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HumeLink

Traffic and Transport Impact Assessment
EIS Technical Report 16

HumeLink

EIS Technical Report 16 – Traffic and Transport Impact Assessment

Transgrid

May 2023

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Executive Summary

Transgrid proposes to increase the energy network capacity in southern New South Wales (NSW) through the development of around 360 kilometres of new 500 kilovolt (kV) high voltage transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle. This project is collectively referred to as HumeLink.

HumeLink would involve construction of a new substation east of Wagga Wagga as well as connect to existing substations near Wagga Wagga and Bannaby. In addition, HumeLink would connect to a future substation at Maragle in the Snowy Mountains (referred to as the future Maragle 500 kV substation), which is subject to a separate major project assessment and approval (reference SSI-9717, EPBC, 2018/836).

This Traffic and Transport Impact Assessment has been prepared in accordance with the Planning Secretary's Environmental Assessment Requirements (SEARs) for the project issued on 14 March 2022. The SEARs relevant to this technical report are:

- an assessment of the transport impacts of the project on the capacity, condition, safety and efficiency of the local and State road network and the rail network
- details of the ongoing maintenance work required to service assets, outlining the measures to maintain the road.

This assessment has been prepared using relevant government guidelines, policies, standards and data related to the project's construction and operation. The traffic study area for the assessment comprises the anticipated access routes for the project within the existing road network within and surrounding the project footprint. This includes roads within the local government areas (LGAs) of Wagga Wagga City, Snowy Valleys, Cootamundra-Gundagai Regional, Yass Valley and Upper Lachlan Shire, Goulburn-Mulwaree and Hilltops. The assessment has also identified and assessed impacts more broadly to the existing:

- public transport services within the LGAs surrounding the project footprint
- oversize-overmass road network for delivery of oversized equipment from ports to substations
- rail network that crosses the project footprint.

High level findings from the assessment are outlined below.

Road capacity

The lightly trafficked road network within the traffic study area reflects the largely rural nature of the locality except for a selection of roads located in urban areas. All roads are operating within capacity at Level of Service A or B under existing conditions.

Construction of the project would generate additional traffic on the existing road network within the traffic study area. Some of the roads are expected to have additional traffic over the full duration of project, however most of the roads are expected to be used for a much shorter duration. The overall increase in construction traffic is expected to be low. The assessment determined that even with the addition of the expected construction traffic, all roads would continue to operate at the existing Level of Service A or B, indicating a low impact on operating conditions. This is because the roads in their existing condition have low traffic volumes, with substantial spare capacity to cater for additional vehicles.

The majority of rural roads experience a low traffic utilisation when compared to the intended design capacity. This is due to the quiet nature of the local road environment within the regional rural setting. The additional traffic generated by the project would result in a perceptible change in traffic volumes compared to existing conditions, However, these roads would continue to operate in relatively free flow conditions due to the available capacity.

During operation of the project there are expected to be very limited traffic movements at isolated locations across the traffic study area for maintenance and operation activities. The low volume of operational traffic would have a negligible impact on the road network.

Road condition

Road condition generally deteriorates over time due to factors including pavement fatigue, lack of regular maintenance or severe weather events. Other factors include wear and tear at intersections as a result of vehicle breaking and turning movements, particularly heavy vehicles (HVs). In general light vehicles (LVs) are associated with negligible road deterioration in comparison to HVs.

The 95th percentile increase in peak hour heavy vehicle construction traffic on sealed roads is estimated at around 20 vehicles per direction of travel. The 95th percentile increase in peak hour heavy vehicle construction traffic on unsealed roads is estimated around 12 vehicles per direction of travel. The impact on road conditions associated with these predicted increases in heavy vehicles may be relatively low, however this is generally dependent upon the existing road condition and applicable load restrictions.

Prior to construction, road dilapidation surveys will be prepared for all local roads to be used during construction. The surveys will assess the condition of the road surface. Engagement with the relevant road authorities and councils would be carried out during detailed design and construction to identify potential upgrade or repair activities on access routes prior to construction with the road dilapidation surveys informing this engagement. Upon completion of construction, a road condition assessment will be prepared to assess the damage to roads accessed by project related traffic. Damage caused by the project will be rectified in consultation with the relevant road authority.

Once operational the project is expected to generate a low number of HV movements required for routine activities including vegetation maintenance, inspections and servicing. The impact of the project on road condition during operation is likely to be negligible due to the low number of HV movements generated and the infrequent nature of the activities.

Road safety

There are numerous factors that contribute to crashes, including, road design, road condition, weather, speed, driver's fatigue, vehicle malfunction, driver's experience and behaviour.

The additional traffic associated with construction and operation of the project is unlikely to impact on road condition, road network performance or other crash contributing factors, and is therefore unlikely to impact on the existing level of road safety. Traffic controls would be identified within the Traffic and Transport Management Plan to be implemented by the construction contractors to minimise any potential impact on road safety.

Rail network

Construction traffic would not have any impact on rail network operation as construction traffic would use the existing road network and approved railway crossings to reach the project. All stringing activities across rail lines would be undertaken during rail possessions in accordance with rail line owners' or operators' requirements.

During operation, maintenance activities near the rail network would be limited to inspections of transmission line structures and managing localised network disruptions. During these events, work would be undertaken in consultation with rail authorities, by appropriately authorised personnel and within the required clearances from existing rail lines.

Active transport

Public active transport infrastructure (cycling and walking facilities) are unlikely to be impacted during either construction or operation of the project.

Public transport

Bus services form the main public transport service surrounding the project footprint. During construction and operation of the project, road network performance would operate with the same Level of Service, therefore no impacts to bus services are expected.

Access to property

During construction and operation of the project, access to properties, including emergency vehicles access and egress would be maintained. Should, short-term temporary restrictions to property access be required, this would only be done following direct consultation and co-ordination with the respective landowners and/or occupiers.

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Abbreviations or term	Description
access routes	The roads within and surrounding the project footprint identified from GIS analysis that are anticipated to be used to provide access to the project footprint.
am / pm	ante meridiem (before noon) / post meridiem (after noon)
Bannaby 500 kV substation	The existing 500 kV substation at Bannaby
CBD	Central Business District
classified roads	Roads classified under Sections 46, 47, 50 or 51 of the *Roads Act 1993* are roads declared as a highway, main road, secondary road or tourist road, as described by Declaration Order in the Government Gazette. To manage the extensive network of roads for which local councils are responsible under the *Roads Act 1993*, Transport for NSW – in partnership with local government – established an administrative framework of state, regional, and local road categories. The administration and management of state roads is carried out and financed by Transport for NSW, while regional and local roads are administered, managed and financed by local councils. The regional road category comprises two sub-categories: regional roads that have been classified under the *Roads Act 1993*, and regional roads that are unclassified. Local roads are unclassified roads.
construction compounds	Main construction compounds proposed for construction of the project. Each main construction compound would accommodate a range of facilities which may include (but not limited to): ■ laydown areas ■ site offices ■ amenities ■ construction support facilities such as vehicle and equipment storage, maintenance sheds, chemical/fuel stores and stockpile areas ■ parking.
CSSI	Critical State Significant Infrastructure
DPE	NSW Department of Planning and Environment
easement	A legal right attached to a parcel of land that enables the non-exclusive use of the land by a third party other than the owner. For transmission lines, an easement defines the corridor area where the lines are located and that allows access, construction and maintenance work to take place. The easements for the 500 kV transmission lines would typically be 70 m wide. However, a few locations would require wider easements up to 110 m wide at transposition locations and up to 130 m wide where the new transmission line would parallel the relocated section of Line 51. The easement grants a right of access and for construction, maintenance and operation of the transmission line and other operational assets.
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
future Maragle 500 kV substation	The future Maragle 500/330 kV substation that would be built under the Snowy 2.0 Transmission Connection Project, which is subject to separate planning approval (reference SS1-9717, EPBC 2018/836)
GAV	General Access Vehicles
GIS	Geographic Information System
HumeLink	The project
HV	Heavy vehicle
kV	Abbreviated form of kilovolt
LGA	Local Government Area
LoS	Road's Level of Service
LV	Light vehicle
NEM	National Electricity Market

Abbreviations or term	Description
NSW	New South Wales
OSOM	oversize and/or over mass
project (the)	The CSSI project “HumeLink”, which is the subject of this Environmental Impact Statement. The project involves the construction and operation of high voltage transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle.
project footprint	The area that has been assumed for the purpose of this EIS to be directly affected by the construction and operation of the project. It includes the indicative location of project infrastructure, the area that would be directly disturbed during construction and any easement required during operation.
proposed Gugaa 500 kV substation	The new 500/330 kV substation proposed near Wagga Wagga.
RAV	Restricted access vehicles includes any vehicle which exceeds the overall dimensions of vehicles as defined in the Heavy Vehicle National Law (NSW).
SEARs	Planning Secretary’s Environmental Assessment Requirements
TfNSW	Transport for NSW
traffic study area	The anticipated access routes for the project within the existing road network within and surrounding the project footprint. This includes roads within the LGAs of Wagga Wagga City, Snowy Valleys, Cootamundra-Gundagai Regional, Yass Valley and Upper Lachlan Shire, Goulburn-Mulwaree and Hilltops.
transmission line routes	The location of the transmission line structures along the middle of the transmission line easement.
transmission line structures	Proposed free standing structures to support the transmission lines
transposition	Transposition is the periodic swapping of positions of the conductors of a transmission line to improve transmission reliability.
Transgrid	The project is proposed to be undertaken by NSW Electricity Networks Operations Pty Ltd (referred to as Transgrid). Transgrid is the operator and manager of the main high voltage transmission network in NSW and the ACT and is the Authorised Network Operator for the purpose of an electricity transmission or distribution network under the provisions of the *Electricity Network Assets (Authorised Transactions) Act 2015*.
TTIA	Traffic and Transport Impact Assessment
VCR	Volume to Capacity Ratio
Wagga 330 kV substation	The existing 330/132 kV substation located in Wagga Wagga
Wagga Wagga	When referencing the place name, except when being used to reference the Wagga 330 kV substation
work site	A general word to describe a defined construction location
worker accommodation facilities	Temporary worker accommodation facilities that would be established for the construction workers.

1 Introduction

1.1 Overview

The Australian energy landscape is transitioning to a greater mix of low-emission renewable energy sources, such as wind and solar. To support this transition, meet our future energy demands and connect Australian communities and businesses to these lower cost energy sources, the national electricity grid needs to evolve.

Transgrid proposes to increase the energy network capacity in southern New South Wales (NSW) through the development of around 360 kilometres of new 500 kilovolt (kV) high voltage transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle. This project is collectively referred to as HumeLink. The project would be located across five Local Government Areas (LGAs) including Wagga Wagga City, Snowy Valleys, Cootamundra-Gundagai Regional, Upper Lachlan Shire and Yass Valley. The location of the project is shown on Figure 1-1.

HumeLink would involve construction of a new substation east of Wagga Wagga as well as connection to existing substations at Wagga Wagga and Bannaby and a future substation at Maragle in the Snowy Mountains (referred to as the future Maragle 500 kV substation). The future Maragle 500 kV substation is subject to a separate major project assessment and approval (reference SSI-9717, EPBC 2018/836).

The project would deliver a cheaper, more reliable and more sustainable grid by increasing the amount of renewable energy that can be delivered across the national electricity grid, helping to transition Australia to a low carbon future. It would achieve this by supporting the transfer of energy from existing renewable generation as well as facilitate development of new renewable generation in the Wagga Wagga and Tumut Renewable Energy Zones. The project would provide the required support for the network in southern NSW, allowing for the increase in transfer capacity between new renewable generation sources and the State's demand centres of Sydney, Newcastle and Wollongong. The project would also improve the efficiency and reliability of the current energy transfer in this part of the network.

Furthermore, HumeLink would form a key part of the transmission line infrastructure that supports the transfer of energy within the National Electricity Market (NEM) by connecting with other major interconnectors. The NEM incorporates around 40,000 kilometres of transmission lines across Queensland (QLD), NSW, Australian Capital Territory (ACT), Victoria (VIC), South Australia (SA) and Tasmania (TAS).

Construction of the project is targeted to commence in 2024, subject to the required planning and regulatory approvals. Once construction has commenced, the project is estimated to take approximately 2.5 years to build and would become operational by the end of 2026.

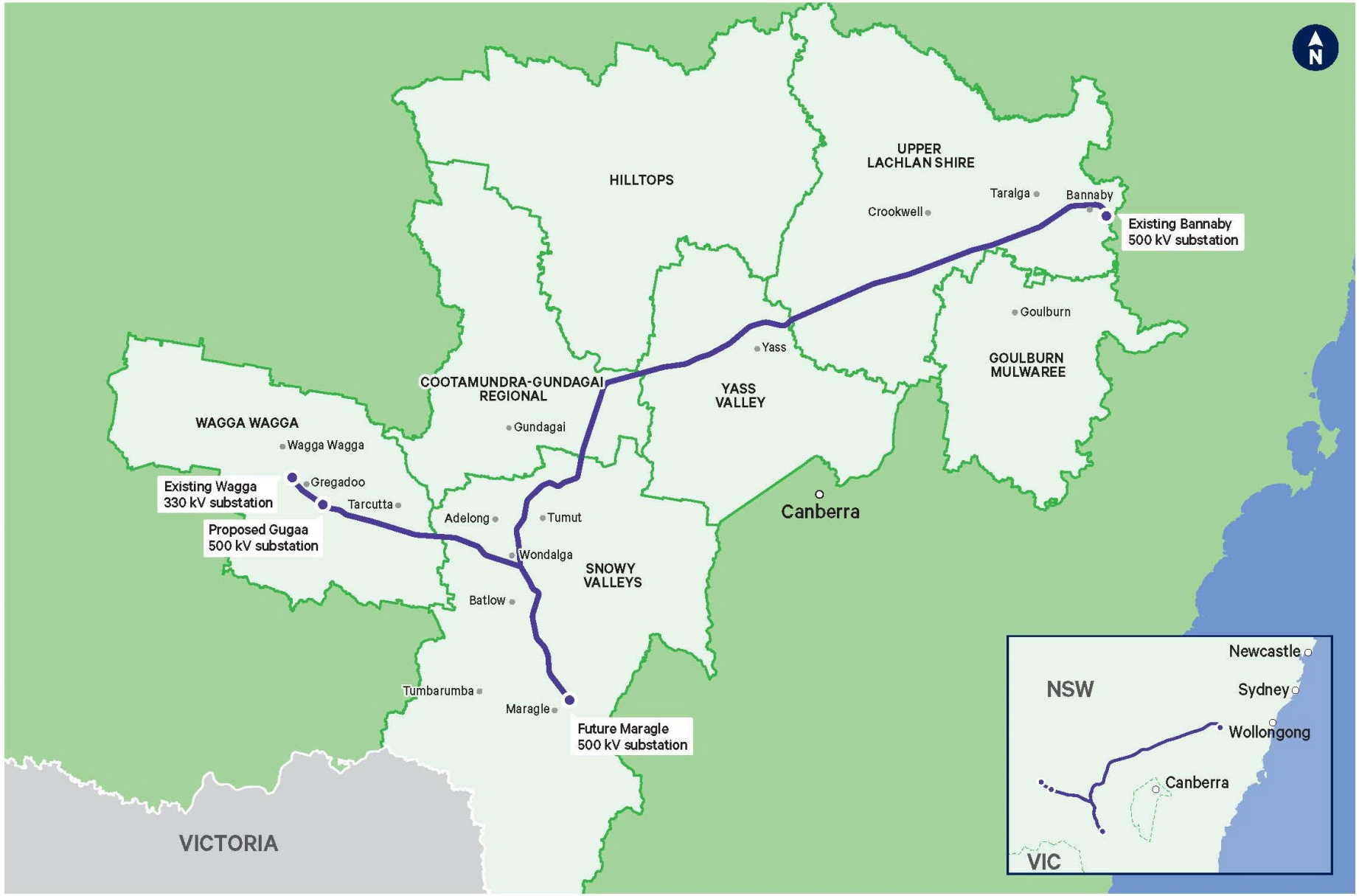
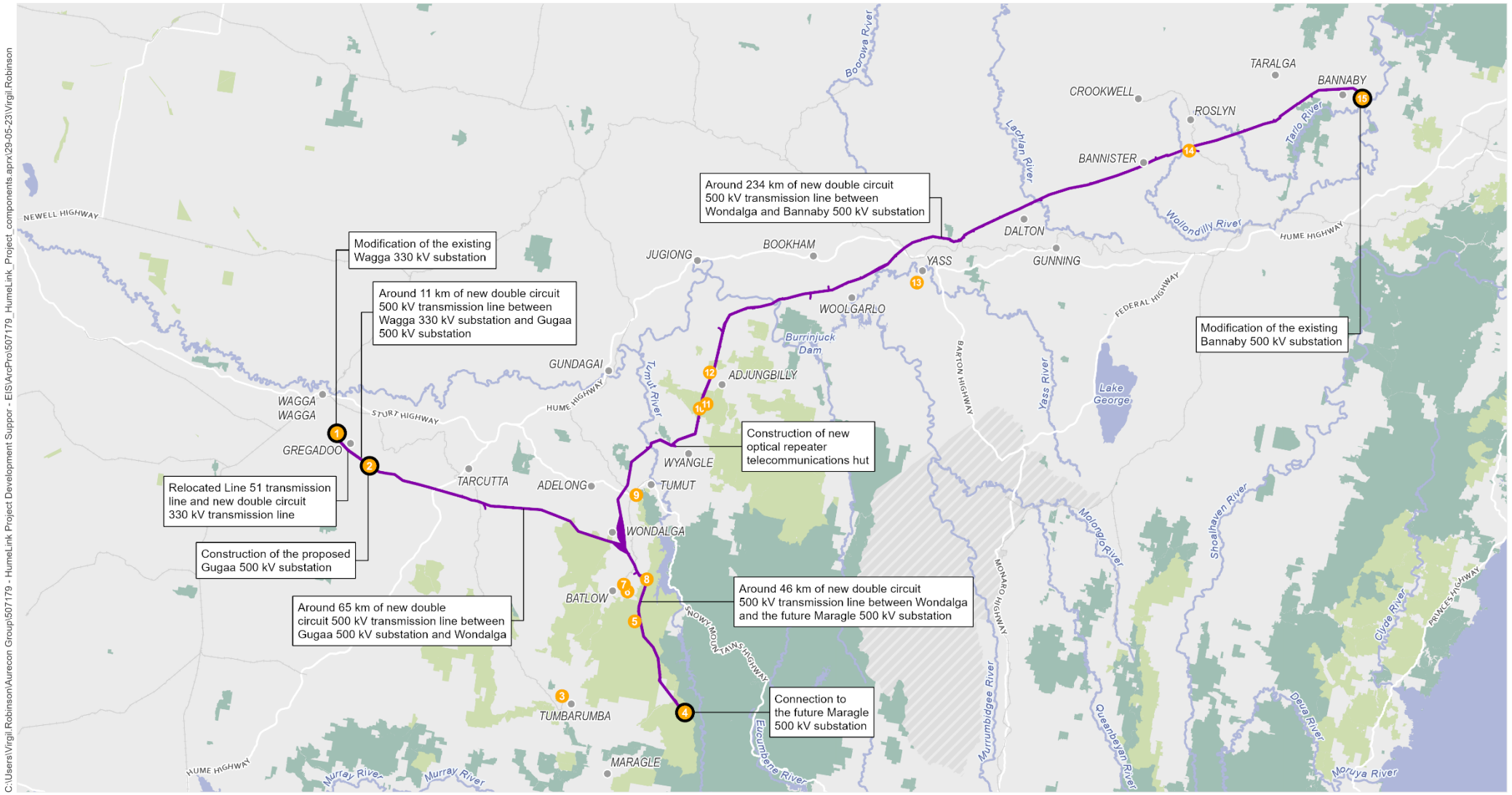


Figure 1-1 Location of project

1.2 Key components of the project

The project includes the following key components as outlined in Figure 1-2:

- construction and operation of around 360 kilometres of new double circuit 500 kV transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle
- construction of a new 500/330 kV substation at Gregadoo (Gugaa 500 kV substation) approximately 11 kilometres south-east of the existing Wagga 330/132 kV substation (Wagga 330 kV substation)
- demolition and rebuild of a section of Line 51 (around two kilometres in length) as a double circuit 330 kV transmission line connecting into the Wagga 330 kV substation
- modification of the existing Wagga 330 kV substation and Bannaby 500/330 kV substation (Bannaby 500 kV substation) to accommodate the new transmission line connections
- connection of transmission lines to the future Maragle 500/330 kV substation (Maragle 500 kV substation, approved under the Snowy 2.0 Transmission Connection Project (SSI-9717))
- provision of one optical repeater telecommunications hut and associated connections to existing local electrical infrastructure
- establishment of new and/or upgraded temporary and permanent access tracks
- ancillary work required for construction of the project such as construction compounds, worker accommodation facilities, utility connections and/or relocations, brake and winch sites, and helipad/helicopter support facilities.



