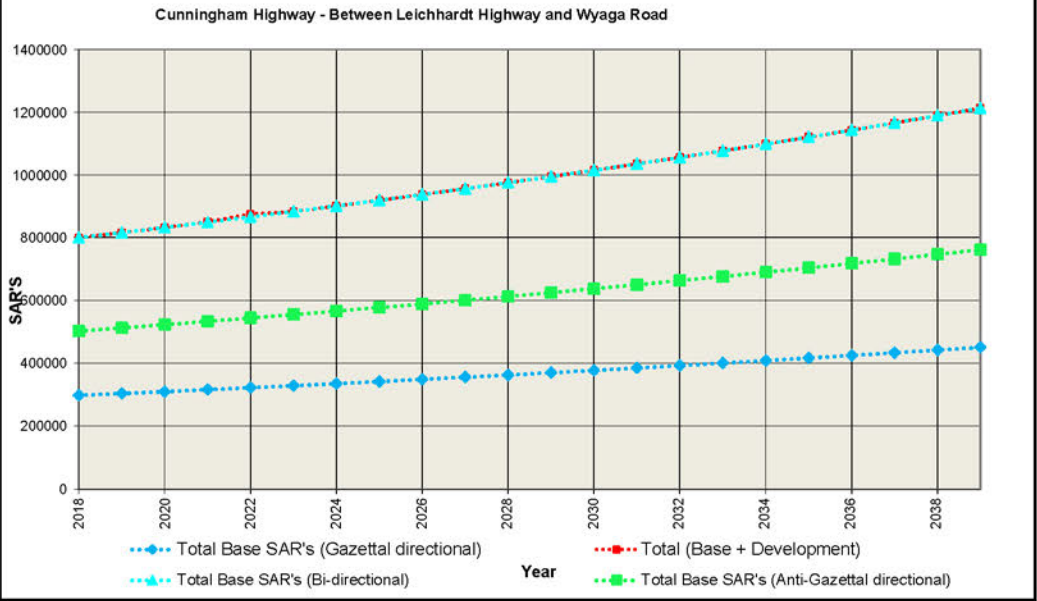
Cunningham Highway			Between QLD/NSW Border and Leichhardt Highway			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal directional)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	919844	586328			1506172	
2019	938241	598055			1536296	
2020	957006	610016	0	0	1567022	
2021	976146	622216	12577	12577	1623516	1.57%
2022	995669	634661	4340	4340	1639009	0.53%
2023	1015582	647354	1516	1516	1665969	0.18%
2024	1035894	660301	1523	1523	1699241	0.18%
2025	1056612	673507	513	513	1731145	0.06%
2026	1077744	686977	3	3	1764728	0.00%
2027	1099299	700717			1800015	
2028	1121285	714731			1836016	
2029	1143710	729026			1872736	
2030	1166584	743606			1910191	
2031	1189916	758478			1948394	
2032	1213715	773648			1987362	
2033	1237989	789121			2027110	
2034	1262749	804903			2067652	
2035	1288004	821001			2109005	
2036	1313764	837421			2151185	
2037	1340039	854170			2194209	
2038	1366840	871253			2238093	
2039	1394176	888678			2282855	



Cunningham Highway - Between Leichhardt Highway and Wyaga Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

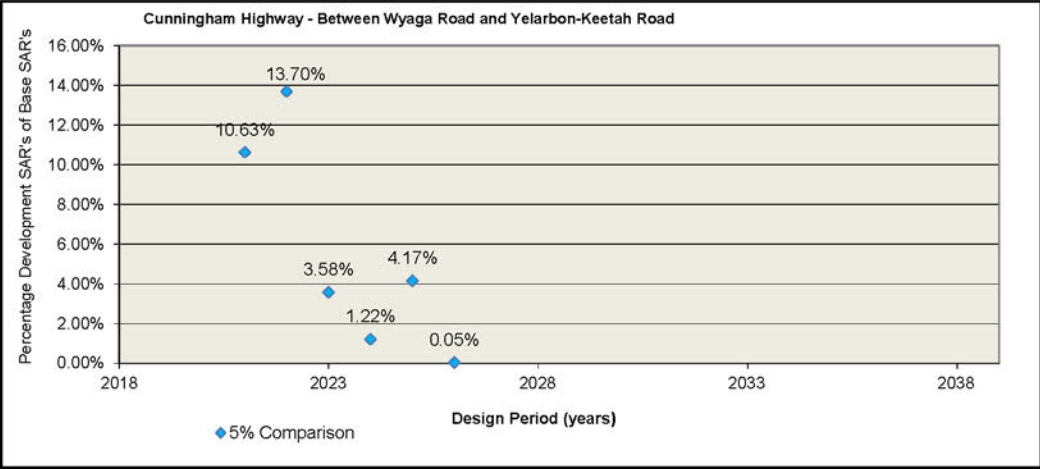
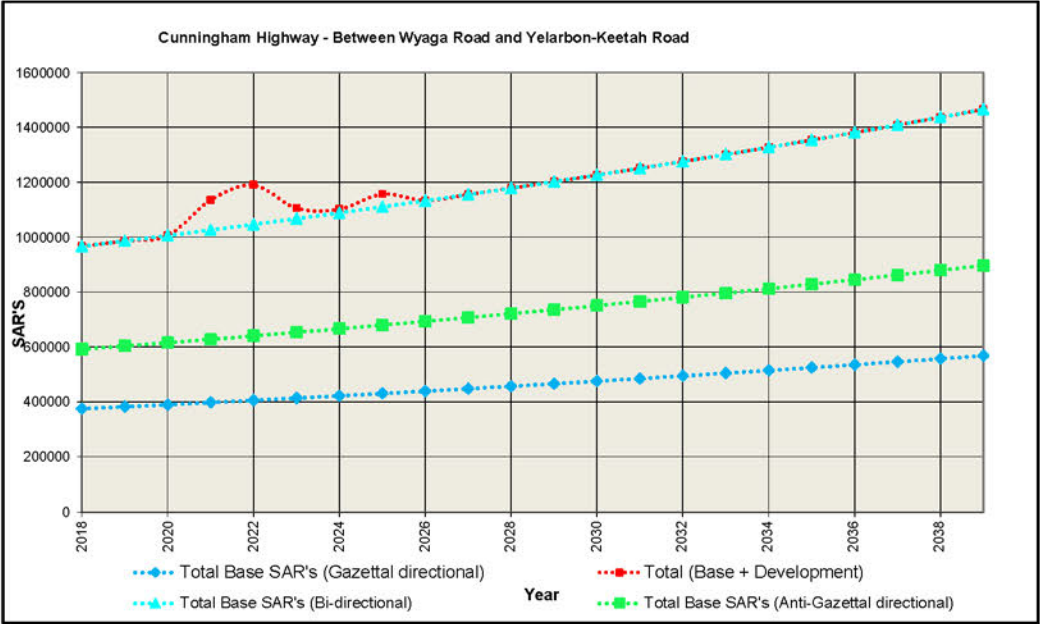
Cunningham Highway			Between Leichhardt Highway and Wyaga Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	502782	297546			800328	
2019	512838	303497			816335	
2020	523095	309567	0	0	832661	
2021	533557	315758	900	900	851116	0.21%
2022	544228	322073	4165	4165	874630	0.96%
2023	555112	328515	247	247	884122	0.06%
2024	566215	335085	0	0	901300	0.00%
2025	577539	341787	0	0	919326	0.00%
2026	589090	348622	0	0	937712	0.00%
2027	600871	355595			956466	
2028	612889	362707			975596	
2029	625147	369961			995108	
2030	637650	377360			1015010	
2031	650403	384907			1035310	
2032	663411	392605			1056016	
2033	676679	400458			1077136	
2034	690212	408467			1098679	
2035	704017	416636			1120653	
2036	718097	424969			1143066	
2037	732459	433468			1165927	
2038	747108	442138			1189246	
2039	762050	450980			1213030	



Cunningham Highway - Between Wyaga Road and Yelarbon-Keetah Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

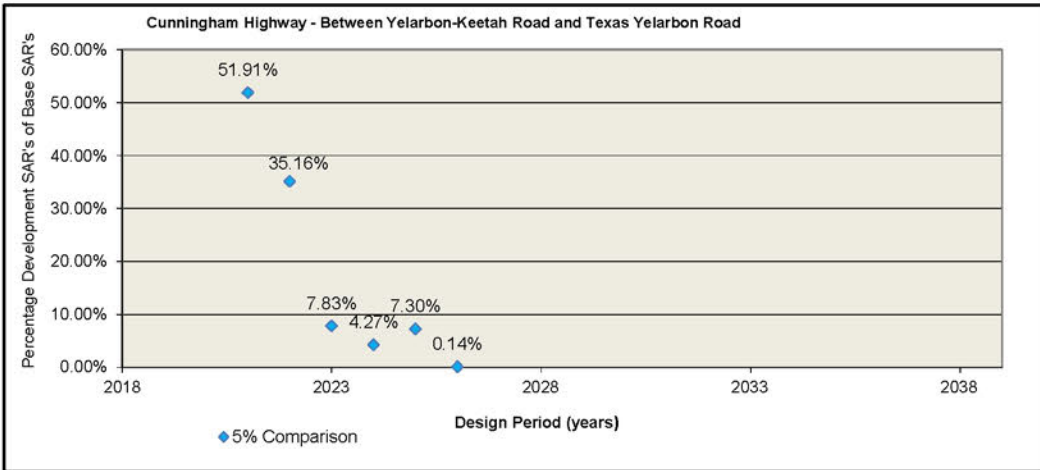
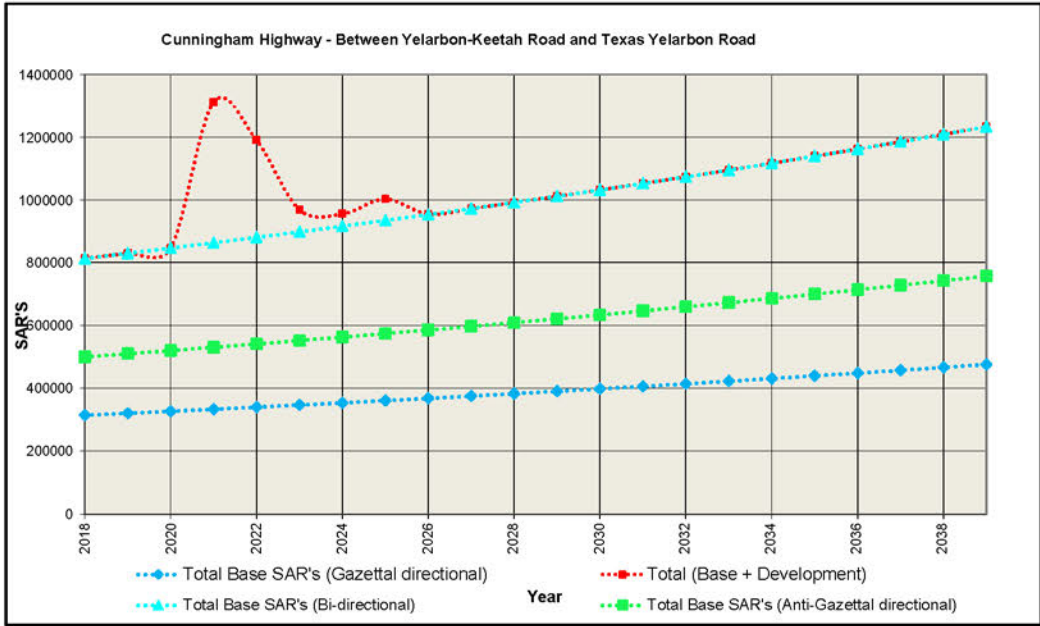
Cunningham Highway			Between Wyaga Road and Yelarbon-Keetah Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	591886	375029			966915	
2019	603724	382530			986253	
2020	615798	390180	0	0	1005978	
2021	628114	397984	54533	54533	1135164	10.63%
2022	640676	405944	71675	71675	1189970	13.70%
2023	653490	414063	19134	19134	1105821	3.58%
2024	666560	422344	6644	6644	1102191	1.22%
2025	679891	430791	23183	23183	1157047	4.17%
2026	693489	439406	279	279	1133454	0.05%
2027	707358	448195			1155553	
2028	721506	457158			1178664	
2029	735936	466302			1202237	
2030	750654	475628			1226282	
2031	765668	485140			1250808	
2032	780981	494843			1275824	
2033	796600	504740			1301340	
2034	812532	514835			1327367	
2035	828783	525131			1353915	
2036	845359	535634			1380993	
2037	862266	546347			1408613	
2038	879511	557274			1436785	
2039	897102	568419			1465521	



Cunningham Highway - Between Yelarbon-Keetah Road and Texas Yelarbon Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

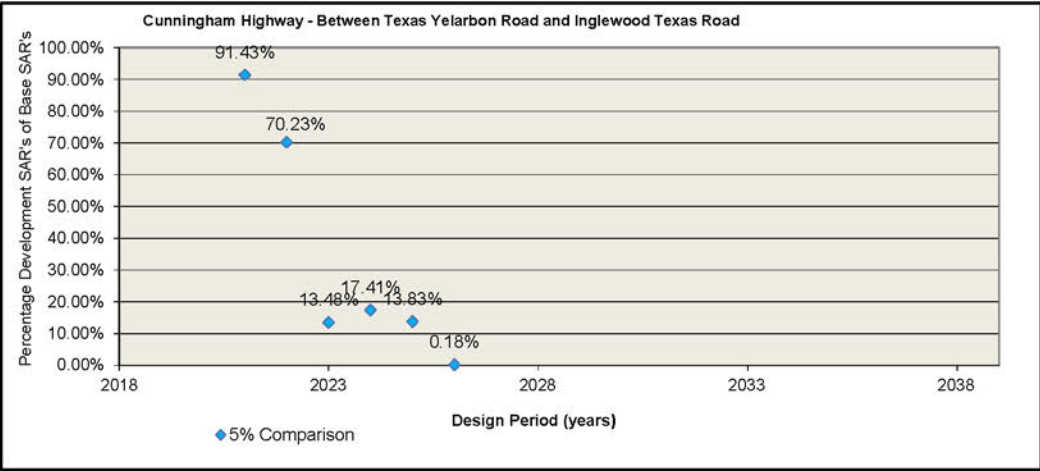
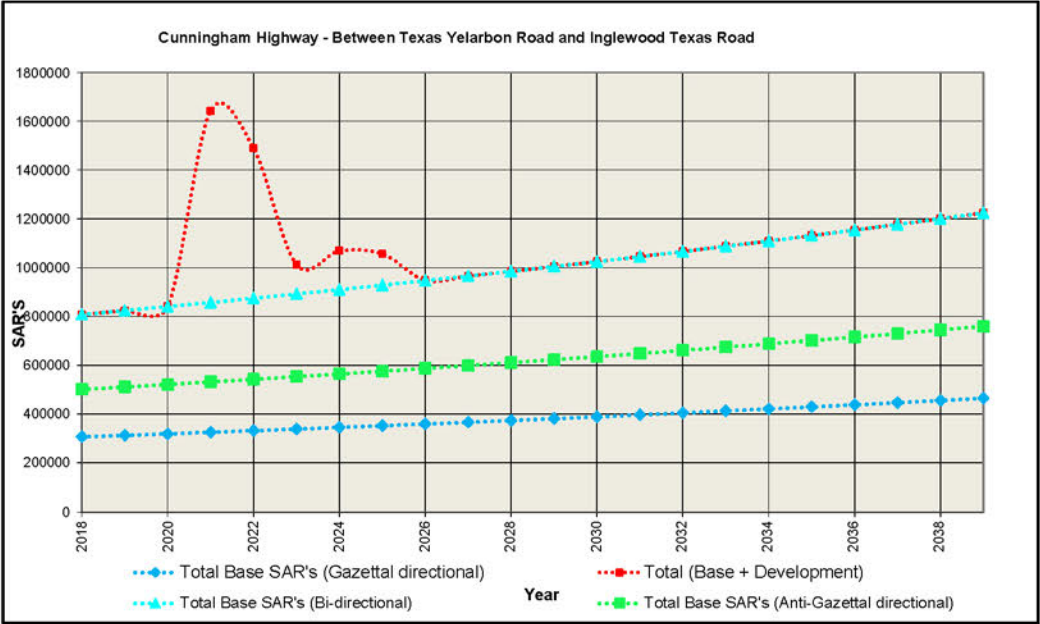
Cunningham Highway			Between Yelarbon-Keetah Road and Texas Yelarbon Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	499839	313947			813786	
2019	509836	320226			830062	
2020	520033	326631	0	0	846663	
2021	530433	333163	224160	224160	1311916	51.91%
2022	541042	339827	154869	154869	1190606	35.16%
2023	551863	346623	35177	35177	968841	7.83%
2024	562900	353556	19544	19544	955544	4.27%
2025	574158	360627	34126	34126	1003036	7.30%
2026	585641	367839	660	660	954801	0.14%
2027	597354	375196			972550	
2028	609301	382700			992001	
2029	621487	390354			1011841	
2030	633917	398161			1032078	
2031	646595	406124			1052719	
2032	659527	414247			1073774	
2033	672718	422532			1095249	
2034	686172	430982			1117154	
2035	699895	439602			1139497	
2036	713893	448394			1162287	
2037	728171	457362			1185533	
2038	742735	466509			1209244	
2039	757589	475839			1233429	



Cunningham Highway - Between Texas Yelarbon Road and Inglewood Texas Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

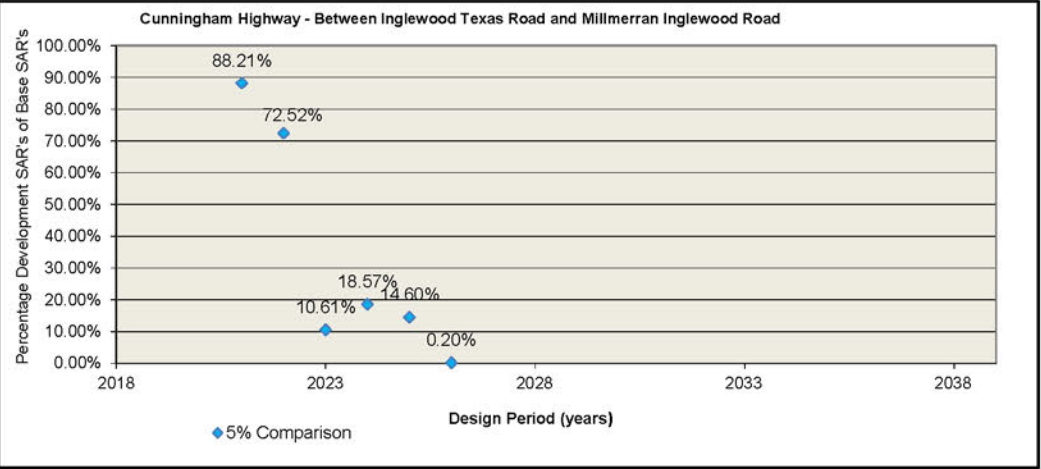
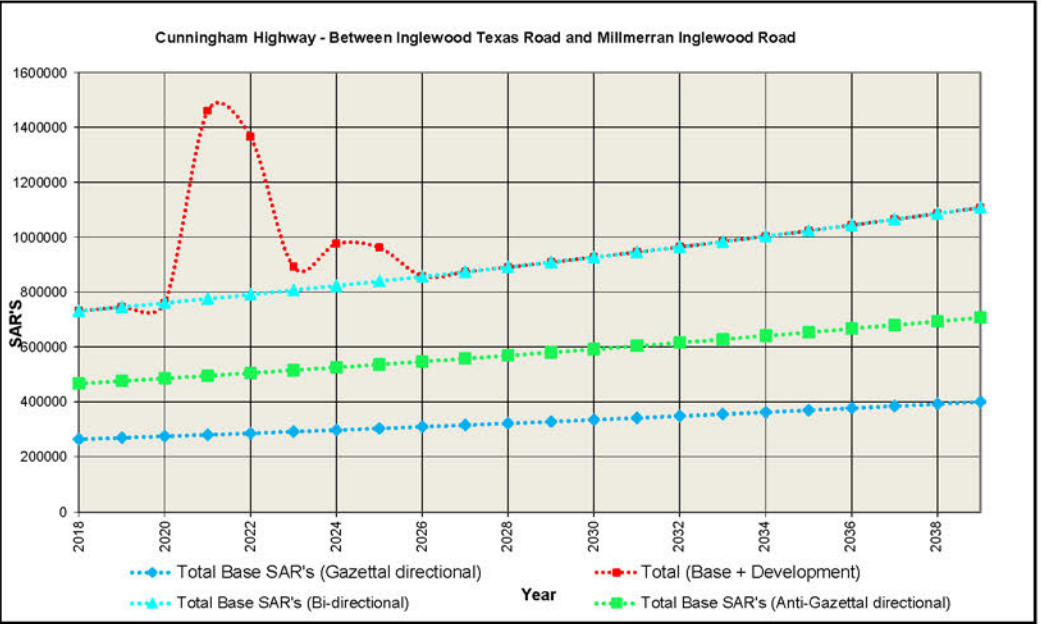
Cunningham Highway			Between Texas Yelarbon Road and Inglewood Texas Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	501242	306931			808172	
2019	511266	313069			824336	
2020	521492	319331	0	0	840822	
2021	531922	325717	392080	392080	1641798	91.43%
2022	542560	332232	874792	307189	1489170	70.23%
2023	553411	338876	60157	60157	1012601	13.48%
2024	564479	345654	79219	79219	1068572	17.41%
2025	575769	352567	64191	64191	1056717	13.83%
2026	587284	359618	829	829	948561	0.18%
2027	599030	366811			965841	
2028	611011	374147			985158	
2029	623231	381630			1004861	
2030	635695	389262			1024958	
2031	648409	397048			1045457	
2032	661378	404989			1066366	
2033	674605	413088			1087694	
2034	688097	421350			1109447	
2035	701859	429777			1131636	
2036	715896	438373			1154269	
2037	730214	447140			1177354	
2038	744819	456083			1200902	
2039	759715	465205			1224920	



Cunningham Highway - Between Inglewood Texas Road and Millmerran Inglewood Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

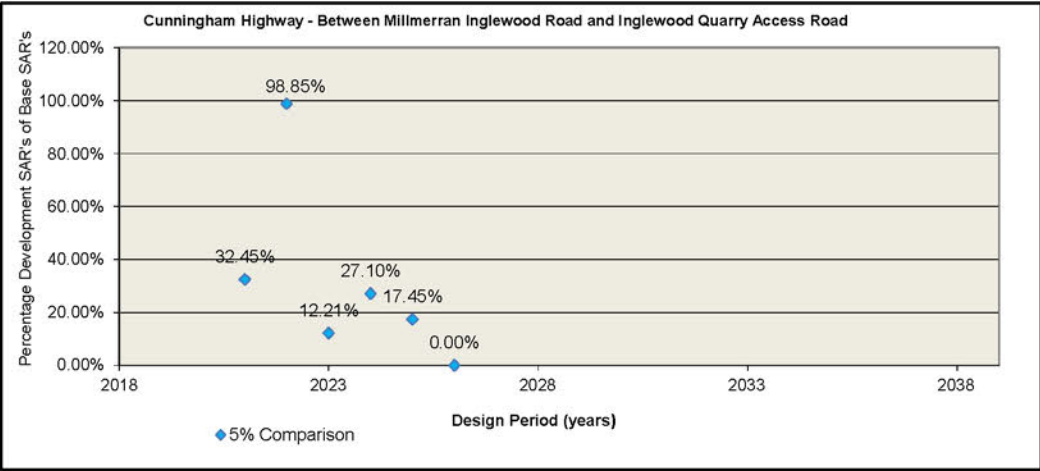
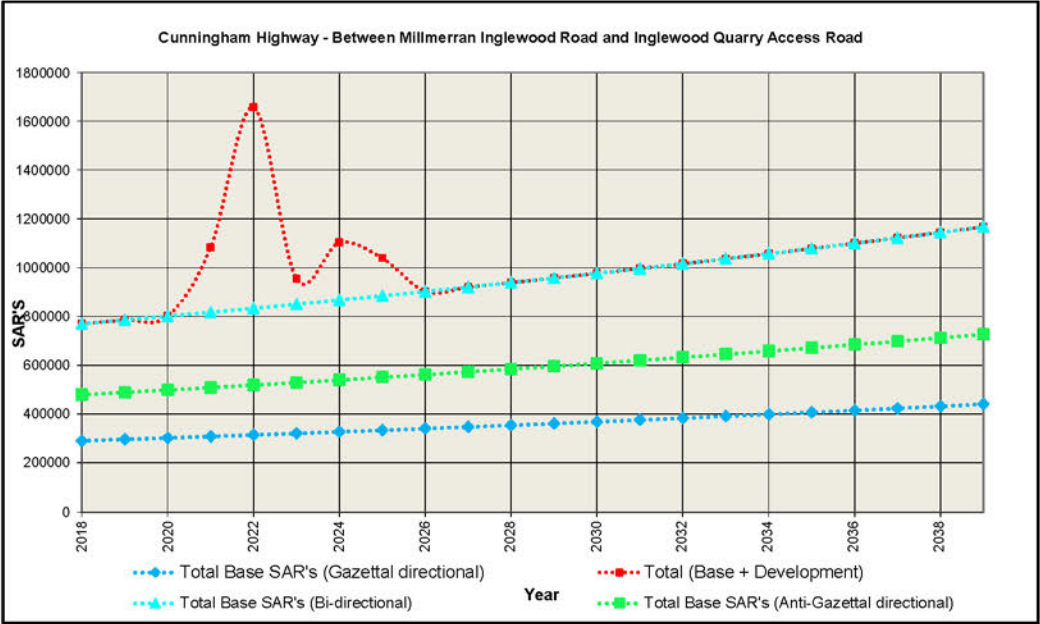
Cunningham Highway			Between Inglewood Texas Road and Millmerran Inglewood Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	466815	264109			730924	
2019	476151	269391			745542	
2020	485674	274779	0	0	760453	
2021	495388	280275	342108	342108	1459878	88.21%
2022	505295	285880	286884	286884	1364943	72.52%
2023	515401	291598	42799	42799	892598	10.61%
2024	525709	297430	76435	76435	976010	18.57%
2025	536223	303378	61300	61300	962203	14.60%
2026	546948	309446	869	869	858132	0.20%
2027	557887	315635			873522	
2028	569045	321948			890992	
2029	580425	328387			908812	
2030	592034	334954			926988	
2031	603875	341653			945528	
2032	615952	348486			964439	
2033	628271	355456			983727	
2034	640837	362565			1003402	
2035	653653	369817			1023470	
2036	666726	377213			1043939	
2037	680061	384757			1064818	
2038	693662	392452			1086114	
2039	707535	400301			1107837	



Cunningham Highway - Between Millmerran Inglewood Road and Inglewood Quarry Access Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

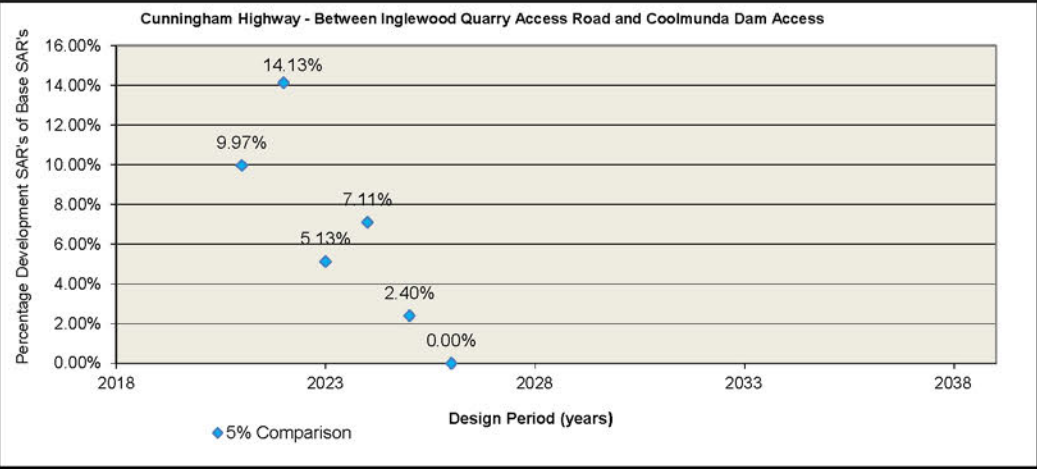
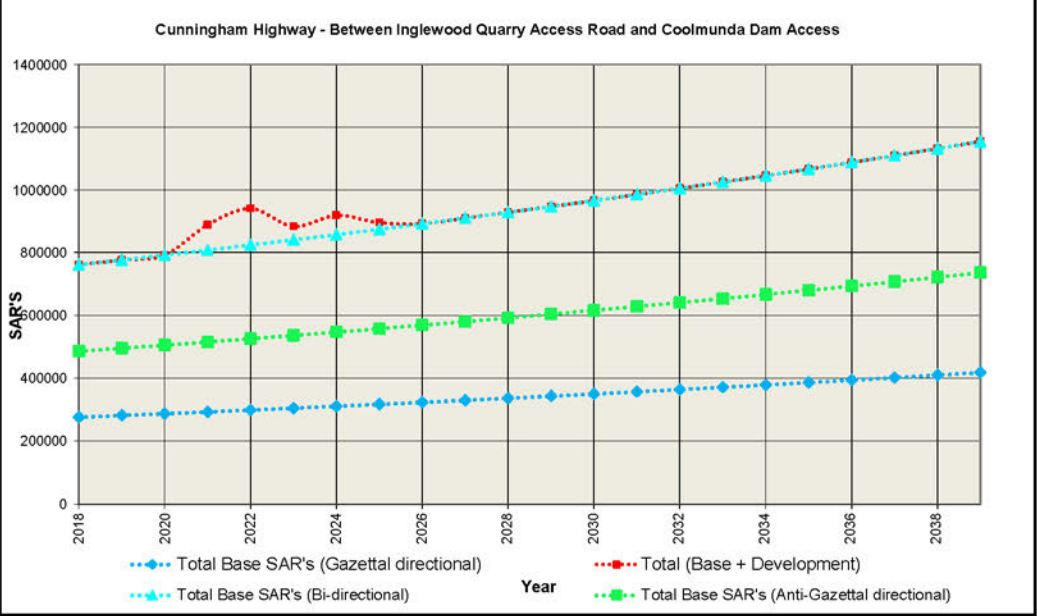
Cunningham Highway			Between Millmerran Inglewood Road and Inglewood Quarry Access Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal directional)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	479477	290750			770227	
2019	489067	296565			785631	
2020	498848	302496	0	0	801344	
2021	508825	308546	132627	132627	1082625	32.45%
2022	519001	314717	412052	412052	1657821	98.85%
2023	529381	321011	51902	51902	954197	12.21%
2024	539969	327431	117541	117541	1102483	27.10%
2025	550768	333980	77186	77186	1039120	17.45%
2026	561784	340659	21	21	902486	0.00%
2027	573019	347473			920492	
2028	584480	354422			938902	
2029	596169	361511			957680	
2030	608093	368741			976834	
2031	620255	376116			996370	
2032	632660	383638			1016298	
2033	645313	391311			1036624	
2034	658219	399137			1057356	
2035	671384	407120			1078503	
2036	684811	415262			1100073	
2037	698508	423567			1122075	
2038	712478	432039			1144516	
2039	726727	440679			1167407	



Cunningham Highway - Between Inglewood Quarry Access Road and Coolmunda Dam Access

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

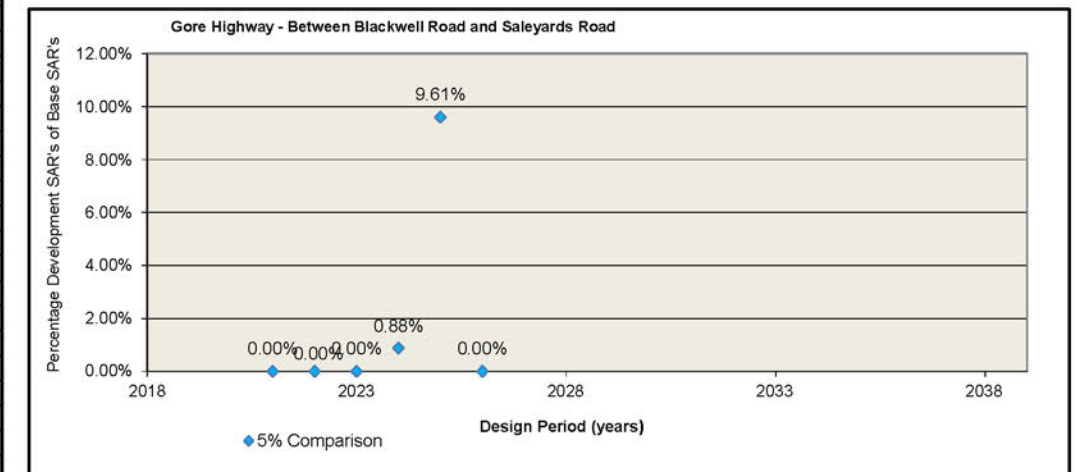
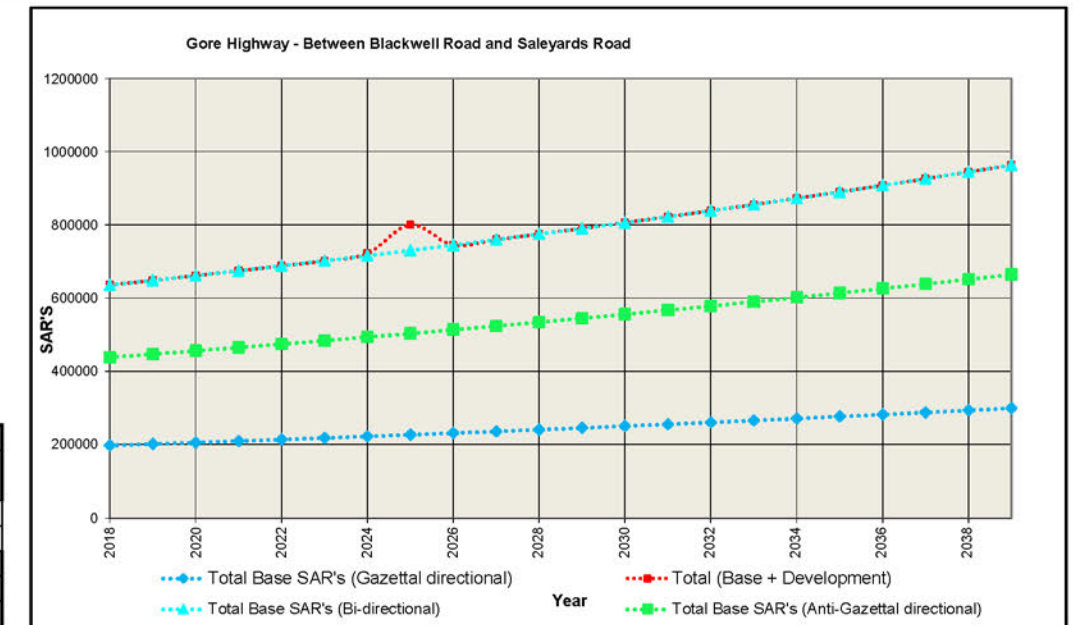
Cunningham Highway			Between Inglewood Quarry Access Road and Coolmunda Dam Access			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	485853	275911			761764	
2019	495570	281429			776999	
2020	505481	287057	0	0	792539	
2021	515591	292799	40306	40306	889002	9.97%
2022	525903	298655	58255	58255	941067	14.13%
2023	536421	304628	21588	21588	884224	5.13%
2024	547149	310720	30511	30511	918892	7.11%
2025	558092	316935	10507	10507	896041	2.40%
2026	569254	323273	21	21	892570	0.00%
2027	580639	329739			910378	
2028	592252	336334			928586	
2029	604097	343060			947157	
2030	616179	349921			966101	
2031	628503	356920			985423	
2032	641073	364058			1005131	
2033	653894	371339			1025234	
2034	666972	378766			1045738	
2035	680312	386342			1066653	
2036	693918	394068			1087986	
2037	707796	401950			1109746	
2038	721952	409989			1131941	
2039	736391	418188			1154580	



Gore Highway - Between Blackwell Road and Saleyards Road
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SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

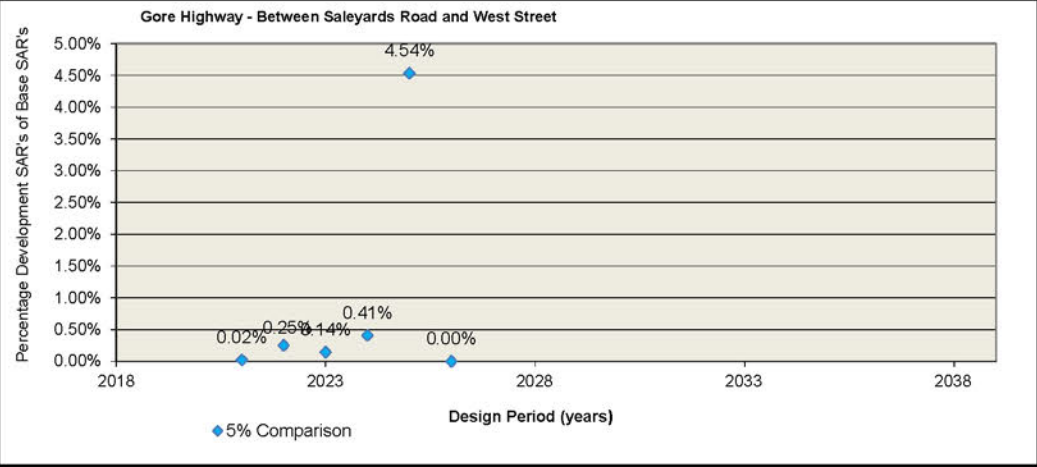
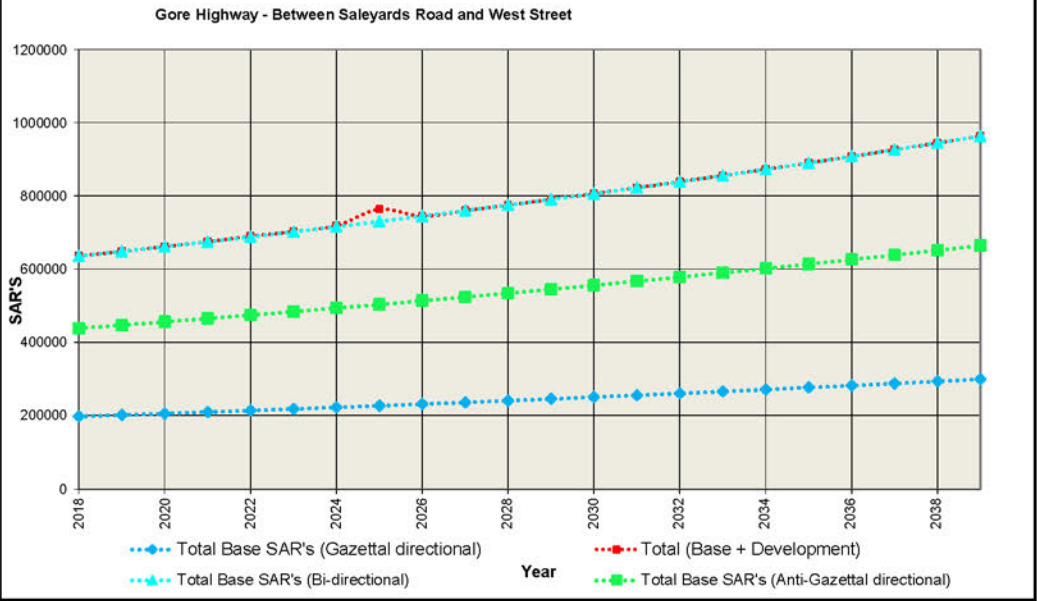
Gore Highway				Between Blackwell Road and Saleyards Road				
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparison	
Total Base SAR's (Anti-Gazettal direction)		Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)		Unloaded			Loaded
2018	438299	197417	635716				635716	
2019	447065	201366	648430				648430	
2020	456006	205393	661399		0	0	661399	
2021	465126	209501	674627		0	0	674627	0.00%
2022	474428	213691	688119		0	0	688119	0.00%
2023	483917	217965	701882		0	0	701882	0.00%
2024	493595	222324	715919		3139	3139	722198	0.88%
2025	503467	226770	730238		35080	35080	800399	9.61%
2026	513537	231306	744843		0	0	744843	0.00%
2027	523807	235932	759739				759739	
2028	534284	240651	774934				774934	
2029	544969	245464	790433				790433	
2030	555869	250373	806242				806242	
2031	566986	255380	822366				822366	
2032	578326	260488	838814				838814	
2033	589892	265698	855590				855590	
2034	601690	271012	872702				872702	
2035	613724	276432	890156				890156	
2036	625998	281961	907959				907959	
2037	638518	287600	926118				926118	
2038	651289	293352	944640				944640	
2039	664314	299219	963533				963533	