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:925,000
0 20 40km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

FIGURE 1-2: Key components of the project

1.3 Purpose and scope of this report

This Traffic and Transport Impact Assessment (TTIA) is one of several technical reports forming part of the Environmental Impact Statement (EIS) for the project.

The purpose of this report is to identify and assess the potential traffic and transport impacts of the construction and operation of the project. It responds directly to the Planning Secretary's Environmental Assessment Requirements (SEARs).

The objectives of this report are to:

- provide an overview of the existing transport network impacted by the project, considering all modes of transport such as vehicles, freight, public transport (including rail) and active transport
- provide an overview of the impact on the transport networks during construction (detailed in Section 6.3) and operation (detailed in Section 7.3) of the project
- provide detail on the construction and operation approach, including expected trip generation and distribution
- assess the potential impacts of construction of the project on the traffic study area including the construction of any access track tie-ins to the public road network
- assess the potential impacts of operation of the project on the traffic study area
- assess the cumulative transport impacts of planned infrastructure programs and significant developments which are anticipated during both the construction and operational phases of the project
- propose mitigation measures to manage traffic and transport impacts of the project.

1.4 Secretary's environmental assessment requirements

The NSW Department of Planning and Environment (DPE) provided the SEARs for the EIS on 14 March 2022 (Application Number: SSI-36656827). The requirements specific to this assessment and where those requirements are considered in this report are identified by in Table 1-1.

Table 1-1 Secretary's Environmental Assessment Requirements

Reference	SEARs Requirements	Where considered
Key Issues - Transport	An assessment of the transport impacts of the project on the capacity, condition, safety and efficiency of the local and State road network and the rail network.	Chapter 6 outlines construction impacts, Chapter 7 outlines operational impacts and Chapter 8 outlines cumulative impacts.
	Details of the ongoing maintenance work required to service assets, outlining the measures to maintain the road.	Chapters 6 and 7 identifies that impacts on road conditions will be low to negligible. Whilst ongoing maintenance activities are addressed in Chapter 7. As identified in Chapter 9 road dilapidation surveys and road condition assessment pre and post construction will be completed as an overarching control to inform potential maintenance requirements for roads impacted by the project.

1.5 Structure of this report

The structure and content of this report is as follows:

- Chapter 1 – Introduction presents an overview of project, purpose, scope and structure of this report.
- Chapter 2 – Project description summary describes the key components of the project.
- Chapter 3 – Legislative and policy context provides an outline of the key legislative and policy guidelines applicable to the project.
- Chapter 4 – Methodology provides an outline of the assessment methodology, assessment approach, key tasks in assessment and limitations.
- Chapter 5 – Existing environment describes the existing environment of road, public and active transport network.
- Chapter 6 – Construction impacts describes the construction methodology of the project and assessment of potential construction impacts associated with the project.
- Chapter 7 – Operational impacts describes the operational infrastructure and potential operational impacts associated with the project.
- Chapter 8 – Cumulative impacts outlines the other development projects within the vicinity of project and assessment of potential cumulative impacts.
- Chapter 9 – Management of impacts outlines the proposed mitigation measures for the project.
- Chapter 10 – Provides a conclusion on potential impacts of the project on the road environment and transport network.
- Chapter 11 – References identifies the key resources used to generate this report.

1.6 Key project terms

The key project terms used in this assessment are as follows:

- Project footprint refers to the area that has been assumed for the purpose of this EIS to be directly affected by the construction and operation of the project. It includes the indicative location of project infrastructure, the area that would be directly disturbed during construction and any easement required during operation.
- The traffic study area comprises the anticipated access routes for the project within the existing road network within and surrounding the project footprint. This includes roads within the LGAs of Wagga Wagga City, Snowy Valleys, Cootamundra-Gundagai Regional, Yass Valley and Upper Lachlan Shire, Goulburn-Mulwaree and Hilltops.

2 Project description summary

The project description in this chapter is based on a concept design and indicative construction methodology for the project. The design and construction methodology would continue to be refined and confirmed during detailed design and construction planning by the construction contractors. Further details on the project are provided in Chapters 3 and 4 of the EIS.

2.1 Summary of key components of the project

Key components of the project are summarised in Table 2-1.

Table 2-1 Summary of key components of the project

Component	Description
Transmission lines and supporting infrastructure	
Transmission lines and structures	The project includes the construction of new 500 kV transmission line sections between: ■ Wagga 330 kV substation and Gugaa 500 kV substation (approximately 11 km) ■ Gugaa 500 kV substation and Wondalga (approximately 65 km) ■ Wondalga and Maragle 500 kV substation (approximately 46 km) ■ Wondalga and Bannaby 500 kV substation (approximately 234 km). The transmission line section between the Wagga 330 kV substation and proposed Gugaa 500 kV substation would operate at 330 kV under HumeLink. The project also includes the rebuild of approximately 2 km of Line 51 as a new 330 kV transmission line between the Wagga 330 kV substation and around Ivydale Road, Gregadoo. This would be adjacent to the new transmission line between the existing Wagga 330 kV and proposed Gugaa 500 kV substations. The 500 kV transmission lines would be supported on a series of free-standing steel lattice structures that would range between around 50 m up to a maximum of 76 m in height and generally spaced between 300 to 600 m apart. The typical transmission line structure height would be around 60 m. Earth wire and communications cables would be co-located on the transmission line structures. The 330 kV structures for the rebuild of Line 51 would range between 24 m and 50 m in height and have a typical height of 40 m. Indicative configurations of transmission line structures that may be used as part of the project are shown in Figure 2-1. The type and arrangement of the structures would be refined during detailed design. The footings of each structure would require an area of 300 up to 450 m^2, depending on ground conditions and the proposed structure type. Additional disturbance at each structure site may be required to facilitate structure assembly and stringing.
Transmission line easements	The easements for the 500 kV transmission lines are typically 70 m wide. However, a number of locations may require wider easements of up to 110 m wide at transposition locations[1] and up to 130 m wide where the new transmission line would parallel the relocated section of Line 51. The easement provides a right of access to construct, maintain and operate the transmission line and other operational assets. The easement also generally identifies the zone of initial vegetation clearance and ongoing vegetation management to ensure safe electrical clearances during the operation of the lines. Vegetation management beyond the easement may also occur where nearby trees have the potential to fall and breach safety clearances.
Telecommunications hut	Telecommunications huts, which contain optical repeaters, would be required to boost the signal in the optical fibre ground wire (OPGW). One telecommunications hut would be required for the project. The telecommunications hut would be located adjacent to existing transmission line structures. Cables would be installed between the transmission line structure and the local power supply. The telecommunications hut would be surrounded by a security fence. A new easement would be established for the telecommunications hut power connection. The project also involves a telecommunications connection of OPGW between two proposed transmission line structures and the future Rye Park Wind Farm substation (SSD-6693). This removes the need for an additional telecommunications hut in this area of the project.

[1] Transposition is the periodic swapping of positions of the conductors of a transmission line in order to improve transmission reliability.

Component	Description
Substation activities	
Construction of the proposed Gugaa 500 kV substation	A new 500/330 kV substation would be constructed at Gregadoo, about 11 km south-east of the Wagga 330 kV substation. The substation would include seven new 500/330 kV transformers and three 500 kV reactors. The proposed Gugaa 500 kV substation is expected to occupy an area of approximately 22 hectares.
Modification of the existing Bannaby 500 kV substation	The existing Bannaby 500 kV substation on Hanworth Road, Bannaby would be expanded to accommodate connections for new 500 kV transmission line circuits. The modification would include changes to the busbars, line bays, bench and associated earthworks, steelwork, drainage, external fence, internal/external substation roads, secondary containment dams, sediment containment dams, cabling, and secondary systems. All of the work would be restricted to the existing substation property.
Modification of the existing Wagga 330 kV substation	The existing Wagga 330 kV substation on Ashfords Road, Gregadoo would be reconfigured to accommodate new bays for two new 500 kV transmission line circuits within the existing substation property. This would include modifications to the busbars, line bays, existing line connections, bench and associated earthworks, relocation of existing high voltage equipment, drainage, external fence, internal substation roads, steelwork, cabling, and secondary systems.
Connection to the future Maragle 500 kV substation	The project would connect to the future Maragle 500 kV substation approved under the Snowy 2.0 Transmission Connection Project (SS1-9717). Construction of the Maragle substation is proposed to be undertaken between 2023 and 2026. Further detail on the Snowy 2.0 Transmission Connection project is available at the Department of Planning and Environment's Major Projects website: **www.planningportal.nsw.gov.au/major-projects/project/10591.**
Ancillary facilities	
Access tracks	Access to the transmission line structures and the substations would be required during construction and operation. Wherever possible, existing roads, tracks and other existing disturbed areas would be used to minimise vegetation clearing or disturbance. Upgrades to existing access tracks may be required. In areas where there are no existing roads or tracks, suitable access would be constructed. This may include waterway crossings.
Construction compounds	Construction compounds would be required during construction to support staging and equipment laydown, concrete batching, temporary storage of materials, plant and equipment and worker parking required to construct the various elements of the project. Fourteen potential construction compound locations have been identified. The proposed use of the construction compounds and their proposed boundaries/layout would be refined as the project design develops in consultation with relevant stakeholders and the construction contractors.
Worker accommodation facility	Existing accommodation facilities within towns adjacent to the project would provide temporary accommodation for the majority of the construction workers. However, a potential shortage in accommodation has been identified close to the project footprint. A potential option to provide additional temporary worker accommodation during the construction period is the establishment of a temporary worker accommodation facility at the corner of Courabyra Road and Alfred Street, Tumbarumba to accommodate about 200 construction workers. The worker accommodation facility would consist of demountable cabins and would be connected to existing utilities. All required amenities for the accommodation facility would be provided including services and worker parking for light and heavy vehicles (HVs). However, the ultimate delivery of the project may include multiple temporary worker accommodation facilities in various forms, which would be outlined in the Worker Accommodation Strategy for the project. The strategy will be developed in consultation with councils, and other relevant stakeholders. Any new or changed worker accommodation facility would be subject to additional environmental assessment, as required.
Helipad/helicopter facilities	To facilitate construction of the project, helicopters may be used to deliver materials/equipment and transfer personnel to construction areas particularly within high alpine regions. To enable helicopters to operate safely and allow easy access to the site, a helicopter landing pad would be required. The helipad is expected to occupy an area of around 30 m by 30 m and would be remediated after construction. These areas would typically be located on existing disturbed land not subject to inundation and a reasonable distance from waterways, sensitive receivers and drainage lines. Eight locations have been identified and assessed as potential helipad locations. The exact locations to be used would be confirmed during detailed design by the construction contractors. In addition to this, the existing facilities at the Wagga Wagga Airport, and Tumut Airport may be used.

Component	Description
Utility connections, adjustments and protection	The project would require utility connections, adjustments and protection. Such work include interfaces with other transmission lines and connections to existing services for temporary facilities. Potential impacts to existing services and utilities would be confirmed during detailed design and any proposed relocation and/or protection work would be determined in consultation with the relevant asset owners.

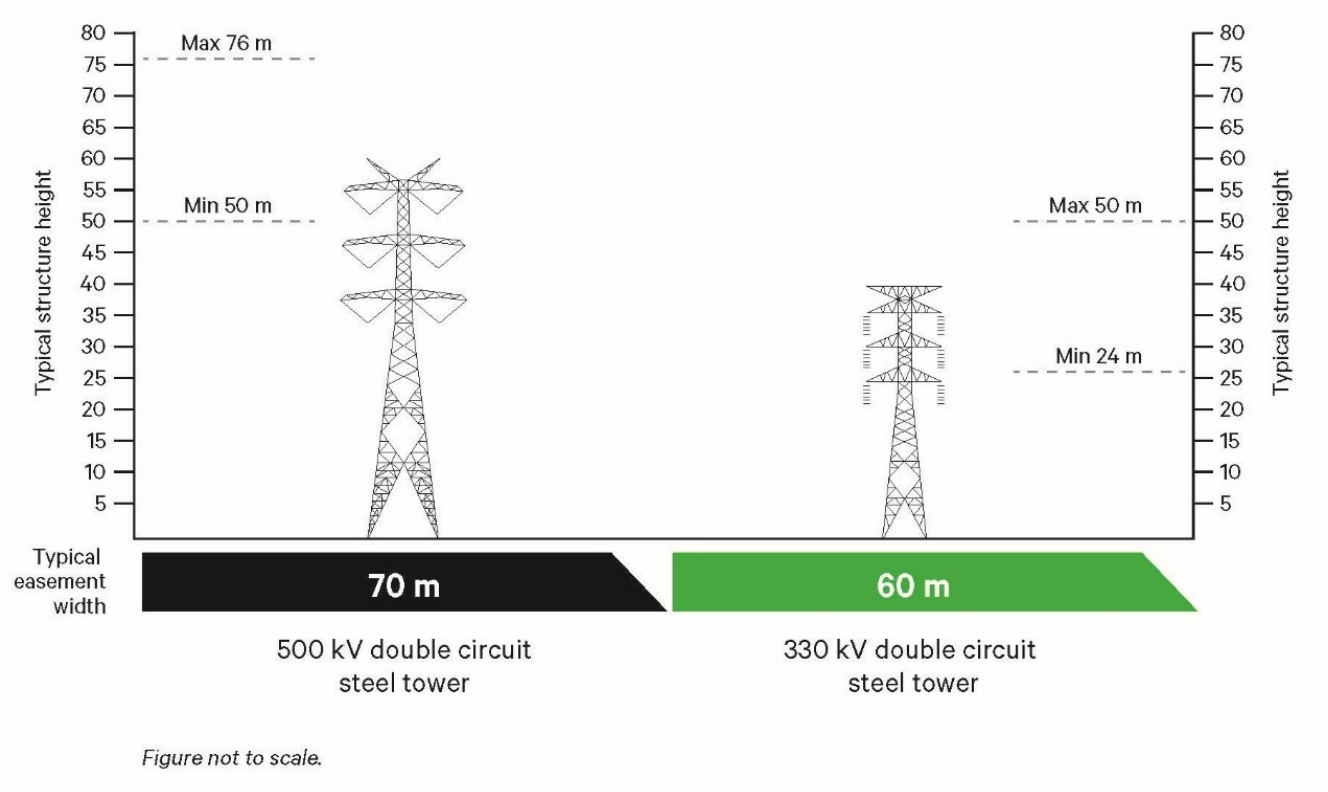


Figure 2-1 Indicative transmission line structures

2.2 Construction of the project

2.2.1 Construction activities

Key construction activities would generally include (but are not limited to):

- site establishment work, such as:
  - clearing of vegetation and topsoil
  - establishment of construction compounds and helipad/helicopter facilities
  - utility relocations and/or adjustments
  - construction of new access tracks and waterway crossings and/or upgrade of existing access tracks to transmission line structures
  - road improvement work
  - establishment of environmental management measures and security fencing
  - construction of temporary worker accommodation
- construction of the transmission lines, including:
  - earthworks and establishment of construction benches and brake and winch sites for each transmission line structure
  - construction of footings and foundation work for the new transmission line structures including boring and/or excavation, steel fabrication work and concrete pours
  - erection of the new transmission line structures
  - stringing of conductors, overhead earth wires and OPGW
  - installation of associated transmission line structure fittings inclusive of all earthing below ground level
- relocation of a section of Line 51, including:
  - demolition of the existing section of Line 51
  - erection of new transmission line structures for the rebuild of Line 51 in a new location
  - stringing of conductors, overhead earth wires and OPGW
  - installation of associated transmission line structure fittings inclusive of all earthing below ground level
- construction of the proposed Gugaa 500 kV substation, including:
  - bulk earthworks to form the substation bench, access roads, drainage and oil containment structures
  - installation of concrete foundations, bund walls, fire walls, noise walls and kerbs including excavation
  - installation of reinforced concrete and piled foundations for the electrical equipment and associated steel support structures
  - installation of electrical conduits, electrical trenches, site stormwater drainage, oil containment work and associated concrete pits, pipes and tanks including excavation
  - installation of new ancillary and equipment control buildings
  - erection of galvanised steel structures to support electrical equipment
  - installation of electrical equipment on foundations and/or steel support structures
  - installation of conductors, cabling, wiring, electrical panels and electrical equipment
  - erection of the substation site boundary security fencing, including site access gates

  - connection of the proposed transmission lines to the substation
- modification of the existing Wagga 330 kV substation to enable the proposed connection and operation of the new transmission lines, including:
  - demolition and removal of redundant electrical equipment, fencing and cabling
  - bulk earthworks to form the extended substation bench and modified drainage structures
  - installation of concrete foundations and kerbs including excavation
  - installation of reinforced concrete and piled foundations for the electrical equipment and associated steel support structures
  - erection of galvanised steel structures to support electrical equipment
  - installation of electrical equipment on foundations and/or steel support structures
  - installation of electrical conduits, electrical trenches, and modified site stormwater drainage including excavation
  - installation of conductors, cabling, wiring, electrical panels and electrical equipment
  - installation of fencing, lighting and other security features
  - testing and commissioning
  - connection of the proposed transmission lines to the substation
- modification of the existing Bannaby 500 kV substation to enable the proposed connection and operation of the new transmission lines, including:
  - bulk earthworks to form the extended substation bench, new access road, modified stormwater drainage, modified oil containment and modified sediment control structures
  - installation of concrete foundations, retaining walls, bund walls, fire walls and kerbs including excavation
  - installation of reinforced concrete and piled foundations for the electrical equipment and associated steel support structures
  - erection of galvanised steel structures to support electrical equipment
  - installation of electrical equipment on foundations and/or steel support structures
  - installation of electrical conduits, electrical trenches, site stormwater drainage, oil containment work and associated concrete pits, pipes and tanks including excavation
  - installation of conductors, cabling, wiring, electrical panels and electrical equipment
  - installation of fencing, lighting and other security features
  - demolish redundant fencing including footings and kerbs
  - testing and commissioning
  - connection of the proposed transmission lines to the substation
- connection of the proposed transmission lines to the future Maragle 500 kV substation, including:
  - stringing conductors between transmission line structures and the future Maragle 500 kV substation gantry (including overhead earth wire (OHEW) and OPGW)
  - installing droppers from the future substation gantry to the switchgear
- construction of the telecommunications hut, including:
  - bulk earthworks to form the pad for the hut
  - excavation and preparation for concrete foundations
  - installation of reinforced concrete and piled foundations

- excavation and installation of electrical equipment conduits, trenches and general site drainage work
- installation of the building, site wiring and electrical equipment
- installation of security fencing and site access gates

- installation of buried cabling from the 500 kV transmission line structures to Rye Park Wind Farm substation
- testing and commissioning of new electrical infrastructure
- demobilisation and rehabilitation of areas disturbed by construction activities.

A number of activities are expected to commence in accordance with the project conditions of approval before the key construction activities outlined above. These activities are considered pre-construction minor work and would comprise low impact activities that would begin after planning approval but prior to approval of the Construction Environmental Management Plan.

2.2.2 Construction program

Construction of the project is targeted to commence in 2024, and is estimated to take about 2.5 years to complete. The project is expected to be fully operational by the end of 2026 (refer to Figure 2-2).

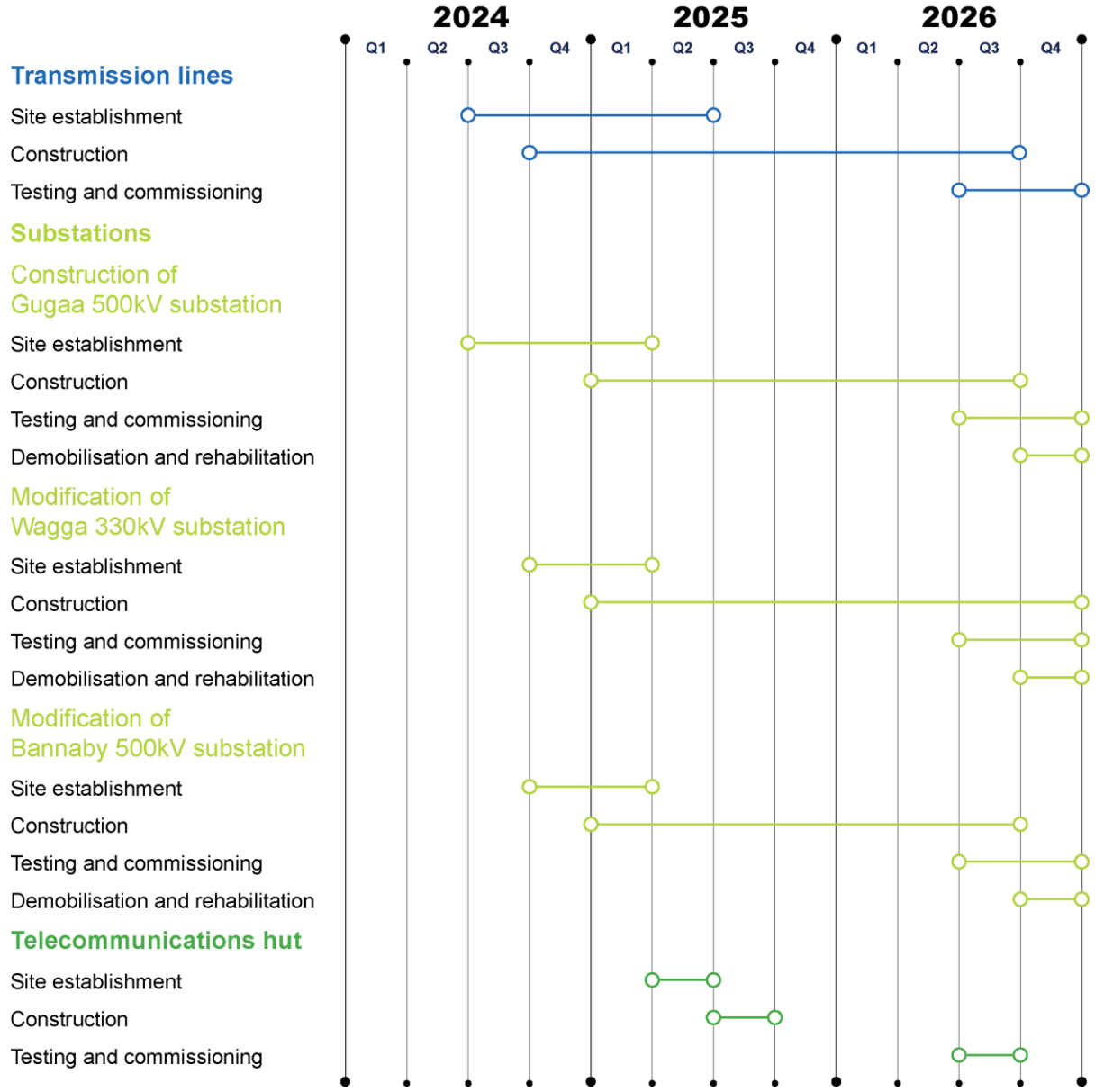


Figure 2-2 HumeLink indicative construction program

2.2.2.1 Indicative duration of construction activities

Construction at each transmission line structure would be intermittent and construction activities would not occur for the full duration at any one location. Durations of any particular construction activity, and inactive/respite periods, may vary for a number of reasons including (but not limited to):

- multiple work fronts
- resource and engineering constraints
- work sequencing and location.

Figure 2-3 presents an indicative duration of construction activities associated with an individual transmission line structure.

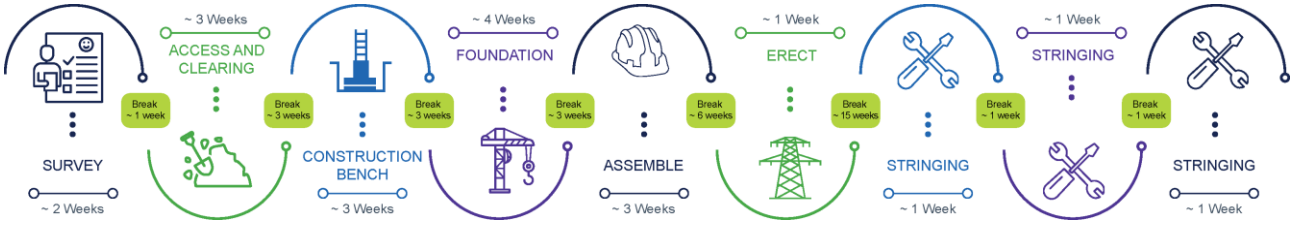


Figure 2-3 Indicative duration and sequence of construction activities for transmission line structures

Construction of the proposed Gugaa 500 kV substation could take up to 2.5 years.

2.2.3 Construction hours

It is expected that construction activities would largely be undertaken during standard construction hours. However, there would be times when working outside of standard construction hours would be required (as defined by the *Interim Construction Noise Guideline* (DECC, 2009)), subject to approval. As the details of construction methodology and project needs are developed, these hours will be refined for certain activities.

Where extended hours are proposed for activities in proximity to sensitive receivers, additional measures would be implemented and the work would be managed through an out-of-hours work protocol.

A series of work outside the standard construction hours is anticipated to include (but is not limited to) the following:

- transmission line construction at crossings of a main road or railway as these locations are expected to have restricted construction hours requiring some night work for activities such as conductor stringing over the crossing(s)
- work where a road occupancy licence (or similar) is required, depending on licence conditions
- transmission line cutover and commissioning
- the delivery of equipment or materials outside standard hours requested by police or other authorities for safety reasons (such as the delivery of transformer units)
- limited substation assembly work (eg oil filling of the transformers)
- connection of the new assets to existing assets under outage conditions (eg modification and/or connection work at Bannaby 500 kV substation, Wagga 330 kV substation and Maragle 500 kV substation), which is likely to require longer working hours
- emergency work to avoid the loss of lives and/or property and/or to prevent environmental harm
- work timed to correlate with system planning outages
- situations where agreement is reached with affected sensitive receivers
- activities that do not generate noise in excess of the applicable noise management level at any sensitive receiver.

2.2.4 Construction plant and equipment

An indicative list of construction plant and equipment likely to be required during construction is provided below.

- air compressor
- backhoe
- bobcat
- bulldozers
- concrete agitator
- concrete pump
- cranes (various sizes up to 400 tonnes)
- crawler crane with grab attachments
- drill and blast units and associated support plant/equipment
- drones
- dumper trucks
- elevated working platforms
- excavators (various sizes)
- flatbed hiab trucks
- fuel trucks
- generators
- graders
- helicopters and associated support plant/equipment
- mulchers
- piling rig
- pneumatic jackhammers
- rigid tippers
- rollers (10 to 15 and 12-15 tonnes)
- semi-trailers
- tilt tray trucks
- trenchers
- transport trucks
- watercarts
- winches.

2.2.5 Construction traffic

Construction vehicle movements would comprise vehicles transporting equipment, waste, materials and spoil, as well as workers' vehicles. A larger number of HVs would be required during the main civil construction work associated with the substations. Non-standard or oversized loads would also be required for the substation work (eg for transformer transport) and transportation of transmission line structure materials and conductors.

Hume Highway, Sturt Highway, Snowy Mountains Highway, Batlow Road and Gocup Road are the main national and state roads proposed to provide access routes to the project footprint. These roads would be supported by regional and local roads throughout the LGAs of Wagga Wagga City, Snowy Valleys, Yass Valley, Cootamundra-Gundagai Regional and Upper Lachlan Shire that provide access routes to the project footprint.

2.2.6 Construction workers

The construction worker numbers would vary depending on the stage of construction and associated activities. During peak construction activities, the project could employ up to 1,200 full-time equivalent construction workers across multiple work fronts. It is expected that the maximum number of construction workers at any one location would not exceed 200.

2.2.7 Testing and commissioning

Prior to energisation of the infrastructure, a series of pre-commissioning activities would be conducted. This would include testing the new transmission lines and substation earthing, primary and secondary equipment.

2.2.8 Demobilisation and rehabilitation

Demobilisation and site rehabilitation would be undertaken progressively throughout the project footprint during the construction program and would include the following typical activities:

- demobilisation of construction compounds and worker accommodation facility
- removal of materials, waste and redundant structures not required during operation of the project
- removal of temporary fencing and environmental controls.

2.3 Operation and maintenance of the project

The design life of the project is 50 years, which can be extended to more than 70 years for some assets.

The substations and transmission lines would be inspected by field staff and contractors on a regular basis, with other operational activities occurring in the event of an emergency (as required). The project would require about five workers (in addition to Transgrid's existing workers) during operation for ongoing maintenance activities. Likely maintenance activities would include:

- regular inspection (ground and aerial) and maintenance of electrical equipment
- general building, asset protection zone and access road/track
- vegetation clearing/trimming within the easement
- fire detection system inspection and maintenance
- stormwater drainage systems maintenance.

It is expected that these activities would only require LVs and/or small to medium plant (depending on the work required).

3 Legislative and policy context

The State legislation and policies applicable to this assessment are listed below.

3.1 State legislation

3.1.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and Environmental Planning and Assessment Regulation 2021 (EP&A Regulation 2021) provides a framework for the assessment and approval of projects in NSW.

The project has been declared as Critical State Significant Infrastructure (CSSI) in accordance with Section 5.13 of the EP&A Act. Therefore, the project is subject to environmental assessment under Division 5.2 of the EP&A Act. An EIS has been prepared in accordance with Division 5.2 of EP&A Act.

Of relevance to this assessment, Section 5.24 (f) of the EP&A Act states that an authorisation for a consent under section 138 of the *Roads Act 1993* cannot be refused, if it is necessary for carrying out approved State Significant Infrastructure and is to be substantially consistent with the approval under this Division.

3.1.2 Roads Act 1993

The objectives of the *Roads Act 1993* include the following:

- set out the rights of members of the public to pass along the road
- set out the rights of person who own land adjoining a public road to have access to the public road
- establish the procedures for opening and closing of a public road
- provide for the classification of roads, declare road authorities for both classified and unclassified roads and to confer certain functions of road authorities
- provide for distribution of functions conferred by the Act between road authorities
- regulate carrying out of various activities on public roads.

Section 138(1)(a) of the *Roads Act 1993* describes activities not permitted without consent of the appropriate road authority including:

- A person must not:
  - erect a structure or carry out a work in, on or over a public road
  - dig up or disturb the surface of a public road
  - remove or interfere with a structure, work or tree on a public road
  - connect a road (whether public or private) to a classified road (being roads declared as a highway, main road, secondary road or tourist road).

Construction of the project would require the installation of a structure over a public road, where the transmission line would cross over roads. In addition, it would potentially involve temporary closure of public roads, disturbance to trees/structures and/or connection to a classified road. While Transgrid would require consent to undertake work on classified roads, as a network operator under the *Electricity Supply Act 1995*, approval is not required from council under section 138 of the *Roads Act 1993* to undertake work over unclassified roads (local roads), due to the application of section 5 of Schedule 2 of the *Roads Act 1993*.

In addition, given the declaration of the project as CSSI in accordance with Section 5.24 (f) of the EP&A Act, authorisation for consent under section 138 of the *Roads Act 1993* cannot be refused.

3.2 Policy and strategic plans

3.2.1 NSW Heavy Vehicle Access Policy Framework 2018

NSW *Heavy Vehicle Access Policy Framework 2018* developed by Transport for NSW (TfNSW) outlines a strategic approach to heavy vehicle access in NSW for both State and council roads aimed at achieving safe and efficient movement of road freight.

With staged implementation, the framework aims to create a performance-based standards (PBS) network with connectivity across the whole NSW road network to unlock freight productivity. This policy provides a strategic planning approach to heavy vehicle access and streamlined policy promoting access on a network basis rather than ad hoc decisions for access via permits.

3.2.2 Road Safety Action Plan 2026

The *Road Safety Action Plan 2026* developed by the NSW Government sets out a road safety delivery framework that focuses on enhancing education and local engagement, transforming the safety of the road network and accelerating safety features in vehicles. The plan adopts the principles of the Safe System approach, which aims to eliminate fatal and serious road injuries to all road users. The key priority areas highlighted in *Road Safety Action Plan 2026* are:

- creating safer country roads and urban places
- enhancing road safety in local communities
- increasing the safety of light vehicles (LVs), HVs and protective equipment
- making safer choices on our roads
- ensuring the safety of vulnerable and other at-risk road users.

The mitigation measures identified in this report consider the approach to road safety and the key principles identified by the *Road Safety Action Plan 2026*, that aim to provide a safe temporary road environment.

3.2.3 Traffic Control at Work Sites – Technical Manual

The *Traffic Control at Work Sites* technical manual Version 6.1 (TfNSW, 2022) was developed by TfNSW to be applied to work sites requiring temporary traffic management. The purpose of this manual is to ensure best practices for traffic control at work sites. The manual also guides personnel involved in design, operation and inspection of temporary traffic management plan to understand their obligation under *Work Health and Safety Act 2011* and the Work Health and Safety Regulation 2017. The technical manual contains instruction for the following:

- managing risks associated with temporary traffic management
- developing a traffic management plan
- design, select, obtain approval, record and storing traffic guidance schemes
- undertaking traffic management in several specific situations.

The technical manual refers to *Australian Standards AS1742 Manual of Uniform Traffic Control Devices (Standards Australia, AS1742))*, *Australian Standards AS1743 Road Signs – Specifications (Standards Australia, AS1743*) and *Australian Standards AS*2700 *Colour standards for general purposes (Standards Australia, AS2700)*. The mitigation measures identified in this report include the implementation of this manual at all traffic control sites during the construction and operation of the project.

4 Methodology

This section provides an outline of the methodology adopted in developing this assessment and the sources of the data used, with consideration to the project SEARs as listed in Section 1.4.

4.1 Overview of approach

The following tasks were completed while undertaking this assessment:

- defining the traffic study area through identification of access routes anticipated to be used for movement of construction workers and materials
- desktop analysis to identify and qualitatively assess existing transport conditions
- calculating traffic generation and distribution within the traffic study area as a result of construction and operation of the project
- assessment of the impacts on LoS on access routes within the traffic study area based on the traffic generated by the project
- traffic and transport impact assessment during construction and operation
- assessment of cumulative impacts
- detailing appropriate traffic and transport mitigation and management measures.