Gore Highway - Between Saleyards Road and West Street

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

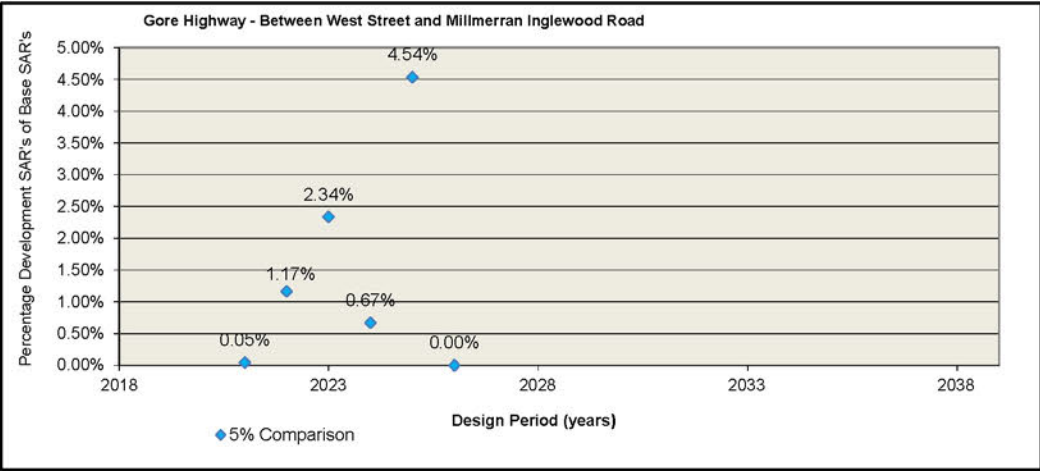
Gore Highway			Between Saleyards Road and West Street			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	438299	197417			635716	
2019	447065	201366			648430	
2020	456006	205393	0	0	661399	
2021	465126	209501	73	73	674772	0.02%
2022	474428	213691	870	870	689860	0.25%
2023	483917	217965	508	508	702897	0.14%
2024	493595	222324	1470	1470	718860	0.41%
2025	503467	226770	16566	16566	763370	4.54%
2026	513537	231306	0	0	744843	0.00%
2027	523807	235932			759739	
2028	534284	240651			774934	
2029	544969	245464			790433	
2030	555869	250373			806242	
2031	566986	255380			822366	
2032	578326	260488			838814	
2033	589892	265698			855590	
2034	601690	271012			872702	
2035	613724	276432			890156	
2036	625998	281961			907959	
2037	638518	287600			926118	
2038	651289	293352			944640	
2039	664314	299219			963533	



Gore Highway - Between West Street and Millmerran Inglewood Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

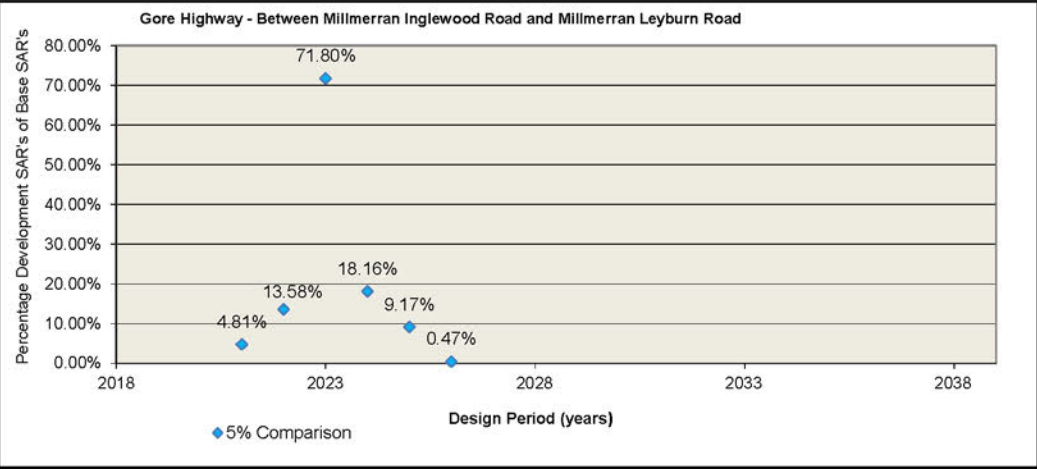
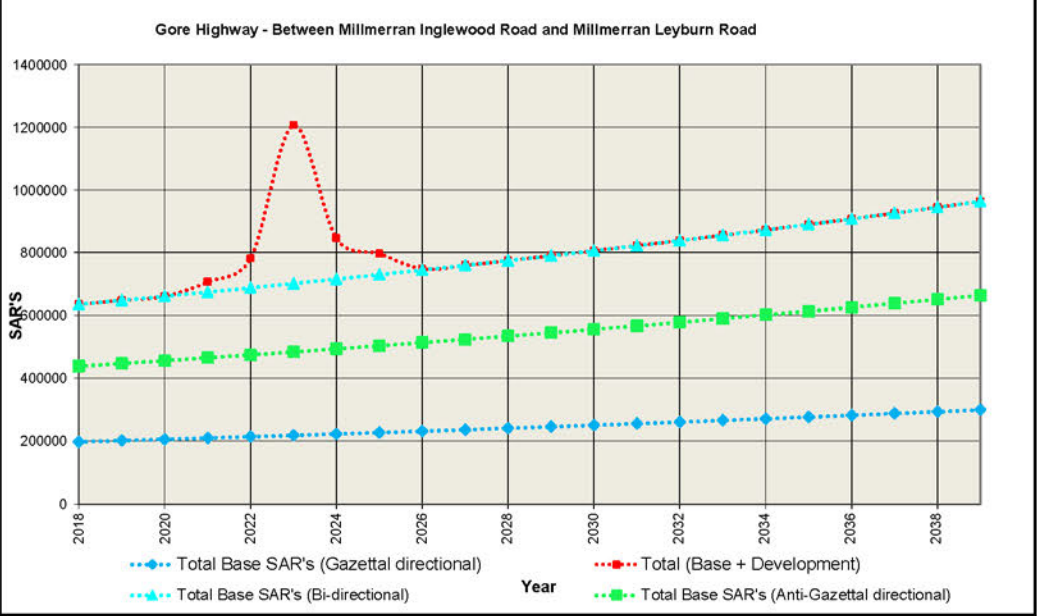
Gore Highway			Between West Street and Millmerran Inglewood Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	438299	197417			635716	
2019	447065	201366			648430	
2020	456006	205393	0	0	661399	
2021	465126	209501	157	157	674940	0.05%
2022	474428	213691	4017	4017	696154	1.17%
2023	483917	217965	8207	8207	718295	2.34%
2024	493595	222324	2410	2410	720739	0.67%
2025	503467	226770	16566	16566	763370	4.54%
2026	513537	231306	0	0	744843	0.00%
2027	523807	235932			759739	
2028	534284	240651			774934	
2029	544969	245464			790433	
2030	555869	250373			806242	
2031	566986	255380			822366	
2032	578326	260488			838814	
2033	589892	265698			855590	
2034	601690	271012			872702	
2035	613724	276432			890156	
2036	625998	281961			907959	
2037	638518	287600			926118	
2038	651289	293352			944640	
2039	664314	299219			963533	



Gore Highway - Between Millmerran Inglewood Road and Millmerran Leyburn Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

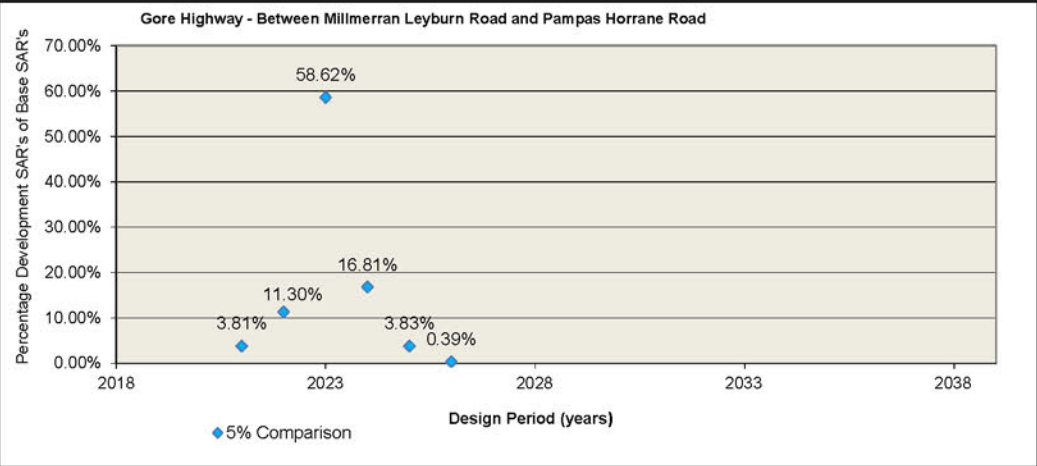
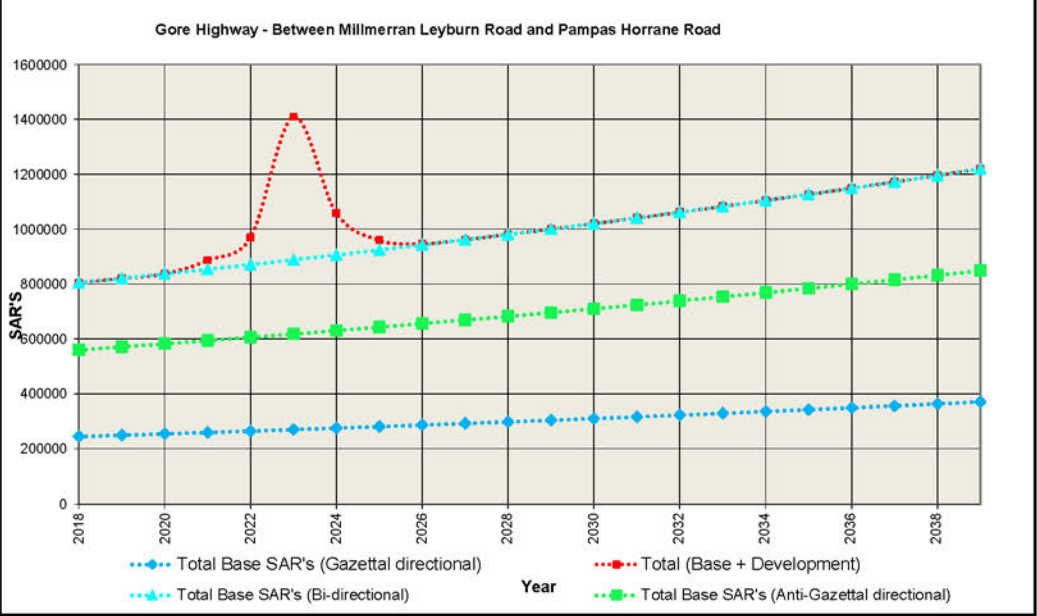
Gore Highway			Between Millmerran Inglewood Road and Millmerran Leyburn Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	438299	197417			635716	
2019	447065	201366			648430	
2020	456006	205393	0	0	661399	
2021	465126	209501	16218	16218	707063	4.81%
2022	474428	213691	46726	46726	781571	13.58%
2023	483917	217965	251968	251968	1205817	71.80%
2024	493595	222324	64988	64988	845896	18.16%
2025	503467	226770	33482	33482	797202	9.17%
2026	513537	231306	1753	1753	748349	0.47%
2027	523807	235932			759739	
2028	534284	240651			774934	
2029	544969	245464			790433	
2030	555869	250373			806242	
2031	566986	255380			822366	
2032	578326	260488			838814	
2033	589892	265698			855590	
2034	601690	271012			872702	
2035	613724	276432			890156	
2036	625998	281961			907959	
2037	638518	287600			926118	
2038	651289	293352			944640	
2039	664314	299219			963533	



Gore Highway - Between Millmerran Leyburn Road and Pampas Horrane Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

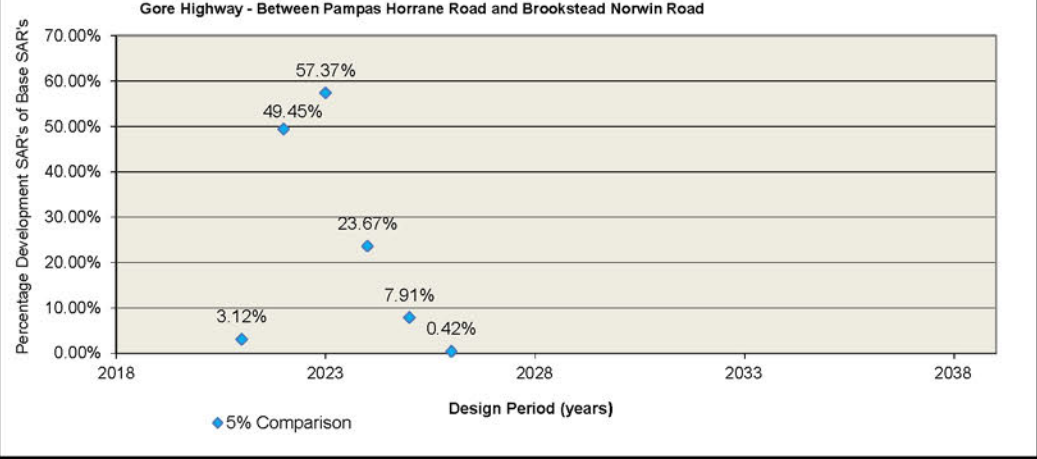
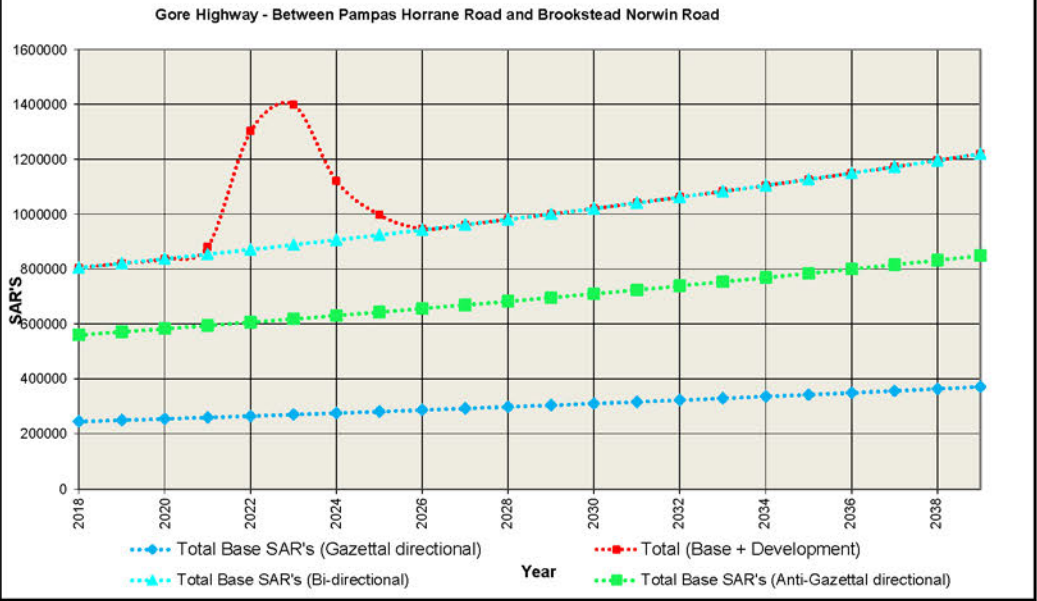
Gore Highway			Between Millmerran Leyburn Road and Pampas Horrane Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	560049	244680			804728	
2019	571250	249573			820823	
2020	582675	254565	0	0	837239	
2021	594328	259656	16282	16282	886547	3.81%
2022	606215	264849	49226	49226	969515	11.30%
2023	618339	270146	260419	260419	1409322	58.62%
2024	630706	275549	76190	76190	1058635	16.81%
2025	643320	281060	17687	17687	959755	3.83%
2026	656186	286681	1818	1818	946503	0.39%
2027	669310	292415			961725	
2028	682696	298263			980959	
2029	696350	304228			1000579	
2030	710277	310313			1020590	
2031	724483	316519			1041002	
2032	738972	322850			1061822	
2033	753752	329307			1083058	
2034	768827	335893			1104720	
2035	784203	342611			1126814	
2036	799887	349463			1149350	
2037	815885	356452			1172337	
2038	832203	363581			1195784	
2039	848847	370853			1219700	



Gore Highway - Between Pampas Horrane Road and Brookstead Norwin Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

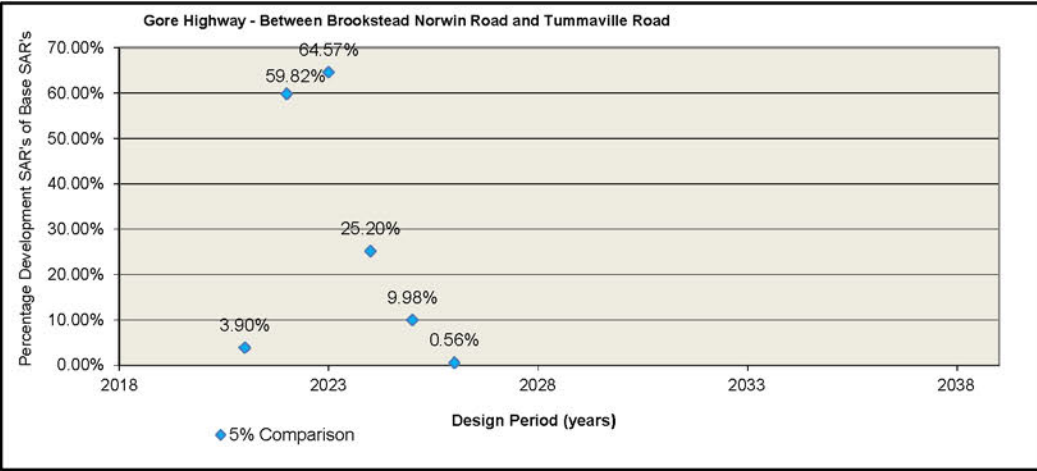
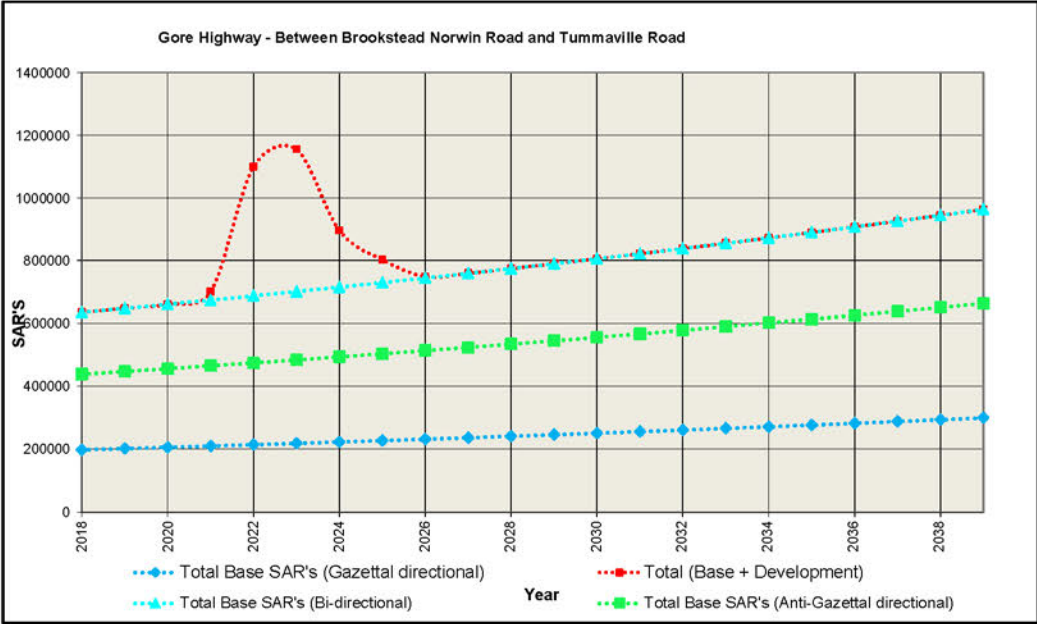
Gore Highway			Between Pampas Horrane Road and Brookstead Norwin Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	560049	244680			804728	
2019	571250	249573			820823	
2020	582675	254565	0	0	837239	
2021	594328	259656	13321	13321	880627	3.12%
2022	606215	264849	215392	215392	1301848	49.45%
2023	618339	270146	254863	254863	1398211	57.37%
2024	630706	275549	107250	107250	1120754	23.67%
2025	643320	281060	36548	36548	997475	7.91%
2026	656186	286681	1989	1989	946846	0.42%
2027	669310	292415			961725	
2028	682696	298263			980959	
2029	696350	304228			1000579	
2030	710277	310313			1020590	
2031	724483	316519			1041002	
2032	738972	322850			1061822	
2033	753752	329307			1083058	
2034	768827	335893			1104720	
2035	784203	342611			1126814	
2036	799887	349463			1149350	
2037	815885	356452			1172337	
2038	832203	363581			1195784	
2039	848847	370853			1219700	



Gore Highway - Between Brookstead Norwin Road and Tummaville Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

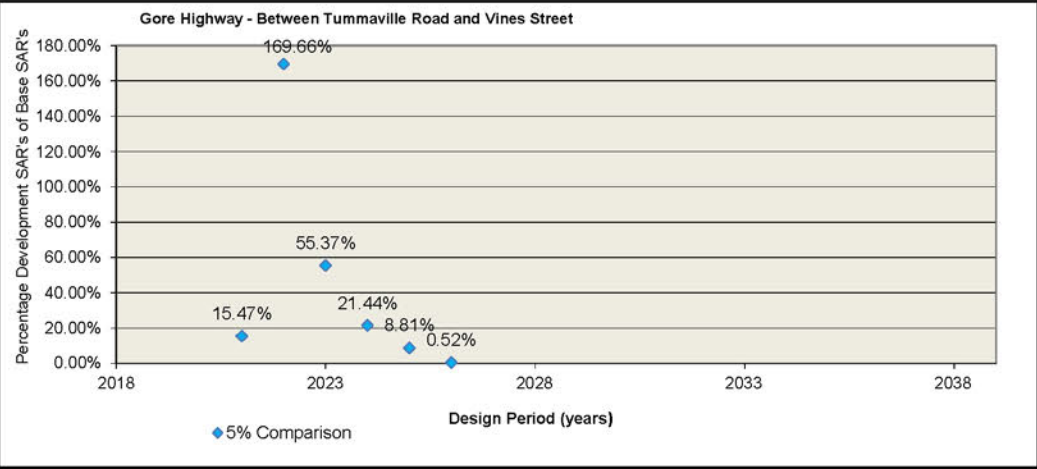
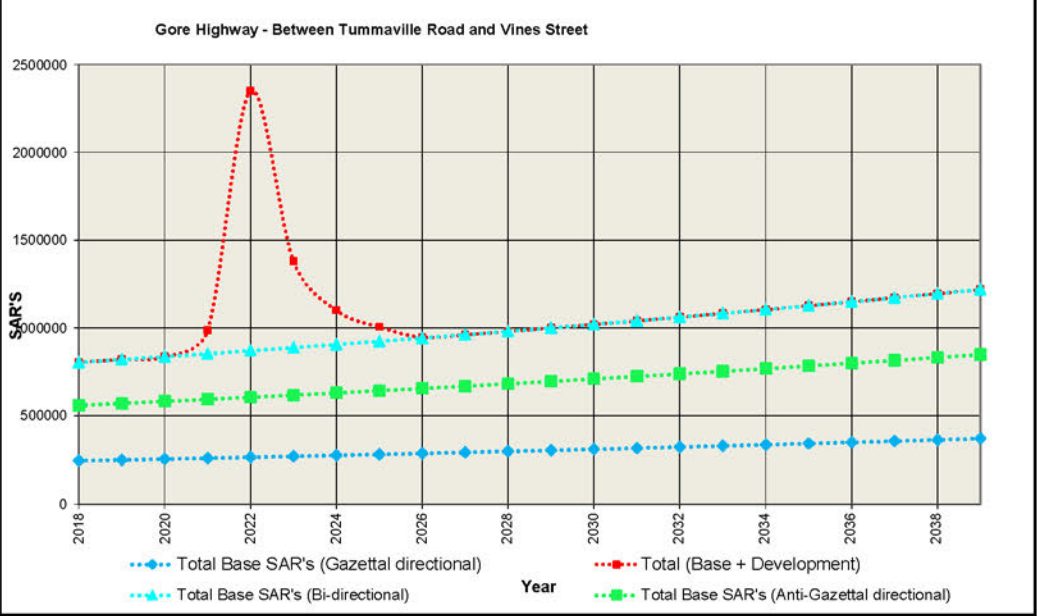
Gore Highway			Between Brookstead Norwin Road and Tummaville Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	438299	197417			635716	
2019	447065	201366			648430	
2020	456006	205393	0	0	661399	
2021	465126	209501	13159	13159	700945	3.90%
2022	474428	213691	205821	205821	1099761	59.82%
2023	483917	217965	226588	226588	1155057	64.57%
2024	493595	222324	90215	90215	896350	25.20%
2025	503467	226770	36444	36444	803126	9.98%
2026	513537	231306	744843		748999	0.56%
2027	523807	235932			759739	
2028	534284	240651			774934	
2029	544969	245464			790433	
2030	555869	250373			806242	
2031	566986	255380			822366	
2032	578326	260488			838814	
2033	589892	265698			855590	
2034	601690	271012			872702	
2035	613724	276432			890156	
2036	625998	281961			907959	
2037	638518	287600			926118	
2038	651289	293352			944640	
2039	664314	299219			963533	



Gore Highway - Between Tummaville Road and Vines Street

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

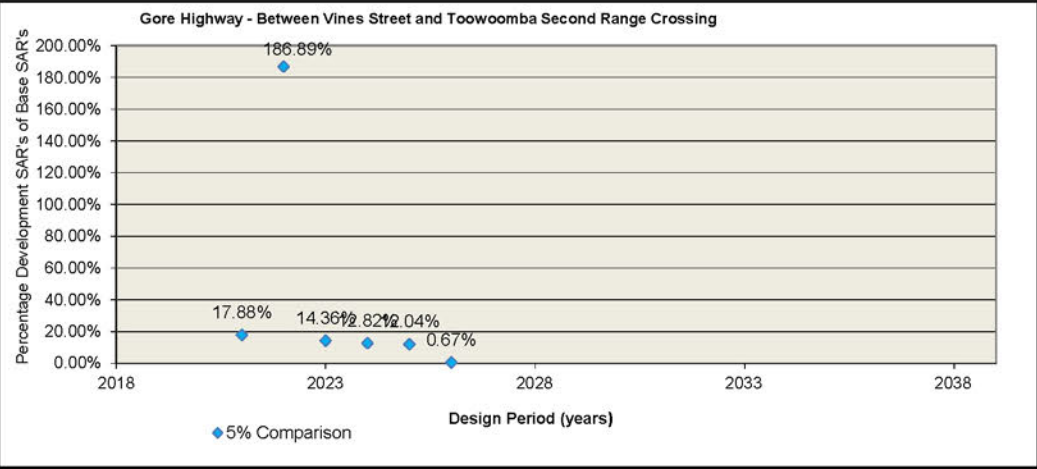
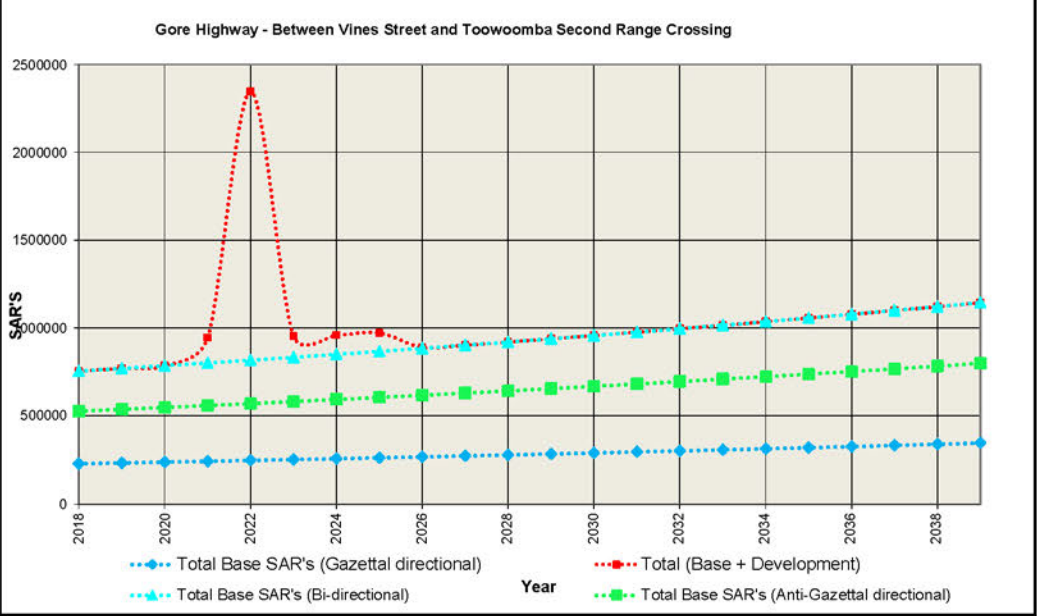
Gore Highway			Between Tummaville Road and Vines Street			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	560049	244680			804728	
2019	571250	249573			820823	
2020	582675	254565	0	0	837239	
2021	594328	259656	66070	66070	986125	15.47%
2022	606215	264849	738933	738933	2348930	169.66%
2023	618339	270146	245957	245957	1380400	55.37%
2024	630706	275549	97166	97166	1100586	21.44%
2025	643320	281060	40721	40721	1005822	8.81%
2026	656186	286681	2442	2442	947752	0.52%
2027	669310	292415			961725	
2028	682696	298263			980959	
2029	696350	304228			1000579	
2030	710277	310313			1020590	
2031	724483	316519			1041002	
2032	738972	322850			1061822	
2033	753752	329307			1083058	
2034	768827	335893			1104720	
2035	784203	342611			1126814	
2036	799887	349463			1149350	
2037	815885	356452			1172337	
2038	832203	363581			1195784	
2039	848847	370853			1219700	



Gore Highway - Between Vines Street and Toowoomba Second Range Crossing

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

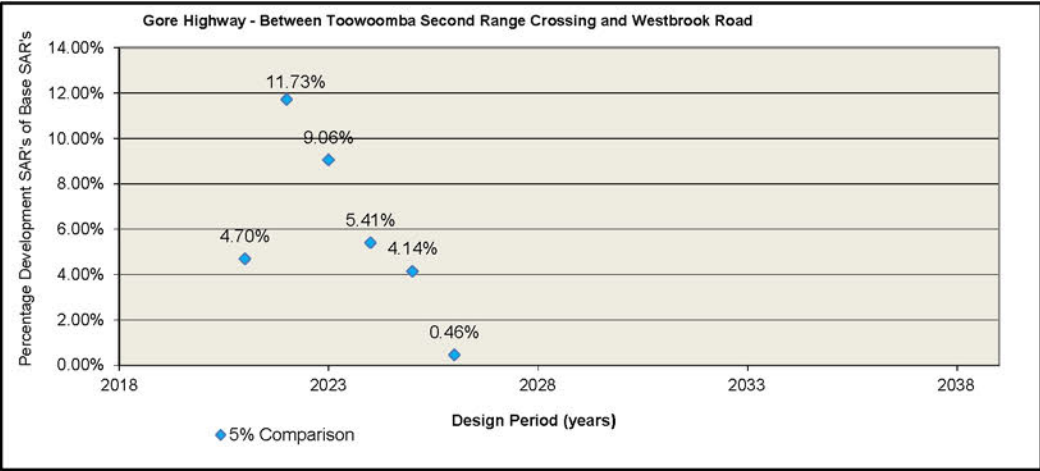
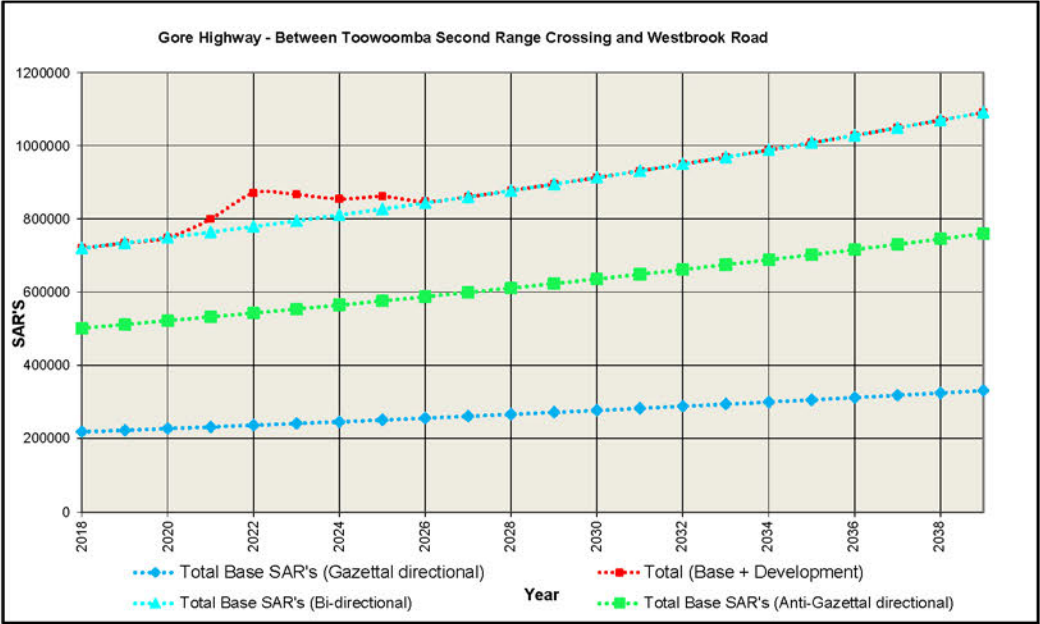
Gore Highway			Between Vines Street and Toowoomba Second Range Crossing			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	527029	227976			755006	
2019	537570	232536			770106	
2020	548321	237187	0	0	785508	
2021	559288	241930	71612	71612	944443	17.88%
2022	570473	246769	763661	763661	2344565	186.89%
2023	581883	251704	59859	59859	953306	14.36%
2024	593520	256739	54512	54512	959282	12.82%
2025	605391	261873	52228	52228	971721	12.04%
2026	617499	267111	2949	2949	890508	0.67%
2027	629849	272453			902302	
2028	642446	277902			920348	
2029	655294	283460			938755	
2030	668400	289129			957530	
2031	681768	294912			976680	
2032	695404	300810			996214	
2033	709312	306826			1016138	
2034	723498	312963			1036461	
2035	737968	319222			1057190	
2036	752727	325607			1078334	
2037	767782	332119			1099901	
2038	783138	338761			1121899	
2039	798800	345536			1144337	



Gore Highway - Between Toowoomba Second Range Crossing and Westbrook Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

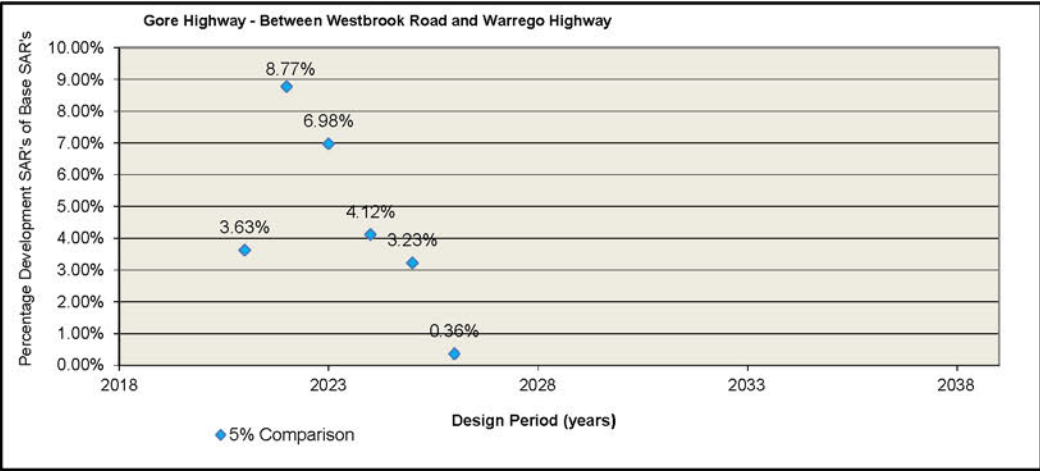
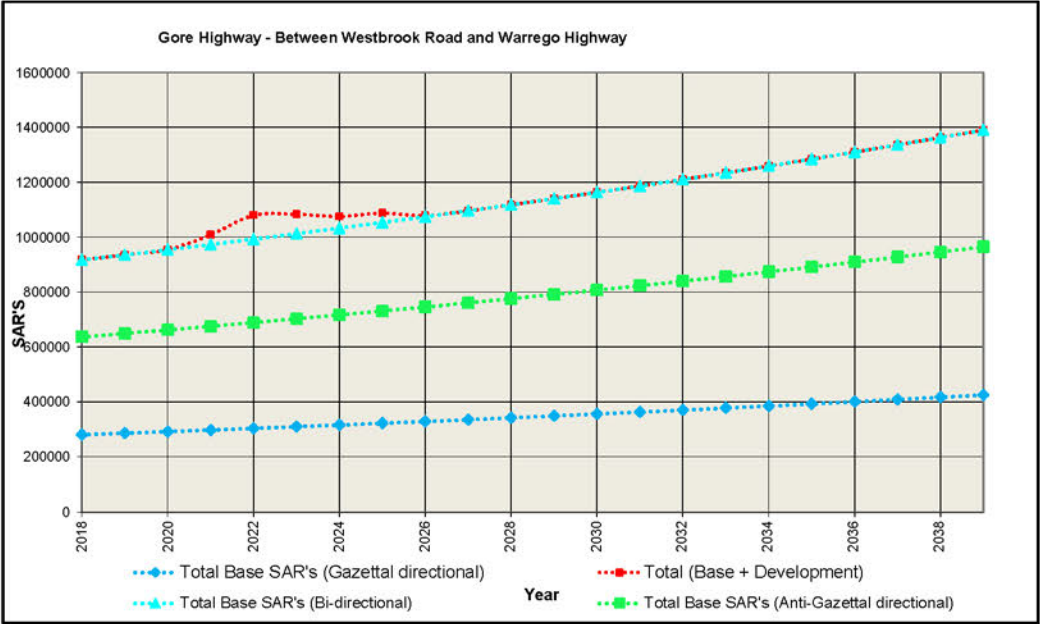
Gore Highway			Between Toowoomba Second Range Crossing and Westbrook Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal directional)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	501422	218348			719771	
2019	511451	222715			734166	
2020	521680	227170	0	0	748850	
2021	532113	231713	17938	17938	799703	4.70%
2022	542756	236347	779103	45682	870467	11.73%
2023	553611	241074	794685	36006	866697	9.06%
2024	564683	245896	810579	21917	854413	5.41%
2025	575977	250814	826790	17130	861050	4.14%
2026	587496	255830	843326	1961	847248	0.46%
2027	599246	260947	860193		860193	
2028	611231	266166	877397		877397	
2029	623456	271489	894945		894945	
2030	635925	276919	912843		912843	
2031	648643	282457	931100		931100	
2032	661616	288106	949722		949722	
2033	674848	293868	968717		968717	
2034	688345	299746	988091		988091	
2035	702112	305741	1007853		1007853	
2036	716155	311855	1028010		1028010	
2037	730478	318092	1048570		1048570	
2038	745087	324454	1069542		1069542	
2039	759989	330943	1090932		1090932	