4.1.1 Study area

4.1.1.1 Traffic study area

The traffic study area, illustrated by Figure 4-1, comprises the anticipated access routes within the existing road network required for the construction and/or operation of the project. The access routes are located across multiple LGAs including Wagga Wagga City, Snowy Valleys, Cootamundra-Gundagai Regional, Yass Valley, Goulburn-Mulwaree, Upper Lachlan Shire and Hilltops.

Construction of the project would require the transport of construction material and equipment from multiple locations using national, state, and local road networks, in addition to local access tracks. There would also be movements of project workers across a wide area during construction, both travelling to and from the project construction work sites at the beginning and end of the working day as well as travelling between project construction work sites during the working day.

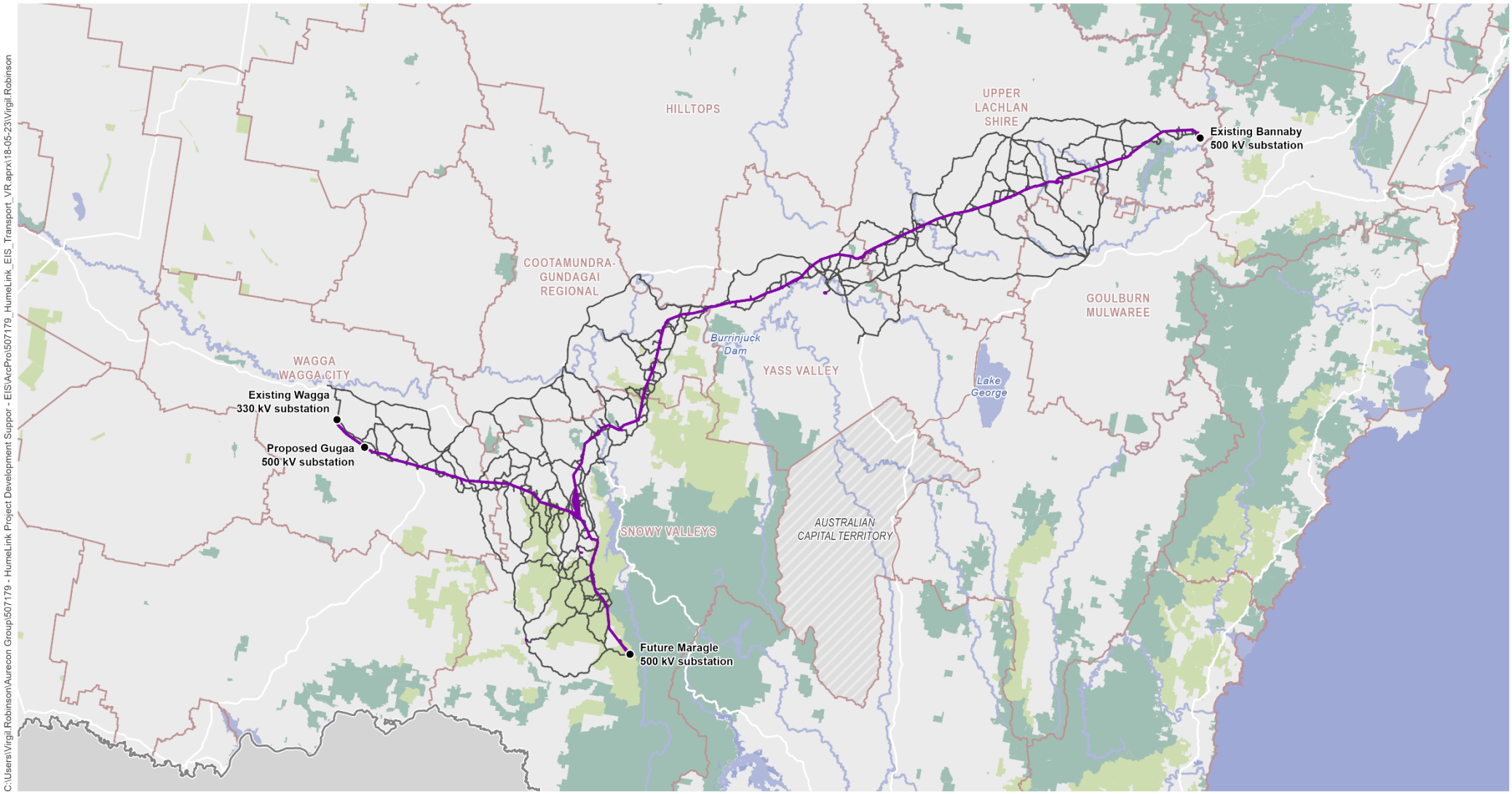
During operation, the project would generate traffic movements within the traffic study area, albeit to a much lesser extent. Traffic movements during operation would generally be associated with maintenance activities.

In order to define the traffic study area, the following were considered:

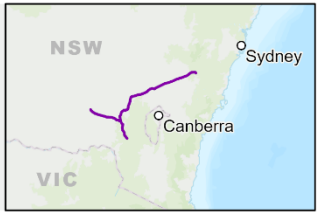
- national road network
- state road network
- local road network
- access tracks.

The traffic study area was then refined to capture the roads that may be used to provide access routes to:

- the project footprint (within which the transmission line structures, construction compounds, substations, proposed worker accommodation facility and other work sites would be located)
- the surrounding existing road network
- the surrounding towns/ urban centres where it is anticipated that the project workers would be accommodated.



Project footprint
State of Victoria
Local Government Area
Traffic study area
National park and reserve
State forest
Waterbody
Waterway
Major road
Substation



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:1,100,000
0 20 40 km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

FIGURE 4-1: Traffic study area

4.1.1.2 Other transport networks considered

The assessment has also identified and assessed impacts more broadly to the existing:

- active and public transport services within the LGAs and the traffic study area
- oversize-overmass road network for delivery of oversized equipment from ports to substations as large components, like transformers, are expected to be transported from Newcastle Port by HVs travelling on restricted routes (including, but not limited to, restricted access vehicles and over size and/or over mass (OSOM routes for OSOM vehicles))
- rail network that crosses the project footprint.

Two studies (Rex J Andrews, 2021 and Rex J Andrews, 2021a) have been used to identify and assess the most suitable OSOM routes for movements from Newcastle to the existing Bannaby 500 kV substation site and Newcastle to the proposed Gugaa 500 kV substation site. Constraints identified on these routes are detailed in Section 6.1.5.

4.1.2 Desktop analysis

The following data and corresponding sources have been used in this assessment:

- *NSW Road Network Classifications* (TfNSW, 2022a) – A publicly available website providing information on classification of roads within NSW
- *TfNSW Traffic Volume Viewer* (TfNSW, 2022b) –A publicly available website providing traffic volumes (including heavy vehicle percentages) at selected state roads within NSW. The location of available data depends on the location of traffic count stations installed and operated by TfNSW
- *Centre for Road Safety* (TfNSW, 2022c) – A publicly available website providing historical crash data for the period 2016 to 2020
- *NSW TrainLink* (TfNSW, 2022d) – Publicly available website providing the regional train and coach services timetable and routes within NSW
- *Cycleway Finder* (TfNSW, 2022e) – Publicly available websites with database of cycling infrastructure located throughout NSW
- *Guide to Traffic Management Part 3: Transport Study and Analysis Methods* (Austroads, 2020) – A publicly available guide to a description of the various level of services impacting road network performance
- *Interactive crash statistics* (TfNSW, 2022c) – Publicly available websites with crash history data to understand the crash severity and to provide a safety overview of the road network conditions
- *NSW Public Level Crossing Finder* (TfNSW, 2022f) – Publicly available website to identify the location of rail line interactions within the project footprint.

Targeted traffic surveys did not form part of the methodology for this assessment. The assessment used publicly available traffic data, which was validated for use in this assessment. The historical traffic count data for previous years validated by considering the change in land use developments. In the cases where no major development was observed a global growth factor of one percent for every five years has been used to estimate the current traffic count. Available traffic count data for roads were increased using growth factors to estimate peak hour traffic. Attachment C provides details of the traffic volumes for access routes which were either estimated or based on publicly available traffic data.

4.1.3 Consultation undertaken with Councils

Consultation has been undertaken with Wagga Wagga City Council, Snowy Valleys Council and Yass Valley Council in February 2022. The consultation consisted of presentations where the following items were discussed in relation to traffic and transport:

- confirmation of road classification and potential constraints
- confirmation of road and bridge weight limitations/constraints for all assets within the relevant LGAs for use in construction route planning
- identification of relevant council contacts for future correspondence in relation to the project.

No key issues were raised during consultation to date. Ongoing consultation with councils will be carried out as the project is developed further during detailed design.

4.1.4 Identification of road network utilised for the project

The access routes have been identified using GIS to create a combination of roads and access tracks. These routes connect proposed transmission line structures, construction compounds, substations and accommodation locations within the traffic study area. The road segments forming the routes were identified and classified as per information available on NSW *Road Network Classifications* (TfNSW, 2022a) for the national, state, regional and local network. A desktop review of the roads comprising the routes was undertaken using available aerial imagery and open-source data to summarise the existing road network condition.

4.1.4.1 Road network performance

Level of Service (LoS) criteria was used to assess the existing road network performance and quantify the anticipated impact on the roads, which are likely to be impacted by the project. It is important to note that LoS criteria does not apply to informal roads such as access tracks and therefore they have not been included in this part of the assessment.

The LoS criteria is based on the volume to capacity ratio (VCR) of the roads for assessment of performance at mid-block. The VCR represents the level of congestion on a road and is calculated by dividing traffic volume along a road with its designated capacity. When the VCR reaches 1, this indicates the road is operating at 100 per cent capacity. The LoS is classified from LoS A to F, with A representing best operating conditions and F the worst. The description of the various level of services is based on Austroads (2020) *Guide to Traffic Management Part 3: Transport Study and Analysis Methods* are listed below:

- **LoS A** describes free-flow operations. Vehicles are almost completely unimpeded in their ability to manoeuvre within the traffic stream. The effects of incident or point breakdowns are easily absorbed.
- **LoS B** represents reasonably free-flow operations. The ability to manoeuvre within the traffic stream is only slightly restricted and the general level of physical and psychological comfort provided to drivers is still high. The effects of incident or point breakdowns are still easily absorbed.
- **LoS C** provides the flow conditions with speeds near the free-flow speed. Freedom to manoeuvre within the traffic stream is noticeably restricted, and lane changes require more care and lane change requires more care and vigilance on the part of the driver. Minor incidents may still be absorbed.
- **LoS D** is the level at which speeds begin to decline slightly with increasing flows, with density increasing more quickly. Freedom to manoeuvre is seriously limited and the drivers experience reduced physical and psychological comfort levels. Even minor incidents can be expected to create queuing, because the traffic stream has little space to absorb disruptions.
- **LoS E** describes operation at or near capacity. Operations at this level are highly volatile as there are virtually no usable gaps within the traffic stream, leaving little room to manoeuvre within the traffic stream. The physical and psychological comfort of drivers is poor.
- **LoS F** describes unstable flow.

Conversion between VCR and LoS is speed dependent and based on methodologies outlined in Austroads (2020) *Guide to Traffic Management Part 3: Transport Study and Analysis Methods*.

With regards to lane capacity, the following assumptions have been made based on the functional hierarchy of road as per Austroads (2020) *Guide to Traffic Management Part 3: Transport Study and Analysis Methods:*

- Highways (typically state roads) represent uninterrupted traffic conditions with high operation speed of 90 km/h or above. At LoS E, as per Austroads maximum service flow rate at free flow speed of 90 km/h is 2,100 passenger/km/h. Conservatively, the lane capacity of 1,800 vehicle/km/h is adopted to account for variation in vehicle type and road conditions.
- Arterial road (typically regional roads or state roads in urban areas) represents interrupted road conditions with access to some properties and streets with operation speed of 70 km/h to 90 km/h.
- Collector roads (typically regional roads and some Local roads) are similar to arterial roads with speed limit less than or equal to 60 km/h.
- Local roads represent interrupted conditions with access to properties, parking lanes and posted speed of 50 km/h.

Table 4-1 provides the reference for conversion of VCR and LOS and lists the lane capacity based on functional classification of roads based on Austroads (2020) *Guide to Traffic Management Part 3: Transport Study and Analysis Methods*.

Table 4-1 Level of Service description for road performance

Level of Service	Volume Capacity Ratio by Speed			
	Local road	Collector road	Arterial	Highway
A	<0.24	<0.24	<0.28	<0.30
B	0.24–0.38	0.24–0.38	0.28–0.44	0.30–0.47
C	0.38–0.54	0.38–0.54	0.44–0.64	0.47–0.68
D	0.54–0.78	0.54–0.78	0.64–0.84	0.68–0.89
E	0.78–1.00	0.78–1.00	0.84–1.00	0.89–1.00
F	>1.00	>1.00	>1.00	>1.00
Lane capacity at Los E	900	1000	1400	1800

Source: Guide to Traffic Management Part 3: Transport Study and Analysis Methods (Austroads, 2020)

By categorising changes to the VCR of affected roads against existing conditions, the LoS criteria can indicate how the project would impact on road network efficiency during construction and operation. The following impact categorisation has been adopted in this assessment:

- **low impact**: no change in LoS
- **medium impact**: one level change in LoS
- **high impact**: two or more level changes in LoS.

The existing road network performance for roads providing access to the project has been identified in Section 5.3. Impact on road performance during construction is assessed in Section 6.3.1. The impact on road network performance during operation is described in Section 7.3.1.

4.1.4.2 Duration of construction impacts

In order to further describe road traffic impacts from construction activities, beyond LoS criteria, impacts are also described in terms of their duration. The duration is categorised as follows:

- short term: impacts are possible up to 6 months
- medium term: impacts are possible up to 1 year
- long term: impacts are possible for the full construction duration.

The roads in the traffic study area (referred to in Section 6.3.1) have been described in the context of these short, medium and long term impacts, based on the expected duration of anticipated construction traffic.

4.1.4.3 Road safety assessment

A road safety review was undertaken using crash data for key roads. Crash data has been sourced from *Interactive crash statistics* (TfNSW, 2022c), for the five-year period from 2016 to 2020. Crash history data was analysed and summarised for each LGA to understand the crash severity and to provide a safety overview of the road network conditions along the route.

For access to the construction compounds, a high-level assessment was undertaken to review the crash history within the vicinity of proposed access road connections.

4.1.4.4 Rail network assessment

NSW Public Level Crossing Finder (TfNSW, 2022f) was used to identify the location of rail line interactions with the project footprint, operational status and usage frequency of the rail network. A qualitative assessment of impacts was then undertaken considering potential road – rail interactions arising from the project. These impacts are presented in Section 6.3.3.

4.2 Limitations and uncertainty

This report is subject to the following limitations:

- No traffic survey data was generated as part of this assessment. The data used in this analysis was sourced from road authorities' records for previous years. Appropriate review and benchmarking were undertaken for data validation.
- No topographic survey was undertaken as part of the scope for the routes identified. The assessment was based on desktop assessment only, utilising the available information provided by the client or publicly listed on the road authorities' websites.
- The access routes identified in this assessment are indicative only and based on the information available and the GIS analysis tool. These routes may change during design development, or as a result of final worker accommodation location(s), changes to the construction methodology and other external factors such as road damage due to severe weather events.
- The impact on active transport was assessed on the potential for interaction of the construction traffic with active transport users, based on the availability of active transport infrastructure.
- On-road public transport would be impacted by the change in level of performance of the road network along the on-road public transport routes. Therefore, impact on public transport has been assessed based on the change in road performance.

5 Existing environment

5.1 Road network

This section describes the existing conditions of roads within the traffic study area. Road classifications are described in accordance with the *Roads Act 1993* and NSW road classification (TfNSW, 2022a).

The locations of the roads listed in this section are shown in Figure 5-1 along with the routes proposed for project access. The roads providing access (during construction and operation) to construction compounds, substation sites and transmission line structure locations comprise national roads, state roads and regional roads connected with a network of sealed and unsealed local roads and access tracks. The lightly trafficked road network within the traffic study area reflects the largely rural nature of the locality.

5.1.1 National and state roads

The characteristics of all national and state roads that may provide access routes to the project footprint are detailed in Table 5-1.

Table 5-1 Key roads that form part of the national and state road network

Road name	Description	Road surface type	Lane counts	Speed limit	Pedestrian / cyclist provisions
National road network					
Hume Highway (M31)	Hume Highway is 840 km long national highway connecting Sydney in the north to Melbourne in the south. Most sections near major towns are bypasses which connect the towns to the highway through local or regional roads. The highway is a dual carriageway with restricted entry from adjoining land.	Sealed	General: ■ two lane per direction.	General: ■ 110 km/h.	General: ■ sealed shoulder.
State road network					
Snowy Mountains Highway (B72) including: ■ Blowering Road ■ Fitzroy Street ■ Adelong Road ■ Tumut Street ■ Inglis Street.	The Snowy Mountains Highway (B72) is a 333 km long state highway connecting Hume Highway in the west to Princess Highway in the east. Within the study area, the highway passed through the LGAs of Snowy Valleys and Cootamundra-Gundagai Regional and serves as an important link for freight and tourism. Blowering Road is a section of the B72 in Tumut between Fitzroy Street and East Street, approximately 2 km long. Fitzroy Street is section of the B72 in Tumut between Wee Jasper Road and Blowering Road, approximately 2.2 km long. Adelong Road is a section of the B72 in Tumut between Capper Street and Boundary Street, approximately 950 m long. Tumut Street is a section of the B72 in Adelong between Campbell Street and Inglis Street, approximately 800 m long. Inglis Street is a section of the B72 route in Adelong between Tumut Street and Lynch Street, approximately 300 m long.	Sealed	General: ■ One lane per direction. In towns: ■ one lane with additional kerbside parking lane per direction.	General: ■ 100 km/h Near towns: ■ 80 – 50 km/h	General: ■ sealed shoulder. In towns ■ mostly with footpaths ■ sealed shoulder on Blowering Road, Adelong Street and Inglis Street.
Batlow Road (HW85) including: ■ Reedy Street.	Batlow Road (HW85) is a 74 km long north-south state highway connecting the towns of Batlow and Tumbarumba in the south with the Snowy Mountains Highway (B72) in the north. Reedy Street is a section of the HW85 between May Day Road and Kurrajong Avenue, approximately 350 m long.	Sealed	General: ■ one lane per direction. In towns: ■ one lane with additional kerbside parking lane per direction.	General: ■ 100 km/h. Near towns: ■ 50 km/h.	General: ■ sealed shoulder. In towns: ■ mostly with footpaths.

Road name	Description	Road surface type	Lane counts	Speed limit	Pedestrian / cyclist provisions
Barton Highway (A25)	Barton Highway (A15) is a north-south rural highway connecting Hume Highway in North at Yass to ACT while serving the towns of Murrumbateman, Hall and Canberra. Upgrade of Barton Highway is planned under Barton Highway Improvement Strategy in 4 stages of which Stage 1 is under construction and Stage 2 is under planning.	Sealed	General: ■ one lane per direction ■ two lane per direction for 8.5 km south of Hume Highway. In towns: ■ one lane with additional kerbside parking lane per.	General: ■ 100 or 110 km/h. Near towns: ■ 70 – 50 km/h.	General: ■ sealed shoulder. In towns: ■ mostly with footpaths.
Crookwell – Goulburn Road including: ■ Goulburn Street (Crookwell) ■ Carrington Street (Crookwell) ■ Fitzroy Street (Goulburn).	Crookwell – Goulburn Road is a north-south highway connecting Crookwell in the north and Goulburn in the south. The section between Crookwell and Pejar Dam is Goulburn Road and the section between Pejar Dam to Goulburn is Crookwell Road. Goulburn Street is a section of Crookwell- Goulburn Road between Grange Road and Laggan Road, approximately 1.8 km long. Carrington Street is a section of Crookwell- Goulburn Road between Laggan Road and Stephenson Street, approximately 1.3 km long. Fitzroy Street is a section of Crookwell- Goulburn Road between Nelson Place and Goulburn High School, approximately 1.5 km long.	Sealed	General: ■ one lane per direction. In towns: ■ one lane with additional kerbside parking lane per.	General: ■ 100 km/h. In towns: ■ 60 – 50 km/h.	General: ■ sealed shoulder. In towns: ■ mostly with footpaths.
Gocup Road including: ■ Minjary Street.	Gocup Road is about 31 km in length and runs north from the Snowy Mountains Highway (HW4) at Tumut to the Hume Highway (HW2) at Gundagai. This road is used by HVs primarily associated with the local timber and milling industry. TfNSW completed the Gocup Road upgrade in 2019 to improve road safety and freight efficiency. Minjary Street is a section of Gocup Road in Minjary, approximately 1.5 km long.	Sealed	General: ■ one lane per direction. In towns: ■ one lane with additional.	General: ■ 100 km/h. Near towns: ■ 50 km/h.	General: ■ sealed shoulder. Near towns: ■ sealed shoulder.

Road name	Description	Road surface type	Lane counts	Speed limit	Pedestrian / cyclist provisions
Sturt Highway (A20) including: ■ Edward Street (Wagga Wagga) ■ Hammond Avenue (Wagga Wagga).	Sturt Highway has a generally east-west alignment connecting Hume Highway in the Wagga Wagga City LGA and passes through Wagga Wagga to connect to Victoria in the LGA of Balranald. Edward Street is the section of the A20 route between Lake Albert Road and Olympic Highway, approximately 3 km long. Hammond Avenue is the section of the A20 route between Lake Albert Road and Tasman Road / Eunony Bridge Road, approximately 4 km long.	Sealed	General: ■ one lane per direction. In towns: ■ mostly one lane with additional kerbside parking lane per direction.	General: ■ 100 km/h. In towns: ■ 50 or 60 km/h.	General: ■ sealed shoulders. In towns: ■ mostly with footpaths.

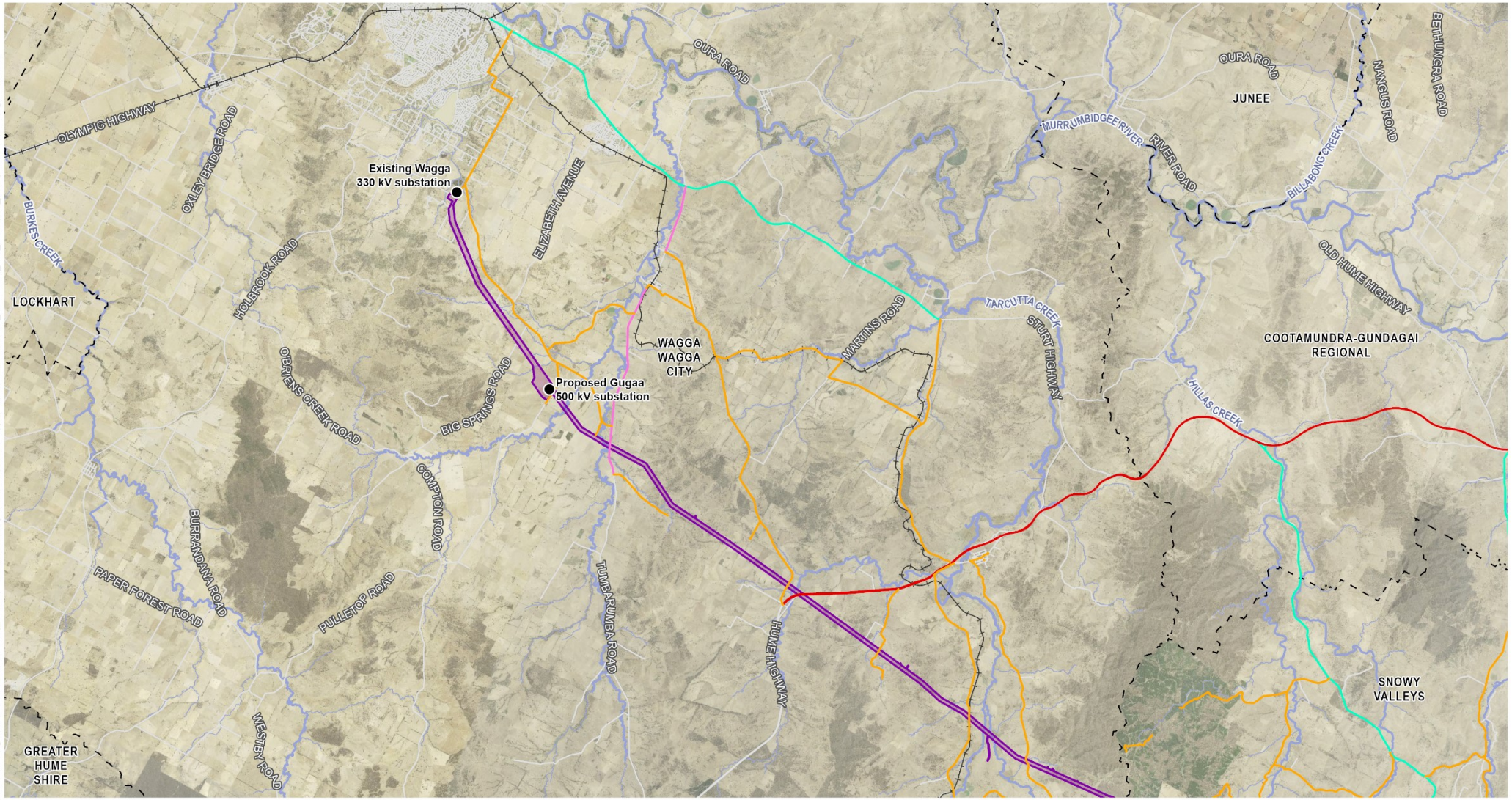
5.1.2 Regional roads

Regional roads perform the intermediate function between state roads and local roads by connecting regional urban areas to the state road network as well as other regional urban areas. The 31 regional roads expected to be used to access the project are summarised in Attachment A.

These regional roads are mostly sealed except for Laggan-Taralga Road, which is unsealed. Posted speed on these regional roads is generally 100 km/h, which reduces to 60 or 80 km/h on approach to towns and 50 km/h in urban areas. Most of the regional roads within the traffic study area do not have dedicated pedestrian and cyclist facilities. Outside towns and urban areas, high speed coupled with the rural nature of the regional roads present a challenging environment for uptake of active transport with minimal pedestrian and cyclist activities provided for or anticipated (refer to Section 5.6).

5.1.3 Local roads

Local roads considered in this assessment within the traffic study area are identified in Attachment B. These roads are considered representative of any potential alternative options that could be used for the project. Attachment B summarises details of these local roads, including lane counts and pavement types of 149 unsealed roads and 99 sealed roads.



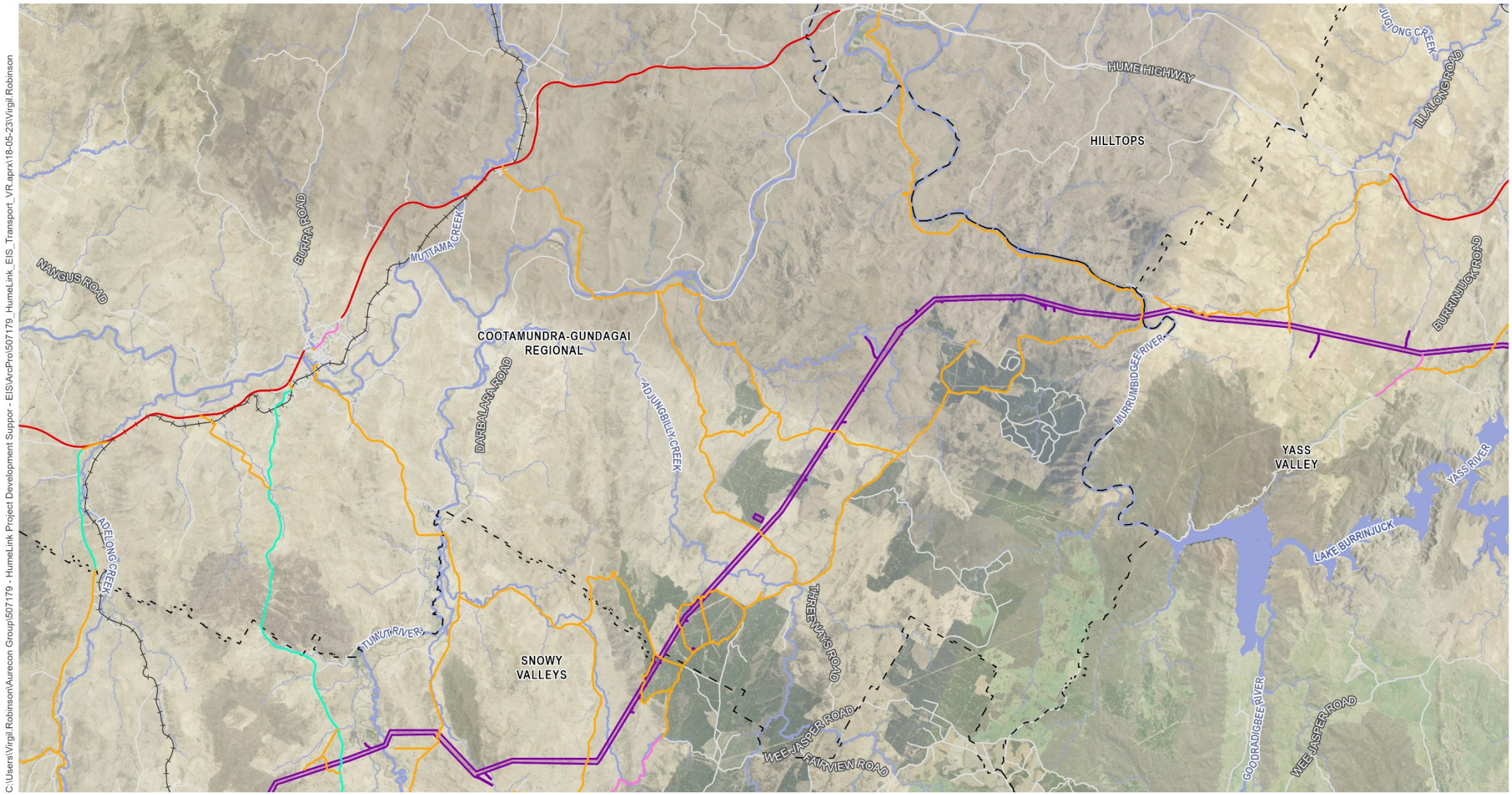
Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8 km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-1a: Road network classification for roads part of the study area



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

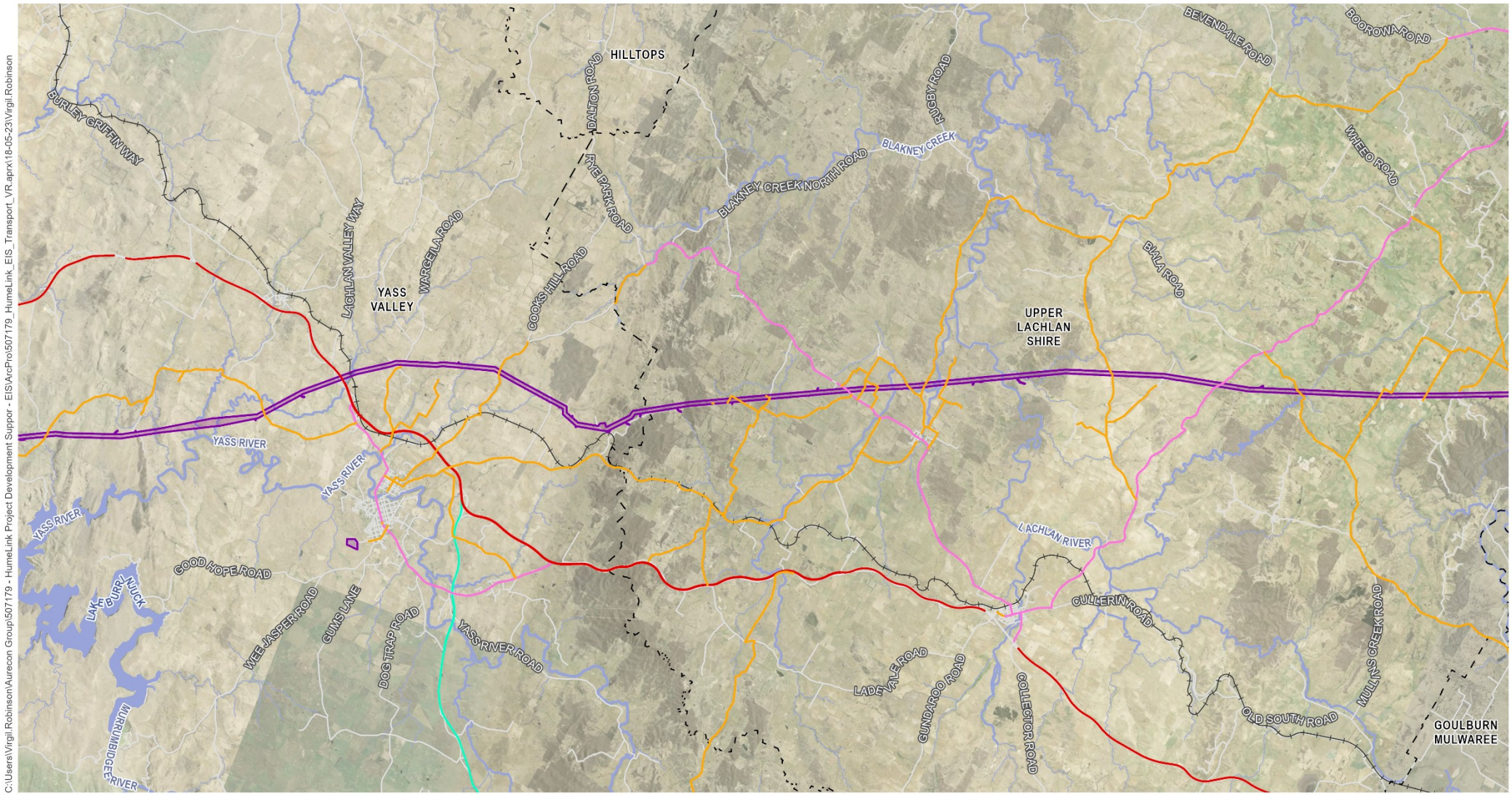
1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-1b: Road network classification for roads part of the study area



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

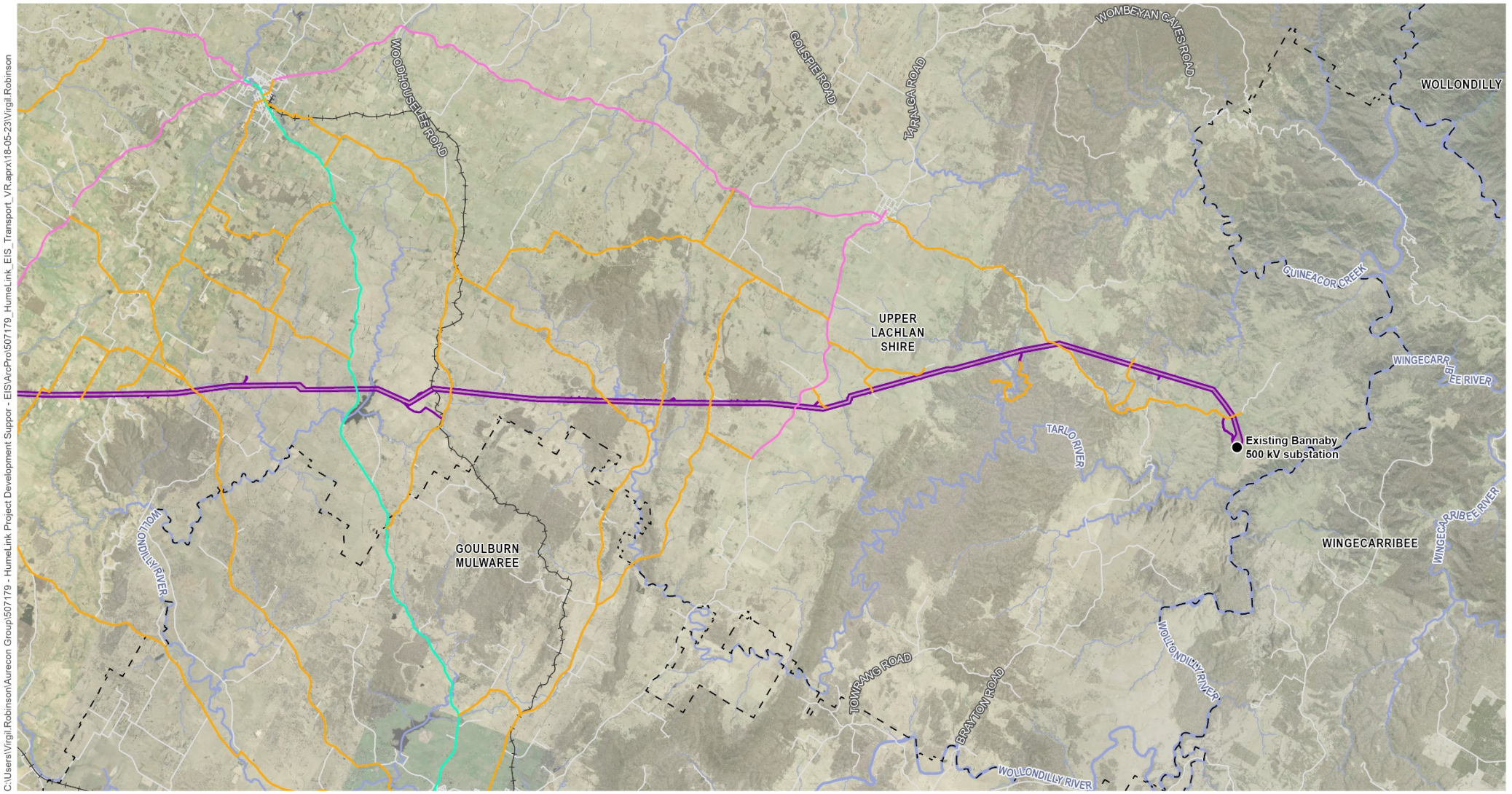
1:200,000

0 4 8 km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-1c: Road network classification for roads part of the study area