Gore Highway - Between Westbrook Road and Warrego Highway

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

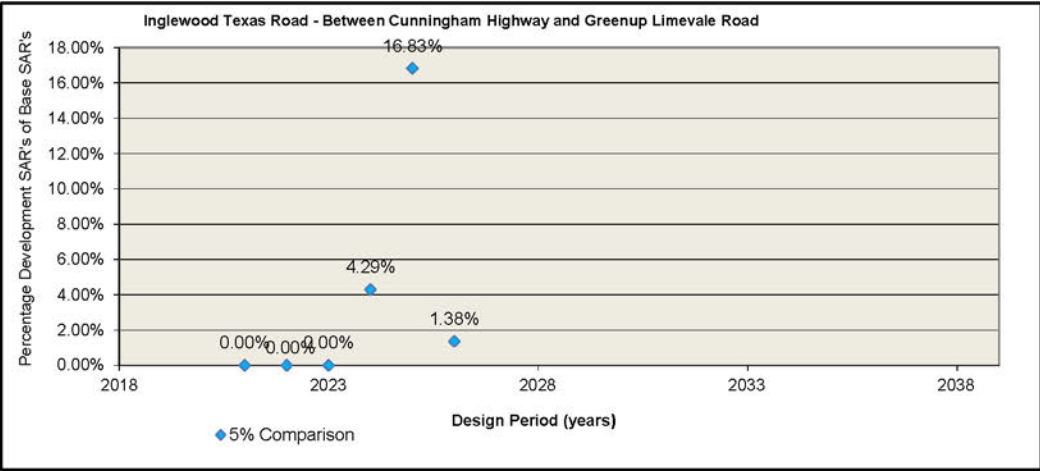
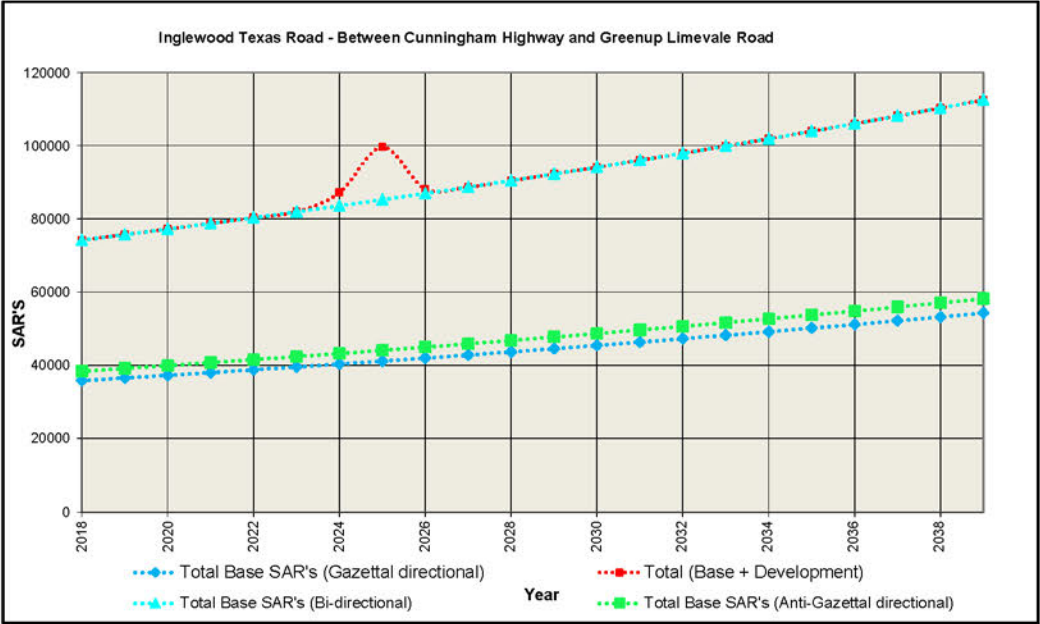
Gore Highway			Between Westbrook Road and Warrego Highway			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal directional)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	636629	280654			917283	
2019	649362	286267			935629	
2020	662349	291992	0	0	954342	
2021	675596	297832	17659	17659	1008746	3.63%
2022	689108	303789	43548	43548	1079993	8.77%
2023	702890	309865	35341	35341	1083437	6.98%
2024	716948	316062	21266	21266	1075543	4.12%
2025	731287	322383	17029	17029	1087729	3.23%
2026	745913	328831	1961	1961	1078665	0.36%
2027	760831	335408			1096239	
2028	776048	342116			1118163	
2029	791569	348958			1140527	
2030	807400	355937			1163337	
2031	823548	363056			1186604	
2032	840019	370317			1210336	
2033	856819	377723			1234543	
2034	873956	385278			1259234	
2035	891435	392983			1284418	
2036	909264	400843			1310107	
2037	927449	408860			1336309	
2038	945998	417037			1363035	
2039	964918	425378			1390296	



Inglewood Texas Road - Between Cunningham Highway and Greenup Limevale Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

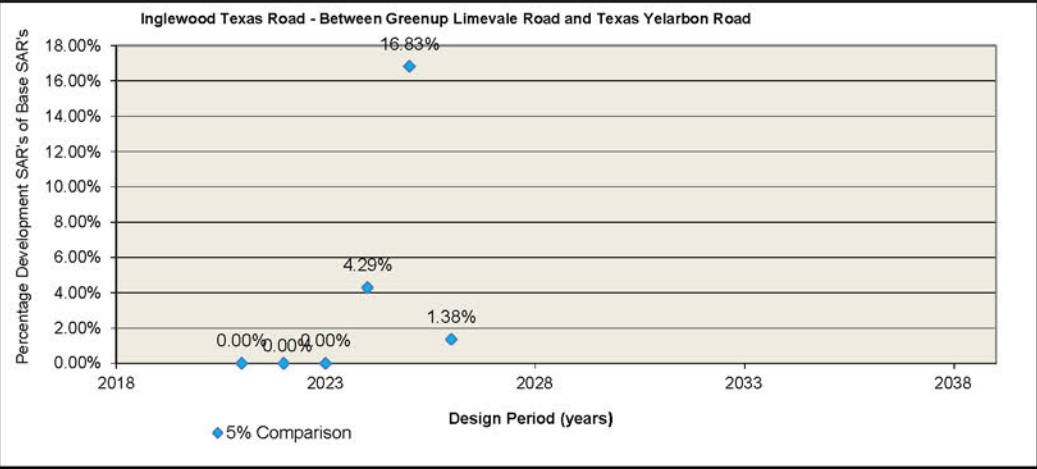
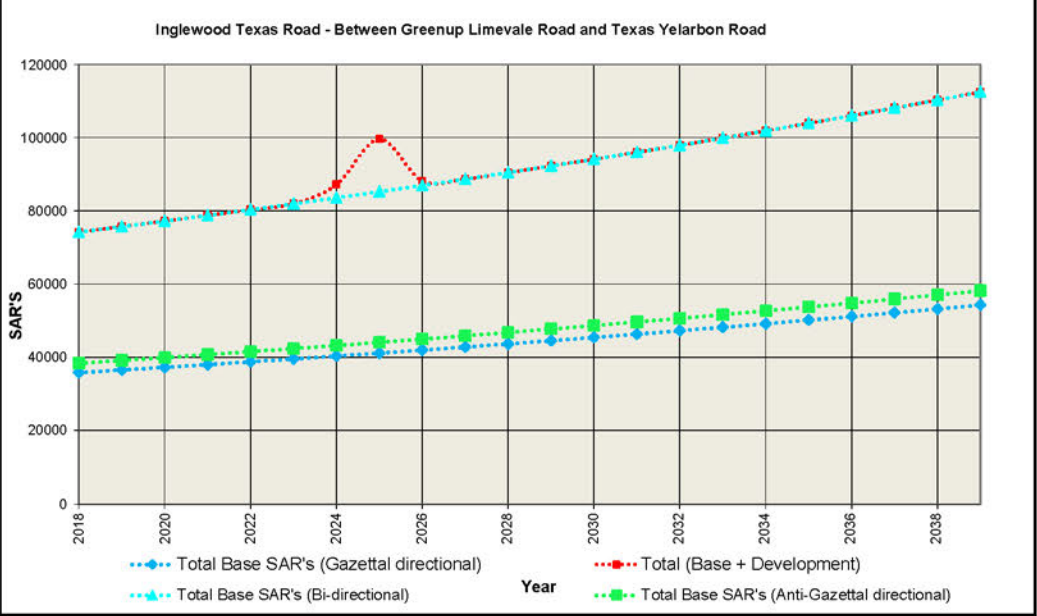
Inglewood Texas Road			Between Cunningham Highway and Greenup Limevale Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	38393	35828			74221	
2019	39161	36545			75706	
2020	39944	37276	0	0	77220	
2021	40743	38021	0	0	78764	0.00%
2022	41558	38782	0	0	80340	0.00%
2023	42389	39557	0	0	81946	0.00%
2024	43237	40348	1794	1794	87173	4.29%
2025	44102	41155	7175	7175	99607	16.83%
2026	44984	41979	598	598	88158	1.38%
2027	45883	42818			88702	
2028	46801	43674			90476	
2029	47737	44548			92285	
2030	48692	45439			94131	
2031	49666	46348			96013	
2032	50659	47275			97934	
2033	51672	48220			99892	
2034	52706	49185			101890	
2035	53760	50168			103928	
2036	54835	51172			106007	
2037	55932	52195			108127	
2038	57050	53239			110289	
2039	58191	54304			112495	



Inglewood Texas Road - Between Greenup Limevale Road and Texas Yelarbon Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

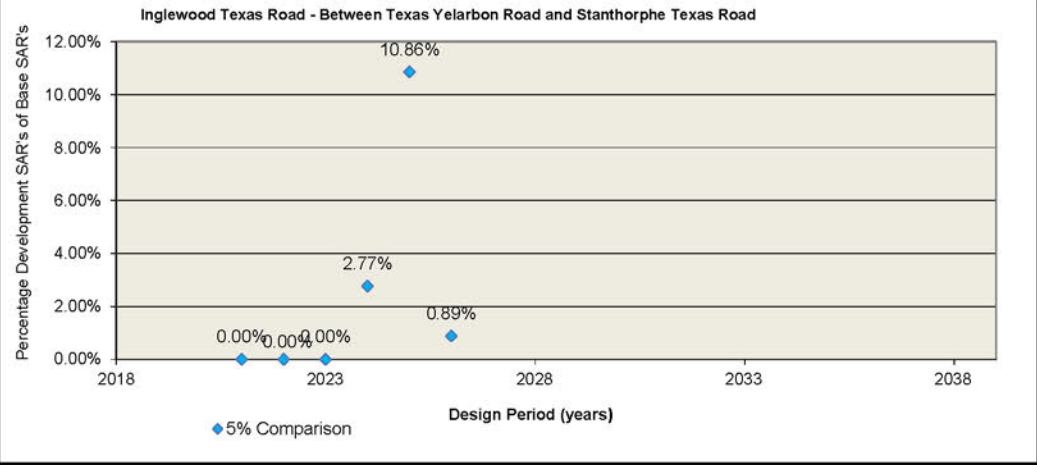
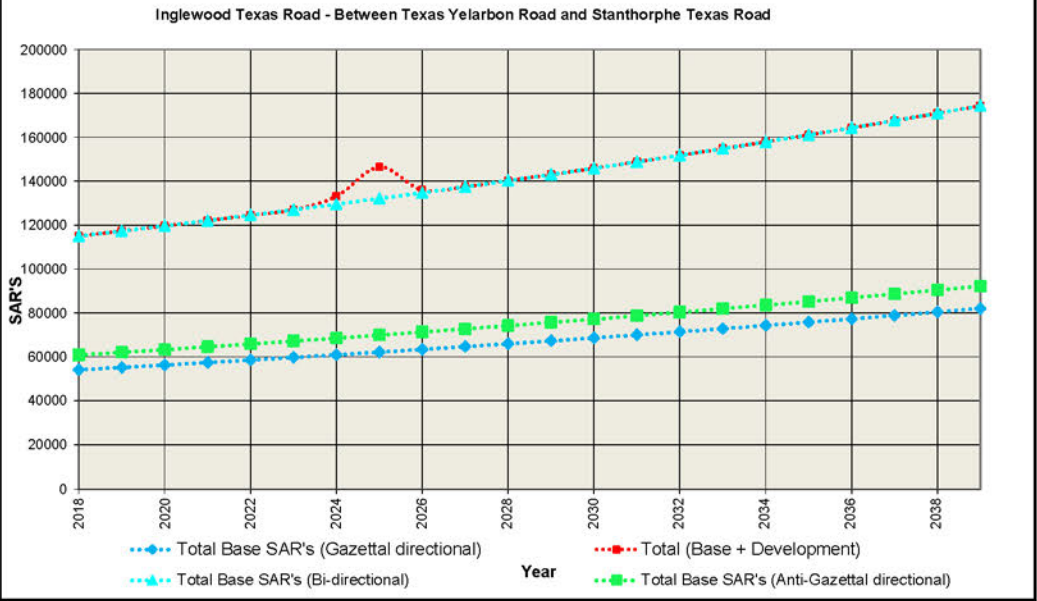
Inglewood Texas Road			Between Greenup Limevale Road and Texas Yelarbon Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	38393	35828			74221	
2019	39161	36545			75706	
2020	39944	37276	0	0	77220	
2021	40743	38021	0	0	78764	0.00%
2022	41558	38782	0	0	80340	0.00%
2023	42389	39557	0	0	81946	0.00%
2024	43237	40348	1794	1794	87173	4.29%
2025	44102	41155	7175	7175	99607	16.83%
2026	44984	41979	598	598	88158	1.38%
2027	45883	42818			88702	
2028	46801	43674			90476	
2029	47737	44548			92285	
2030	48692	45439			94131	
2031	49666	46348			96013	
2032	50659	47275			97934	
2033	51672	48220			99892	
2034	52706	49185			101890	
2035	53760	50168			103928	
2036	54835	51172			106007	
2037	55932	52195			108127	
2038	57050	53239			110289	
2039	58191	54304			112495	



Inglewood Texas Road - Between Texas Yelarbon Road and Stanthorpe Texas Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

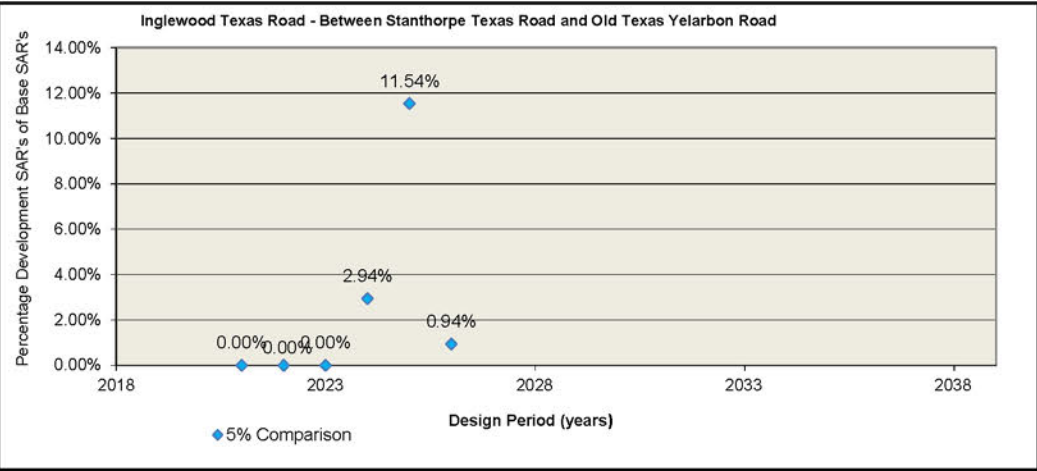
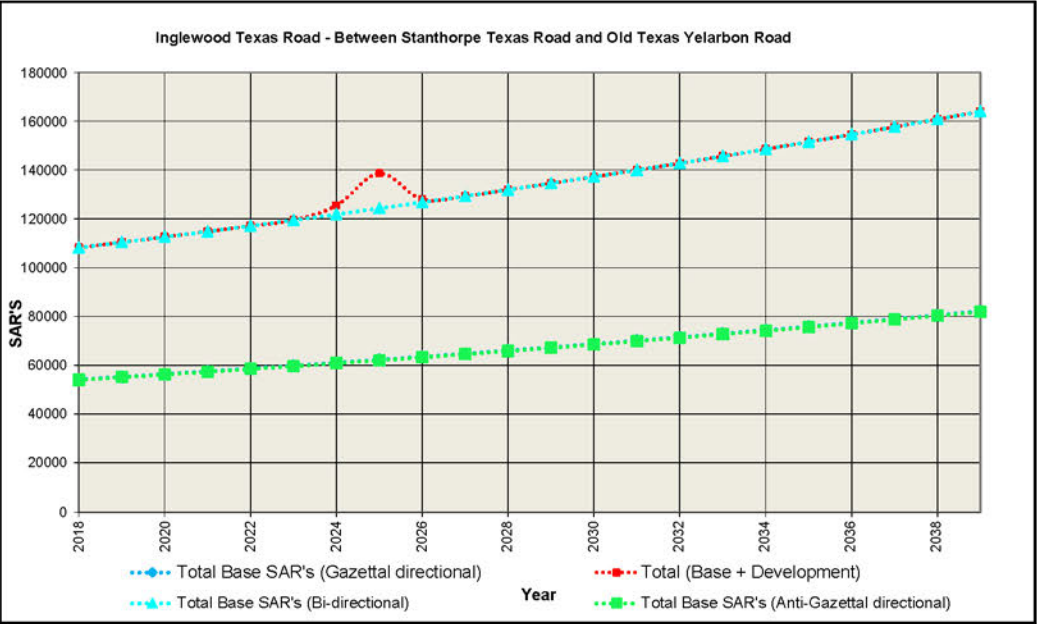
Inglewood Texas Road				Between Texas Yelarbon Road and Stanthorpe Texas Road			
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal directional)		Total Base SAR's (Gazettal directional)		Total Base SAR's (Bi-directional)			
Unloaded		Loaded					
2018	60894	54161	115055			115055	
2019	62112	55244	117356			117356	
2020	63355	56349	119703	0	0	119703	
2021	64622	57476	122097	0	0	122097	0.00%
2022	65914	58625	124539	0	0	124539	0.00%
2023	67232	59798	127030	0	0	127030	0.00%
2024	68577	60994	129571	1794	1794	133158	2.77%
2025	69949	62213	132162	7175	7175	146512	10.86%
2026	71348	63458	134805	598	598	136001	0.89%
2027	72774	64727	137501			137501	
2028	74230	66021	140251			140251	
2029	75715	67342	143056			143056	
2030	77229	68689	145918			145918	
2031	78773	70062	148836			148836	
2032	80349	71464	151813			151813	
2033	81956	72893	154849			154849	
2034	83595	74351	157946			157946	
2035	85267	75838	161105			161105	
2036	86972	77355	164327			164327	
2037	88712	78902	167613			167613	
2038	90486	80480	170966			170966	
2039	92296	82089	174385			174385	



Inglewood Texas Road - Between Stanthorpe Texas Road and Old Texas Yelarbon Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

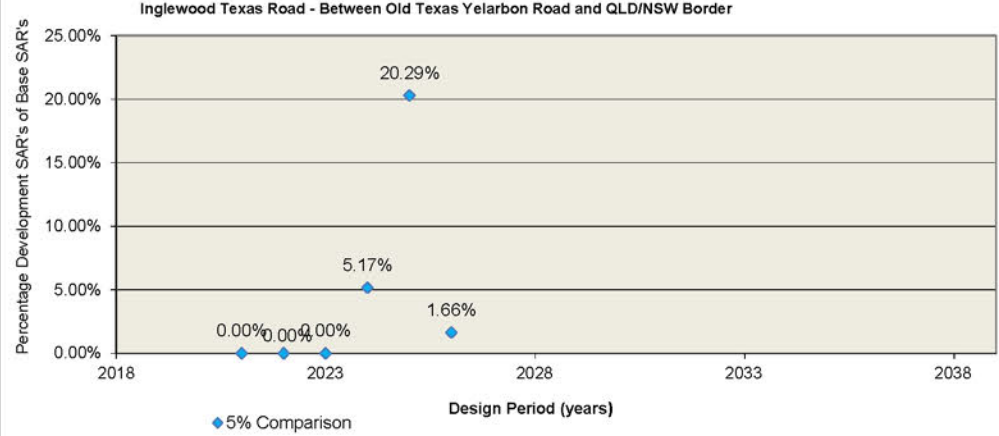
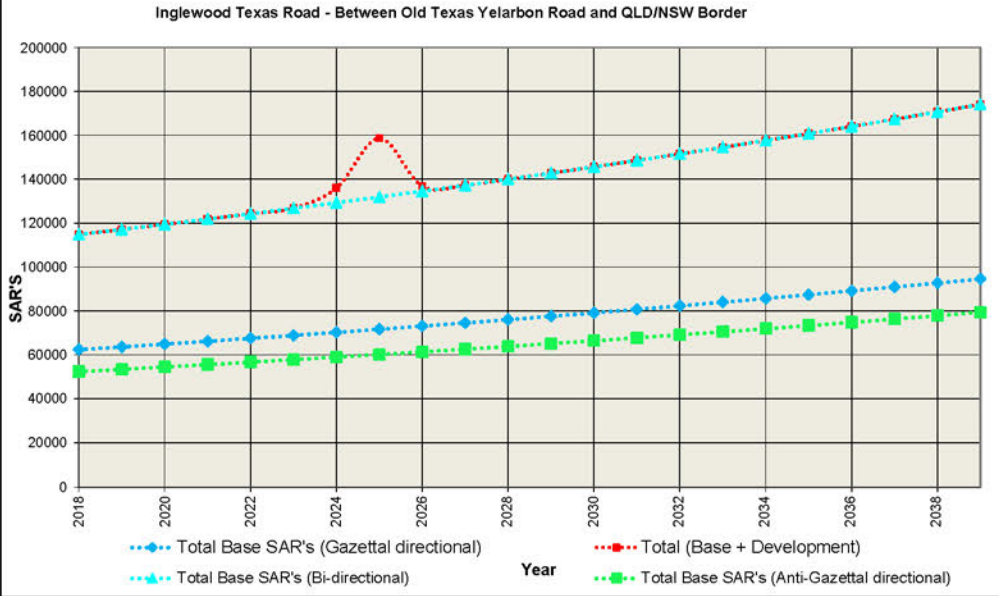
Inglewood Texas Road			Between Stanthorpe Texas Road and Old Texas Yelarbon Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	54019	54217			108236	
2019	55099	55301			110401	
2020	56201	56407	0	0	112809	
2021	57325	57535	0	0	114861	0.00%
2022	58472	58686	0	0	117158	0.00%
2023	59641	59860	0	0	119501	0.00%
2024	60834	61057	1794	1794	125479	2.94%
2025	62051	62278	7175	7175	138679	11.54%
2026	63292	63524	598	598	128011	0.94%
2027	64558	64794			129352	
2028	65849	66090			131939	
2029	67166	67412			134578	
2030	68509	68760			137269	
2031	69879	70135			140015	
2032	71277	71538			142815	
2033	72703	72969			145671	
2034	74157	74428			148585	
2035	75640	75917			151556	
2036	77153	77435			154587	
2037	78696	78984			157679	
2038	80269	80563			160833	
2039	81875	82175			164049	



Inglewood Texas Road - Between Old Texas Yelarbon Road and QLD/NSW Border

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

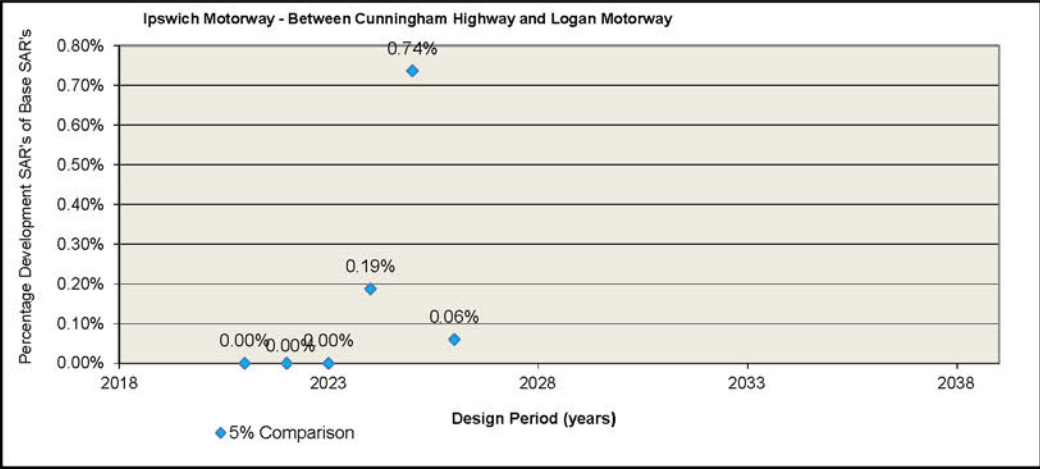
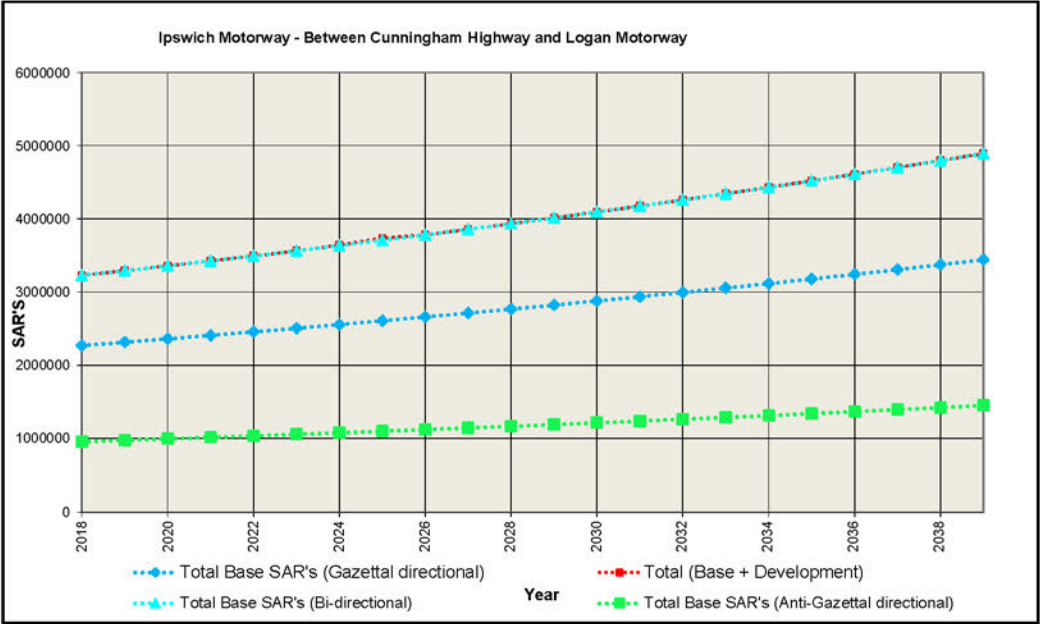
Inglewood Texas Road			Between Old Texas Yelarbon Road and QLD/NSW Border			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	52418	62431			114849	
2019	53467	63679			117146	
2020	54536	64953	0	0	119489	
2021	55627	66252	0	0	121879	0.00%
2022	56739	67577	0	0	124316	0.00%
2023	57874	68928	0	0	126802	0.00%
2024	59032	70307	3346	3346	136030	5.17%
2025	60212	71713	13383	13383	158691	20.29%
2026	61416	73147	1115	1115	136794	1.66%
2027	62645	74610			137255	
2028	63898	76103			140000	
2029	65176	77625			142800	
2030	66479	79177			145656	
2031	67809	80761			148569	
2032	69165	82376			151541	
2033	70548	84023			154572	
2034	71959	85704			157663	
2035	73398	87418			160816	
2036	74866	89166			164033	
2037	76364	90950			167313	
2038	77891	92769			170659	
2039	79449	94624			174073	



Ipswich Motorway - Between Cunningham Highway and Logan Motorway

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

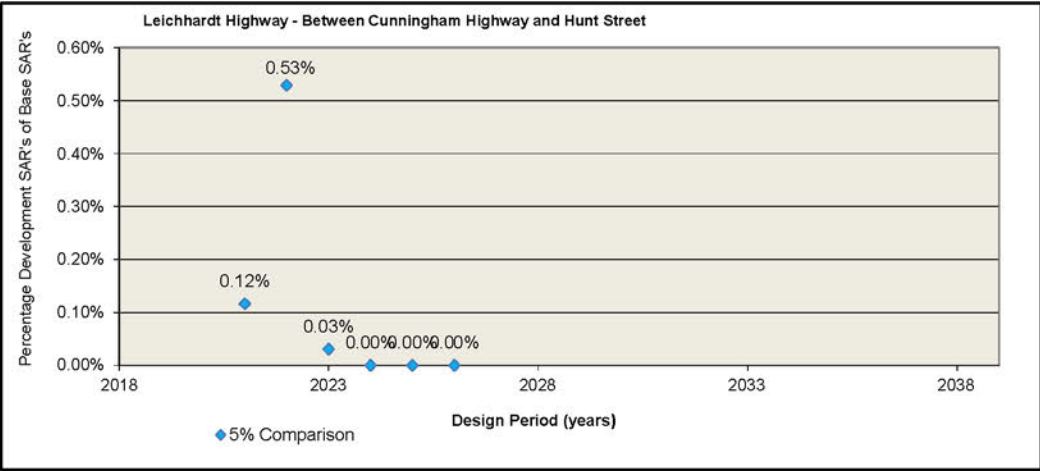
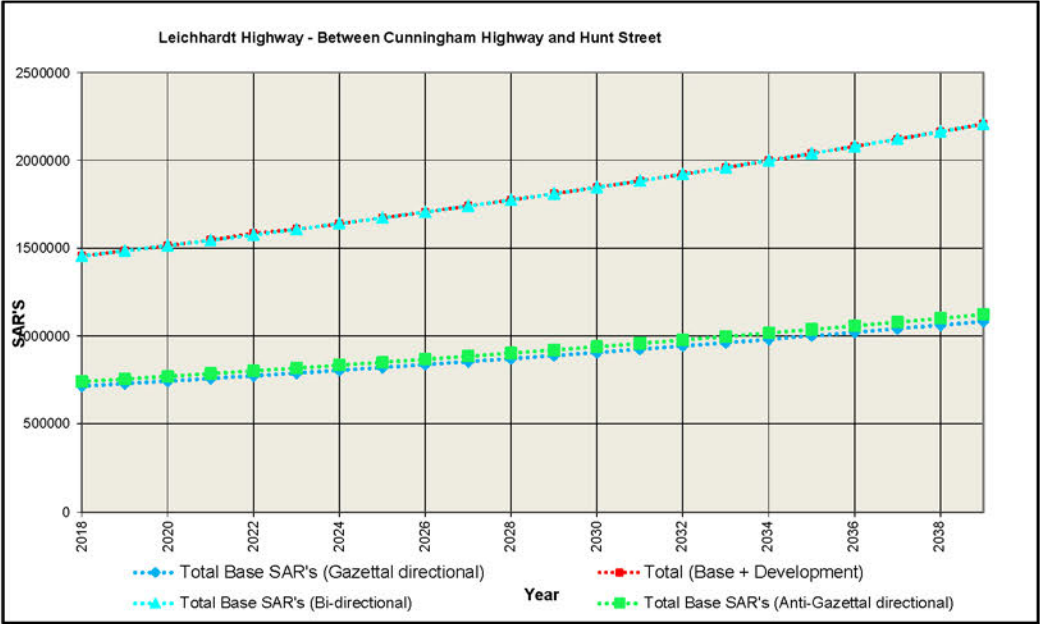
Ipswich Motorway			Between Cunningham Highway and Logan Motorway			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	957707	2270427			3228134	
2019	976862	2315836			3292697	
2020	996399	2362152	0	0	3358551	
2021	1016327	2409395	0	0	3425722	0.00%
2022	1036653	2457583	0	0	3494236	0.00%
2023	1057386	2506735	0	0	3564121	0.00%
2024	1078534	2556870	3415	3415	3642235	0.19%
2025	1100105	2608007	13662	13662	3735435	0.74%
2026	1122107	2660167	1138	1138	3784551	0.06%
2027	1144549	2713370			3857919	
2028	1167440	2767638			3935078	
2029	1190789	2822991			4013779	
2030	1214605	2879450			4094055	
2031	1238897	2937039			4175936	
2032	1263675	2995780			4259455	
2033	1288948	3055696			4344644	
2034	1314727	3116810			4431537	
2035	1341022	3179146			4520167	
2036	1367842	3242729			4610571	
2037	1395199	3307583			4702782	
2038	1423103	3373735			4796838	
2039	1451565	3441210			4892775	



Leichhardt Highway - Between Cunningham Highway and Hunt Street

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

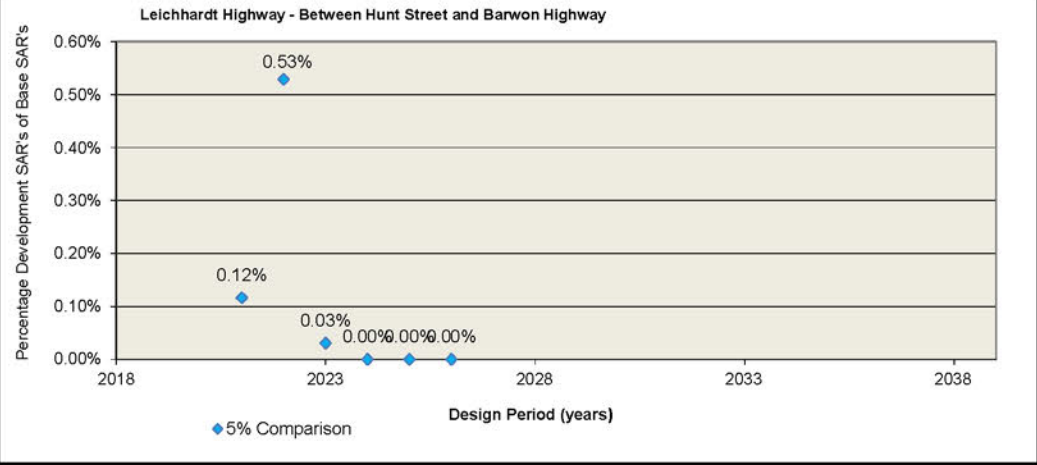
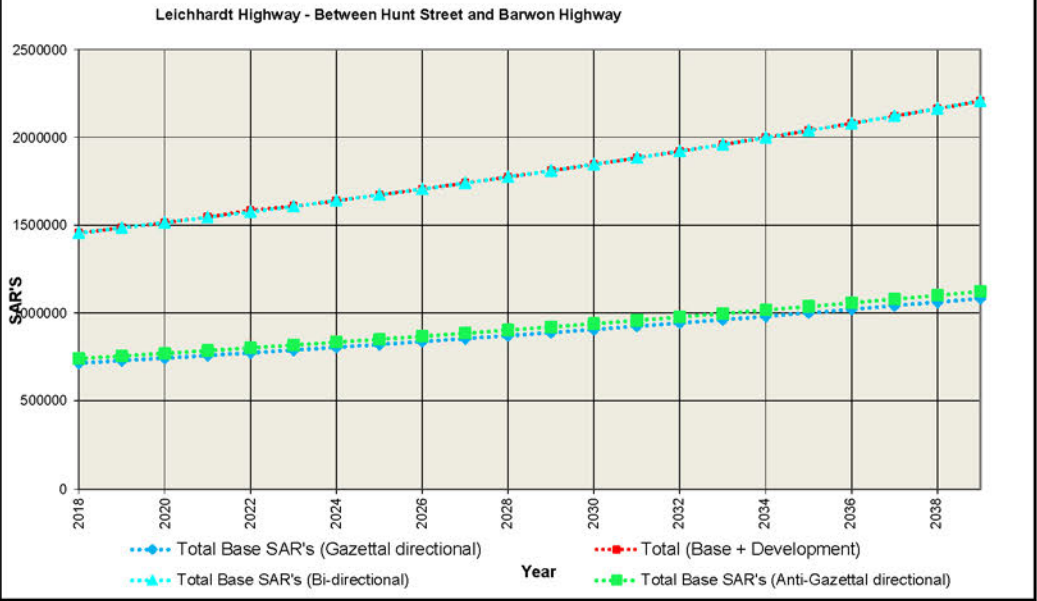
Leichhardt Highway			Between Cunningham Highway and Hunt Street			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	740787	715036			1455824	
2019	755603	729337			1484940	
2020	770715	743924	0	0	1514639	
2021	786129	758802	900	900	1546733	0.12%
2022	801852	773978	4165	4165	1584160	0.53%
2023	817889	789458	247	247	1607842	0.03%
2024	834247	805247	0	0	1639494	0.00%
2025	850932	821352	0	0	1672284	0.00%
2026	867950	837779	0	0	1705730	0.00%
2027	885309	854535			1739844	
2028	903016	871625			1774641	
2029	921076	889058			1810134	
2030	939497	906839			1846337	
2031	958287	924976			1883263	
2032	977453	943475			1920929	
2033	997002	962345			1959347	
2034	1016942	981592			1998534	
2035	1037281	1001224			2038505	
2036	1058027	1021248			2079275	
2037	1079187	1041673			2120860	
2038	1100771	1062507			2163278	
2039	1122786	1083757			2206543	