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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

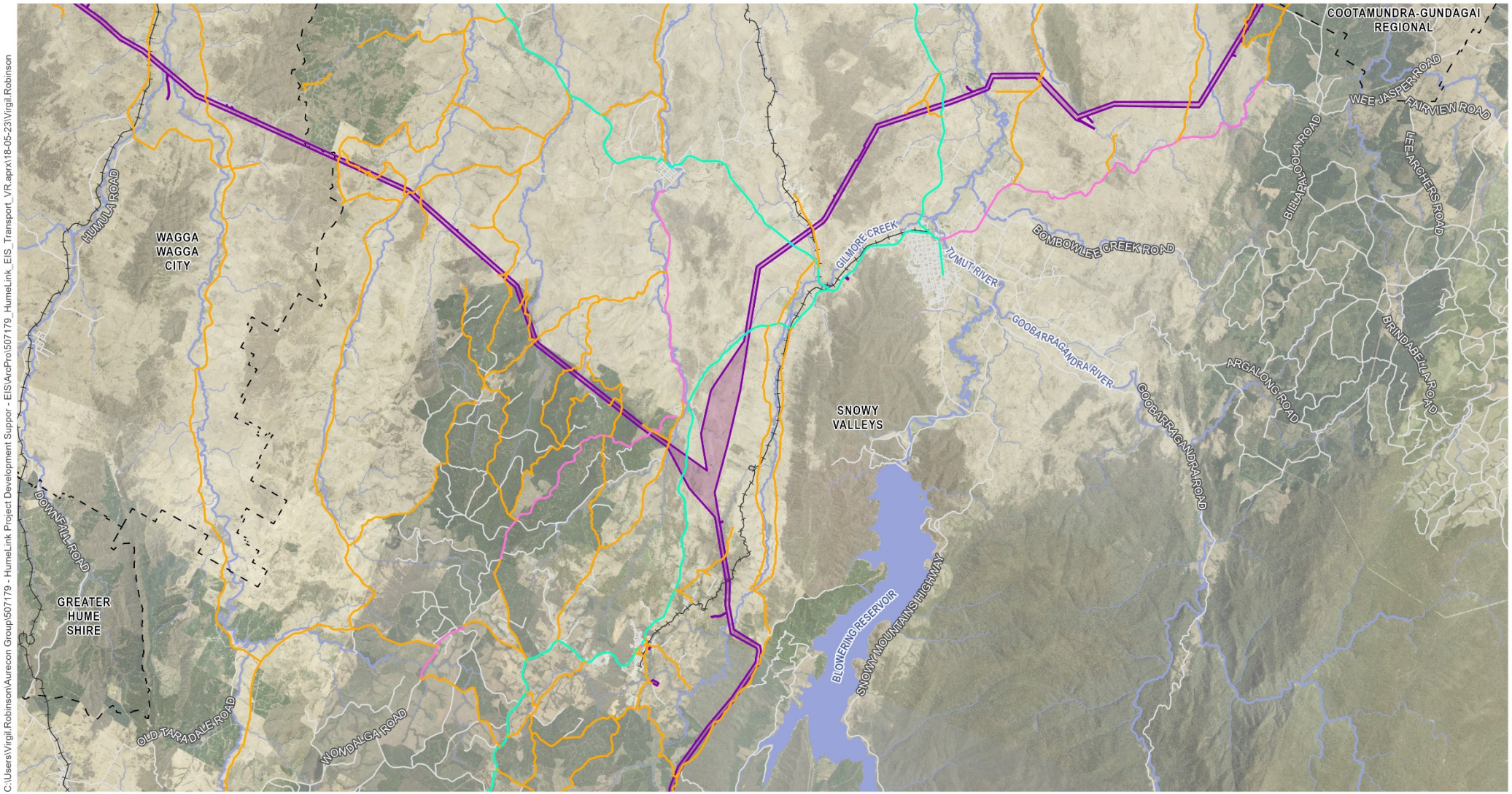
1:200,000

0 4 8km

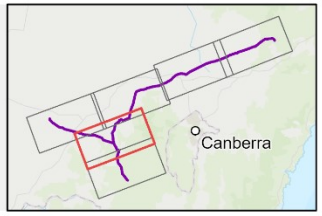
Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-1d: Road network classification for roads part of the study area



Project footprint
Local Government Area
Watercourse
Railway
Local road
National road
Regional road
State road

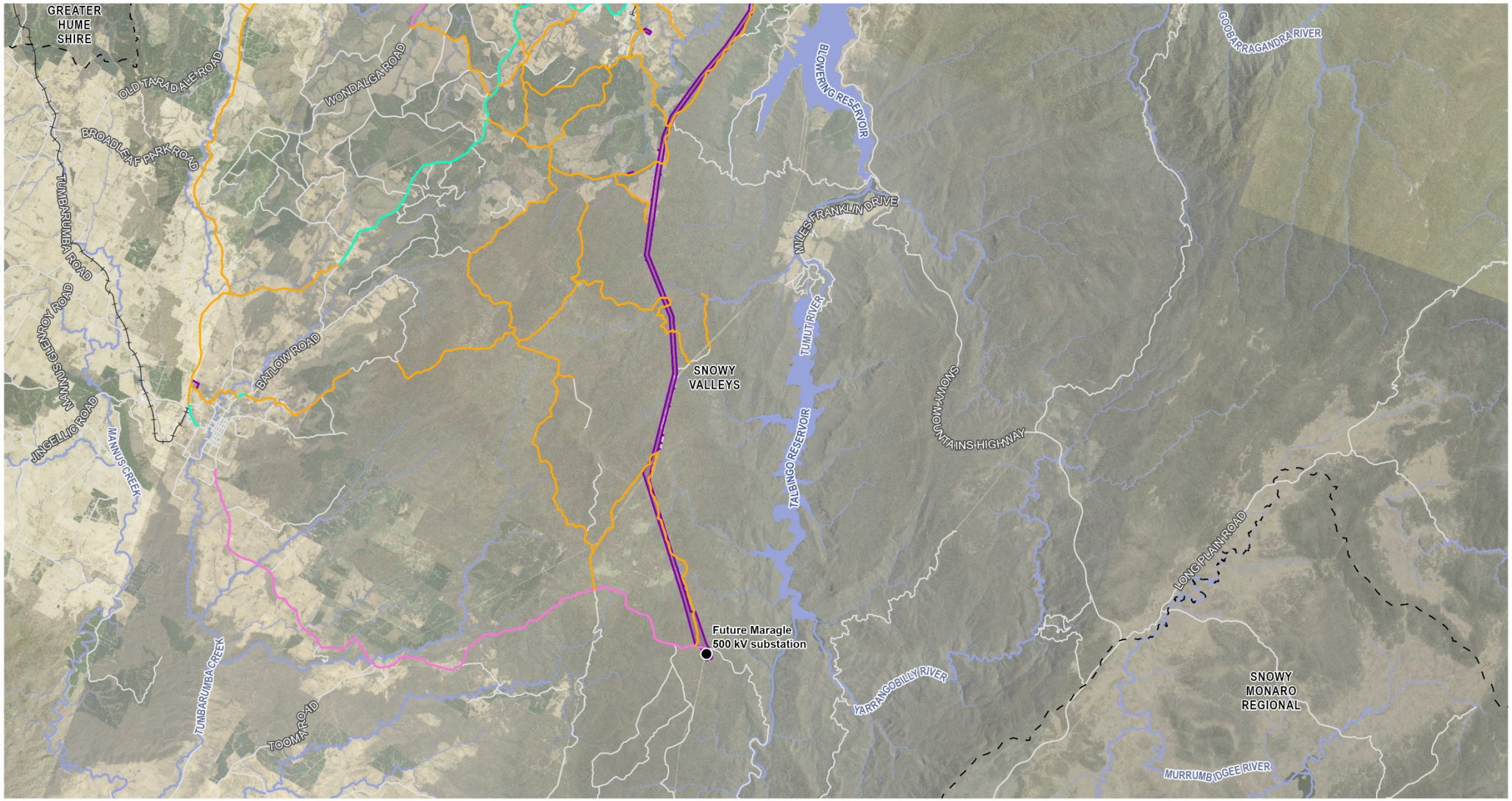


Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8 km

Projection: GDA 1994 MGA Zone 55

Figure 5-1e: Road network classification for roads part of the study area



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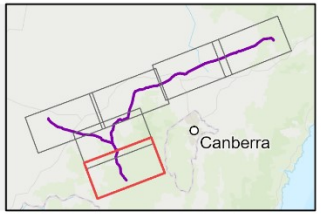
Project footprint
Local Government Area
Watercourse
Railway
Local road
National road
Regional road
State road
Substation



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8km

Projection: GDA 1994 MGA Zone 55

Figure 5-1f: Road network classification for roads part of the study area

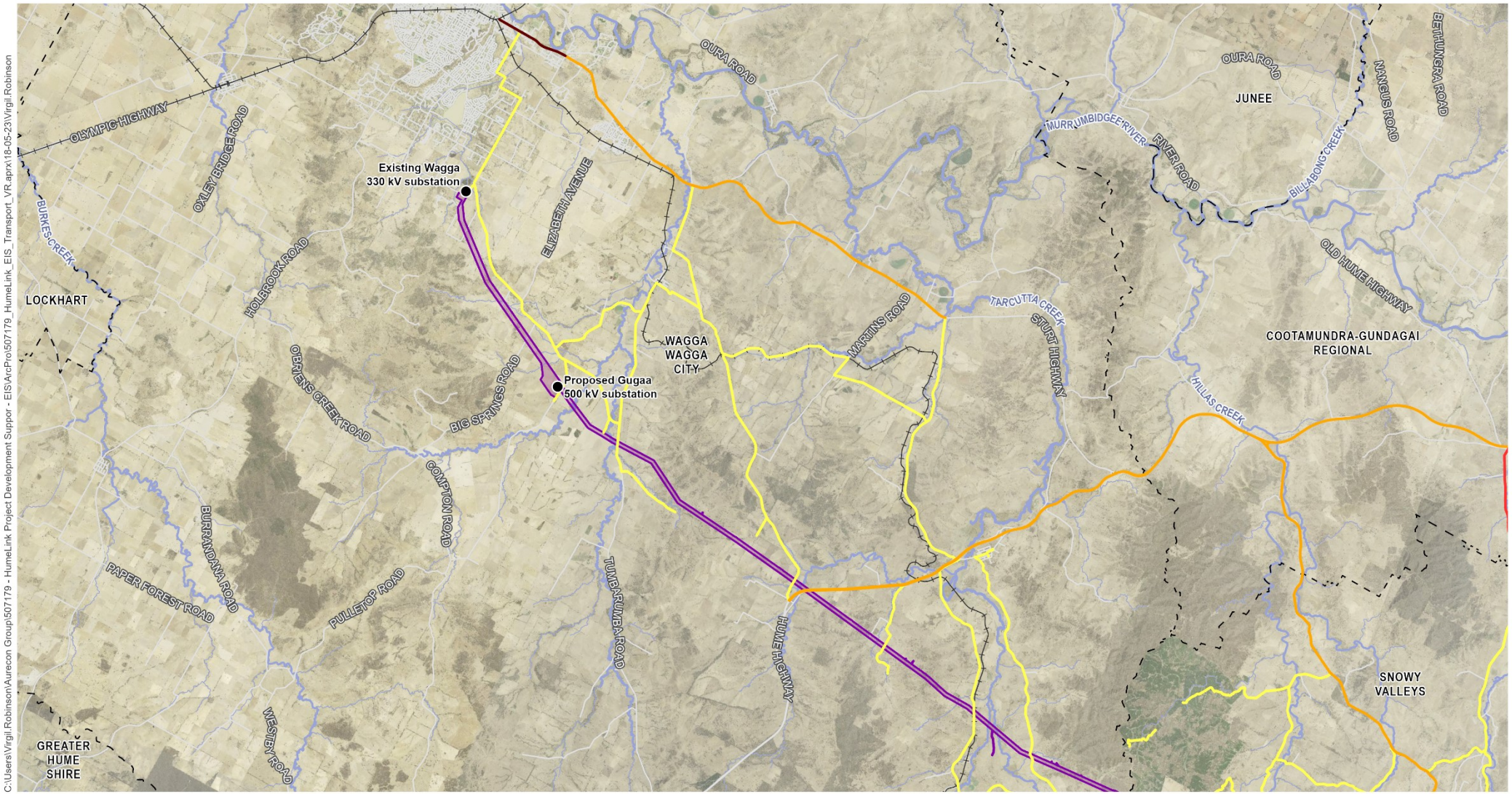
5.2 Traffic volumes

The peak hour traffic volume of the roads within the traffic study area is summarised in Attachment C and illustrated in Figure 5-2.

Due to their design and functional characteristics, state roads are expected to cater for high traffic volumes. In the traffic study area, state roads likely to be used for accessing the project have typical peak hourly traffic volumes upwards of 50 vehicles in one direction of travel. Hammond Avenue, which forms part of the Sturt Highway in Wagga Wagga City LGA, is the busiest state road carrying 910 vehicles in one direction of travel (TfNSW, 2022). Otherwise, the Hume Highway and Barton Highway within Yass Valley LGA and the Hume Highway in Cootamundra-Gundagai Regional LGA are the only state roads with peak hourly volume over 350 vehicles in one direction of travel.

Regional roads providing access to the project have typical peak volumes between 20 to 70 vehicles in one direction. Comur Street, Laidlaw Street and Yass Valley Way within Yass Valley LGA caters to maximum peak hour traffic volume of between 320 to 350 vehicles in one direction.

Local roads providing access to the project have typical peak volumes of 10 to 70 vehicles in one direction of travel. Few local roads, owing to their location in busy urban environments or functional hierarchy, carry higher peak hour volumes between 100 to 150 vehicle per direction. As expected, the sealed local roads carry higher peak hour volumes per direction. Peak hour volumes on unsealed roads is about 30 vehicles per direction.



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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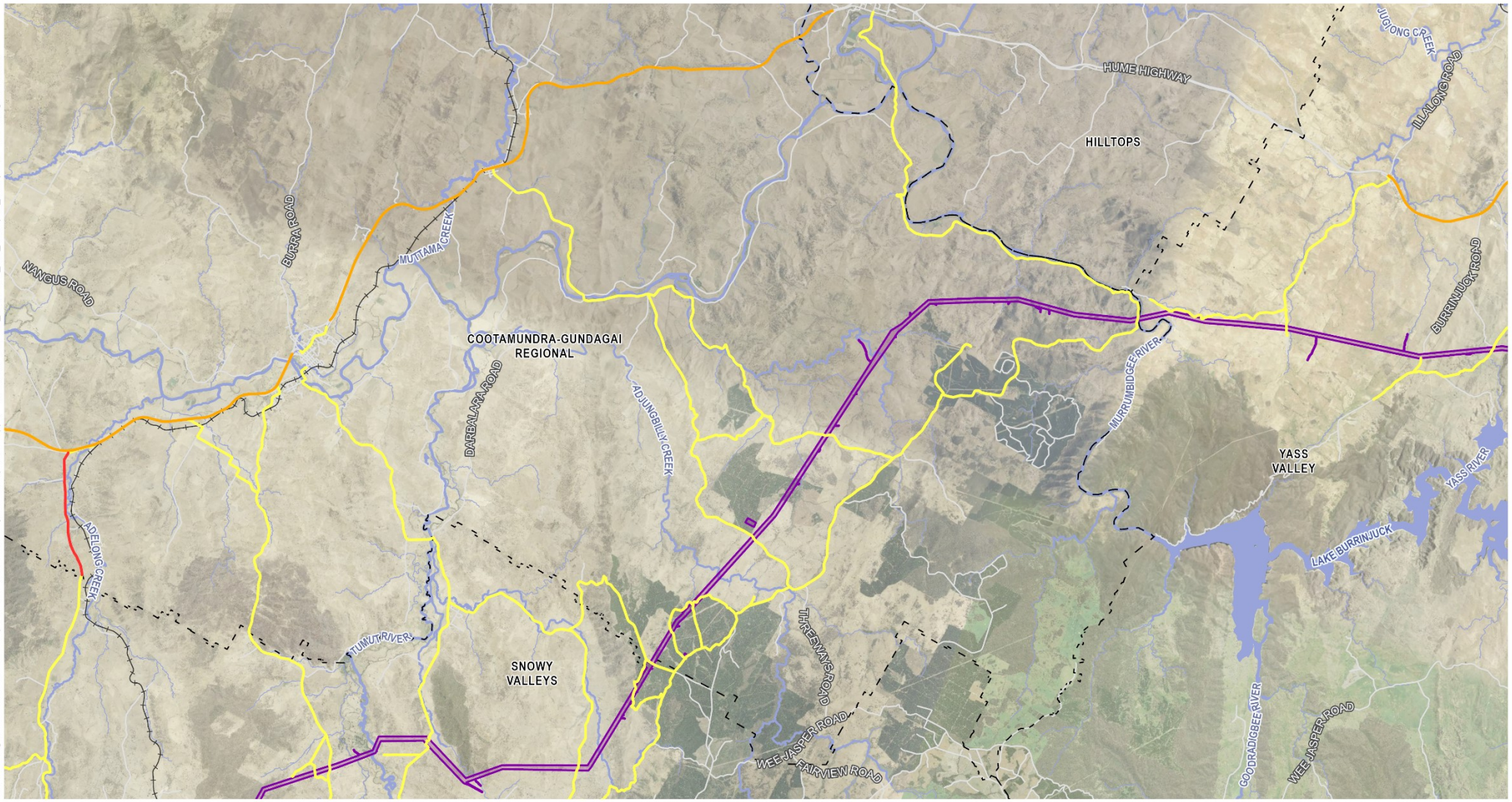
0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-2a: Peak hour traffic volume on roads providing access to project



Project footprint

Local Government Area

Watercourse

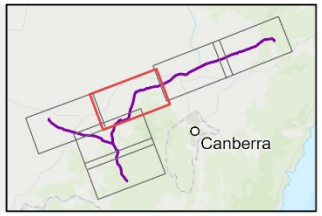
Railway

Estimated peak hour volume (vehicles per hour in one direction)

10 - 100

101 - 200

201 - 400



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

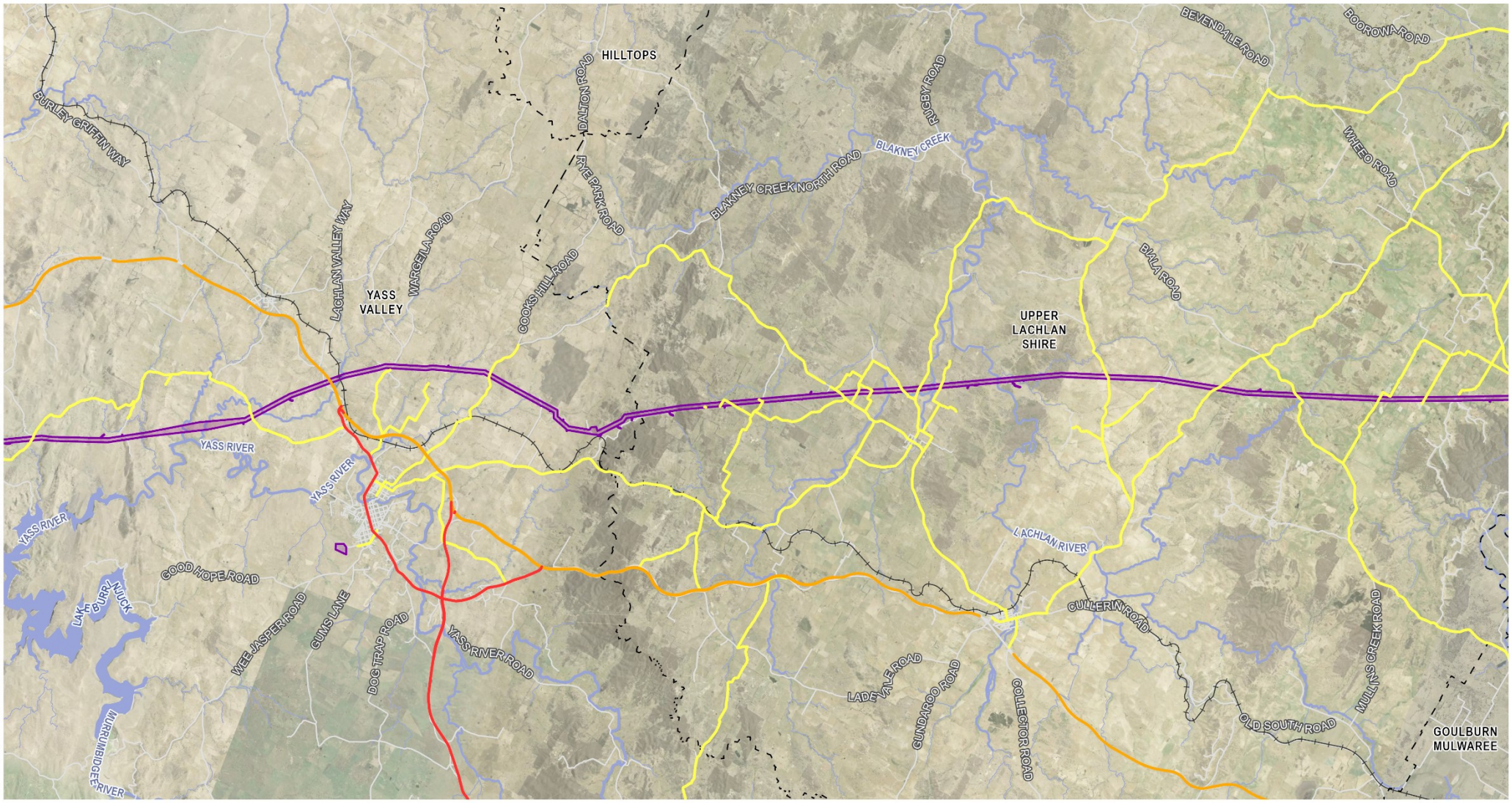
1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-2b: Peak hour traffic volume on roads providing access to project



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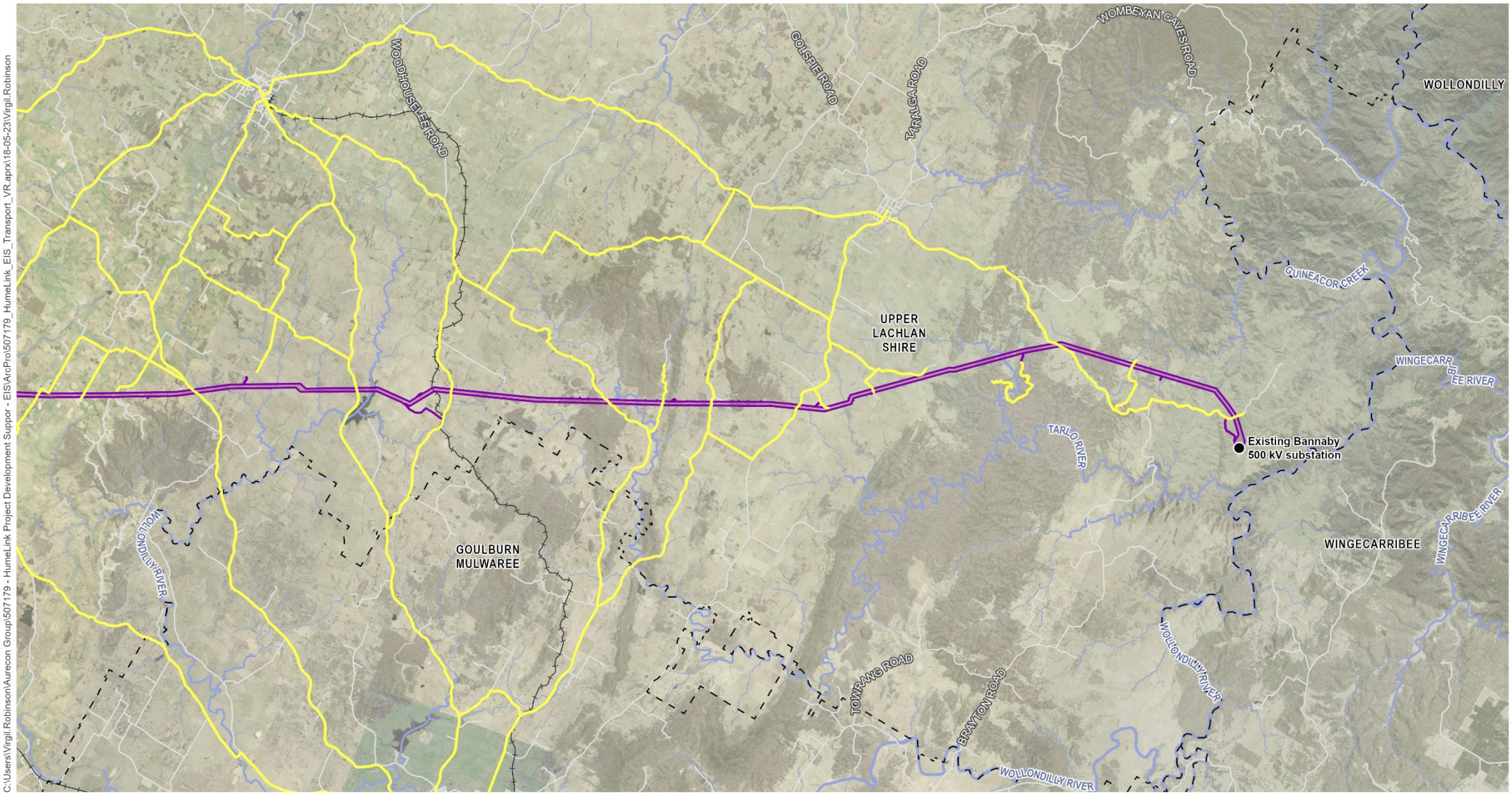
Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

Figure 5-2c: Peak hour traffic volume on roads providing access to project



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

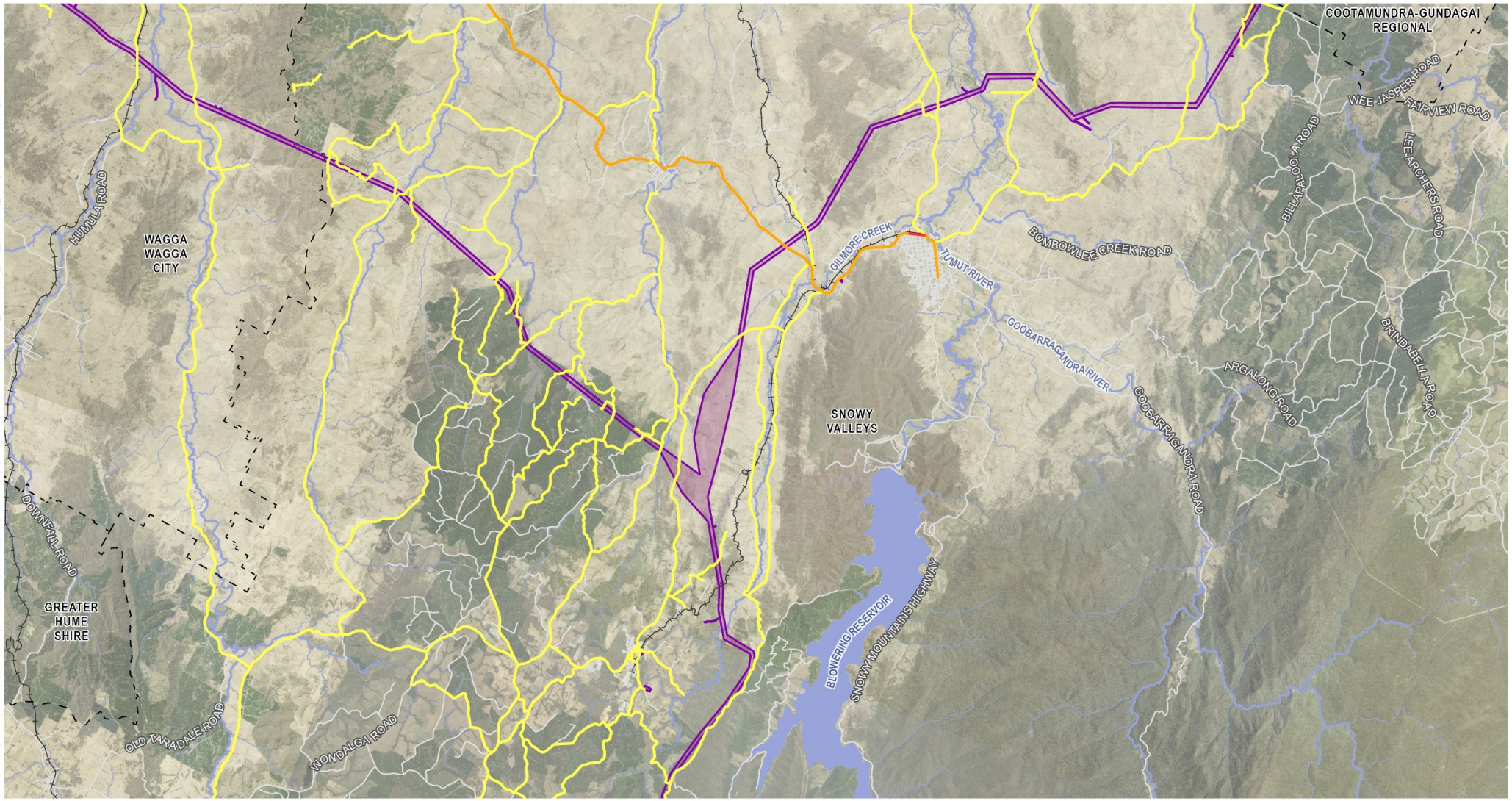
1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-2d: Peak hour traffic volume on roads providing access to project



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-2e: Peak hour traffic volume on roads providing access to project

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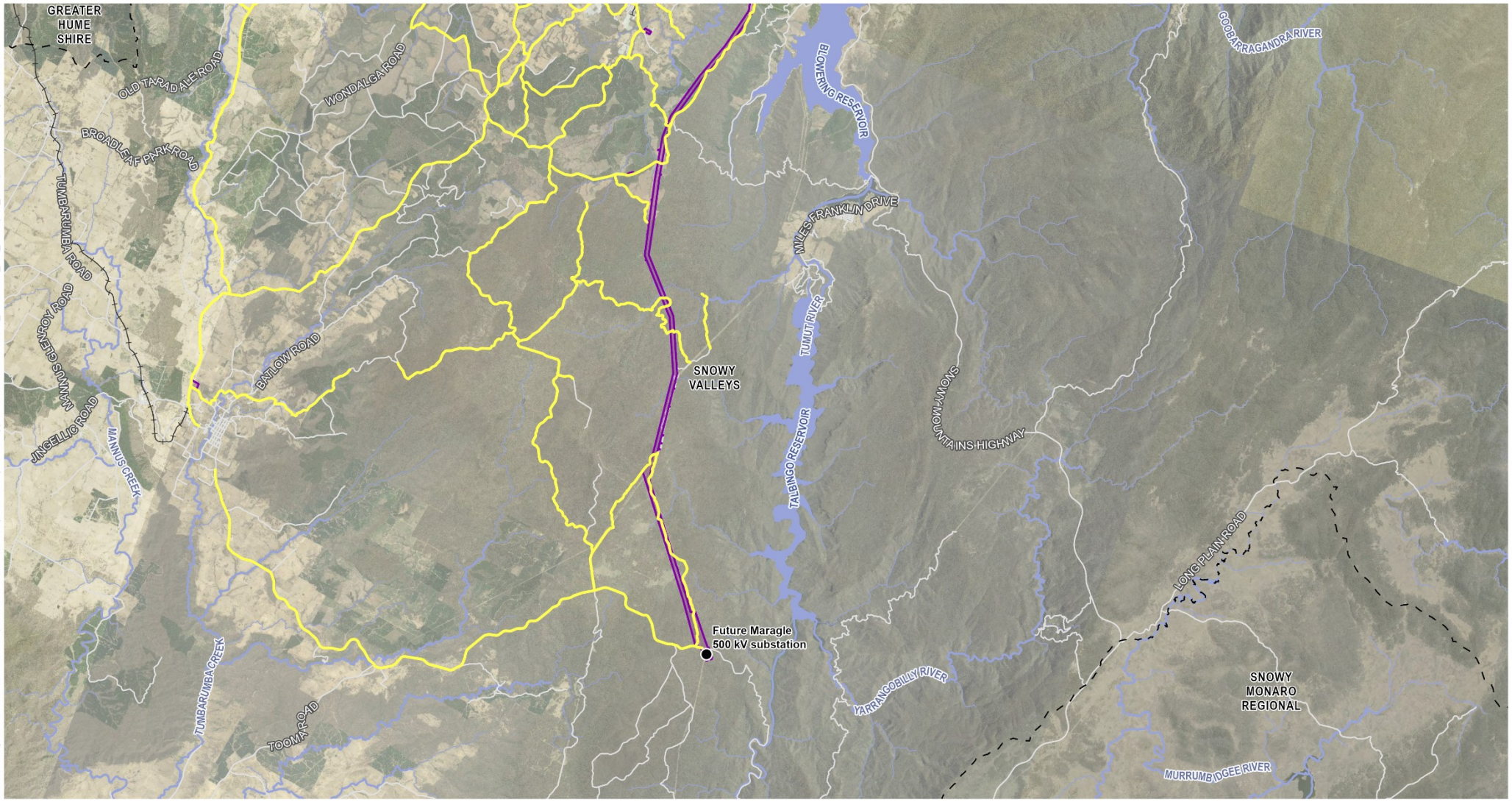

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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-2f: Peak hour traffic volume on roads providing access to project

5.3 Road network performance

Details on the performance of the existing road network within the traffic study area are presented in Attachment D as volume to capacity ratio (VCR) and LoS. The significance of each LoS is detailed in Section 4.1.4.1.

During peak hour, most of the roads within the traffic study area are operating at LoS A, indicating free-flow operations, where vehicles are almost completely unimpeded in their ability to manoeuvre within the traffic stream. VCR values for the roads in the traffic study area performing at LoS A is far below the threshold range for LoS A (refer to Table 4-1 for VCR values for each type of road), indicating available traffic capacity in the network. Only one road, Hammond Avenue, part of Sturt Highway within Wagga Wagga City LGA was observed to operate at LoS B, which indicates a higher traffic volume however traffic is still operating under reasonably free flowing conditions, with available capacity in the network.

5.4 Heavy vehicle route restrictions

HVs that conform with mass and dimension requirements within the definitions of General Access Vehicles (GAV) do not require a notice or permit from the National Heavy Vehicle regulator (NHVR, 2022) to operate on the road network.