Leichhardt Highway - Between Hunt Street and Barwon Highway

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

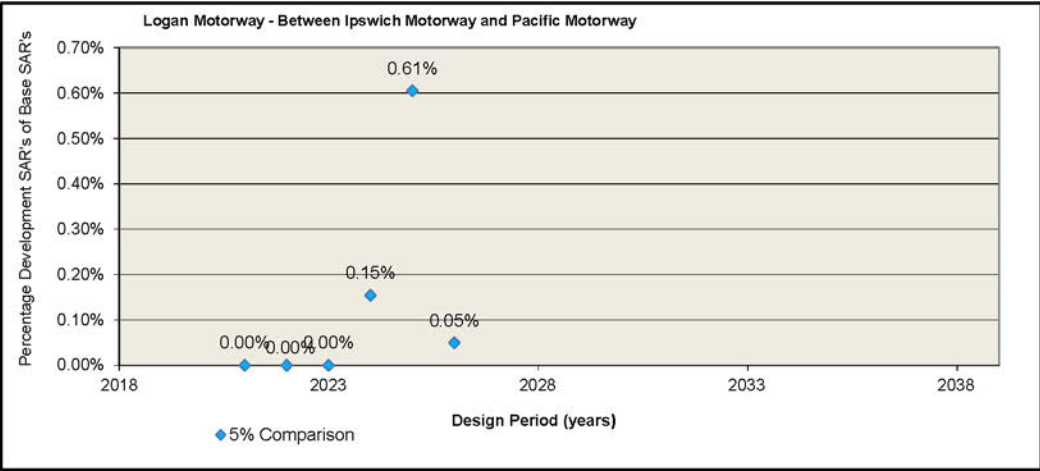
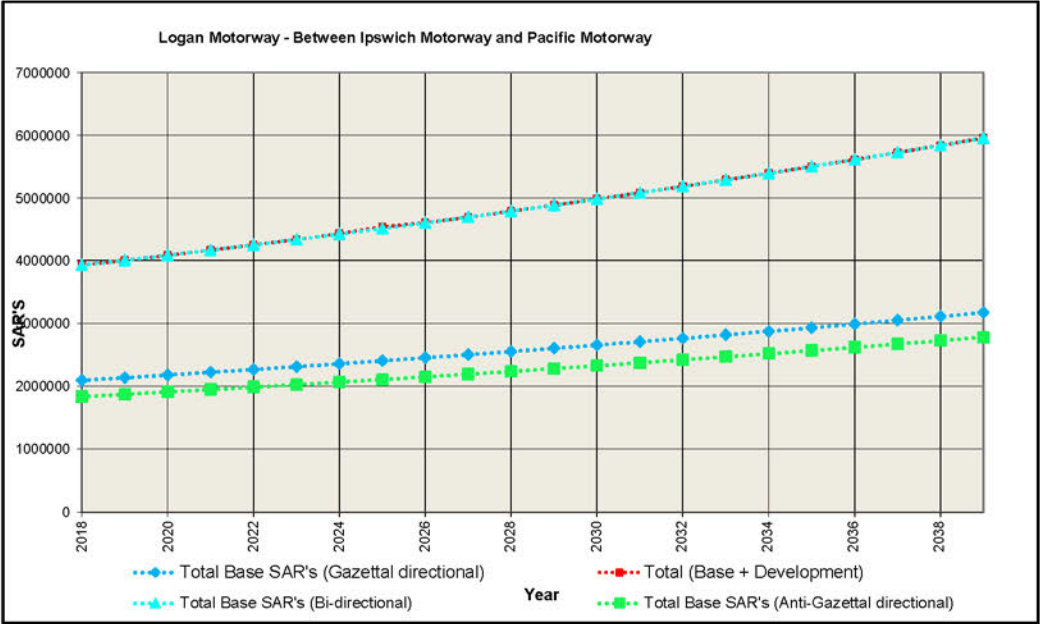
Leichhardt Highway				Between Hunt Street and Barwon Highway			
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)		Total Base SAR's (Gazettal directional)		Total Base SAR's (Bi-directional)			
Unloaded		Loaded					
2018	740787	715036	1455824			1455824	
2019	755603	729337	1484940			1484940	
2020	770715	743924	1514639	0	0	1514639	
2021	786129	758802	1544932	900	900	1546733	0.12%
2022	801852	773978	1575831	4165	4165	1584160	0.53%
2023	817889	789458	1607347	247	247	1607842	0.03%
2024	834247	805247	1639494	0	0	1639494	0.00%
2025	850932	821352	1672284	0	0	1672284	0.00%
2026	867950	837779	1705730	0	0	1705730	0.00%
2027	885309	854535	1739844			1739844	
2028	903016	871625	1774641			1774641	
2029	921076	889058	1810134			1810134	
2030	939497	906839	1846337			1846337	
2031	958287	924976	1883263			1883263	
2032	977453	943475	1920929			1920929	
2033	997002	962345	1959347			1959347	
2034	1016942	981592	1998534			1998534	
2035	1037281	1001224	2038505			2038505	
2036	1058027	1021248	2079275			2079275	
2037	1079187	1041673	2120860			2120860	
2038	1100771	1062507	2163278			2163278	
2039	1122786	1083757	2206543			2206543	



Logan Motorway - Between Ipswich Motorway and Pacific Motorway

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

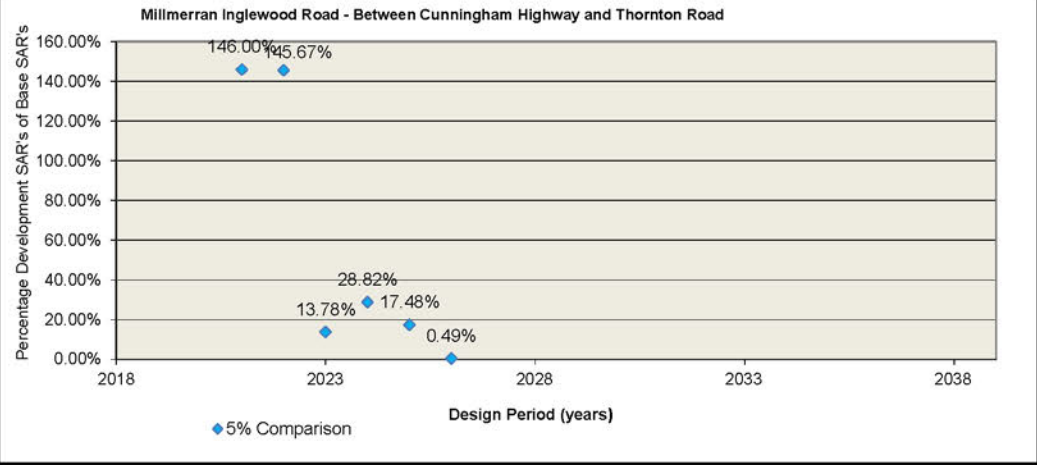
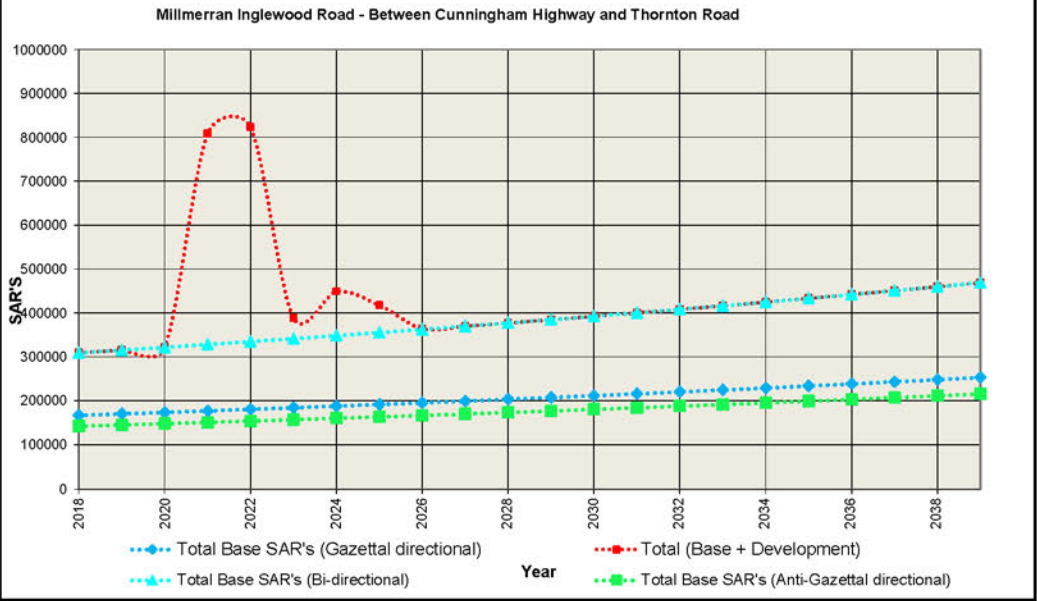
Logan Motorway				Between Ipswich Motorway and Pacific Motorway			
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal directional)		Total Base SAR's (Gazettal directional)		Total Base SAR's (Bi-directional)			
2018	1834689	2094490	3929178			3929178	
2019	1871382	2136380	4007762			4007762	
2020	1908810	2179107	4087917	0	0	4087917	
2021	1946986	2222689	4169676	0	0	4169676	0.00%
2022	1985926	2267143	4253069	0	0	4253069	0.00%
2023	2025644	2312486	4338130	0	0	4338130	0.00%
2024	2066157	2358736	4424893	3415	3415	4431724	0.15%
2025	2107480	2405910	4513391	13662	13662	4540714	0.61%
2026	2149630	2454029	4603659	1138	1138	4605936	0.05%
2027	2192623	2503109	4695732			4695732	
2028	2236475	2553171	4789647			4789647	
2029	2281205	2604235	4885439			4885439	
2030	2326829	2656320	4983148			4983148	
2031	2373365	2709446	5082811			5082811	
2032	2420833	2763635	5184467			5184467	
2033	2469249	2818908	5288157			5288157	
2034	2518634	2875286	5393920			5393920	
2035	2569007	2932791	5501798			5501798	
2036	2620387	2991447	5611834			5611834	
2037	2672795	3051276	5724071			5724071	
2038	2726251	3112302	5838552			5838552	
2039	2780776	3174548	5955323			5955323	



Millmerran Inglewood Road - Between Cunningham Highway and Thornton Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

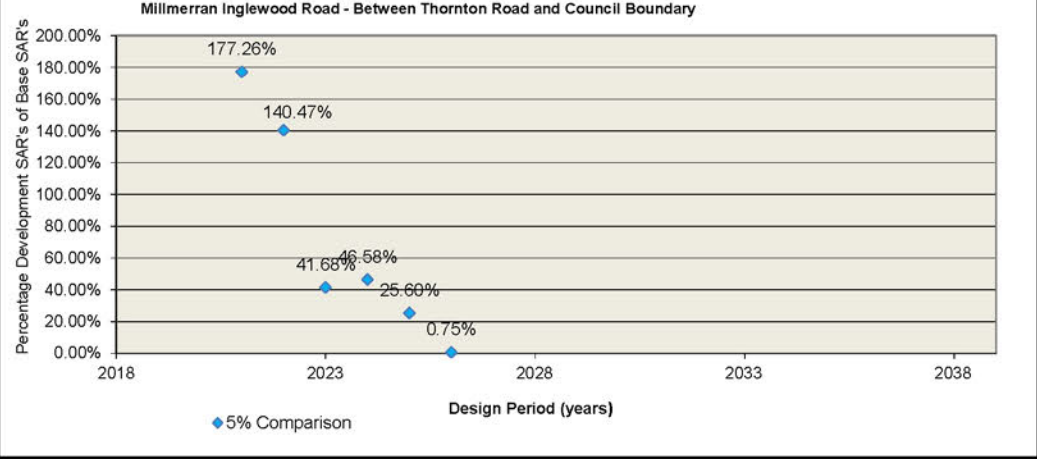
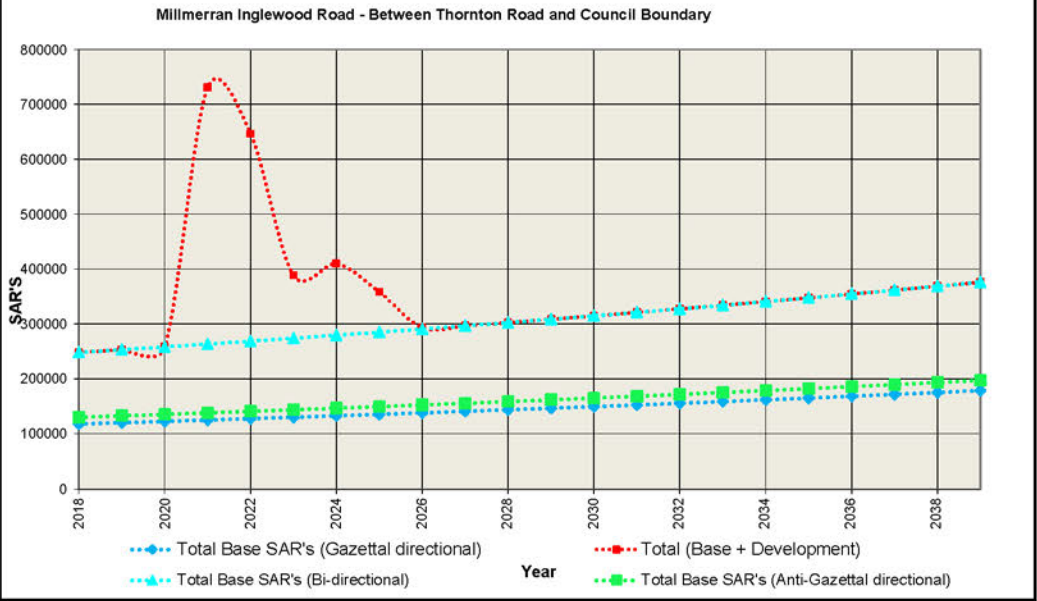
Millmerran Inglewood Road			Between Cunningham Highway and Thornton Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	142432	167077			309509	
2019	145281	170418			315699	
2020	148186	173827	0	0	322013	
2021	151150	177303	239778	239778	808010	146.00%
2022	154173	180849	244010	244010	823043	145.67%
2023	157256	184466	23545	23545	388812	13.78%
2024	160401	188156	50225	50225	449007	28.82%
2025	163610	191919	31076	31076	417680	17.48%
2026	166882	195757	884	884	364406	0.49%
2027	170219	199672			369892	
2028	173624	203666			377289	
2029	177096	207739			384835	
2030	180638	211894			392532	
2031	184251	216132			400383	
2032	187936	220454			408390	
2033	191695	224863			416558	
2034	195529	229361			424889	
2035	199439	233948			433387	
2036	203428	238627			442055	
2037	207496	243399			450896	
2038	211646	248267			459914	
2039	215879	253233			469112	



Millmerran Inglewood Road - Between Thornton Road and Council Boundary

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

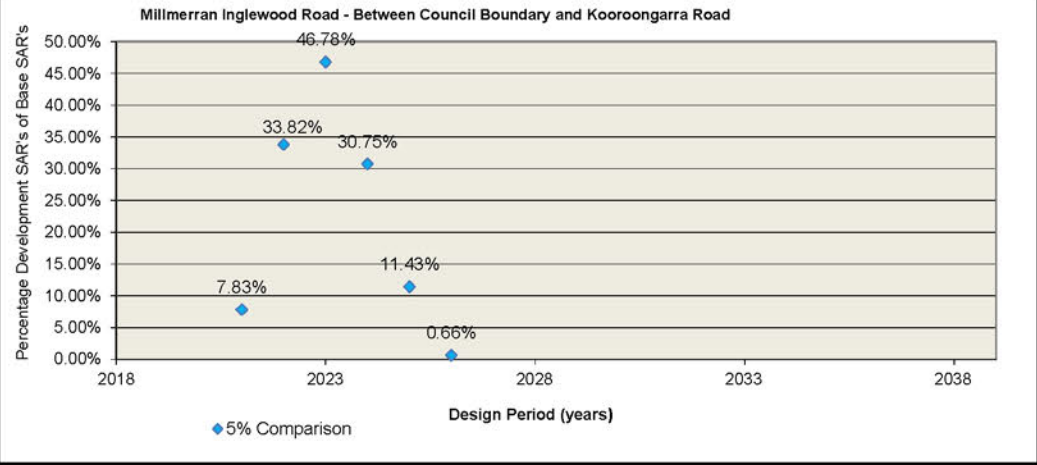
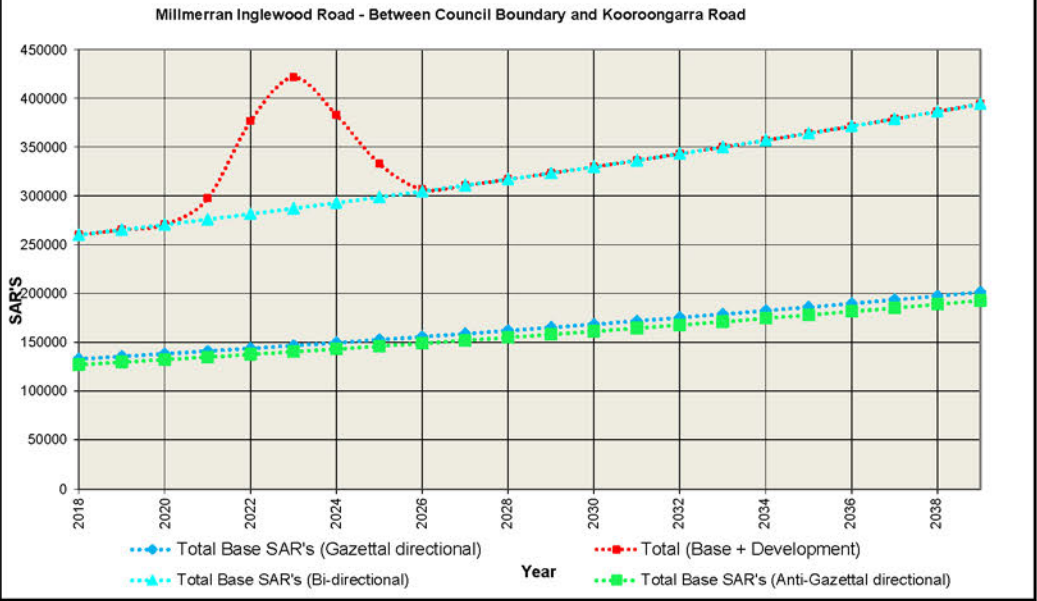
Millmerran Inglewood Road			Between Thornton Road and Council Boundary			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	130276	118008			248284	
2019	132882	120368			253250	
2020	135539	122776	0	0	258315	
2021	138250	125231	233517	233517	730516	177.26%
2022	141015	127736	188758	188758	646266	140.47%
2023	143836	130290	57122	57122	388371	41.68%
2024	146712	132896	65122	65122	409852	46.58%
2025	149646	135554	36508	36508	358217	25.60%
2026	152639	138265	1089	1089	293082	0.75%
2027	155692	141031			296723	
2028	158806	143851			302657	
2029	161982	146728			308710	
2030	165222	149663			314885	
2031	168526	152656			321182	
2032	171897	155709			327606	
2033	175335	158823			334158	
2034	178841	162000			340841	
2035	182418	165240			347658	
2036	186067	168545			354611	
2037	189788	171916			361703	
2038	193584	175354			368938	
2039	197455	178861			376316	



Millmerran Inglewood Road - Between Council Boundary and Kooroongarra Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

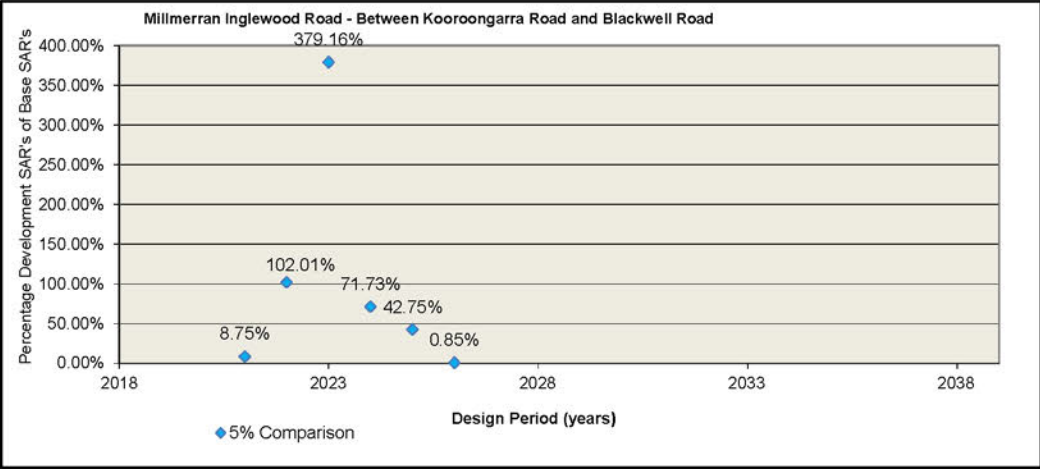
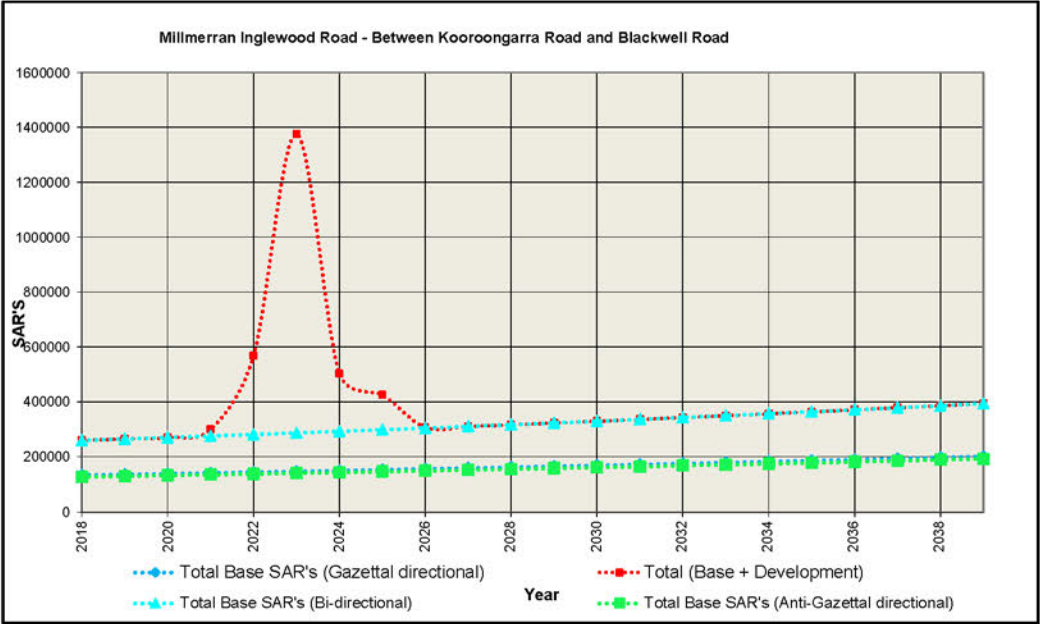
Millmerran Inglewood Road			Between Council Boundary and Kooroongarra Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	127136	132887			260022	
2019	129678	135544			265223	
2020	132272	138255	0	0	270527	
2021	134917	141020	10801	10801	297539	7.83%
2022	137616	143841	47590	47590	376636	33.82%
2023	140368	146718	67156	67156	421397	46.78%
2024	143175	149652	45018	45018	382864	30.75%
2025	146039	152645	17069	17069	332821	11.43%
2026	148960	155698	1001	1001	306659	0.66%
2027	151939	158812			310751	
2028	154978	161988			316966	
2029	158077	165228			323305	
2030	161239	168533			329771	
2031	164464	171903			336367	
2032	167753	175341			343094	
2033	171108	178848			349956	
2034	174530	182425			356955	
2035	178021	186074			364094	
2036	181581	189795			371376	
2037	185213	193591			378804	
2038	188917	197463			386380	
2039	192695	201412			394107	



Millmerran Inglewood Road - Between Kooroongarra Road and Blackwell Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

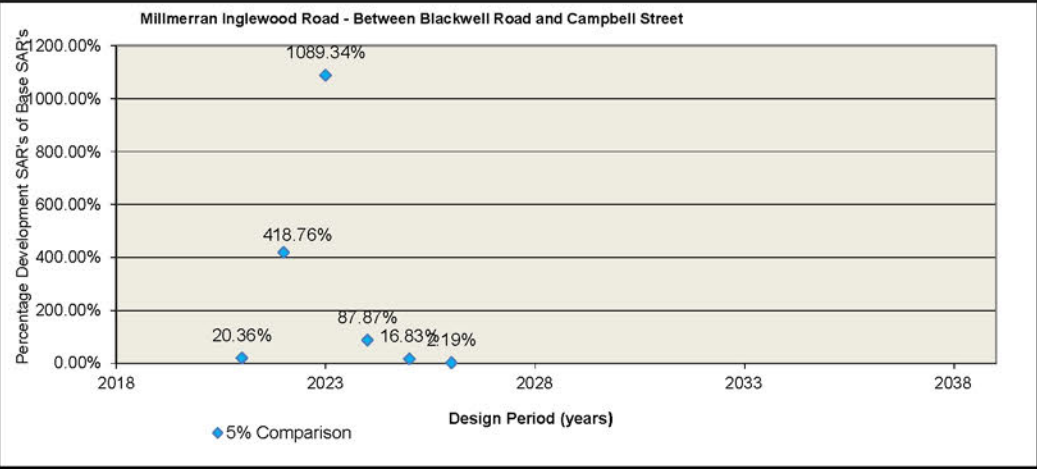
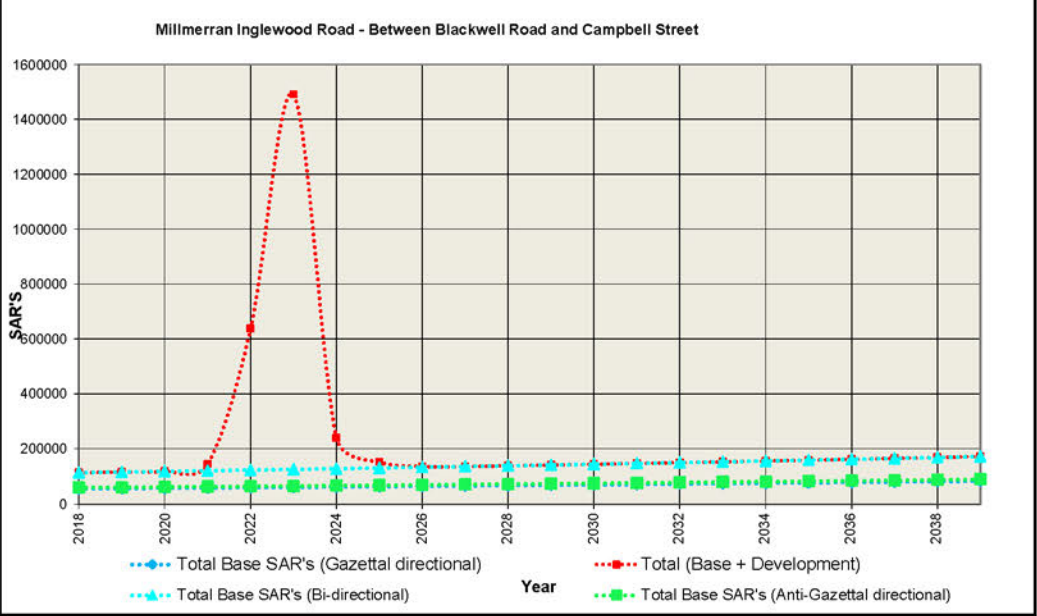
Millmerran Inglewood Road			Between Kooroongarra Road and Blackwell Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	127136	132887			260022	
2019	129678	135544			265223	
2020	132272	138255	0	0	270527	
2021	134917	141020	12078	12078	300093	8.75%
2022	137616	143841	143557	143557	568571	102.01%
2023	140368	146718	544264	544264	1375613	379.16%
2024	143175	149652	105025	105025	502878	71.73%
2025	146039	152645	63850	63850	426384	42.75%
2026	148960	155698	304658	1298	307253	0.85%
2027	151939	158812			310751	
2028	154978	161988			316966	
2029	158077	165228			323305	
2030	161239	168533			329771	
2031	164464	171903			336367	
2032	167753	175341			343094	
2033	171108	178848			349956	
2034	174530	182425			356955	
2035	178021	186074			364094	
2036	181581	189795			371376	
2037	185213	193591			378804	
2038	188917	197463			386380	
2039	192695	201412			394107	



Millmerran Inglewood Road - Between Blackwell Road and Campbell Street

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

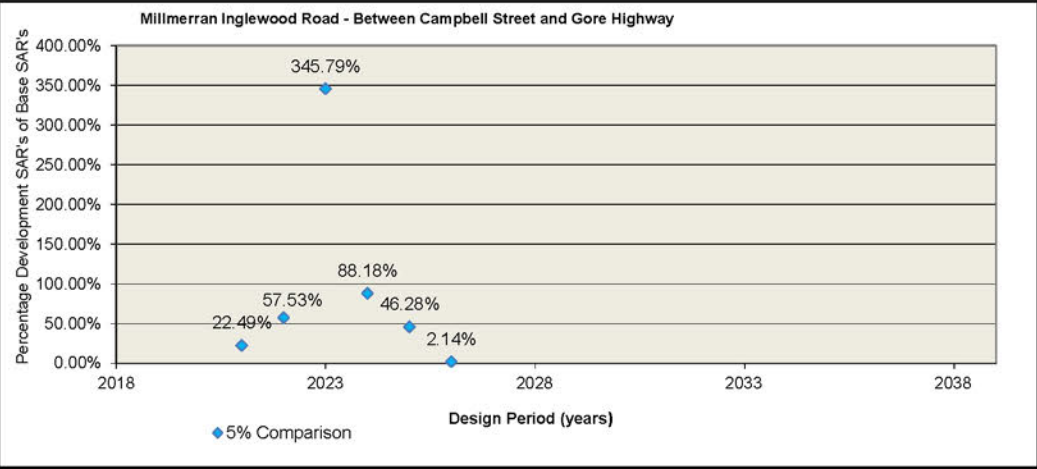
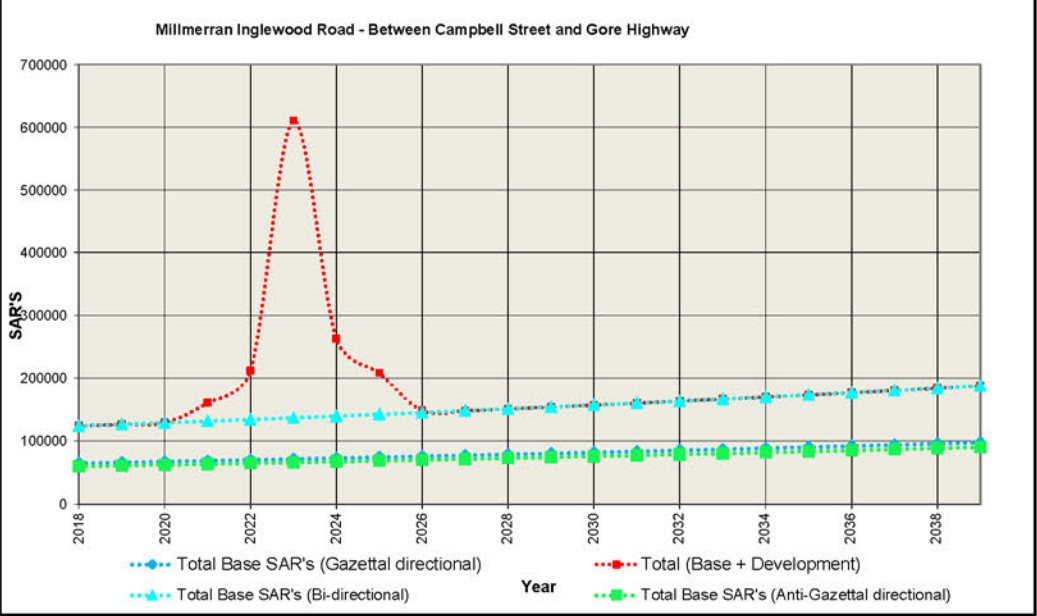
Millmerran Inglewood Road			Between Blackwell Road and Campbell Street			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	58686	54821			113507	
2019	59860	55917			115778	
2020	61057	57036	0	0	118093	
2021	62279	58177	12263	12263	144981	20.36%
2022	63524	59340	257252	257252	637369	418.76%
2023	64795	60527	682585	682585	1490492	1089.34%
2024	66090	61737	56160	56160	240148	87.87%
2025	67412	62972	10973	10973	152331	16.83%
2026	68761	64232	1460	1460	135911	2.19%
2027	70136	65516			135652	
2028	71538	66827			138365	
2029	72969	68163			141132	
2030	74429	69526			143955	
2031	75917	70917			146834	
2032	77436	72335			149771	
2033	78984	73782			152766	
2034	80564	75258			155821	
2035	82175	76763			158938	
2036	83819	78298			162117	
2037	85495	79864			165359	
2038	87205	81461			168666	
2039	88949	83090			172039	



Millmerran Inglewood Road - Between Campbell Street and Gore Highway

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

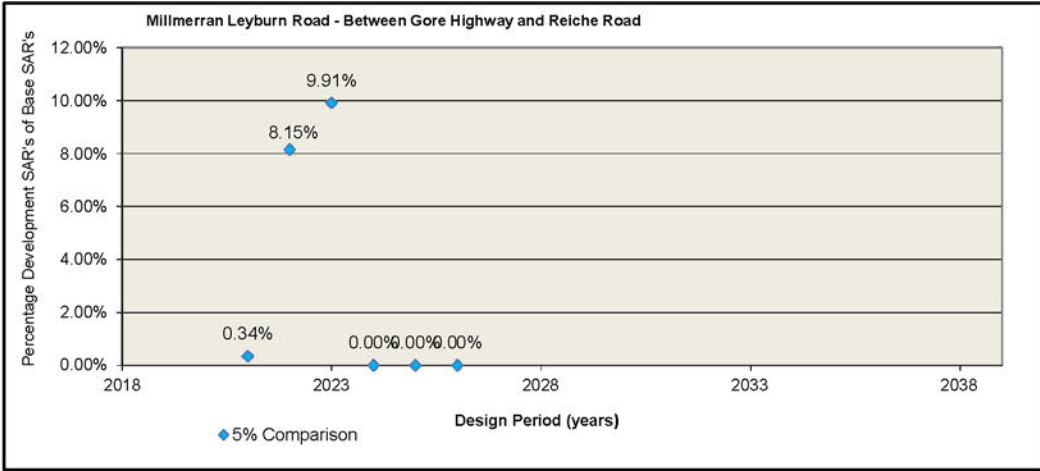
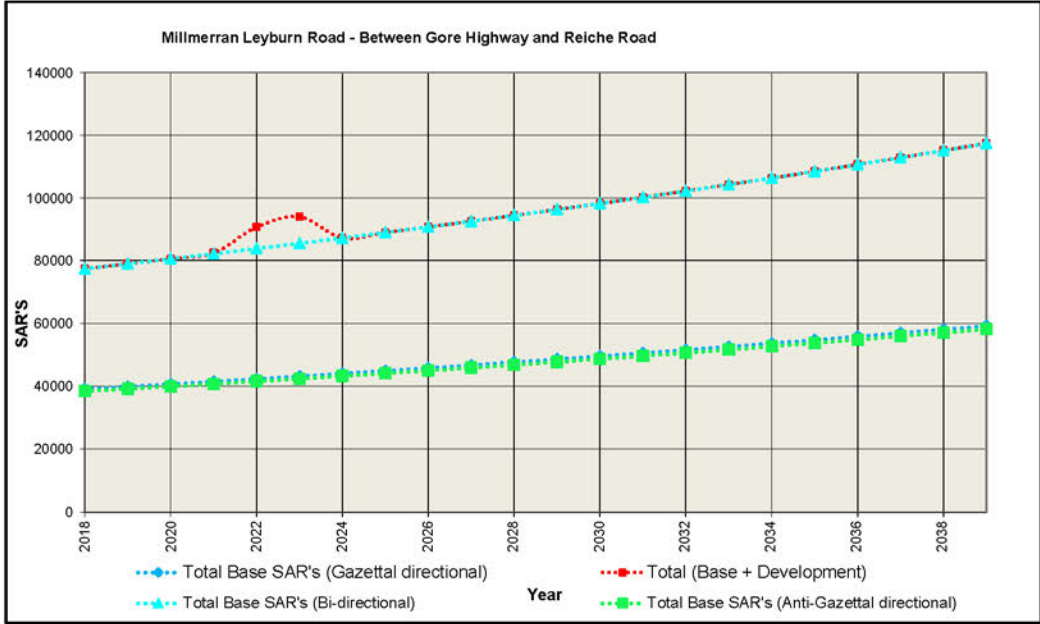
Millmerran Inglewood Road			Between Campbell Street and Gore Highway			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	59535	64458			123992	
2019	60725	65747			126472	
2020	61940	67062	0	0	129002	
2021	63179	68403	14793	14793	161168	22.49%
2022	64442	69771	38603	38603	211420	57.53%
2023	65731	71166	236691	236691	610280	345.79%
2024	67046	72590	61564	61564	262764	88.18%
2025	68387	74041	32959	32959	208346	46.28%
2026	69754	75522	1554	1554	148386	2.14%
2027	71149	77033			148182	
2028	72572	78573			151146	
2029	74024	80145			154169	
2030	75504	81748			157252	
2031	77014	83383			160397	
2032	78555	85050			163605	
2033	80126	86751			166877	
2034	81728	88486			170215	
2035	83363	90256			173619	
2036	85030	92061			177091	
2037	86731	93902			180633	
2038	88465	95780			184246	
2039	90235	97696			187931	



Millmerran Leyburn Road - Between Gore Highway and Reiche Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

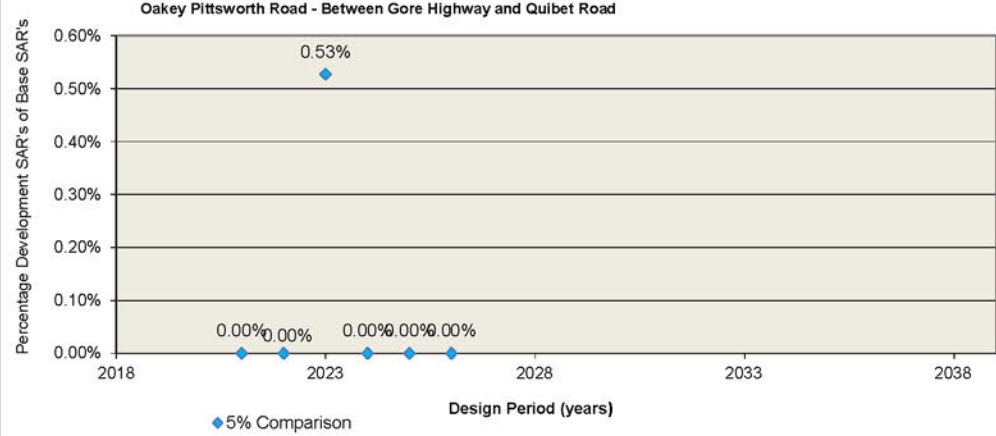
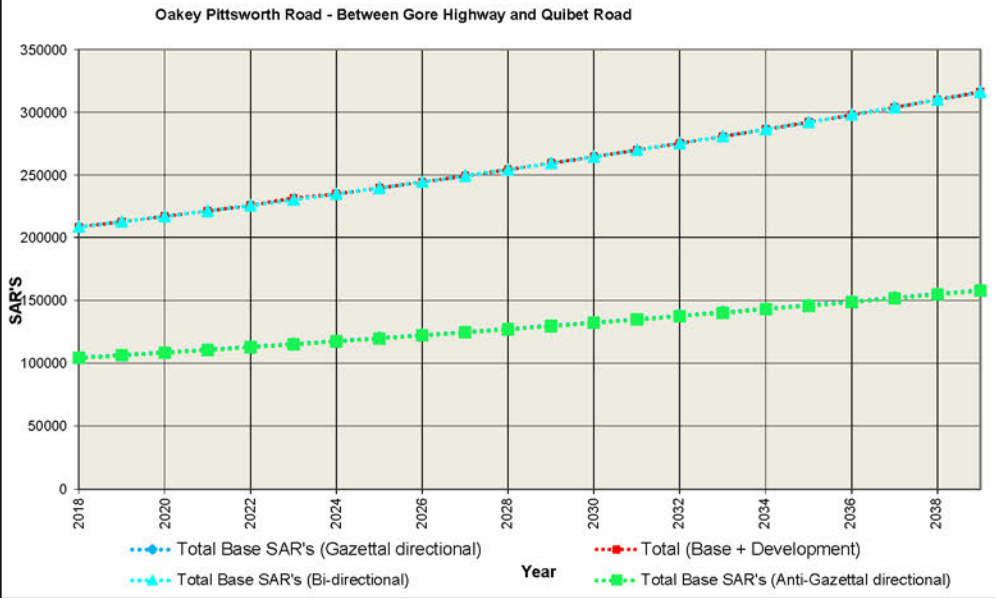
Millmerran Leyburn Road			Between Gore Highway and Reiche Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal directional)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	38385	39092			77477	
2019	39153	39874			79027	
2020	39936	40671	0	0	80607	
2021	40735	41485	140	140	82499	0.34%
2022	41549	42315	3415	3415	90695	8.15%
2023	42380	43161	4239	4239	94020	9.91%
2024	43228	44024	0	0	87252	0.00%
2025	44092	44905	0	0	88997	0.00%
2026	44974	45803	0	0	90777	0.00%
2027	45874	46719			92592	
2028	46791	47653			94444	
2029	47727	48606			96333	
2030	48682	49578			98260	
2031	49655	50570			100225	
2032	50648	51581			102230	
2033	51661	52613			104274	
2034	52695	53665			106360	
2035	53748	54738			108487	
2036	54823	55833			110657	
2037	55920	56950			112870	
2038	57038	58089			115127	
2039	58179	59251			117430	



Oakey Pittsworth Road - Between Gore Highway and Quibet Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

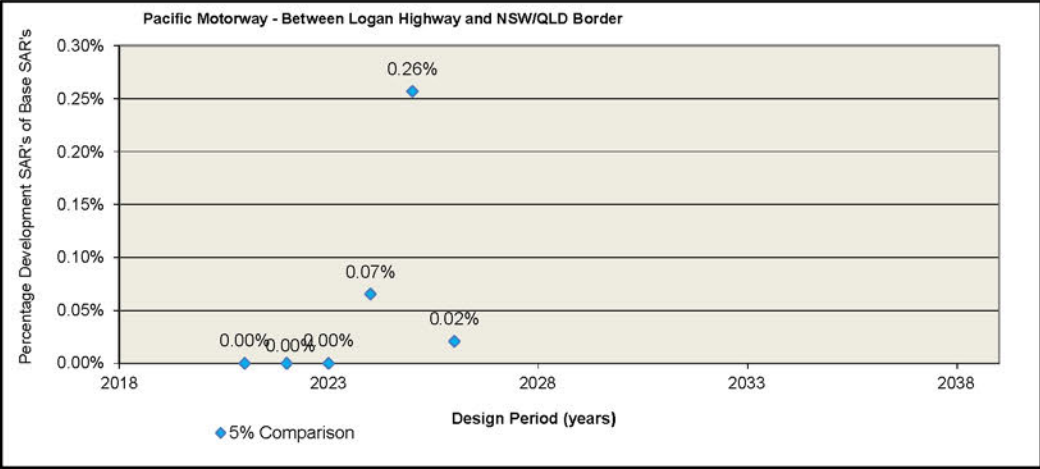
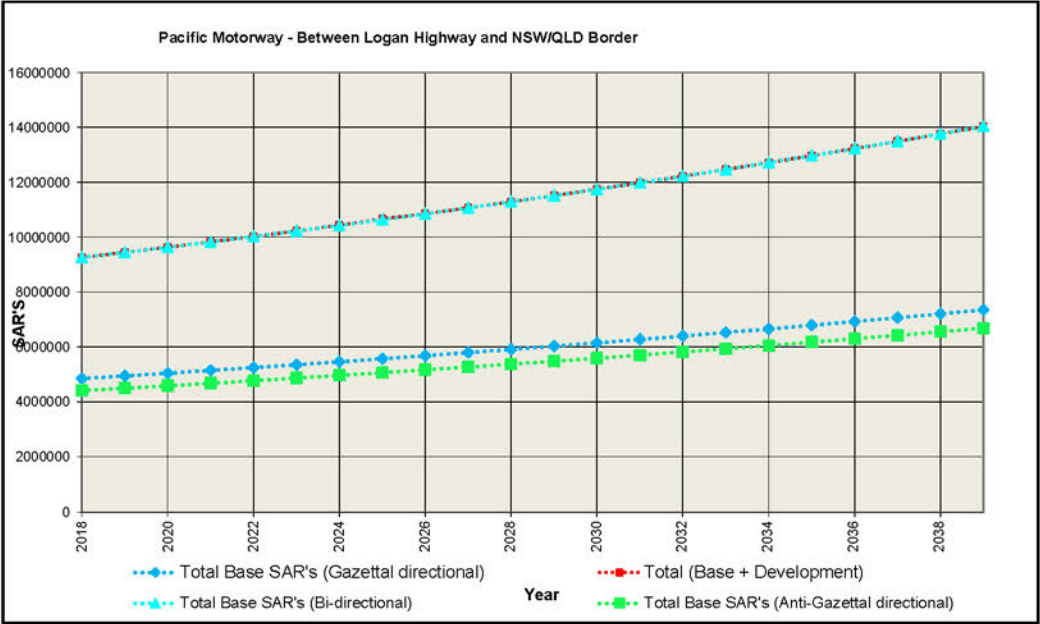
Oakey Pittsworth Road			Between Gore Highway and Quibet Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	104111	104493			208604	
2019	106193	106583			212776	
2020	108317	108715	0	0	217032	
2021	110483	110889	0	0	221372	0.00%
2022	112693	113107	0	0	225800	0.00%
2023	114947	115369	607	607	231530	0.53%
2024	117246	117677	0	0	234922	0.00%
2025	119591	120030	0	0	239621	0.00%
2026	121982	122431	0	0	244413	0.00%
2027	124422	124879			249301	
2028	126911	127377			254287	
2029	129449	129924			259373	
2030	132038	132523			264561	
2031	134678	135173			269852	
2032	137372	137877			275249	
2033	140119	140634			280754	
2034	142922	143447			286369	
2035	145780	146316			292096	
2036	148696	149242			297938	
2037	151670	152227			303897	
2038	154703	155272			309975	
2039	157797	158377			316174	



Pacific Motorway - Between Logan Highway and NSW/QLD Border

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

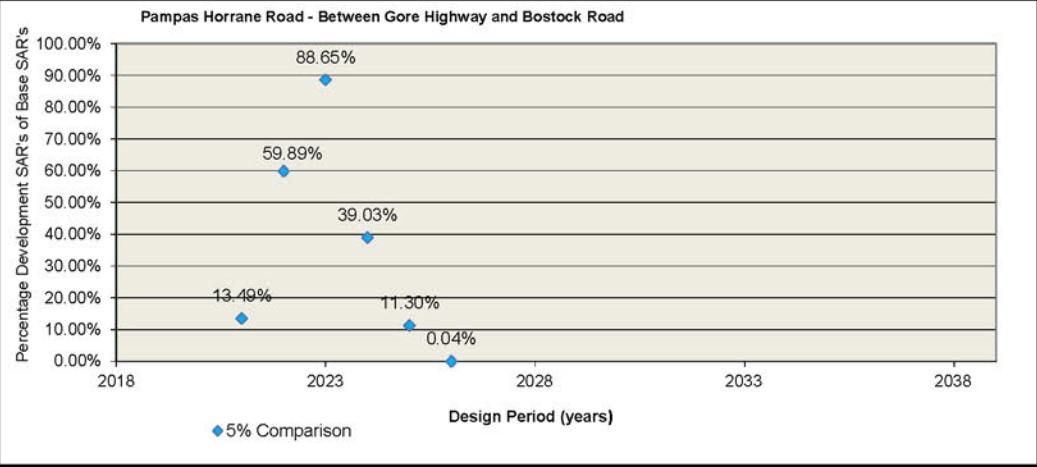
Pacific Motorway			Between Logan Highway and NSW/QLD Border			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal directional)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	4411313	4851728			9263041	
2019	4499539	4948762			9448302	
2020	4589530	5047737	0	0	9637268	
2021	4681321	5148692	0	0	9830013	0.00%
2022	4774947	5251666	0	0	10026613	0.00%
2023	4870446	5356699	0	0	10227145	0.00%
2024	4967855	5463833	3415	3415	10438519	0.07%
2025	5067212	5573110	13662	13662	10667646	0.26%
2026	5168557	5684572	1138	1138	10855406	0.02%
2027	5271928	5798264			11070191	
2028	5377366	5914229			11291595	
2029	5484914	6032513			11517427	
2030	5594612	6153164			11747775	
2031	5706504	6276227			11982731	
2032	5820634	6401751			12222386	
2033	5937047	6529787			12466833	
2034	6055788	6660382			12716170	
2035	6176903	6793590			12970493	
2036	6300442	6929462			13229903	
2037	6426450	7068051			13494501	
2038	6554979	7209412			13764391	
2039	6686079	7353600			14039679	



Pampas Horrane Road - Between Gore Highway and Bostock Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

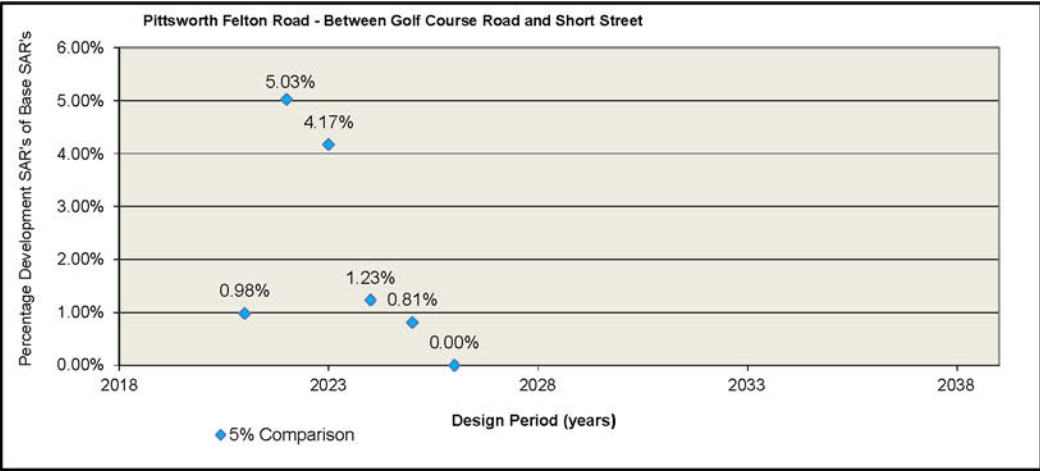
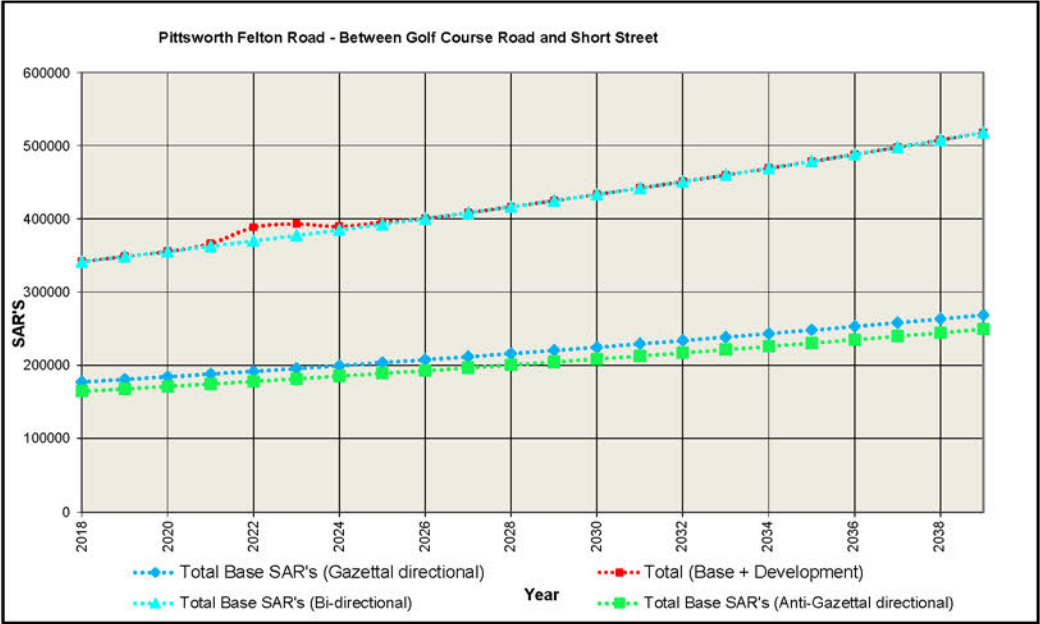
Pampas Horrane Road			Between Gore Highway and Bostock Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	33265	35839			69104	
2019	33930	36556			70486	
2020	34609	37287	0	0	71896	
2021	35301	38032	4947	4947	83228	13.49%
2022	36007	38793	22399	22399	119598	59.89%
2023	36727	39569	33817	33817	143931	88.65%
2024	37462	40360	15186	15186	108194	39.03%
2025	38211	41168	4485	4485	88348	11.30%
2026	38975	41991	14	14	80995	0.04%
2027	39755	42831			82585	
2028	40550	43687			84237	
2029	41361	44561			85922	
2030	42188	45452			87640	
2031	43032	46361			89393	
2032	43892	47289			91181	
2033	44770	48234			93005	
2034	45666	49199			94865	
2035	46579	50183			96762	
2036	47511	51187			98697	
2037	48461	52210			100671	
2038	49430	53255			102685	
2039	50419	54320			104738	



Pittsworth Felton Road - Between Golf Course Road and Short Street

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

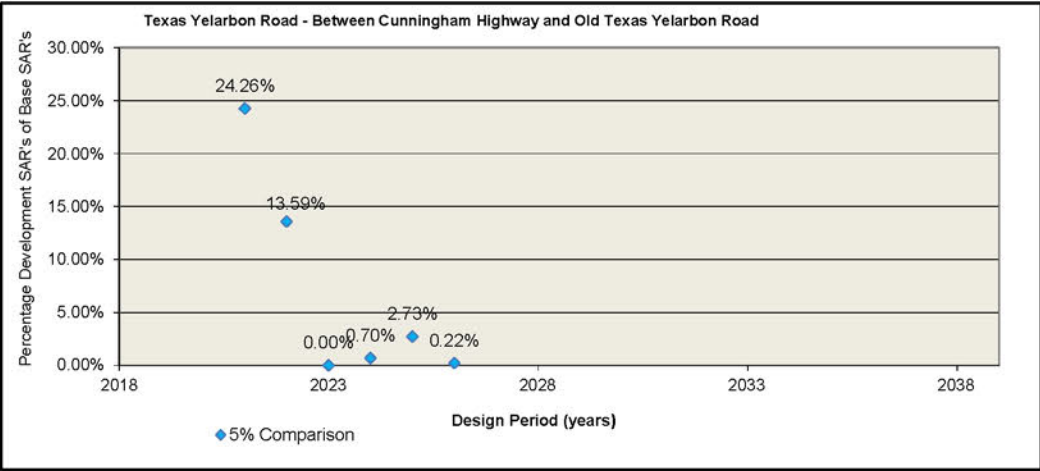
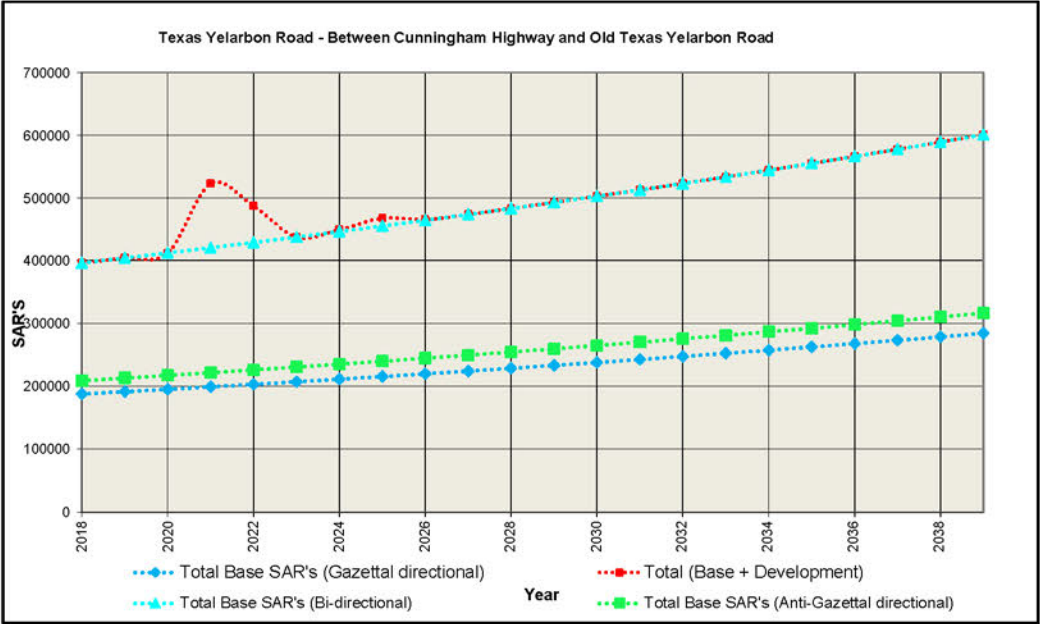
Pittsworth Felton Road			Between Golf Course Road and Short Street			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	164483	177210			341693	
2019	167773	180754			348527	
2020	171128	184369	0	0	355498	
2021	174551	188057	1779	1779	366167	0.98%
2022	178042	191818	9293	9293	388447	5.03%
2023	181603	195654	7868	7868	392993	4.17%
2024	185235	199567	2375	2375	389553	1.23%
2025	188940	203559	1598	1598	395695	0.81%
2026	192718	207630	3	3	400354	0.00%
2027	196573	211783			408355	
2028	200504	216018			416522	
2029	204514	220339			424853	
2030	208605	224745			433350	
2031	212777	229240			442017	
2032	217032	233825			450857	
2033	221373	238502			459874	
2034	225800	243272			469072	
2035	230316	248137			478453	
2036	234923	253100			488022	
2037	239621	258162			497783	
2038	244414	263325			507739	
2039	249302	268591			517893	



Texas Yelarbon Road - Between Cunningham Highway and Old Texas Yelarbon Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

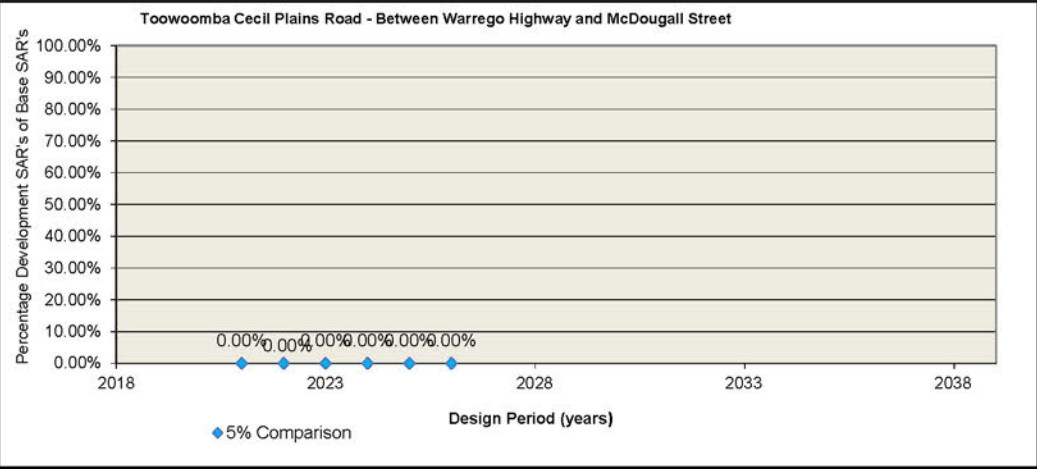
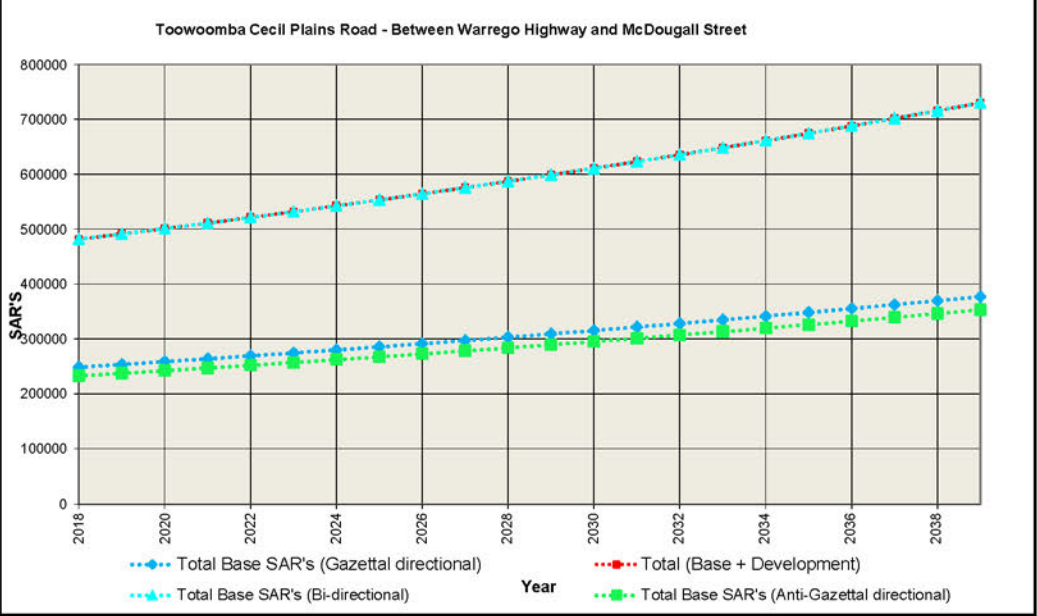
Texas Yelarbon Road			Between Cunningham Highway and Old Texas Yelarbon Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	208868	187591			396459	
2019	213046	191343			404388	
2020	217306	195170	0	0	412476	
2021	221653	199073	51030	51030	522786	24.26%
2022	226086	203055	29160	29160	487460	13.59%
2023	230607	207116	0	0	437723	0.00%
2024	235220	211258	1552	1552	449581	0.70%
2025	239924	215483	6208	6208	467823	2.73%
2026	244722	219793	517	517	465550	0.22%
2027	249617	224189			473805	
2028	254609	228672			483282	
2029	259701	233246			492947	
2030	264895	237911			502806	
2031	270193	242669			512862	
2032	275597	247522			523120	
2033	281109	252473			533582	
2034	286731	257522			544254	
2035	292466	262673			555139	
2036	298315	267926			566241	
2037	304282	273285			577566	
2038	310367	278750			589118	
2039	316574	284325			600900	



Toowoomba Cecil Plains Road - Between Warrego Highway and McDougall Street

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

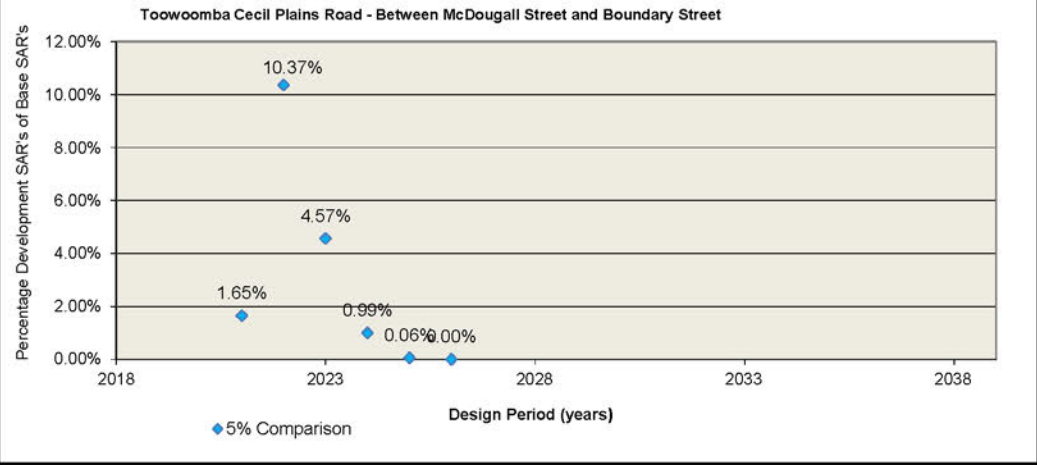
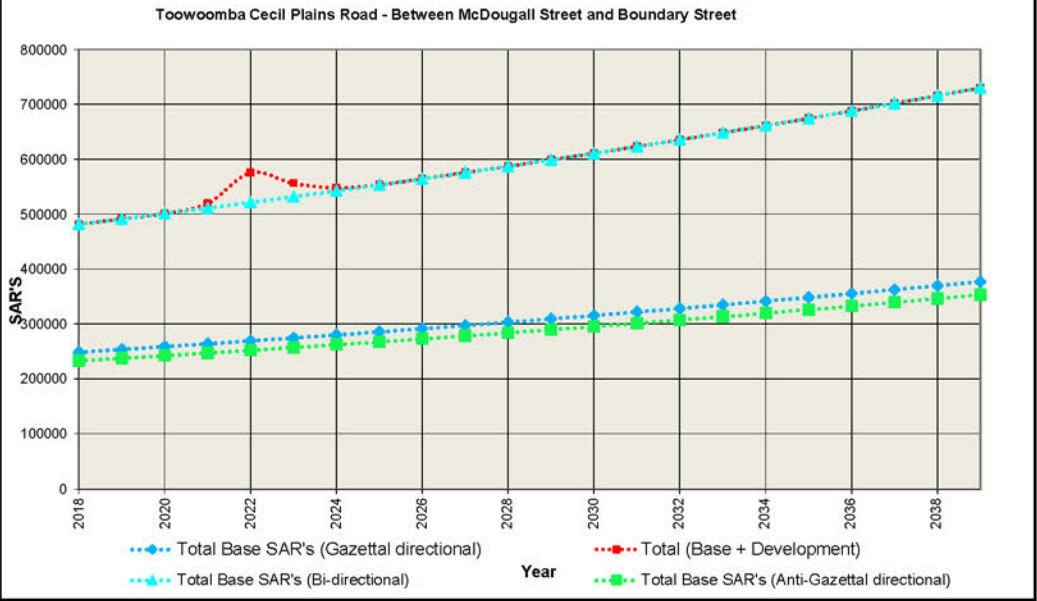
Toowoomba Cecil Plains Road			Between Warrego Highway and McDougall Street			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	232929	248805			481733	
2019	237587	253781			491368	
2020	242339	258857	0	0	501196	
2021	247186	264034	0	0	511219	0.00%
2022	252129	269314	0	0	521444	0.00%
2023	257172	274701	0	0	531873	0.00%
2024	262315	280195	0	0	542510	0.00%
2025	267562	285799	0	0	553360	0.00%
2026	272913	291515	0	0	564428	0.00%
2027	278371	297345			575716	
2028	283939	303292			587230	
2029	289617	309358			598975	
2030	295410	315545			610955	
2031	301318	321856			623174	
2032	307344	328293			635637	
2033	313491	334859			648350	
2034	319761	341556			661317	
2035	326156	348387			674543	
2036	332679	355355			688034	
2037	339333	362462			701795	
2038	346120	369711			715831	
2039	353042	377105			730147	



Toowoomba Cecil Plains Road - Between McDougall Street and Boundary Street

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

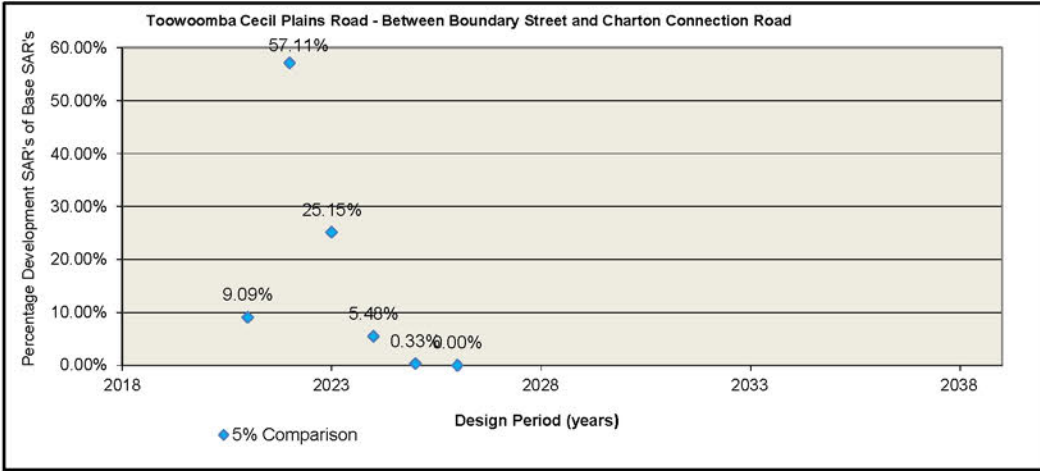
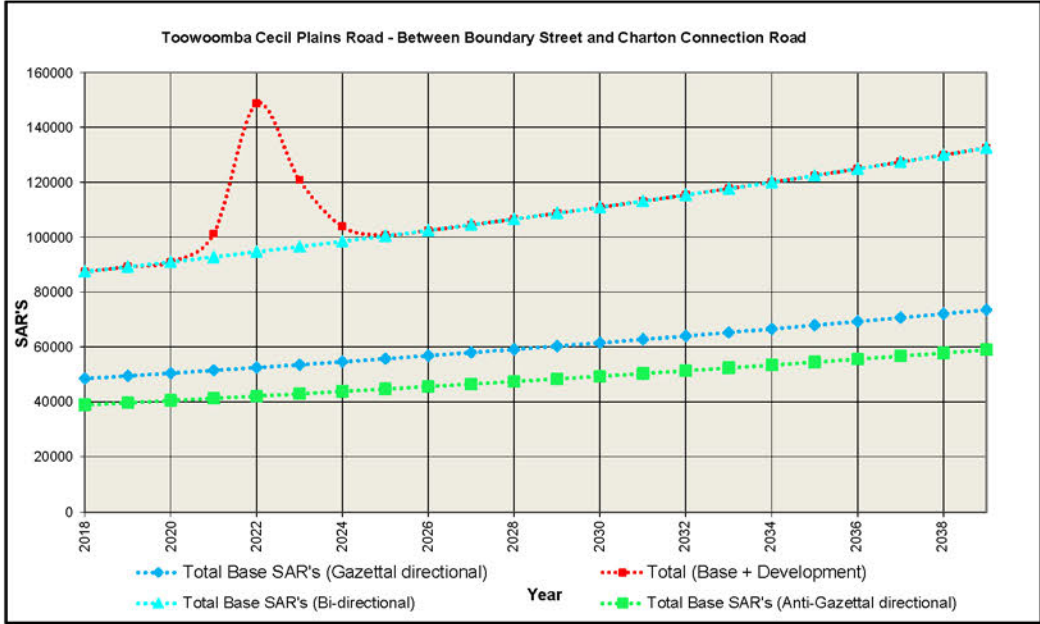
Toowoomba Cecil Plains Road			Between McDougall Street and Boundary Street			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal directional)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	232929	248805			481733	
2019	237587	253781			491368	
2020	242339	258857	0	0	501196	
2021	247186	264034	4218	4218	519655	1.65%
2022	252129	269314	27025	27025	575493	10.37%
2023	257172	274701	12142	12142	556156	4.57%
2024	262315	280195	2699	2699	547908	0.99%
2025	267562	285799	164	164	553688	0.06%
2026	272913	291515	0	0	564428	0.00%
2027	278371	297345			575716	
2028	283939	303292			587230	
2029	289617	309358			598975	
2030	295410	315545			610955	
2031	301318	321856			623174	
2032	307344	328293			635637	
2033	313491	334859			648350	
2034	319761	341556			661317	
2035	326156	348387			674543	
2036	332679	355355			688034	
2037	339333	362462			701795	
2038	346120	369711			715831	
2039	353042	377105			730147	



Toowoomba Cecil Plains Road - Between Boundary Street and Charton Connection Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

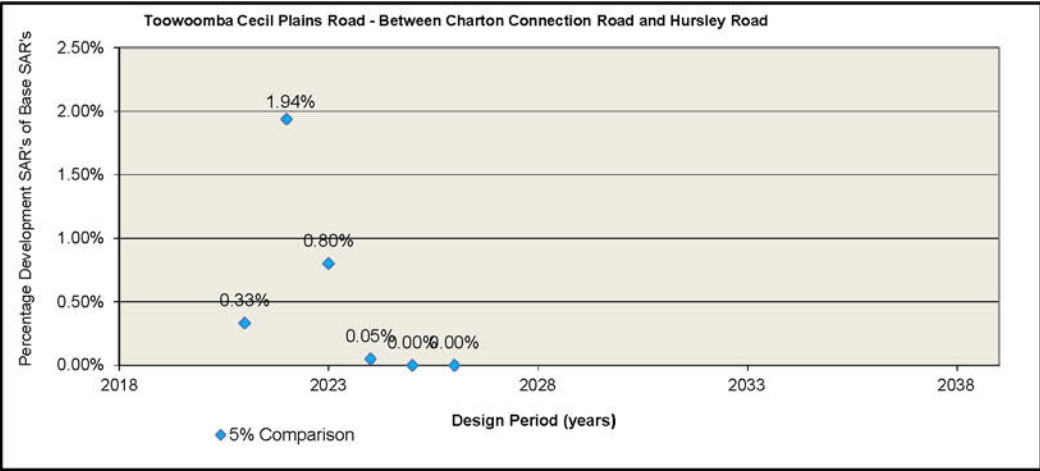
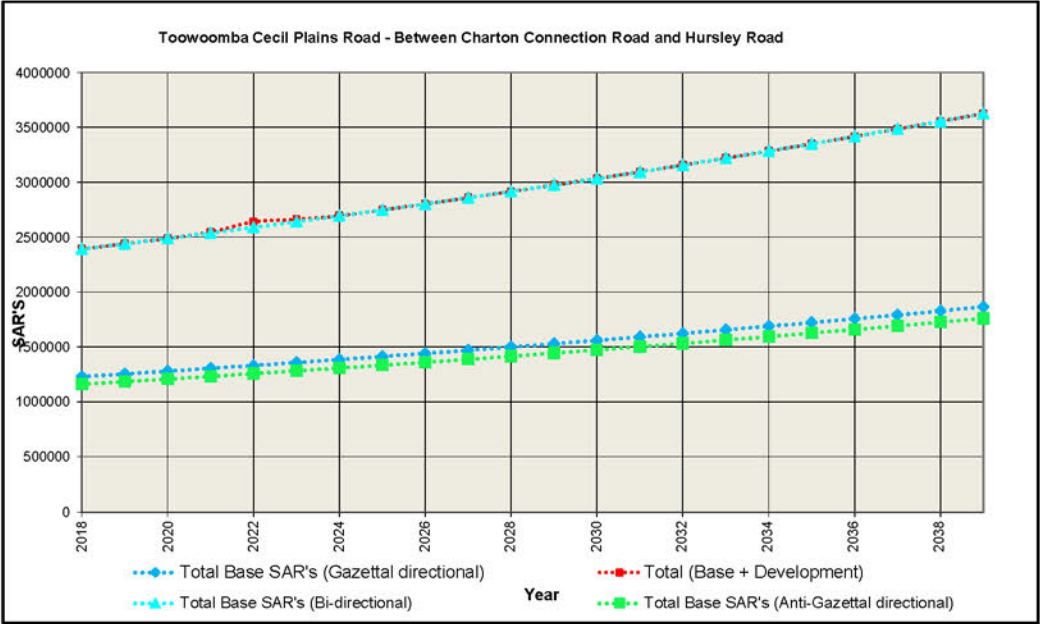
Toowoomba Cecil Plains Road			Between Boundary Street and Charton Connection Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	38920	48519			87439	
2019	39699	49490			89188	
2020	40493	50479	0	0	90972	
2021	41302	51489	4218	4218	101227	9.09%
2022	42129	52519	27025	27025	148696	57.11%
2023	42971	53569	12142	12142	120823	25.15%
2024	43830	54640	2699	2699	103869	5.48%
2025	44707	55733	164	164	100768	0.33%
2026	45601	56848	0	0	102449	0.00%
2027	46513	57985			104498	
2028	47444	59145			106588	
2029	48392	60328			108720	
2030	49360	61534			110894	
2031	50347	62765			113112	
2032	51354	64020			115374	
2033	52382	65300			117682	
2034	53429	66606			120036	
2035	54498	67939			122436	
2036	55588	69297			124885	
2037	56699	70683			127383	
2038	57833	72097			129930	
2039	58990	73539			132529	



Toowoomba Cecil Plains Road - Between Charton Connection Road and Hursley Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

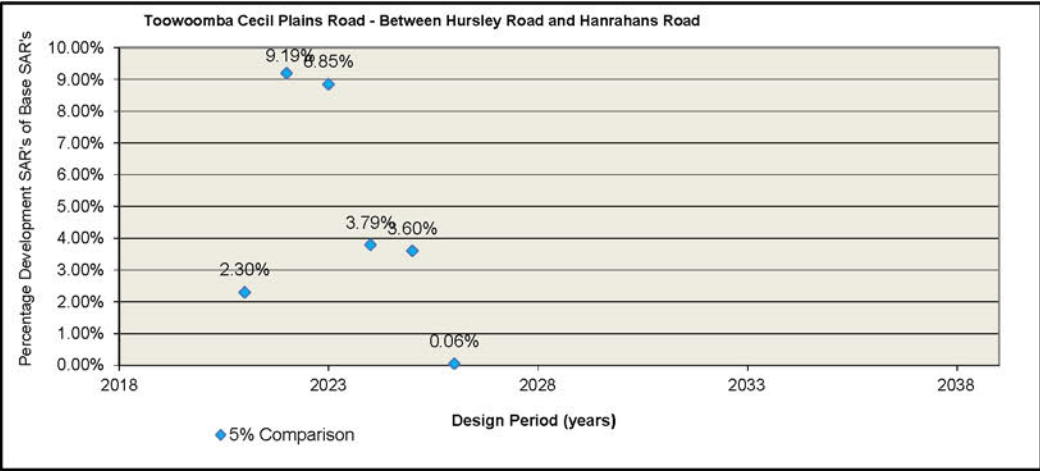
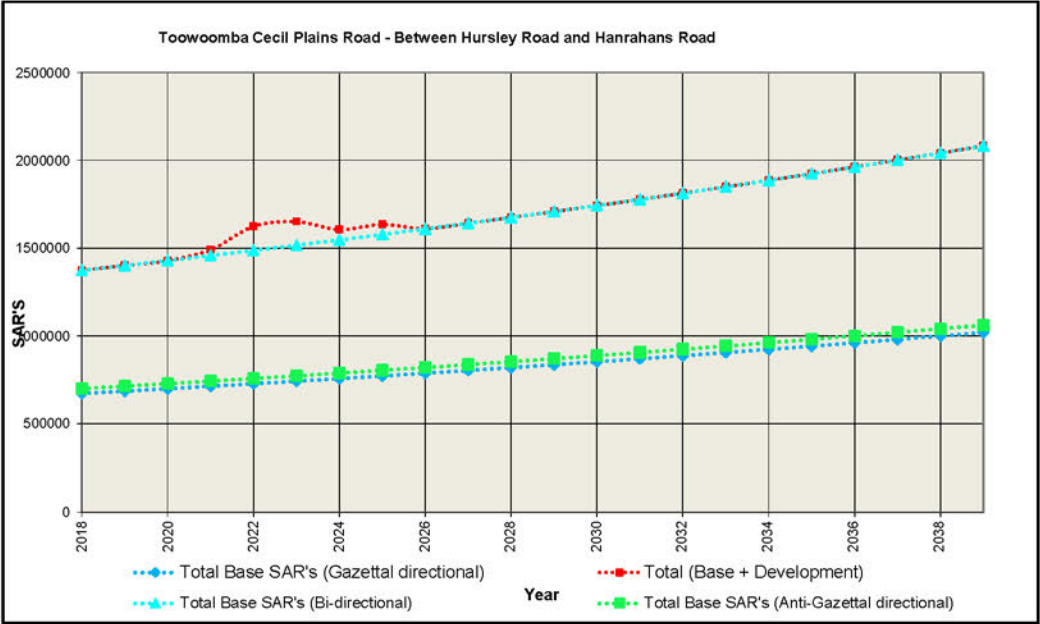
Toowoomba Cecil Plains Road				Between Charton Connection Road and Hursley Road			
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal directional)		Total Base SAR's (Gazettal directional)		Total Base SAR's (Bi-directional)			
Unloaded		Loaded					
2018	1161634	1230750	2392384			2392384	
2019	1184866	1255365	2440232			2440232	
2020	1208564	1280473	2489036	0	0	2489036	
2021	1232735	1306082	2538817	4218	4218	2547253	0.33%
2022	1257390	1332204	2589593	25085	25085	2639764	1.94%
2023	1282537	1358848	2641385	10613	10613	2662611	0.80%
2024	1308188	1386025	2694213	674	674	2695560	0.05%
2025	1334352	1413745	2748097	0	0	2748097	0.00%
2026	1361039	1442020	2803059	0	0	2803059	0.00%
2027	1388260	1470861	2859120			2859120	
2028	1416025	1500278	2916303			2916303	
2029	1444345	1530283	2974629			2974629	
2030	1473232	1560889	3034121			3034121	
2031	1502697	1592107	3094804			3094804	
2032	1532751	1623949	3156700			3156700	
2033	1563406	1656428	3219834			3219834	
2034	1594674	1689556	3284231			3284231	
2035	1626568	1723348	3349915			3349915	
2036	1659099	1757815	3416913			3416913	
2037	1692281	1792971	3485252			3485252	
2038	1726126	1828830	3554957			3554957	
2039	1760649	1865407	3626056			3626056	



Toowoomba Cecil Plains Road - Between Hursley Road and Hanrahans Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

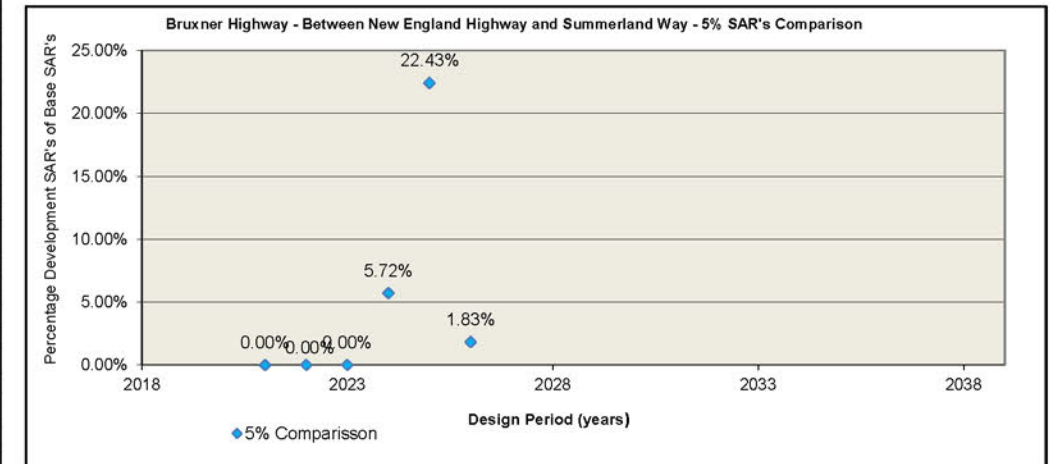
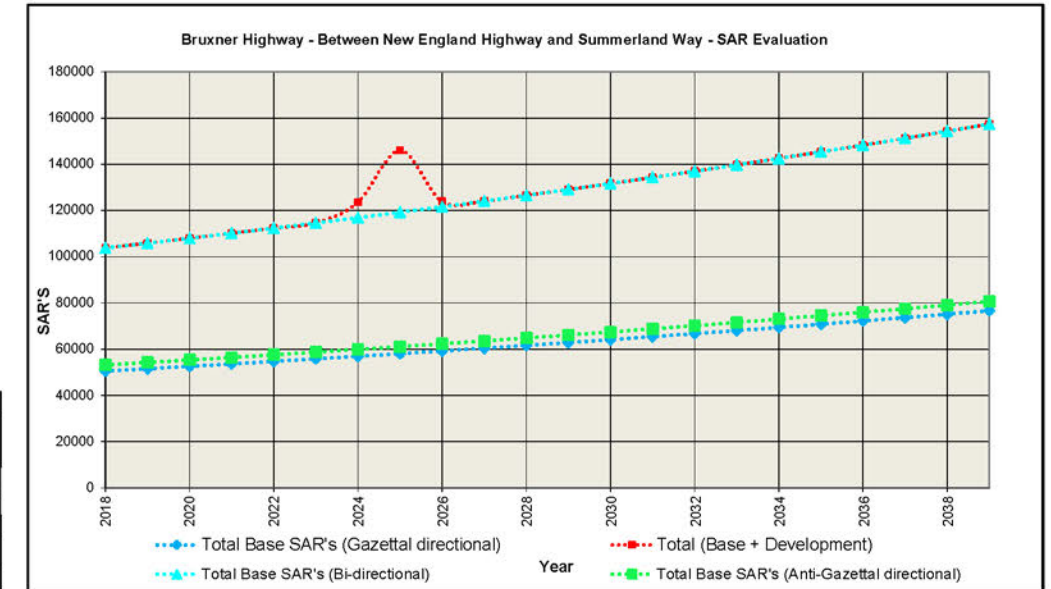
Toowoomba Cecil Plains Road				Between Hursley Road and Hanrahans Road			
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparison
Total Base SAR's (Anti-Gazettal direction)		Total Base SAR's (Gazettal directional)		Total Base SAR's (Bi-directional)			
Unloaded	Loaded						
2018	700753	673128	1373881			1373881	
2019	714768	686590	1401359			1401359	
2020	729064	700322	1429386	0	0	1429386	
2021	743645	714329	1457974	16747	16747	1491467	2.30%
2022	758518	728615	1487133	68357	68357	1623846	9.19%
2023	773688	743187	1516876	67140	67140	1651155	8.85%
2024	789162	758051	1547213	29329	29329	1605872	3.79%
2025	804945	773212	1578158	28439	28439	1635036	3.60%
2026	821044	788677	1609721	455	455	1610632	0.06%
2027	837465	804450	1641915			1641915	
2028	854214	820539	1674753			1674753	
2029	871299	836950	1708249			1708249	
2030	888725	853689	1742413			1742413	
2031	906499	870763	1777262			1777262	
2032	924629	888178	1812807			1812807	
2033	943122	905941	1849063			1849063	
2034	961984	924060	1886044			1886044	
2035	981224	942541	1923765			1923765	
2036	1000848	961392	1962241			1962241	
2037	1020865	980620	2001485			2001485	
2038	1041283	1000233	2041515			2041515	
2039	1062108	1020237	2082345			2082345	



Bruxner Highway - Between New England Highway and Summerland Way

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

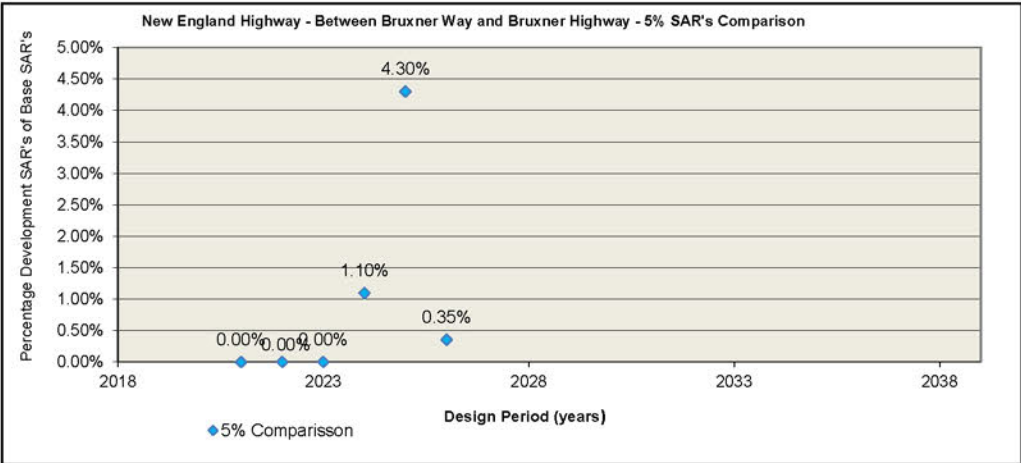
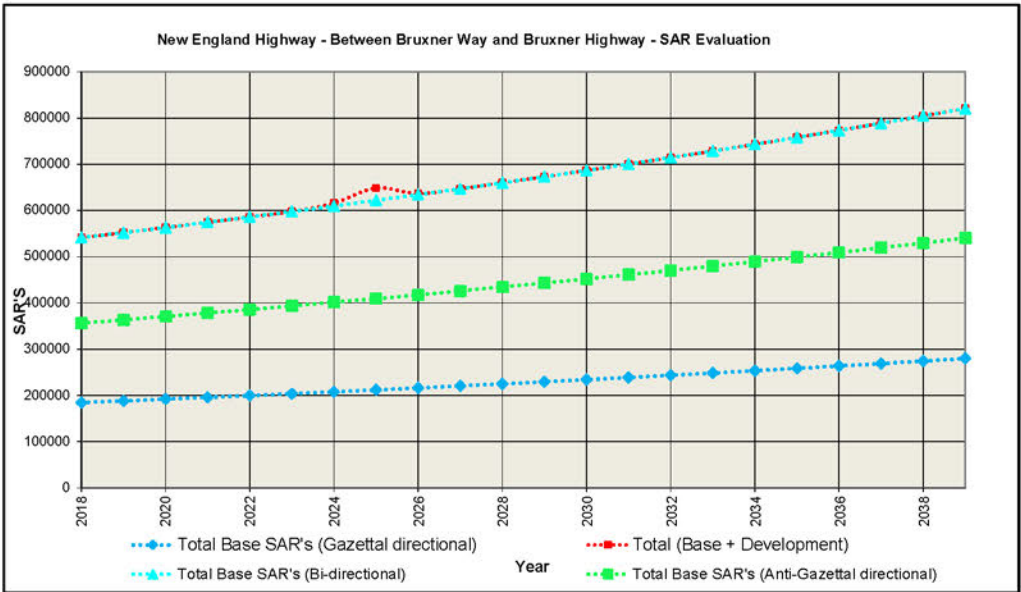
Bruxner Highway				Between New England Highway and Summerland Way			
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson
Total Base SAR's (Anti-Gazettal directio		Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	53251	50611	103861			103861	
2019	54316	51623	105938			105938	
2020	55402	52655	108057	0	0	108057	
2021	56510	53708	110218	0	0	110218	0.00%
2022	57640	54782	112423	0	0	112423	0.00%
2023	58793	55878	114671	0	0	114671	0.00%
2024	59969	56996	116965	3346	3346	123656	5.72%
2025	61168	58136	119304	13383	13383	146070	22.43%
2026	62392	59298	121690	1115	1115	123920	1.83%
2027	63639	60484	124124			124124	
2028	64912	61694	126606			126606	
2029	66211	62928	129138			129138	
2030	67535	64186	131721			131721	
2031	68885	65470	134356			134356	
2032	70263	66780	137043			137043	
2033	71668	68115	139783			139783	
2034	73102	69477	142579			142579	
2035	74564	70867	145431			145431	
2036	76055	72284	148339			148339	
2037	77576	73730	151306			151306	
2038	79128	75205	154332			154332	
2039	80710	76709	157419			157419	



New England Highway - Between Bruxner Way and Bruxner Highway

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

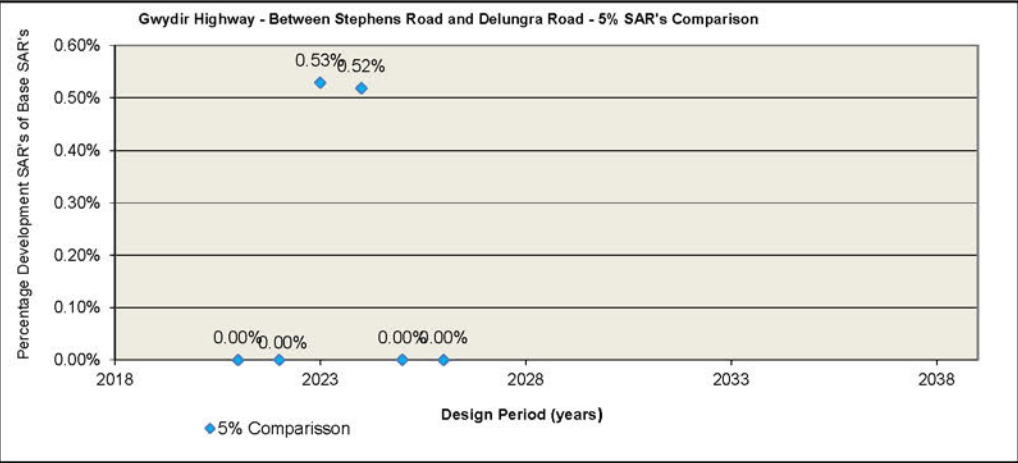
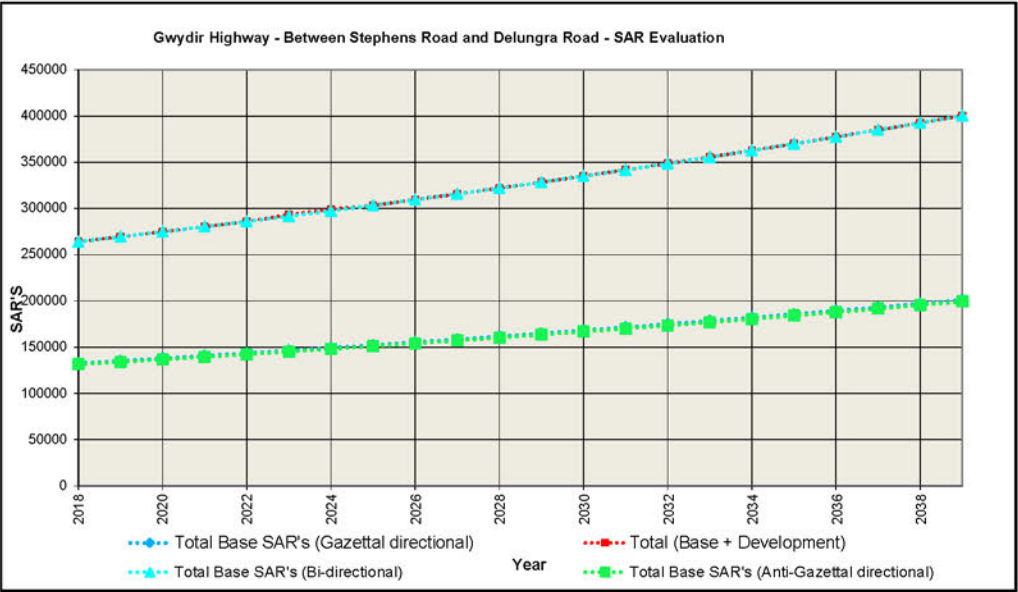
New England Highway				Between Bruxner Way and Bruxner Highway			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded			
2018	356717	184888	541585		541585		
2019	363851	188565	552416		552416		
2020	371128	192336	563465	0	0	563465	
2021	378551	196183	574734	0	0	574734	0.00%
2022	386122	200107	586229	0	0	586229	0.00%
2023	393844	204109	597953	0	0	597953	0.00%
2024	401721	208191	609912	3346	3346	616604	1.10%
2025	409756	212355	622110	13383	13383	648876	4.30%
2026	417951	216602	634553	1115	1115	636783	0.35%
2027	426310	220934	647244			647244	
2028	434836	225353	660189			660189	
2029	443533	229860	673392			673392	
2030	452403	234457	686860			686860	
2031	461451	239146	700597			700597	
2032	470681	243929	714609			714609	
2033	480094	248807	728902			728902	
2034	489696	253784	743480			743480	
2035	499490	258859	758349			758349	
2036	509480	264036	773516			773516	
2037	519669	269317	788986			788986	
2038	530063	274703	804766			804766	
2039	540664	280198	820861			820861	



Gwydir Highway - Between Stephens Road and Delungra Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

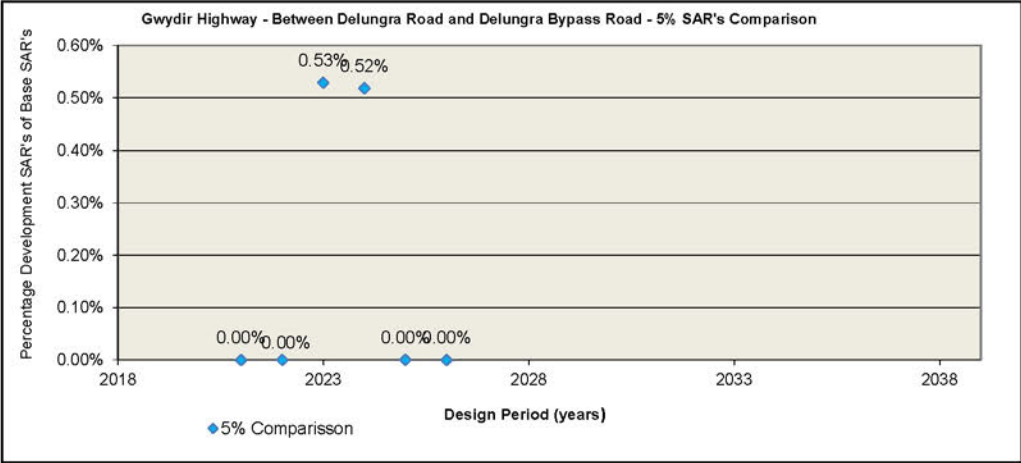
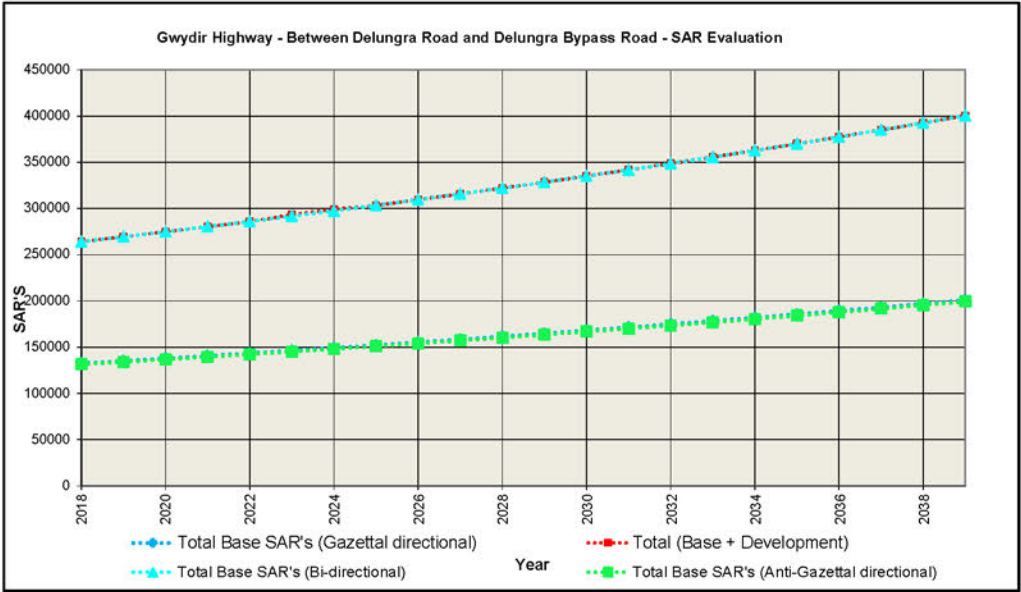
Gwydir Highway				Between Stephens Road and Delungra Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded			
2018	131622	132685			264307		
2019	134254	135338			269593		
2020	136940	138045	0	0	274985		
2021	139678	140806	0	0	280484	0.00%	
2022	142472	143622	0	0	286094	0.00%	
2023	145321	146495	772	772	293359	0.53%	
2024	148228	149425	772	772	299195	0.52%	
2025	151192	152413	0	0	303605	0.00%	
2026	154216	155461	0	0	309678	0.00%	
2027	157301	158571			315871		
2028	160447	161742			322188		
2029	163655	164977			328632		
2030	166929	168276			335205		
2031	170267	171642			341909		
2032	173672	175075			348747		
2033	177146	178576			355722		
2034	180689	182148			362837		
2035	184303	185791			370093		
2036	187989	189506			377495		
2037	191748	193297			385045		
2038	195583	197163			392746		
2039	199495	201106			400601		



Gwydir Highway - Between Delungra Road and Delungra Bypass Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

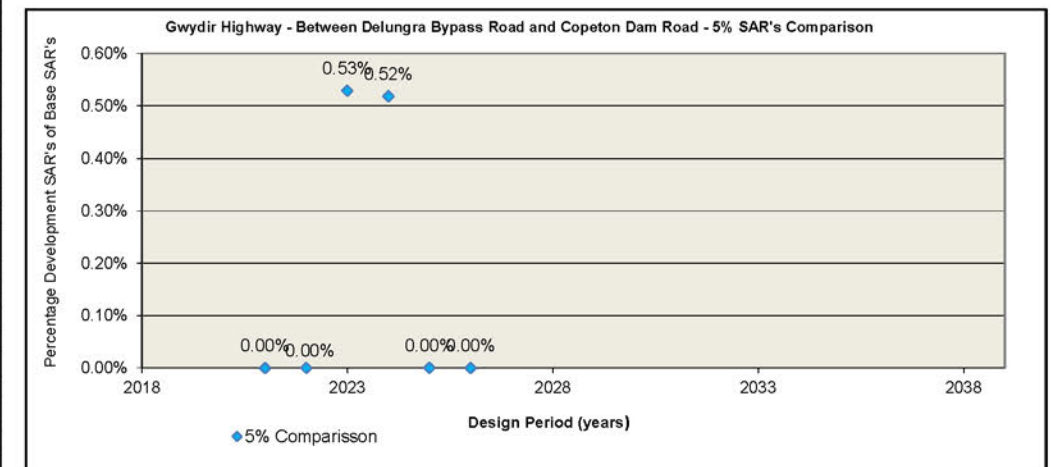
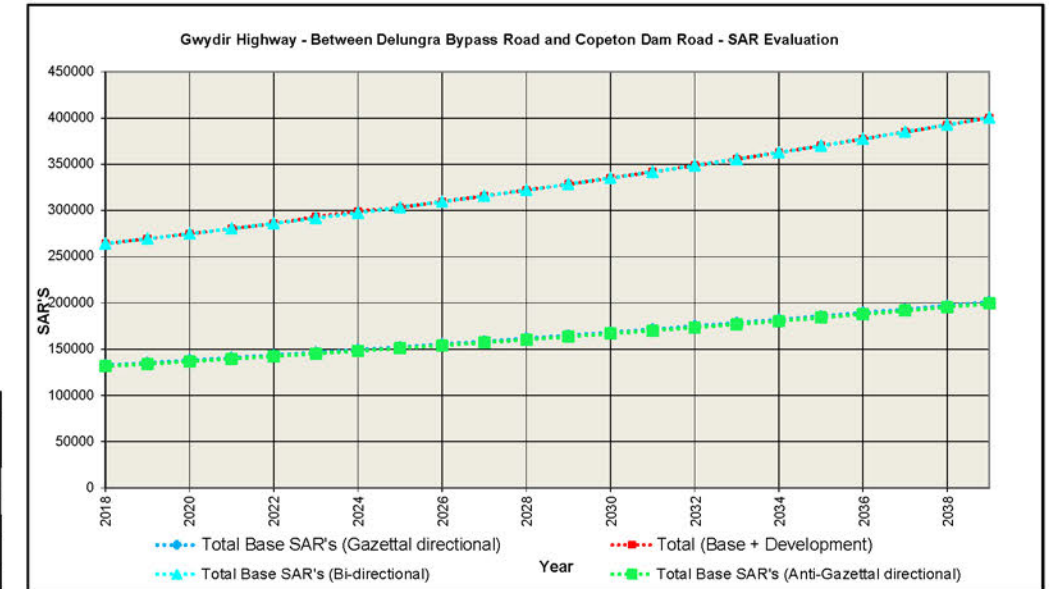
Gwydir Highway				Between Delungra Road and Delungra Bypass Road			
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson
Total Base SAR's (Anti-Gazettal direction)		Total Base SAR's (Gazettal directional)		Total Base SAR's (Bi-directional)			
2018	131622	132685	264307			264307	
2019	134254	135338	269593			269593	
2020	136940	138045	274985	0	0	274985	
2021	139678	140806	280484	0	0	280484	0.00%
2022	142472	143622	286094	0	0	286094	0.00%
2023	145321	146495	291816	772	772	293359	0.53%
2024	148228	149425	297652	772	772	299195	0.52%
2025	151192	152413	303605	0	0	303605	0.00%
2026	154216	155461	309678	0	0	309678	0.00%
2027	157301	158571	315871			315871	
2028	160447	161742	322188			322188	
2029	163655	164977	328632			328632	
2030	166929	168276	335205			335205	
2031	170267	171642	341909			341909	
2032	173672	175075	348747			348747	
2033	177146	178576	355722			355722	
2034	180689	182148	362837			362837	
2035	184303	185791	370093			370093	
2036	187989	189506	377495			377495	
2037	191748	193297	385045			385045	
2038	195583	197163	392746			392746	
2039	199495	201106	400601			400601	



Gwydir Highway - Between Delungra Bypass Road and Copeton Dam Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

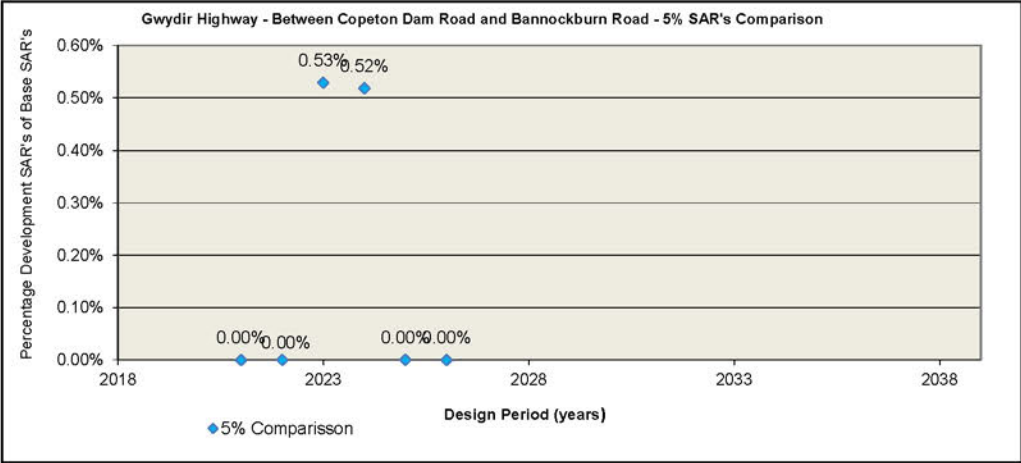
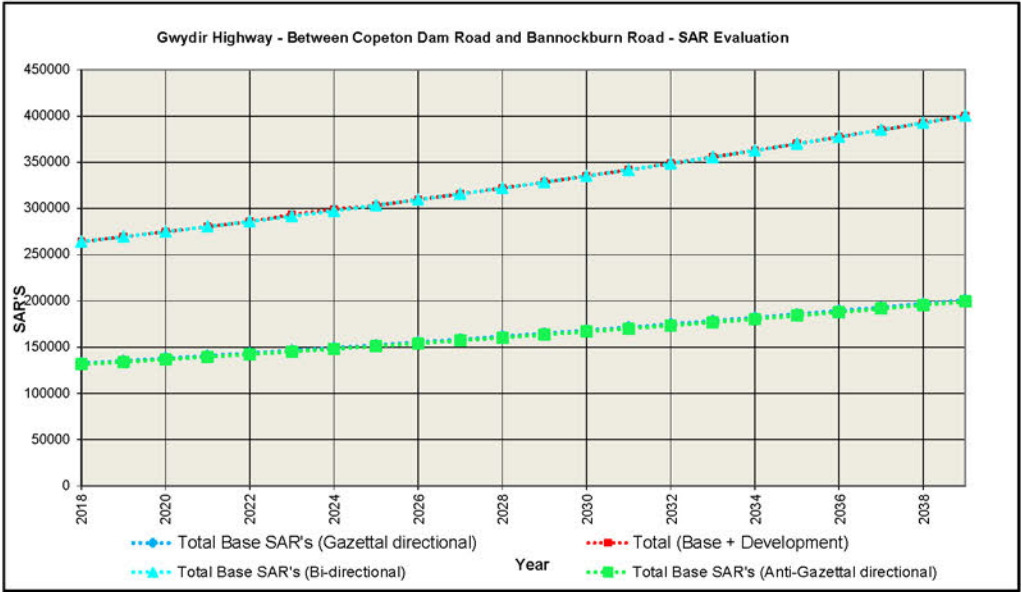
Gwydir Highway				Between Delungra Bypass Road and Copeton Dam Road			
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson
Total Base SAR's (Anti-Gazettal directi		Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)		Unloaded		
2018	131622	132685	264307			264307	
2019	134254	135338	269593			269593	
2020	136940	138045	274985	0	0	274985	
2021	139678	140806	280484	0	0	280484	0.00%
2022	142472	143622	286094	0	0	286094	0.00%
2023	145321	146495	291816	772	772	293359	0.53%
2024	148228	149425	297652	772	772	299195	0.52%
2025	151192	152413	303605	0	0	303605	0.00%
2026	154216	155461	309678	0	0	309678	0.00%
2027	157301	158571	315871			315871	
2028	160447	161742	322188			322188	
2029	163655	164977	328632			328632	
2030	166929	168276	335205			335205	
2031	170267	171642	341909			341909	
2032	173672	175075	348747			348747	
2033	177146	178576	355722			355722	
2034	180689	182148	362837			362837	
2035	184303	185791	370093			370093	
2036	187989	189506	377495			377495	
2037	191748	193297	385045			385045	
2038	195583	197163	392746			392746	
2039	199495	201106	400601			400601	



Gwydir Highway - Between Copeton Dam Road and Bannockburn Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

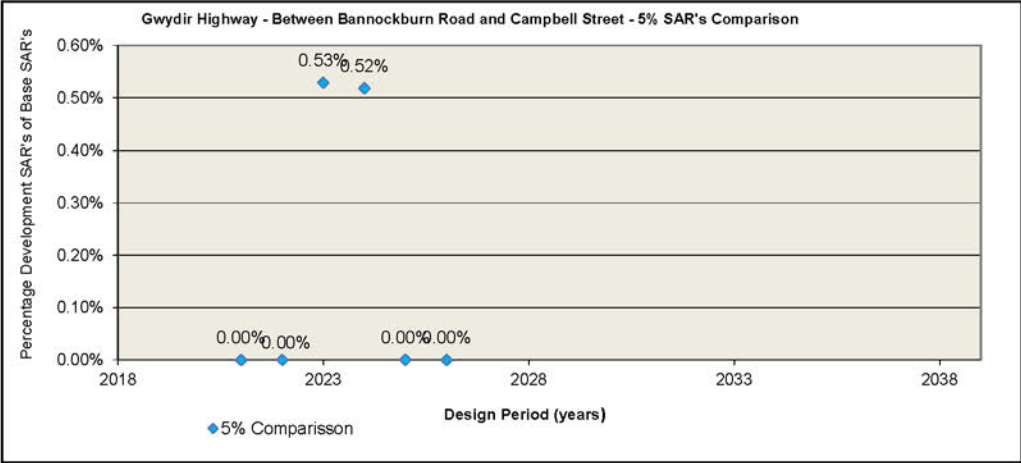
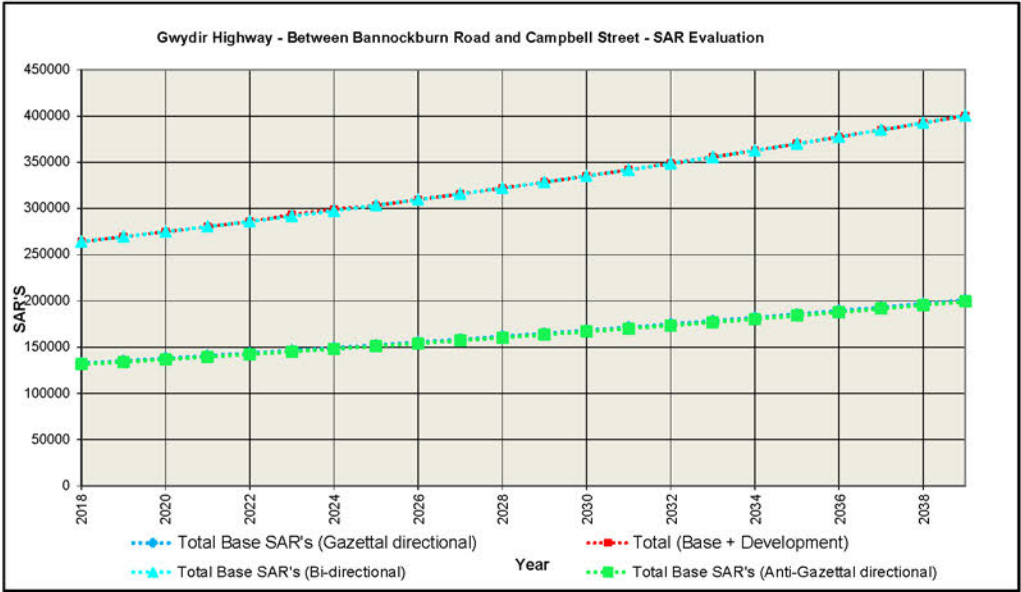
Gwydir Highway				Between Copeton Dam Road and Bannockburn Road			
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson
Total Base SAR's (Anti-Gazettal directio		Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	131622	132685	264307			264307	
2019	134254	135338	269593			269593	
2020	136940	138045	274985	0	0	274985	
2021	139678	140806	280484	0	0	280484	0.00%
2022	142472	143622	286094	0	0	286094	0.00%
2023	145321	146495	291816	772	772	293359	0.53%
2024	148228	149425	297652	772	772	299195	0.52%
2025	151192	152413	303605	0	0	303605	0.00%
2026	154216	155461	309678	0	0	309678	0.00%
2027	157301	158571	315871			315871	
2028	160447	161742	322188			322188	
2029	163655	164977	328632			328632	
2030	166929	168276	335205			335205	
2031	170267	171642	341909			341909	
2032	173672	175075	348747			348747	
2033	177146	178576	355722			355722	
2034	180689	182148	362837			362837	
2035	184303	185791	370093			370093	
2036	187989	189506	377495			377495	
2037	191748	193297	385045			385045	
2038	195583	197163	392746			392746	
2039	199495	201106	400601			400601	



Gwydir Highway - Between Bannockburn Road and Campbell Street

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

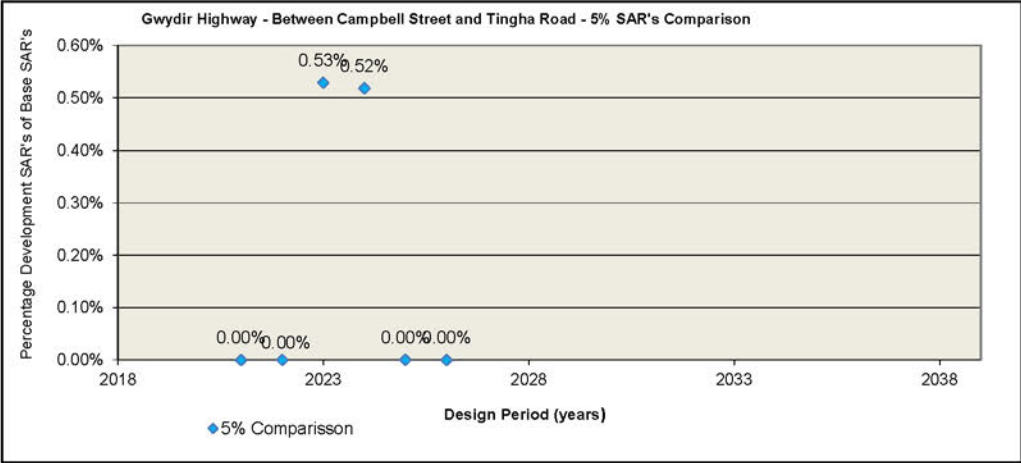
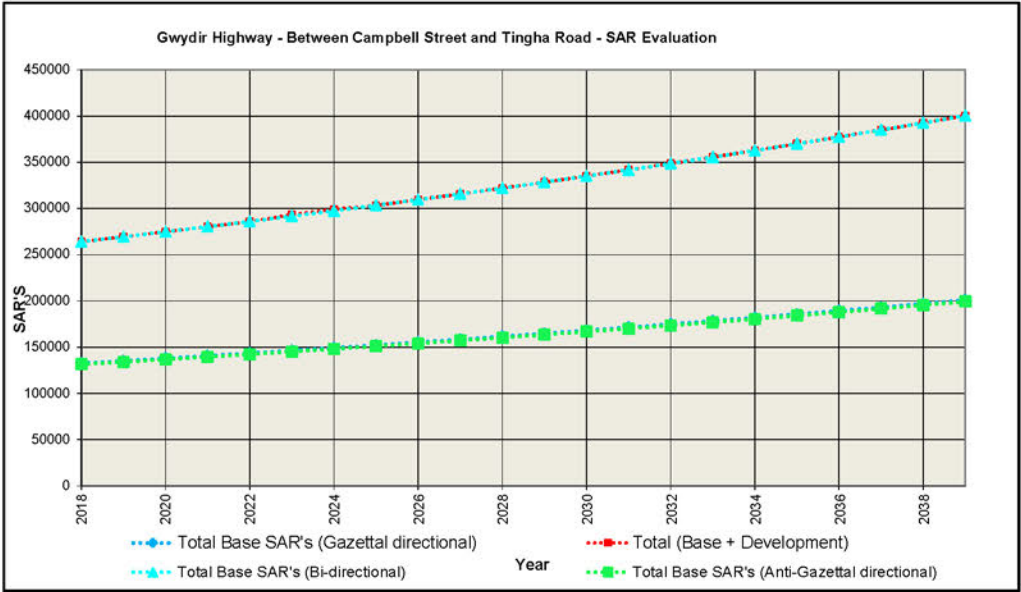
Gwydir Highway				Between Bannockburn Road and Campbell Street			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal directio	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded			
2018	131622	132685			264307		
2019	134254	135338			269593		
2020	136940	138045	0	0	274985		
2021	139678	140806	0	0	280484	0.00%	
2022	142472	143622	0	0	286094	0.00%	
2023	145321	146495	772	772	293359	0.53%	
2024	148228	149425	772	772	299195	0.52%	
2025	151192	152413	0	0	303605	0.00%	
2026	154216	155461	0	0	309678	0.00%	
2027	157301	158571			315871		
2028	160447	161742			322188		
2029	163655	164977			328632		
2030	166929	168276			335205		
2031	170267	171642			341909		
2032	173672	175075			348747		
2033	177146	178576			355722		
2034	180689	182148			362837		
2035	184303	185791			370093		
2036	187989	189506			377495		
2037	191748	193297			385045		
2038	195583	197163			392746		
2039	199495	201106			400601		



Gwydir Highway - Between Campbell Street and Tingha Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

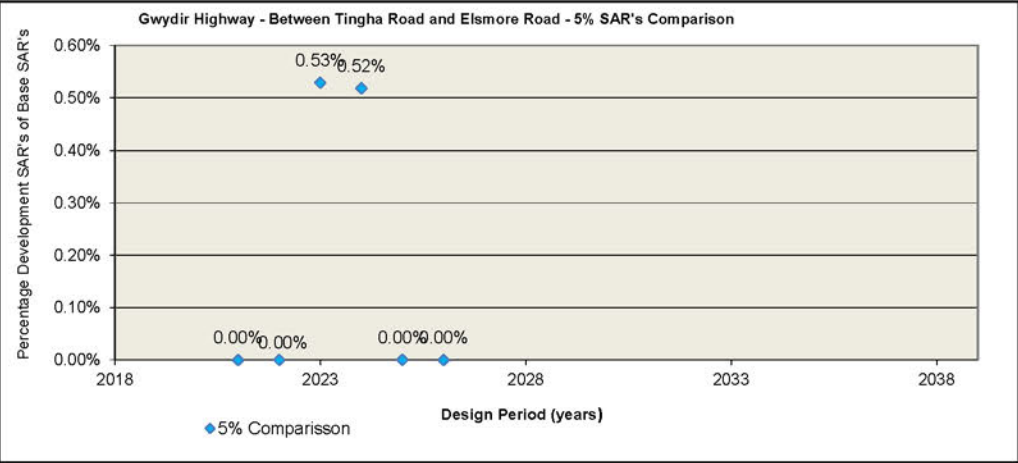
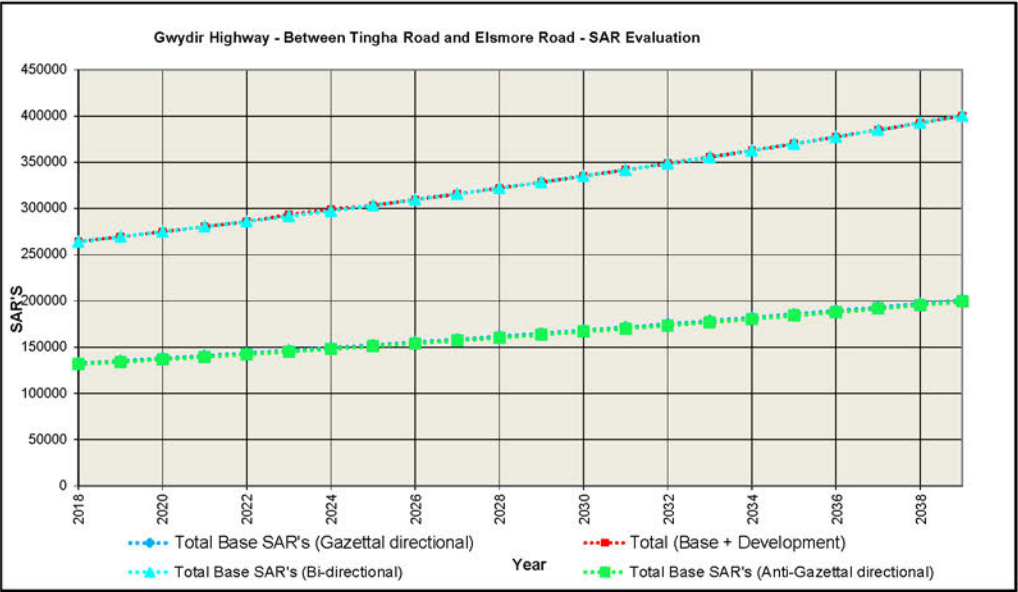
Gwydir Highway				Between Campbell Street and Tingha Road			
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson
Total Base SAR's (Anti-Gazettal directio	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)		Unloaded	Loaded		
2018	131622	132685	264307			264307	
2019	134254	135338	269593			269593	
2020	136940	138045	274985	0	0	274985	
2021	139678	140806	280484	0	0	280484	0.00%
2022	142472	143622	286094	0	0	286094	0.00%
2023	145321	146495	291816	772	772	293359	0.53%
2024	148228	149425	297652	772	772	299195	0.52%
2025	151192	152413	303605	0	0	303605	0.00%
2026	154216	155461	309678	0	0	309678	0.00%
2027	157301	158571	315871			315871	
2028	160447	161742	322188			322188	
2029	163655	164977	328632			328632	
2030	166929	168276	335205			335205	
2031	170267	171642	341909			341909	
2032	173672	175075	348747			348747	
2033	177146	178576	355722			355722	
2034	180689	182148	362837			362837	
2035	184303	185791	370093			370093	
2036	187989	189506	377495			377495	
2037	191748	193297	385045			385045	
2038	195583	197163	392746			392746	
2039	199495	201106	400601			400601	



Gwydir Highway - Between Tingha Road and Elsmore Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

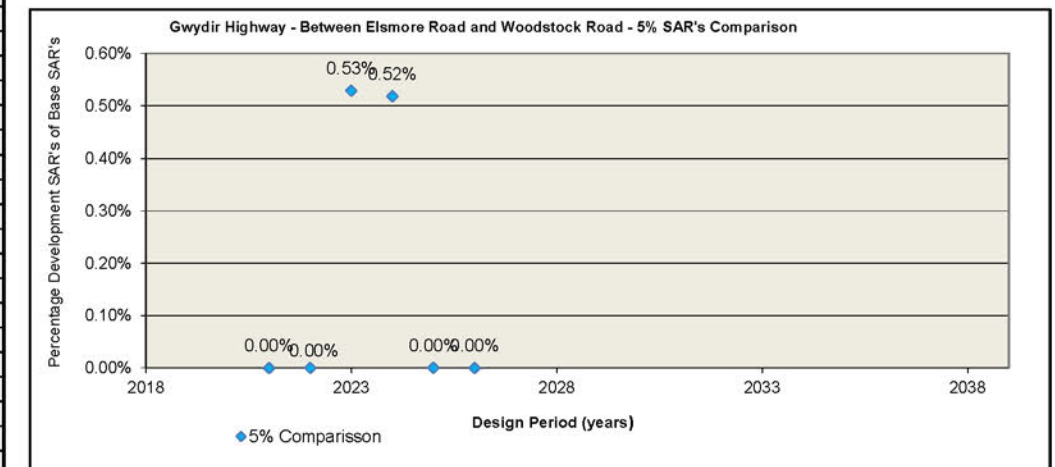
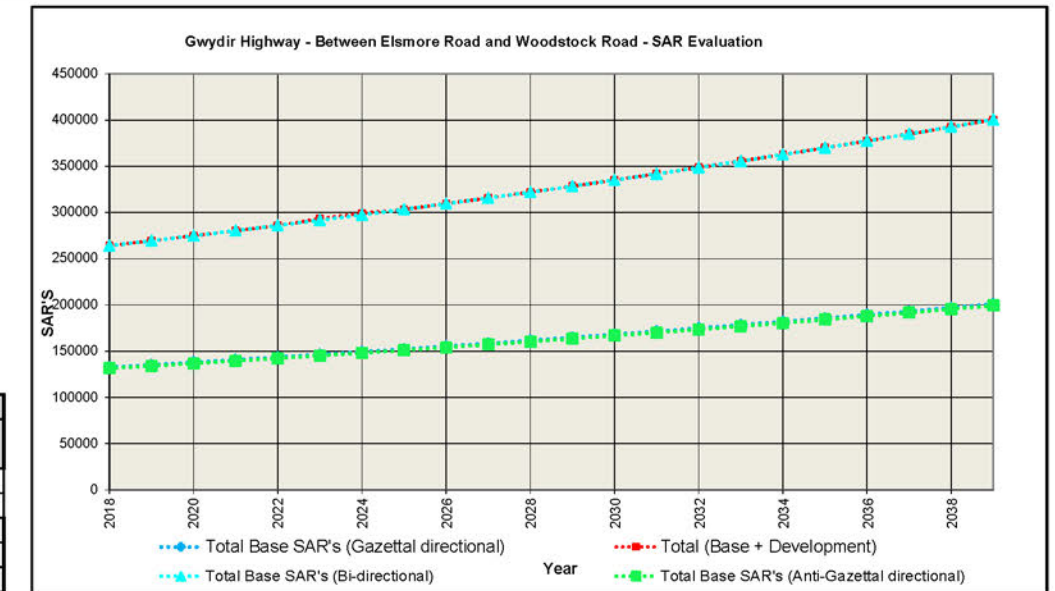
Gwydir Highway				Between Tingha Road and Elsmore Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal directio	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded			
2018	131622	132685			264307		
2019	134254	135338			269593		
2020	136940	138045	0	0	274985		
2021	139678	140806	0	0	280484	0.00%	
2022	142472	143622	0	0	286094	0.00%	
2023	145321	146495	772	772	293359	0.53%	
2024	148228	149425	772	772	299195	0.52%	
2025	151192	152413	0	0	303605	0.00%	
2026	154216	155461	0	0	309678	0.00%	
2027	157301	158571			315871		
2028	160447	161742			322188		
2029	163655	164977			328632		
2030	166929	168276			335205		
2031	170267	171642			341909		
2032	173672	175075			348747		
2033	177146	178576			355722		
2034	180689	182148			362837		
2035	184303	185791			370093		
2036	187989	189506			377495		
2037	191748	193297			385045		
2038	195583	197163			392746		
2039	199495	201106			400601		



Gwydir Highway - Between Elsmore Road and Woodstock Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

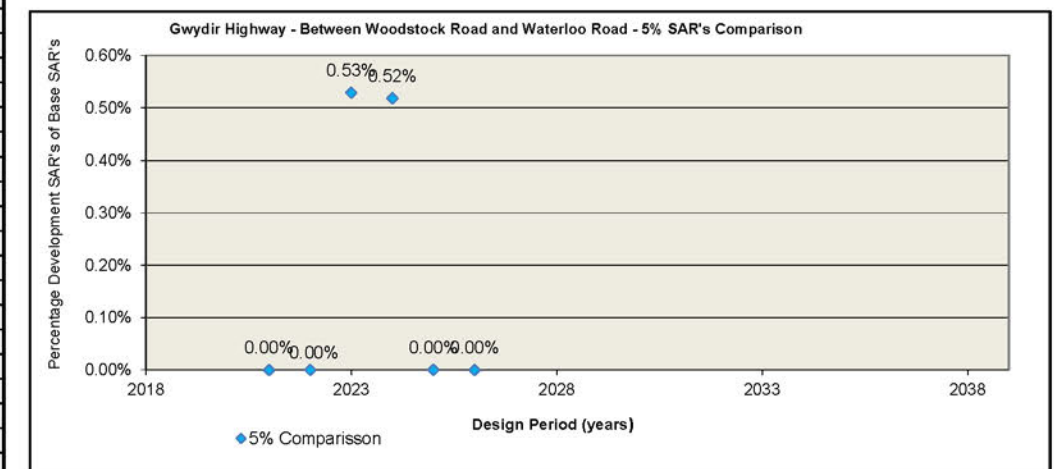
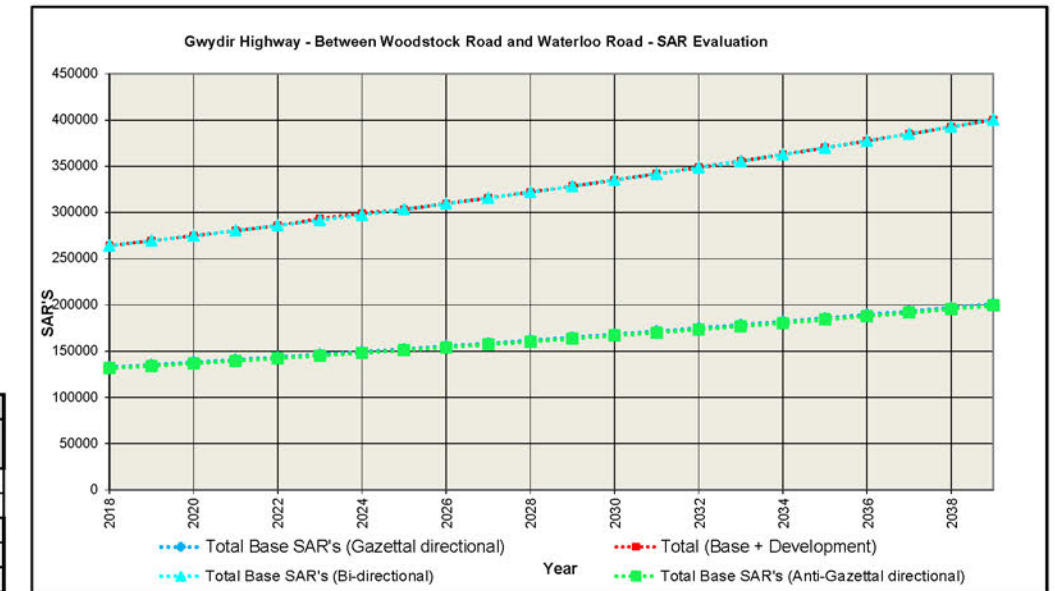
Gwydir Highway				Between Elsmore Road and Woodstock Road				
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal directio		Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)		Unloaded			Loaded
2018	131622	132685	264307				264307	
2019	134254	135338	269593				269593	
2020	136940	138045	274985		0	0	274985	
2021	139678	140806	280484		0	0	280484	0.00%
2022	142472	143622	286094		0	0	286094	0.00%
2023	145321	146495	291816		772	772	293359	0.53%
2024	148228	149425	297652		772	772	299195	0.52%
2025	151192	152413	303605		0	0	303605	0.00%
2026	154216	155461	309678		0	0	309678	0.00%
2027	157301	158571	315871				315871	
2028	160447	161742	322188				322188	
2029	163655	164977	328632				328632	
2030	166929	168276	335205				335205	
2031	170267	171642	341909				341909	
2032	173672	175075	348747				348747	
2033	177146	178576	355722				355722	
2034	180689	182148	362837				362837	
2035	184303	185791	370093				370093	
2036	187989	189506	377495				377495	
2037	191748	193297	385045				385045	
2038	195583	197163	392746				392746	
2039	199495	201106	400601				400601	



Gwydir Highway - Between Woodstock Road and Waterloo Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

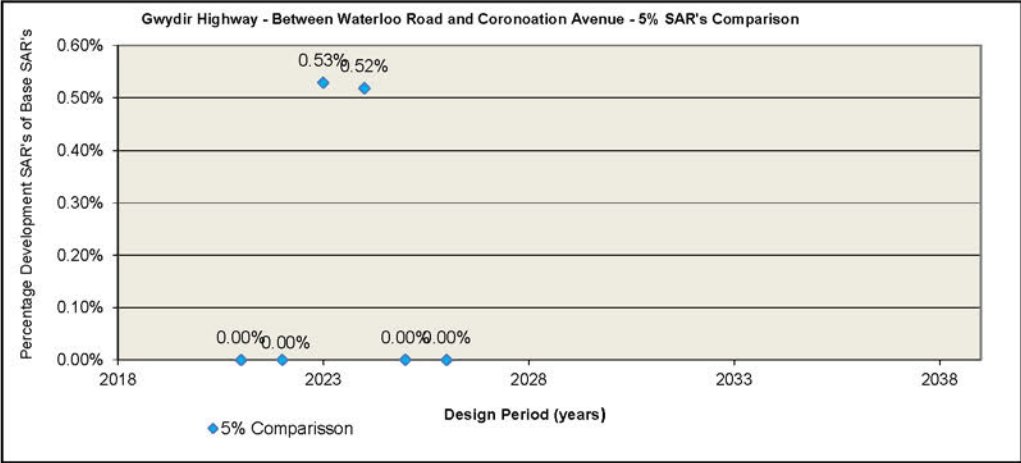
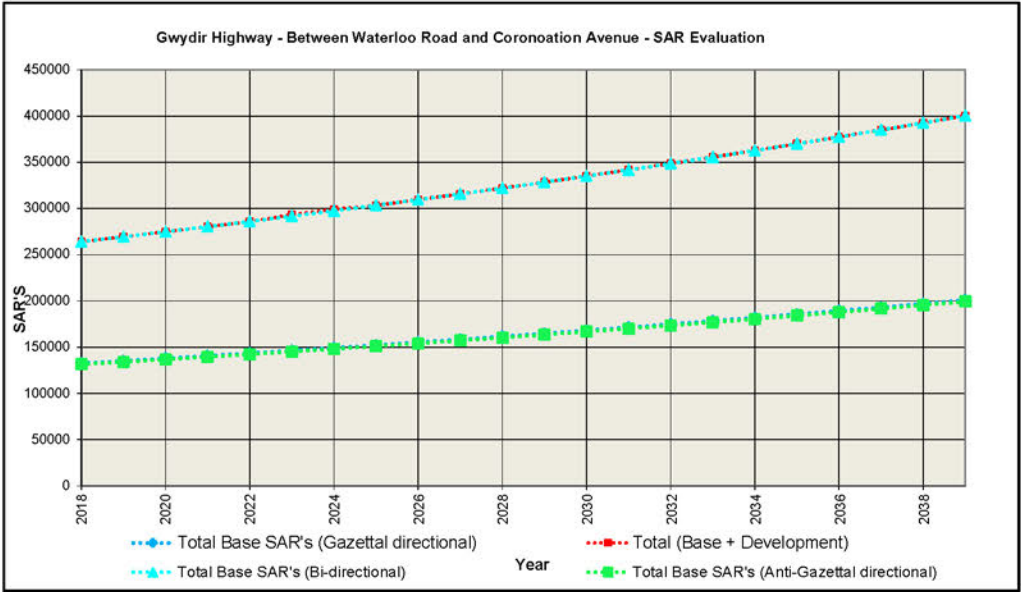
Gwydir Highway				Between Woodstock Road and Waterloo Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded			
2018	131622	132685			264307		
2019	134254	135338			269593		
2020	136940	138045	0	0	274985		
2021	139678	140806	0	0	280484	0.00%	
2022	142472	143622	0	0	286094	0.00%	
2023	145321	146495	772	772	293359	0.53%	
2024	148228	149425	772	772	299195	0.52%	
2025	151192	152413	0	0	303605	0.00%	
2026	154216	155461	0	0	309678	0.00%	
2027	157301	158571			315871		
2028	160447	161742			322188		
2029	163655	164977			328632		
2030	166929	168276			335205		
2031	170267	171642			341909		
2032	173672	175075			348747		
2033	177146	178576			355722		
2034	180689	182148			362837		
2035	184303	185791			370093		
2036	187989	189506			377495		
2037	191748	193297			385045		
2038	195583	197163			392746		
2039	199495	201106			400601		



Gwydir Highway - Between Waterloo Road and Coronoation Avenue

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

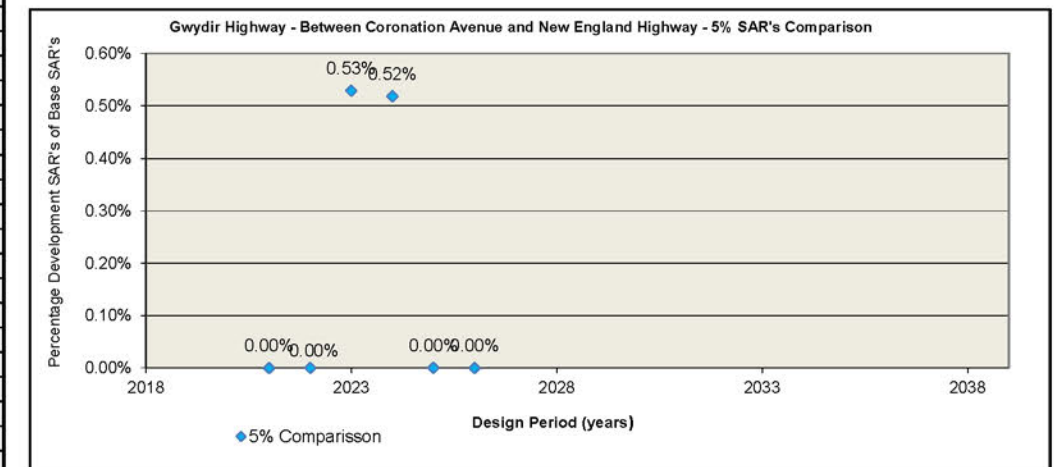
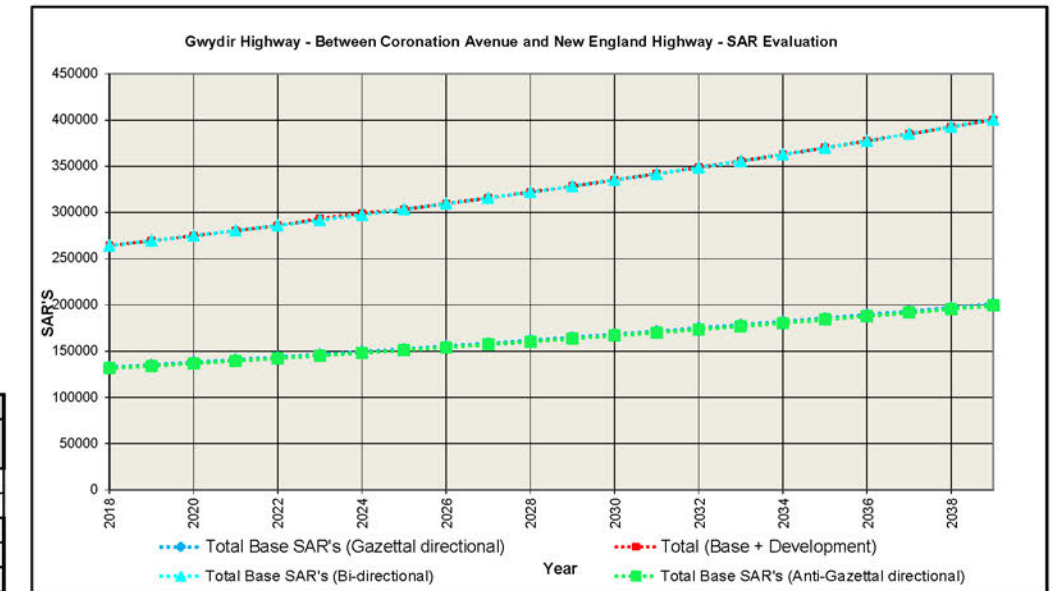
Gwydir Highway				Between Waterloo Road and Coronoation Avenue			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal directio	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded			
2018	131622	132685			264307		
2019	134254	135338			269593		
2020	136940	138045	0	0	274985		
2021	139678	140806	0	0	280484	0.00%	
2022	142472	143622	0	0	286094	0.00%	
2023	145321	146495	772	772	293359	0.53%	
2024	148228	149425	772	772	299195	0.52%	
2025	151192	152413	0	0	303605	0.00%	
2026	154216	155461	0	0	309678	0.00%	
2027	157301	158571			315871		
2028	160447	161742			322188		
2029	163655	164977			328632		
2030	166929	168276			335205		
2031	170267	171642			341909		
2032	173672	175075			348747		
2033	177146	178576			355722		
2034	180689	182148			362837		
2035	184303	185791			370093		
2036	187989	189506			377495		
2037	191748	193297			385045		
2038	195583	197163			392746		
2039	199495	201106			400601		



Gwydir Highway - Between Coronation Avenue and New England Highway

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

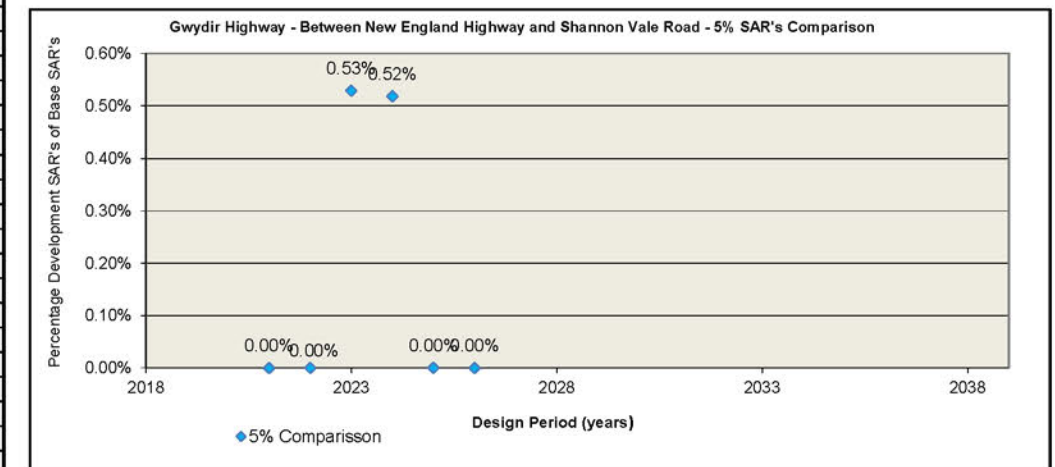
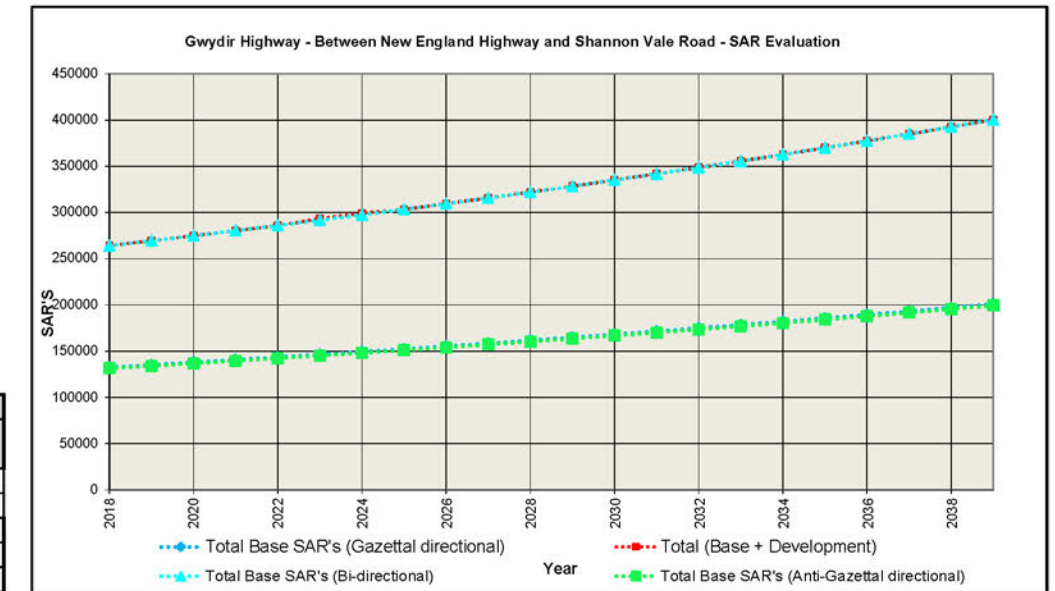
Gwydir Highway				Between Coronation Avenue and New England Highway				
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal directi		Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)		Unloaded			Loaded
2018	131622	132685	264307				264307	
2019	134254	135338	269593				269593	
2020	136940	138045	274985		0	0	274985	
2021	139678	140806	280484		0	0	280484	0.00%
2022	142472	143622	286094		0	0	286094	0.00%
2023	145321	146495	291816		772	772	293359	0.53%
2024	148228	149425	297652		772	772	299195	0.52%
2025	151192	152413	303605		0	0	303605	0.00%
2026	154216	155461	309678		0	0	309678	0.00%
2027	157301	158571	315871				315871	
2028	160447	161742	322188				322188	
2029	163655	164977	328632				328632	
2030	166929	168276	335205				335205	
2031	170267	171642	341909				341909	
2032	173672	175075	348747				348747	
2033	177146	178576	355722				355722	
2034	180689	182148	362837				362837	
2035	184303	185791	370093				370093	
2036	187989	189506	377495				377495	
2037	191748	193297	385045				385045	
2038	195583	197163	392746				392746	
2039	199495	201106	400601				400601	



Gwydir Highway - Between New England Highway and Shannon Vale Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

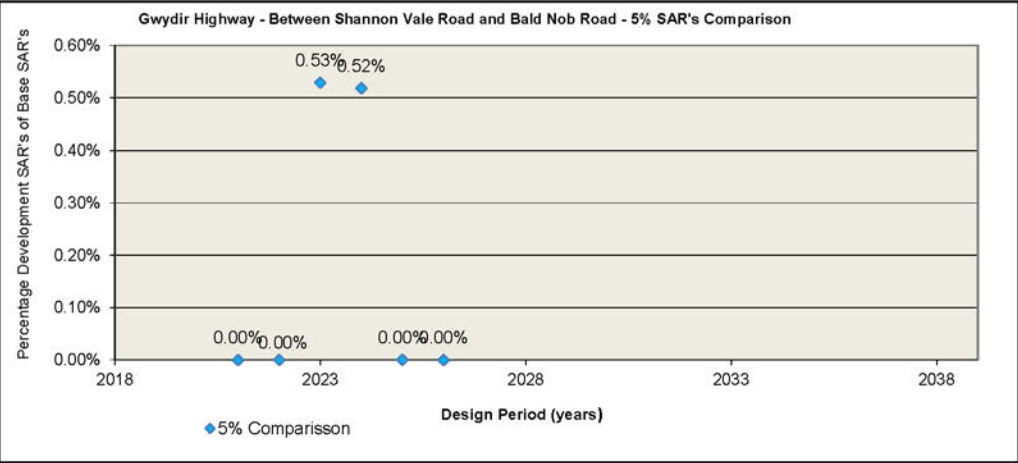
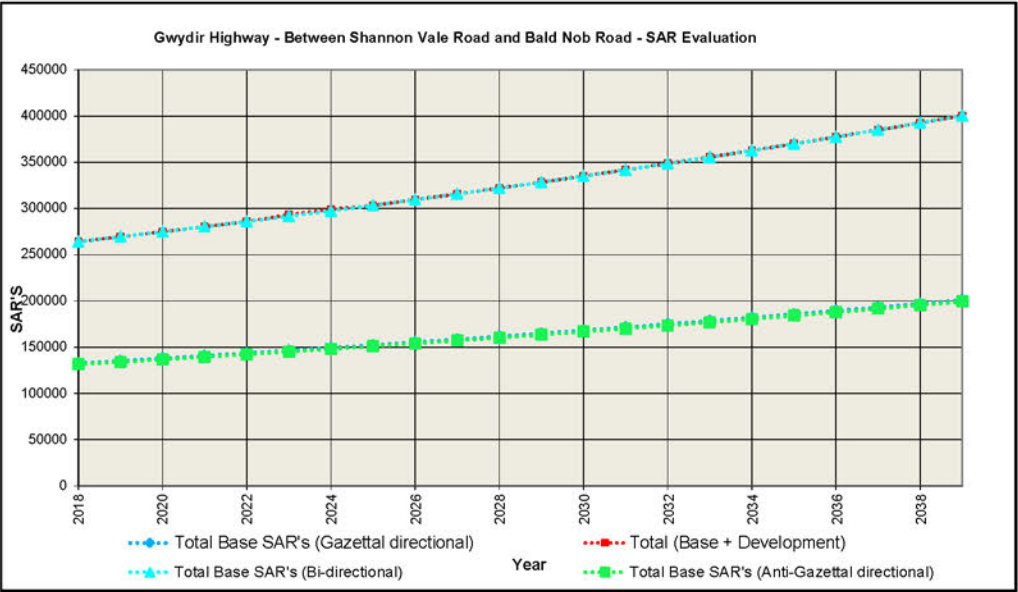
Gwydir Highway				Between New England Highway and Shannon Vale Road				
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal directio		Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)		Unloaded			Loaded
2018	131622	132685	264307				264307	
2019	134254	135338	269593				269593	
2020	136940	138045	274985		0	0	274985	
2021	139678	140806	280484		0	0	280484	0.00%
2022	142472	143622	286094		0	0	286094	0.00%
2023	145321	146495	291816		772	772	293359	0.53%
2024	148228	149425	297652		772	772	299195	0.52%
2025	151192	152413	303605		0	0	303605	0.00%
2026	154216	155461	309678		0	0	309678	0.00%
2027	157301	158571	315871				315871	
2028	160447	161742	322188				322188	
2029	163655	164977	328632				328632	
2030	166929	168276	335205				335205	
2031	170267	171642	341909				341909	
2032	173672	175075	348747				348747	
2033	177146	178576	355722				355722	
2034	180689	182148	362837				362837	
2035	184303	185791	370093				370093	
2036	187989	189506	377495				377495	
2037	191748	193297	385045				385045	
2038	195583	197163	392746				392746	
2039	199495	201106	400601				400601	



Gwydir Highway - Between Shannon Vale Road and Bald Nob Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

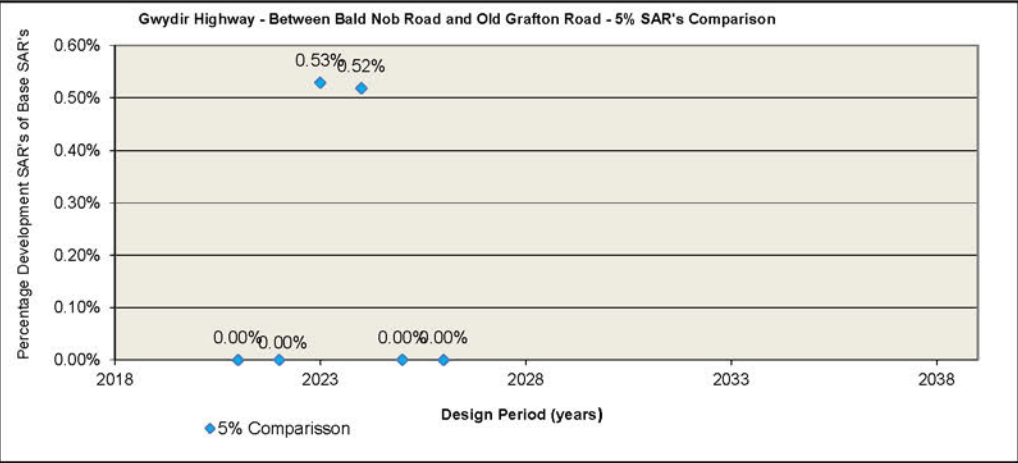
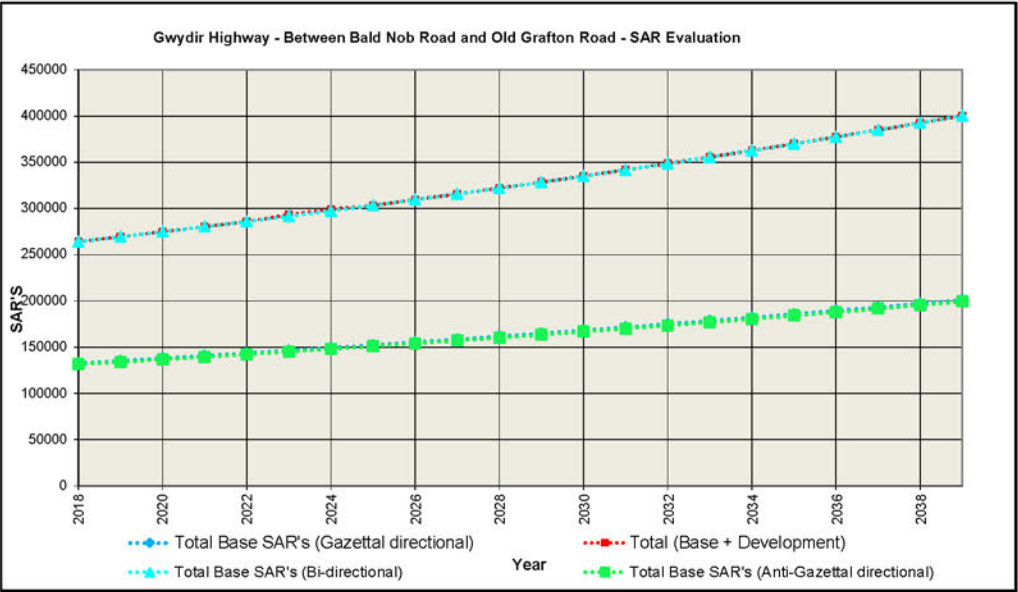
Gwydir Highway				Between Shannon Vale Road and Bald Nob Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal directio	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded			
2018	131622	132685			264307		
2019	134254	135338			269593		
2020	136940	138045	0	0	274985		
2021	139678	140806	0	0	280484	0.00%	
2022	142472	143622	0	0	286094	0.00%	
2023	145321	146495	772	772	293359	0.53%	
2024	148228	149425	772	772	299195	0.52%	
2025	151192	152413	0	0	303605	0.00%	
2026	154216	155461	0	0	309678	0.00%	
2027	157301	158571			315871		
2028	160447	161742			322188		
2029	163655	164977			328632		
2030	166929	168276			335205		
2031	170267	171642			341909		
2032	173672	175075			348747		
2033	177146	178576			355722		
2034	180689	182148			362837		
2035	184303	185791			370093		
2036	187989	189506			377495		
2037	191748	193297			385045		
2038	195583	197163			392746		
2039	199495	201106			400601		



Gwydir Highway - Between Bald Nob Road and Old Grafton Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

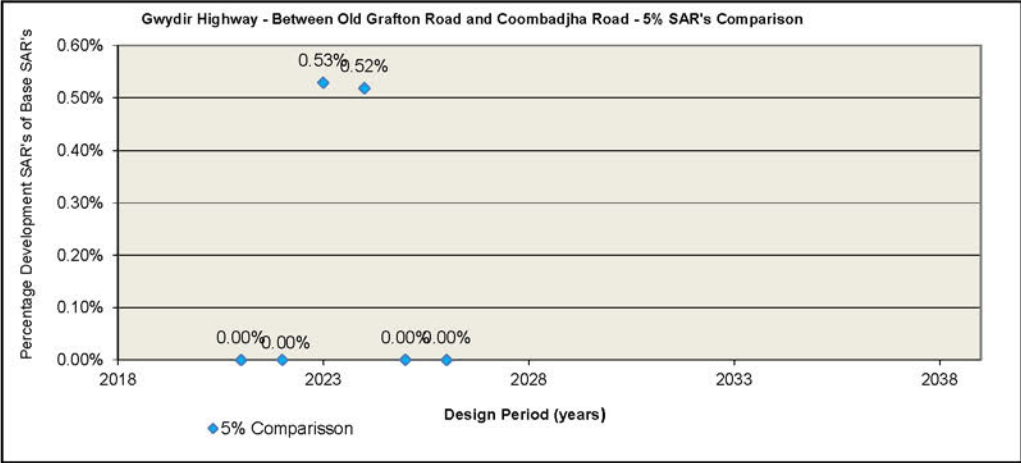
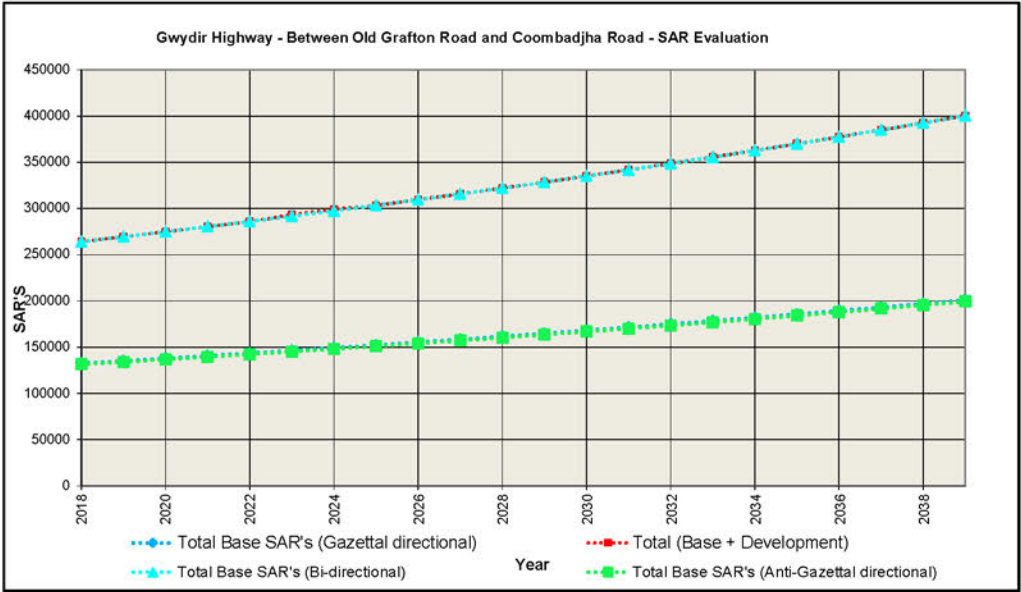
Gwydir Highway				Between Bald Nob Road and Old Grafton Road				
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal directio		Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)		Unloaded			Loaded
2018	131622	132685	264307				264307	
2019	134254	135338	269593				269593	
2020	136940	138045	274985		0	0	274985	
2021	139678	140806	280484		0	0	280484	0.00%
2022	142472	143622	286094		0	0	286094	0.00%
2023	145321	146495	291816		772	772	293359	0.53%
2024	148228	149425	297652		772	772	299195	0.52%
2025	151192	152413	303605		0	0	303605	0.00%
2026	154216	155461	309678		0	0	309678	0.00%
2027	157301	158571	315871				315871	
2028	160447	161742	322188				322188	
2029	163655	164977	328632				328632	
2030	166929	168276	335205				335205	
2031	170267	171642	341909				341909	
2032	173672	175075	348747				348747	
2033	177146	178576	355722				355722	
2034	180689	182148	362837				362837	
2035	184303	185791	370093				370093	
2036	187989	189506	377495				377495	
2037	191748	193297	385045				385045	
2038	195583	197163	392746				392746	
2039	199495	201106	400601				400601	



Gwydir Highway - Between Old Grafton Road and Coombadjha Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

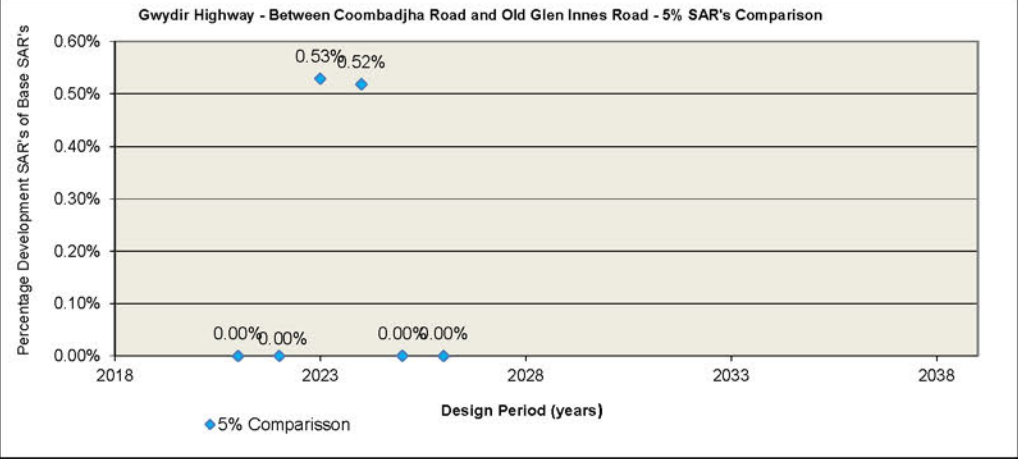
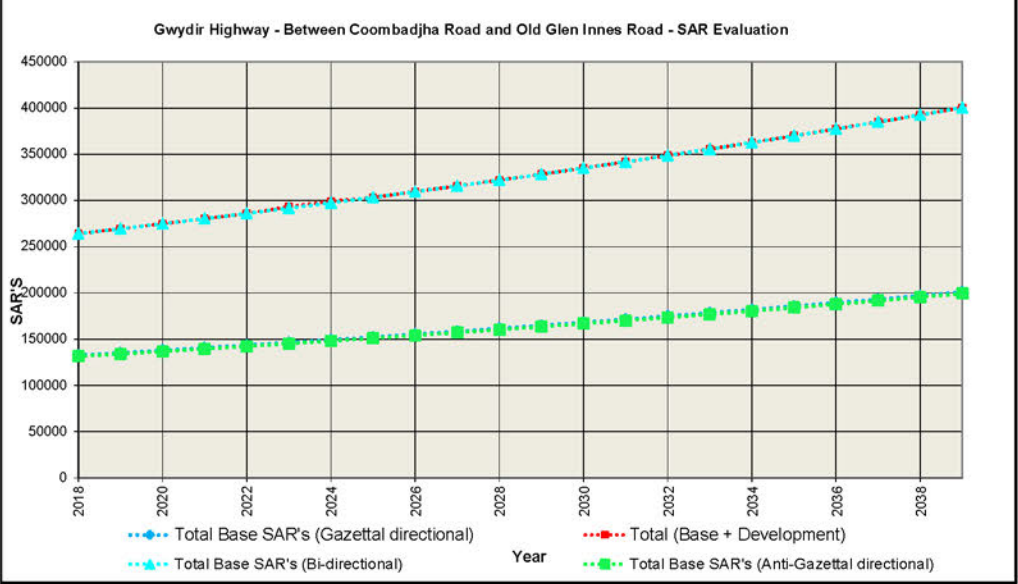
Gwydir Highway				Between Old Grafton Road and Coombadjha Road			
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson
Total Base SAR's (Anti-Gazettal directio		Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded		
2018	131622	132685	264307			264307	
2019	134254	135338	269593			269593	
2020	136940	138045	274985	0	0	274985	
2021	139678	140806	280484	0	0	280484	0.00%
2022	142472	143622	286094	0	0	286094	0.00%
2023	145321	146495	291816	772	772	293359	0.53%
2024	148228	149425	297652	772	772	299195	0.52%
2025	151192	152413	303605	0	0	303605	0.00%
2026	154216	155461	309678	0	0	309678	0.00%
2027	157301	158571	315871			315871	
2028	160447	161742	322188			322188	
2029	163655	164977	328632			328632	
2030	166929	168276	335205			335205	
2031	170267	171642	341909			341909	
2032	173672	175075	348747			348747	
2033	177146	178576	355722			355722	
2034	180689	182148	362837			362837	
2035	184303	185791	370093			370093	
2036	187989	189506	377495			377495	
2037	191748	193297	385045			385045	
2038	195583	197163	392746			392746	
2039	199495	201106	400601			400601	



Gwydir Highway - Between Coombadjha Road and Old Glen Innes Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

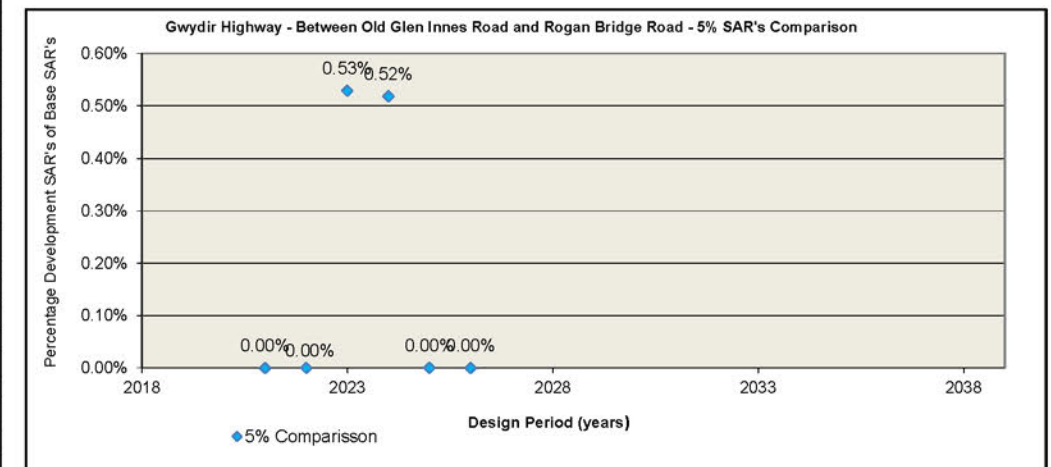
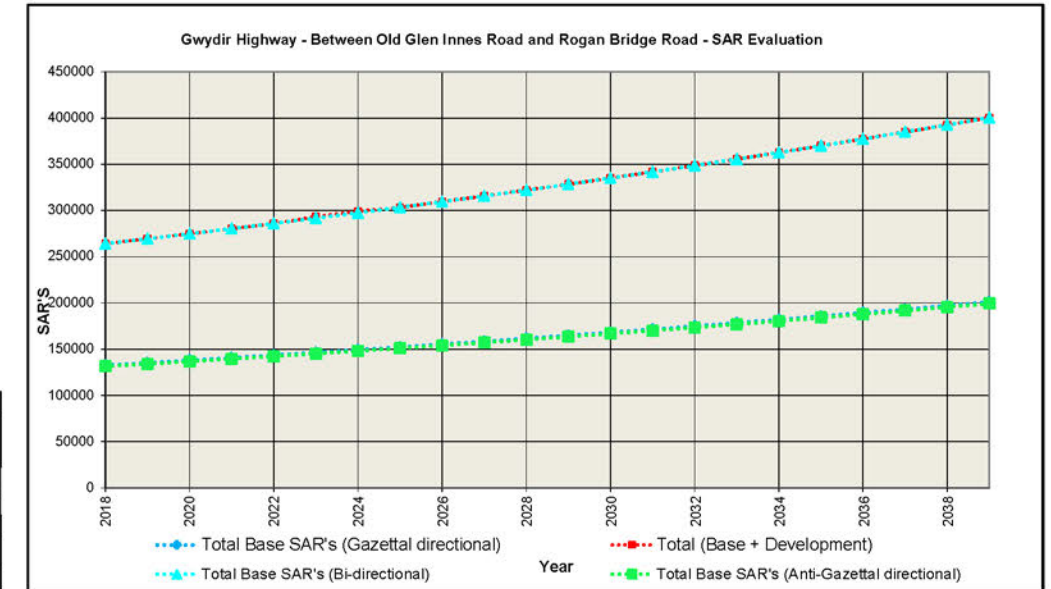
Gwydir Highway				Between Coombadjha Road and Old Glen Innes Road			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded			
2018	131622	132685			264307		
2019	134254	135338			269593		
2020	136940	138045	0	0	274985		
2021	139678	140806	0	0	280484	0.00%	
2022	142472	143622	0	0	286094	0.00%	
2023	145321	146495	772	772	293359	0.53%	
2024	148228	149425	772	772	299195	0.52%	
2025	151192	152413	0	0	303605	0.00%	
2026	154216	155461	0	0	309678	0.00%	
2027	157301	158571			315871		
2028	160447	161742			322188		
2029	163655	164977			328632		
2030	166929	168276			335205		
2031	170267	171642			341909		
2032	173672	175075			348747		
2033	177146	178576			355722		
2034	180689	182148			362837		
2035	184303	185791			370093		
2036	187989	189506			377495		
2037	191748	193297			385045		
2038	195583	197163			392746		
2039	199495	201106			400601		



Gwydir Highway - Between Old Glen Innes Road and Rogan Bridge Road

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

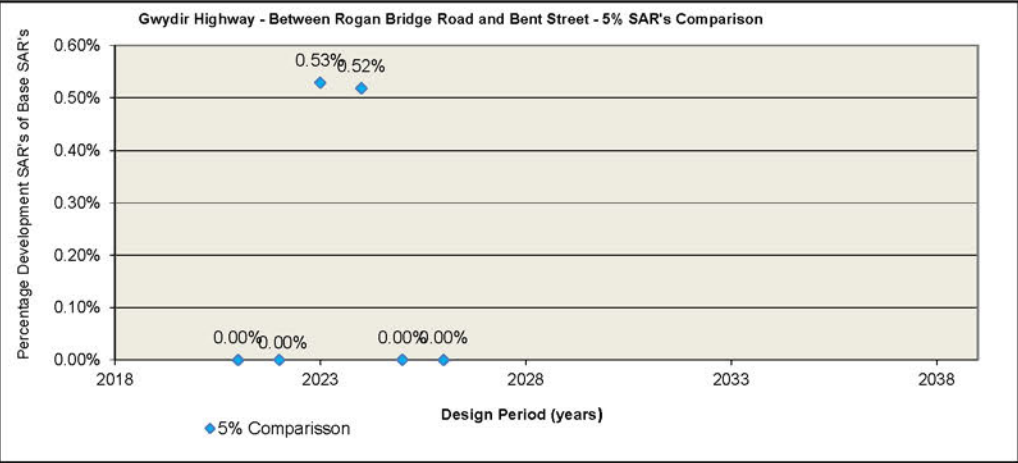
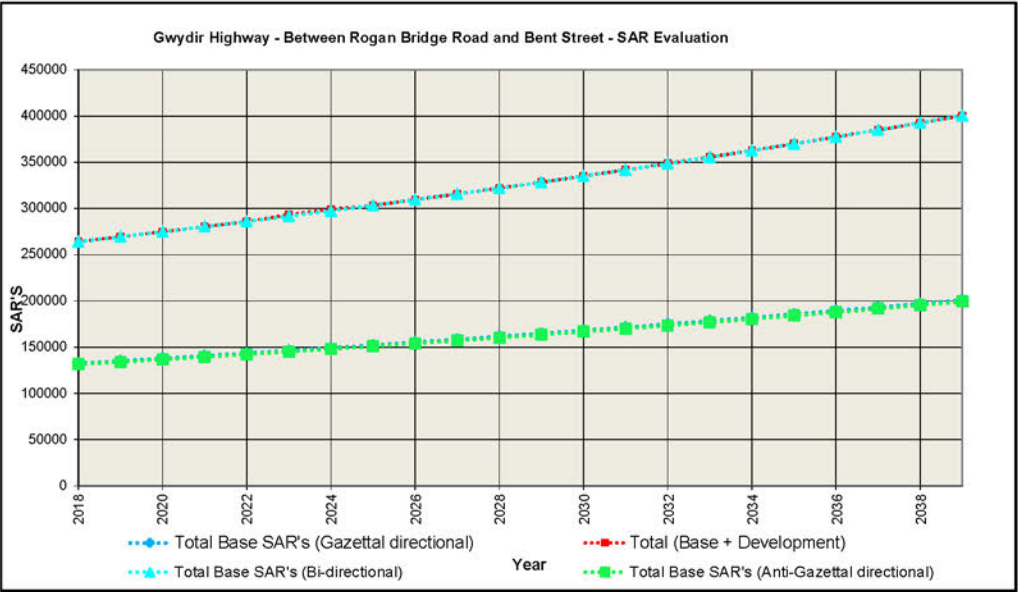
Gwydir Highway				Between Old Glen Innes Road and Rogan Bridge Road				
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal directi		Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)		Unloaded			Loaded
2018	131622	132685	264307				264307	
2019	134254	135338	269593				269593	
2020	136940	138045	274985		0	0	274985	
2021	139678	140806	280484		0	0	280484	0.00%
2022	142472	143622	286094		0	0	286094	0.00%
2023	145321	146495	291816		772	772	293359	0.53%
2024	148228	149425	297652		772	772	299195	0.52%
2025	151192	152413	303605		0	0	303605	0.00%
2026	154216	155461	309678		0	0	309678	0.00%
2027	157301	158571	315871				315871	
2028	160447	161742	322188				322188	
2029	163655	164977	328632				328632	
2030	166929	168276	335205				335205	
2031	170267	171642	341909				341909	
2032	173672	175075	348747				348747	
2033	177146	178576	355722				355722	
2034	180689	182148	362837				362837	
2035	184303	185791	370093				370093	
2036	187989	189506	377495				377495	
2037	191748	193297	385045				385045	
2038	195583	197163	392746				392746	
2039	199495	201106	400601				400601	



Gwydir Highway - Between Rogan Bridge Road and Bent Street

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

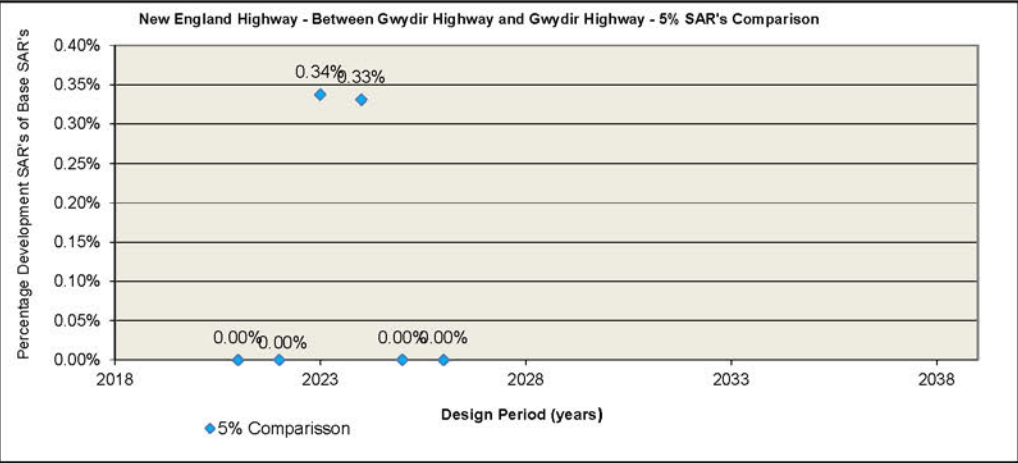
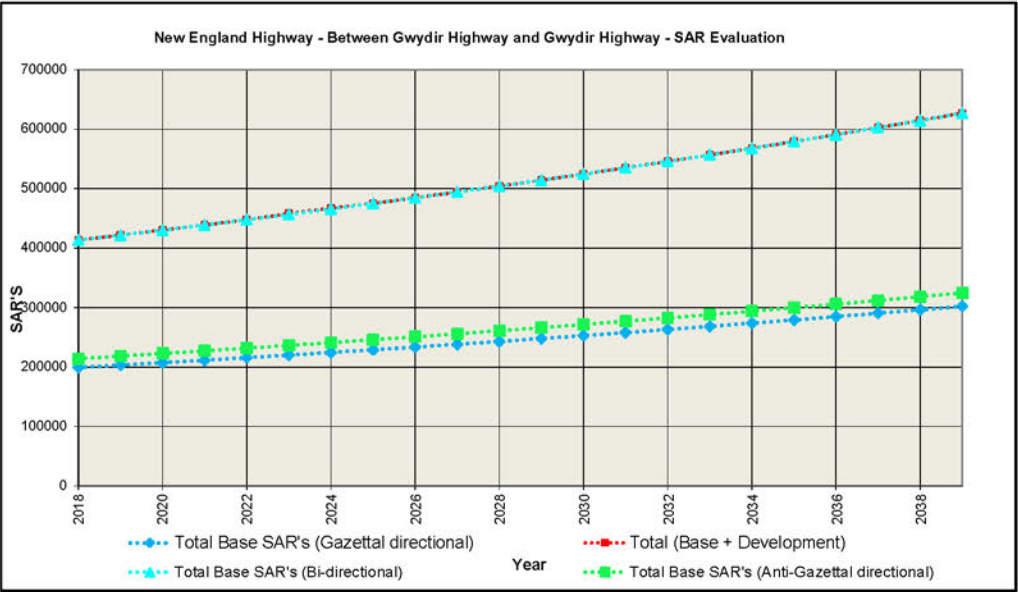
Gwydir Highway				Between Rogan Bridge Road and Bent Street			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded			
2018	131622	132685			264307		
2019	134254	135338			269593		
2020	136940	138045	0	0	274985		
2021	139678	140806	0	0	280484	0.00%	
2022	142472	143622	0	0	286094	0.00%	
2023	145321	146495	772	772	293359	0.53%	
2024	148228	149425	772	772	299195	0.52%	
2025	151192	152413	0	0	303605	0.00%	
2026	154216	155461	0	0	309678	0.00%	
2027	157301	158571			315871		
2028	160447	161742			322188		
2029	163655	164977			328632		
2030	166929	168276			335205		
2031	170267	171642			341909		
2032	173672	175075			348747		
2033	177146	178576			355722		
2034	180689	182148			362837		
2035	184303	185791			370093		
2036	187989	189506			377495		
2037	191748	193297			385045		
2038	195583	197163			392746		
2039	199495	201106			400601		



New England Highway - Between Gwydir Highway and Gwydir Highway

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

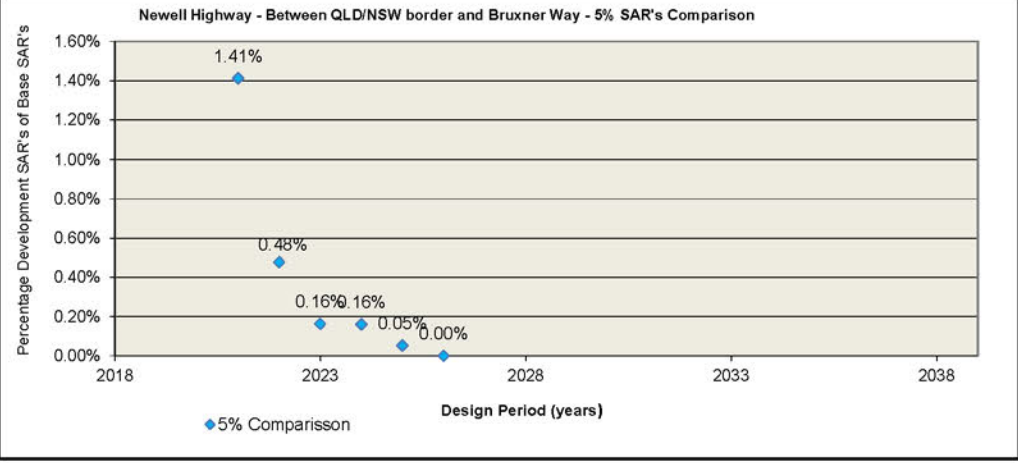
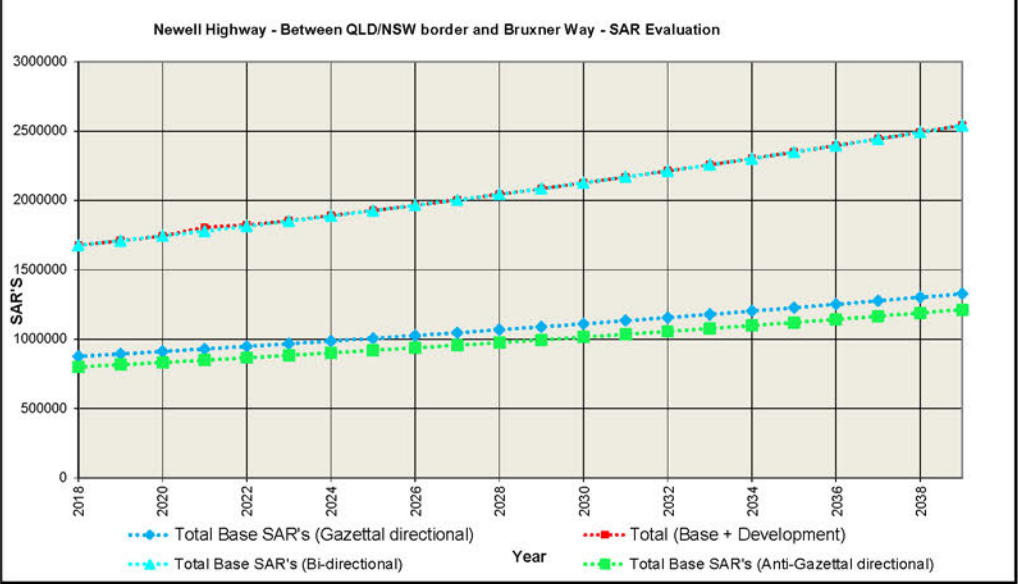
New England Highway				Between Gwydir Highway and Gwydir Highway			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded			
2018	214311	199570	413881		413881		
2019	218597	203561	422158		422158		
2020	222969	207633	430602	0	430602		
2021	227428	211785	439214	0	439214	0.00%	
2022	231977	216021	447998	0	447998	0.00%	
2023	236616	220341	456958	772	458501	0.34%	
2024	241349	224748	466097	772	467640	0.33%	
2025	246176	229243	475419	0	475419	0.00%	
2026	251099	233828	484927	0	484927	0.00%	
2027	256121	238505	494626		494626		
2028	261244	243275	504518		504518		
2029	266469	248140	514609		514609		
2030	271798	253103	524901		524901		
2031	277234	258165	535399		535399		
2032	282779	263328	546107		546107		
2033	288434	268595	557029		557029		
2034	294203	273967	568170		568170		
2035	300087	279446	579533		579533		
2036	306089	285035	591124		591124		
2037	312210	290736	602946		602946		
2038	318455	296551	615005		615005		
2039	324824	302482	627305		627305		



Newell Highway - Between QLD/NSW border and Bruxner Way

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

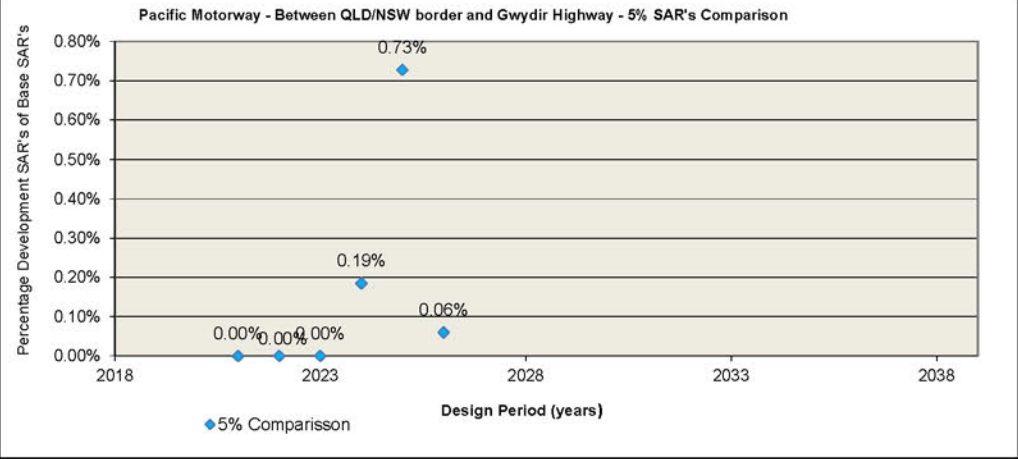
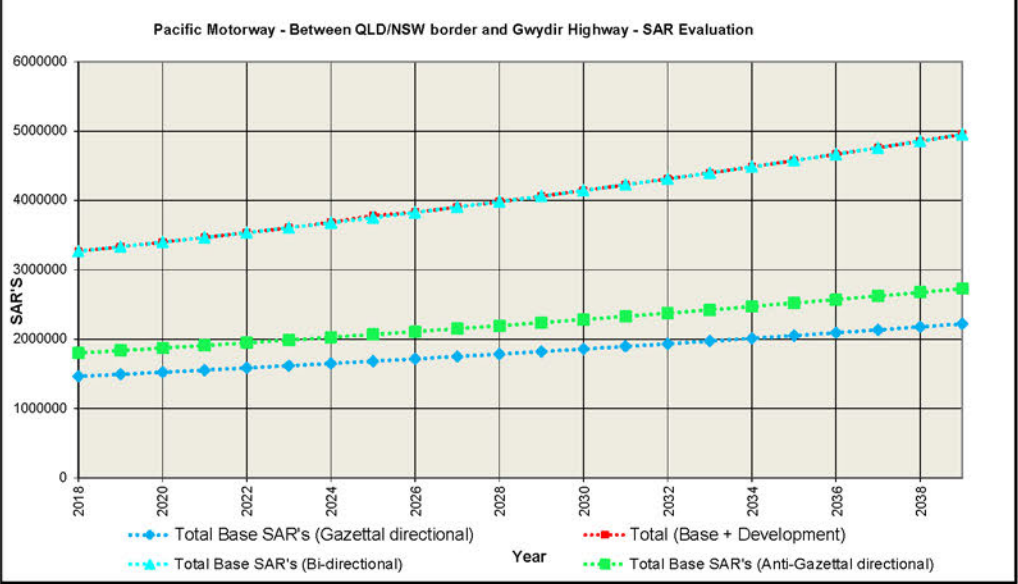
Newell Highway				Between QLD/NSW border and Bruxner Way			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded			
2018	801012	876849	1677861		1677861		
2019	817032	894386	1711418		1711418		
2020	833373	912274	1745646	0	0	1745646	
2021	850040	930519	1780559	12577	12577	1805714	1.41%
2022	867041	949130	1816171	4340	4340	1824850	0.48%
2023	884382	968112	1852494	1516	1516	1855527	0.16%
2024	902069	987474	1889544	1523	1523	1892590	0.16%
2025	920111	1007224	1927335	513	513	1928361	0.05%
2026	938513	1027368	1965881	3	3	1965888	0.00%
2027	957283	1047916	2005199			2005199	
2028	976429	1068874	2045303			2045303	
2029	995958	1090252	2086209			2086209	
2030	1015877	1112057	2127933			2127933	
2031	1036194	1134298	2170492			2170492	
2032	1056918	1156984	2213902			2213902	
2033	1078056	1180123	2258180			2258180	
2034	1099618	1203726	2303343			2303343	
2035	1121610	1227800	2349410			2349410	
2036	1144042	1252356	2396398			2396398	
2037	1166923	1277403	2444326			2444326	
2038	1190261	1302952	2493213			2493213	
2039	1214067	1329011	2543077			2543077	



Pacific Motorway - Between QLD/NSW border and Gwydir Highway

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

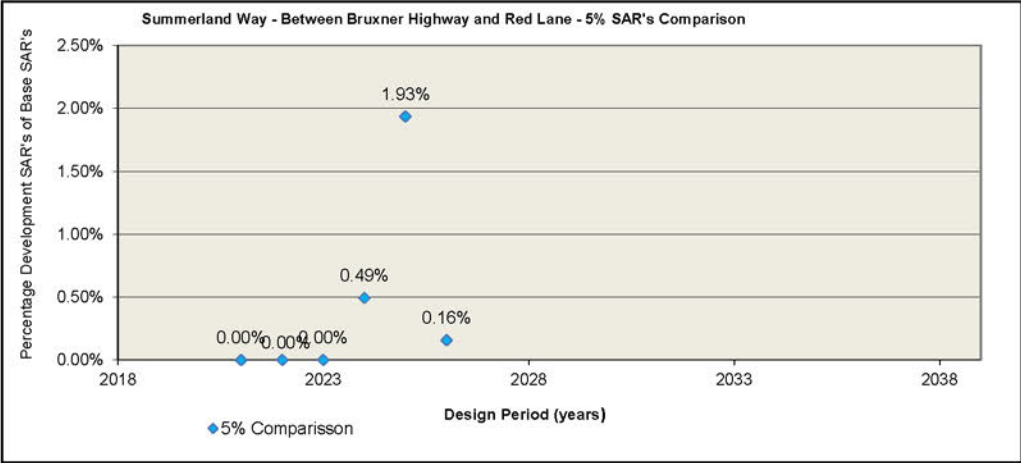
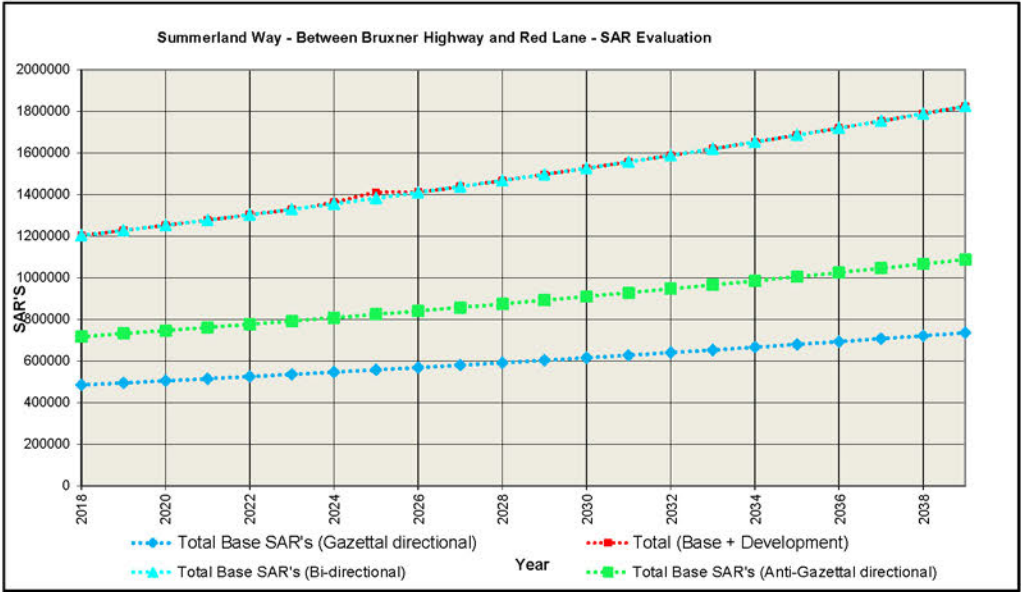
Pacific Motorway				Between QLD/NSW border and Gwydir Highway				
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal directio		Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)		Unloaded			Loaded
2018	1802046	1466825	3268871				3268871	
2019	1838087	1496161	3334248				3334248	
2020	1874849	1526084	3400933		0	0	3400933	
2021	1912346	1556606	3468952		0	0	3468952	0.00%
2022	1950593	1587738	3538331		0	0	3538331	0.00%
2023	1989605	1619493	3609098		0	0	3609098	0.00%
2024	2029397	1651883	3681280		3415	3415	3688111	0.19%
2025	2069985	1684921	3754905		13662	13662	3782229	0.73%
2026	2111384	1718619	3830003		1138	1138	3832280	0.06%
2027	2153612	1752991	3906603				3906603	
2028	2196684	1788051	3984736				3984736	
2029	2240618	1823812	4064430				4064430	
2030	2285430	1860288	4145719				4145719	
2031	2331139	1897494	4228633				4228633	
2032	2377762	1935444	4313206				4313206	
2033	2425317	1974153	4399470				4399470	
2034	2473823	2013636	4487459				4487459	
2035	2523300	2053909	4577209				4577209	
2036	2573766	2094987	4668753				4668753	
2037	2625241	2136887	4762128				4762128	
2038	2677746	2179624	4857370				4857370	
2039	2731301	2223217	4954518				4954518	



Summerland Way - Between Bruxner Highway and Red Lane

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

Summerland Way				Between Bruxner Highway and Red Lane			
Base SAR's			Development SAR's		Total (Base + Development)	5% Comparisson	
Total Base SAR's (Anti-Gazettal direction)	Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)	Unloaded	Loaded			
2018	718340	486042			1204382		
2019	732707	495763			1228470		
2020	747361	505678	0	0	1253039		
2021	762308	515792	0	0	1278100	0.00%	
2022	777555	526108	0	0	1303662	0.00%	
2023	793106	536630	0	0	1329735	0.00%	
2024	808968	547362	3346	3346	1363022	0.49%	
2025	825147	558310	13383	13383	1410222	1.93%	
2026	841650	569476	1115	1115	1413356	0.16%	
2027	858483	580885			1439348		
2028	875653	592483			1468135		
2029	893166	604332			1497498		
2030	911029	616419			1527448		
2031	929250	628747			1557997		
2032	947835	641322			1589157		
2033	966791	654149			1620940		
2034	986127	667232			1653359		
2035	1005850	680576			1686426		
2036	1025967	694188			1720155		
2037	1046486	708072			1754558		
2038	1067416	722233			1789649		
2039	1088764	736678			1825442		



Summerland Way - Between Trenayr Road and Turf Street

SAR's per heavy vehicle - Development	Loaded	Unloaded
Class 3	n/a	n/a
Class 4	n/a	n/a
Class 5	4.09	n/a
Class 6	n/a	n/a
Class 7	5.02	n/a
Class 8	n/a	n/a
Class 9	n/a	n/a
Class 10	7.72	n/a
Class 11	n/a	n/a
Class 12	n/a	n/a
Special	12.21	n/a

Summerland Way				Between Trenayr Road and Turf Street			
Base SAR's				Development SAR's		Total (Base + Development)	5% Comparisson
Total Base SAR's (Anti-Gazettal directic		Total Base SAR's (Gazettal directional)	Total Base SAR's (Bi-directional)		Unloaded		
2018	299807	196095	495902			495902	
2019	305804	200017	505820			505820	
2020	311920	204017	515937	0	0	515937	
2021	318158	208098	526256	0	0	526256	0.00%
2022	324521	212259	536781	0	0	536781	0.00%
2023	331012	216505	547516	772	772	549059	0.28%
2024	337632	220835	558467	772	772	560010	0.28%
2025	344384	225251	569636	0	0	569636	0.00%
2026	351272	229756	581029	0	0	581029	0.00%
2027	358298	234352	592649			592649	
2028	365464	239039	604502			604502	
2029	372773	243819	616592			616592	
2030	380228	248696	628924			628924	
2031	387833	253670	641503			641503	
2032	395590	258743	654333			654333	
2033	403501	263918	667419			667419	
2034	411571	269196	680768			680768	
2035	419803	274580	694383			694383	
2036	428199	280072	708271			708271	
2037	436763	285673	722436			722436	
2038	445498	291387	736885			736885	
2039	454408	297214	751623			751623	