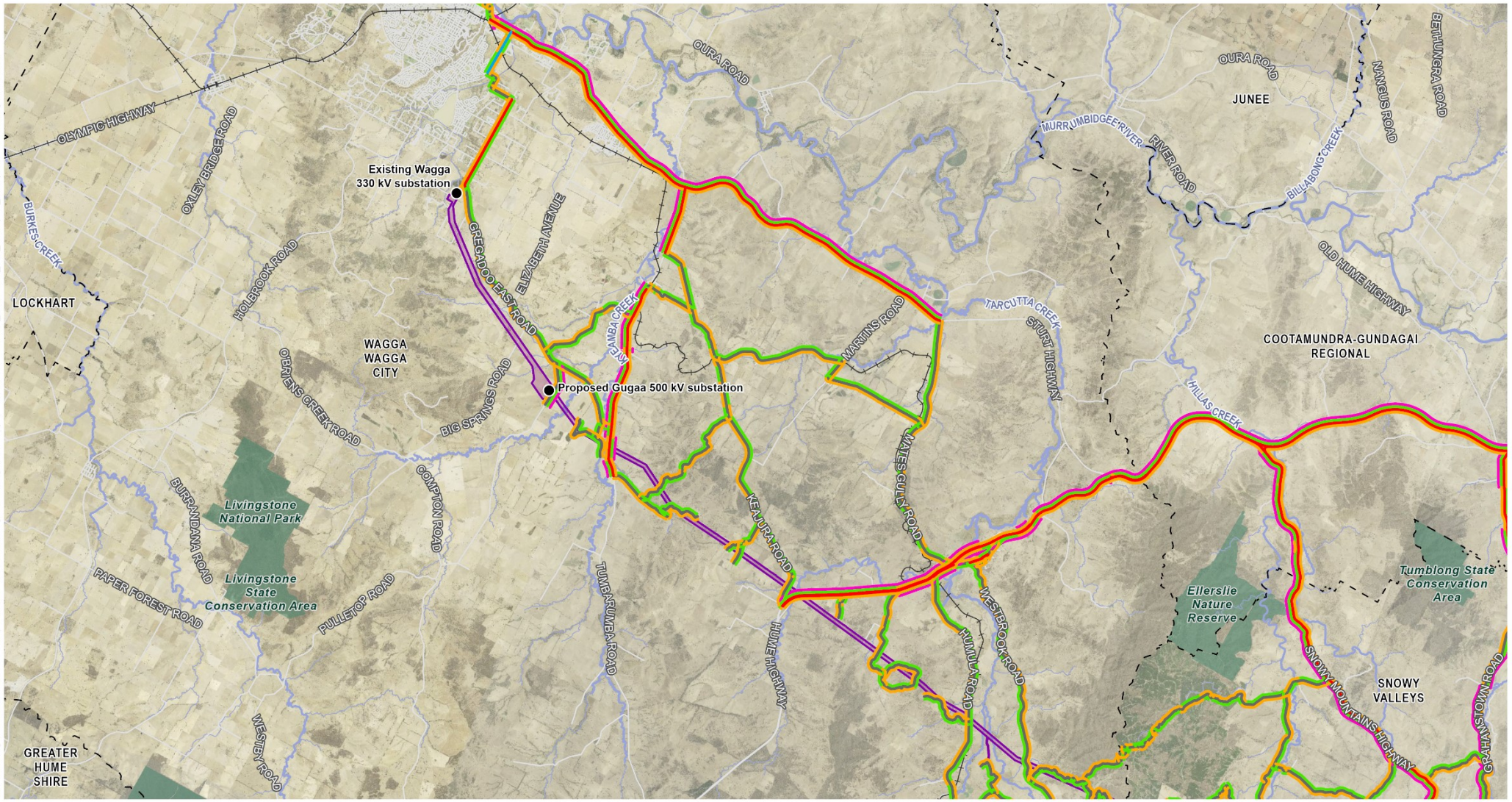
The mass and dimensions of GAVs according to the NHVR (2022) is as follows, where L is length, W is width, H is height and M is mass:

- rigid truck – L: 12.5 m, W: 2.5 m, H:4.3 m, M: 31 tonne
- prime mover and trailer – L: 19 m, W: 2.5 m, H:4.3 m, M: 42.5 tonne
- rigid truck and trailer – L: 19 m, W: 2.5 m, H:4.3 m, M: 42.5 tonne
- B-double (prime mover, trailer and trailer) – L: 19 m, W: 2.5 m, H:4.3 m, M: 42.5 tonne.

The following HVs are subject to road network restrictions:

- restricted access vehicles (RAV) (vehicle length larger than 19 m, 23 m or 25/26 m B-doubles)
- road trains (Type 1 A-double, modular B-triple, B-triple, AB-triple or Type 2 A-triple)
- OSOM vehicles, which are defined as a vehicle (or vehicle combination) that exceeds any general access mass or dimension limits.

The heavy vehicle road restrictions on the access routes are illustrated in Figure 5-3. The details of HV restrictions are summarised in Attachment E. All the state roads and some regional roads such as Tumbarumba Road, Elliot Way, Binda Road are approved for the movement of RAV and OSOM vehicles. However, none of the roads in the traffic study area are approved for movement of road trains. Local roads are generally not part of approved network for movement of RAV, road trains and OSOM vehicles. Within the State forest areas, RAV drivers are required to hold a current Forest Operator's Licence and follow the Contractor Haulage Operations Plans. This requirement applies on Elliot Way (a regional road), and 23 local roads in the Green Hill, Bago and Red Hill State forest (refer to Figure 5-3). This is common practice for haulage operators within the State forest areas.



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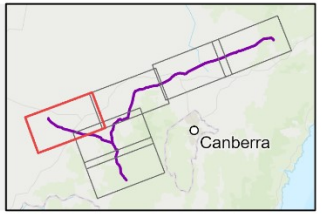
Project footprint
National park and reserve
State forest
Local Government Area
Watercourse
Railway
Traffic study area – access routes
Substation

Heavy Vehicle Route Restrictions
Restricted Access vehicle : 25/26 M B-double
Restricted Access vehicle : 25/26 M B-double with conditions

Road train : Type 1 A- double approved
Not approved

Access approval
Required

Oversize Over mass including 4.6 M Vehicles
Approved

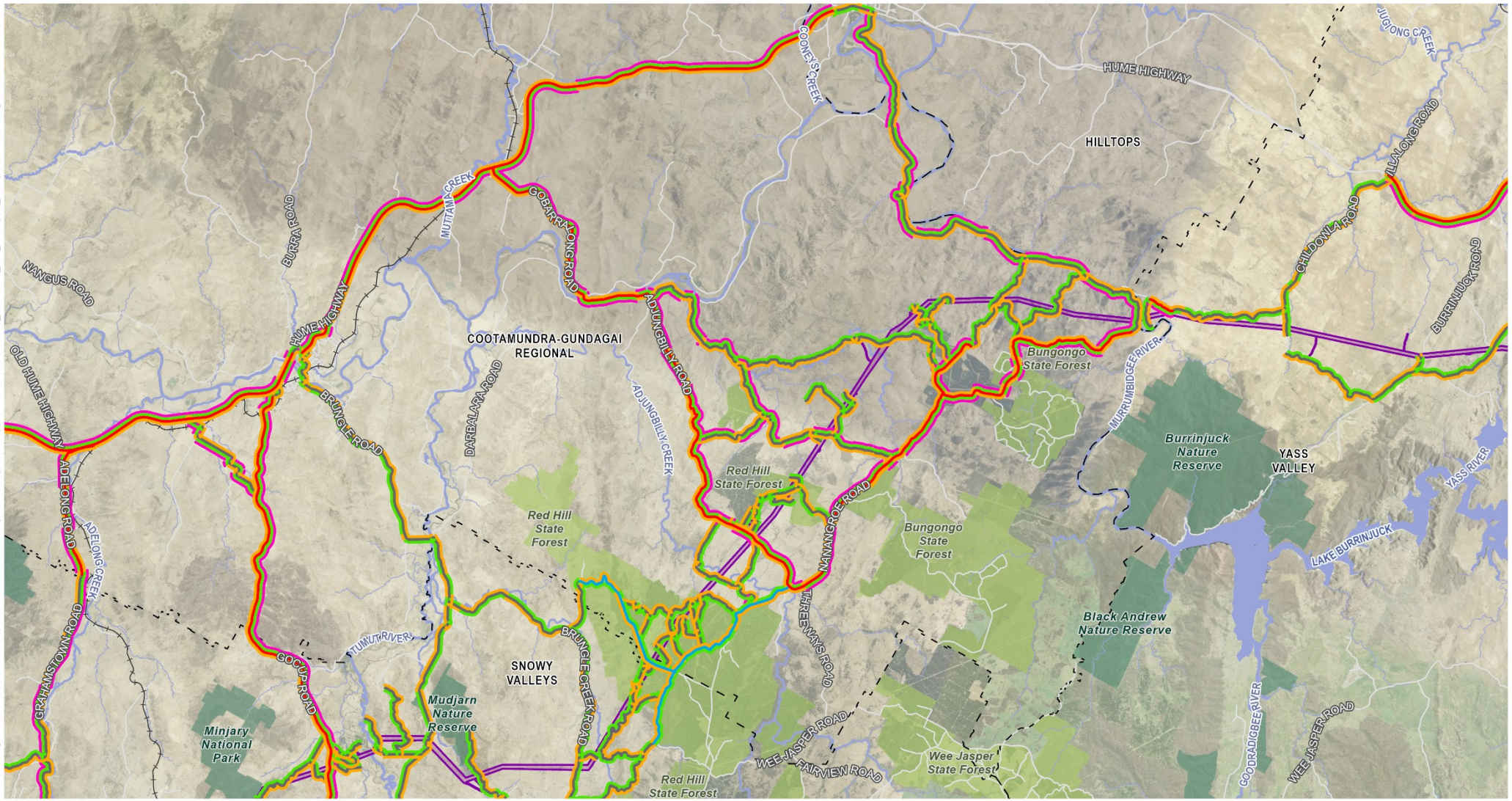


Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8km

Projection: GDA 1994 MGA Zone 55

Figure 5-3a: Location of TfNSW approved heavy vehicle route restriction



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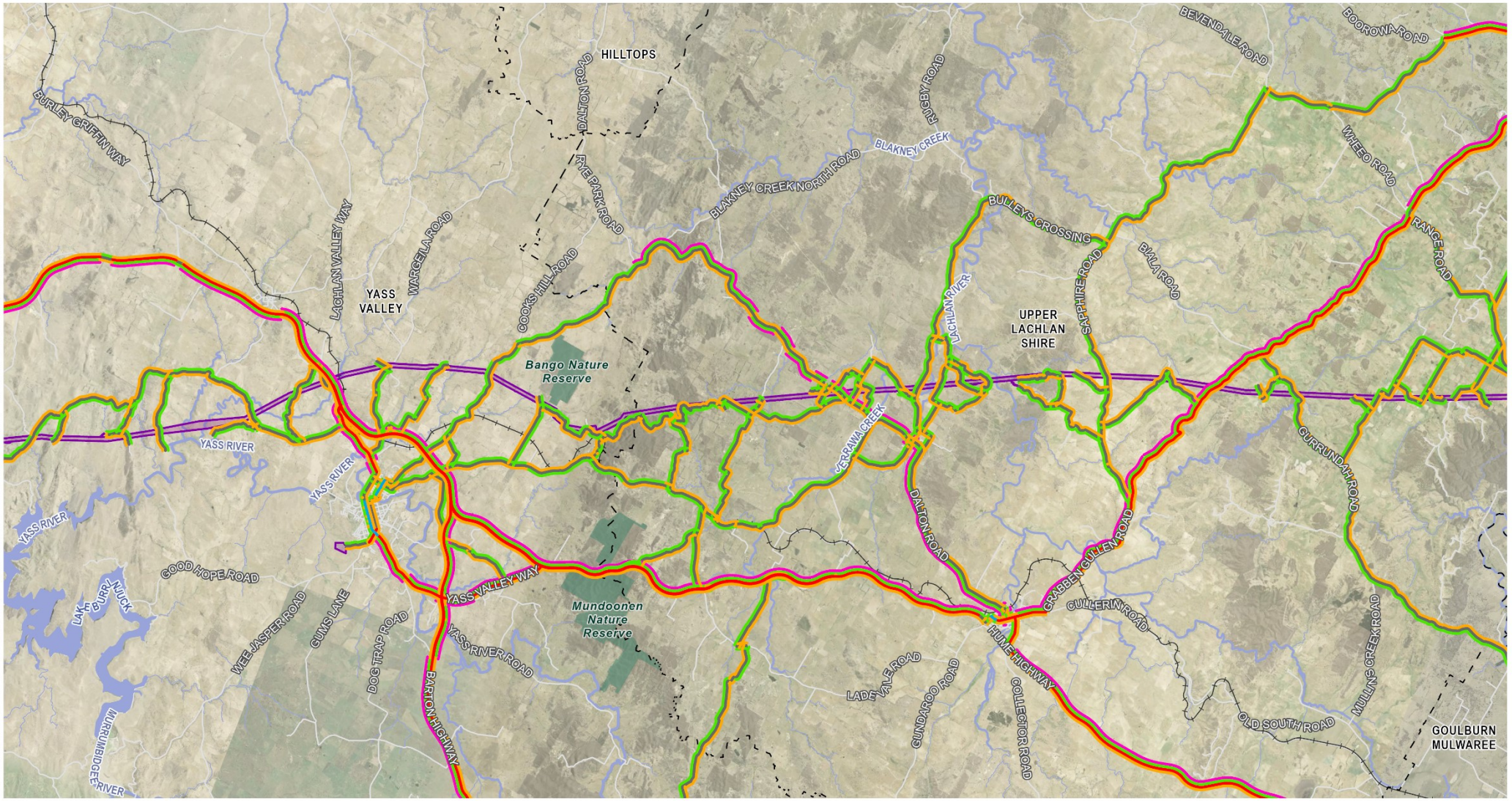
Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-3b: Location of TfNSW approved heavy vehicle route restriction



- Project footprint
- National park and reserve
- State forest
- Local Government Area
- Watercourse
- Railway
- Traffic study area – access routes

Heavy Vehicle Route Restrictions

- Restricted Access vehicle : 25/26 M B-double
- Restricted Access vehicle : 25/26 M B-double with conditions

Road train : Type 1 A- double approved

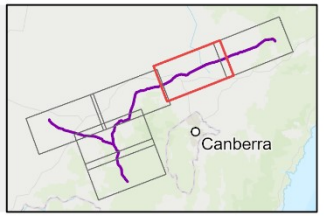
- Not approved

Access approval

- Required

Oversize Over mass including 4.6 M Vehicles

- Approved



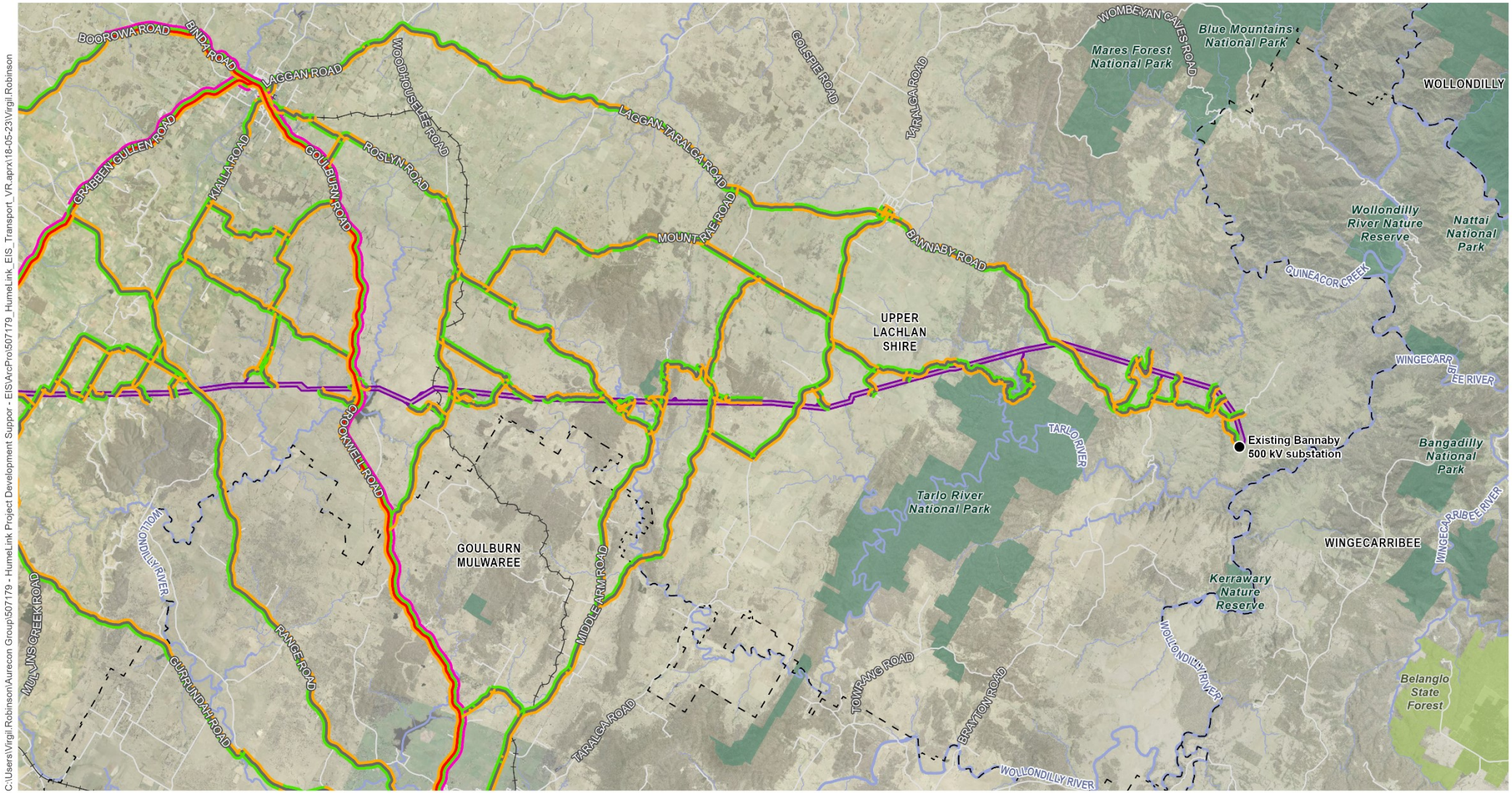
Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

Figure 5-3c: Location of TfNSW approved heavy vehicle route restriction



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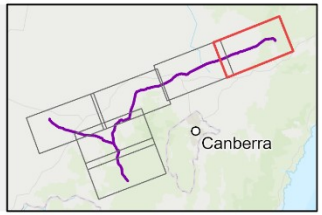
Project footprint
National park and reserve
State forest
Local Government Area
Watercourse
Railway
Traffic study area – access routes
Substation

Heavy Vehicle Route Restrictions
Restricted Access vehicle : 25/26 M B-double
Restricted Access vehicle : 25/26 M B-double with conditions

Road train : Type 1 A- double approved
Not approved

Access approval
Required

Oversize Over mass including 4.6 M Vehicles
Approved



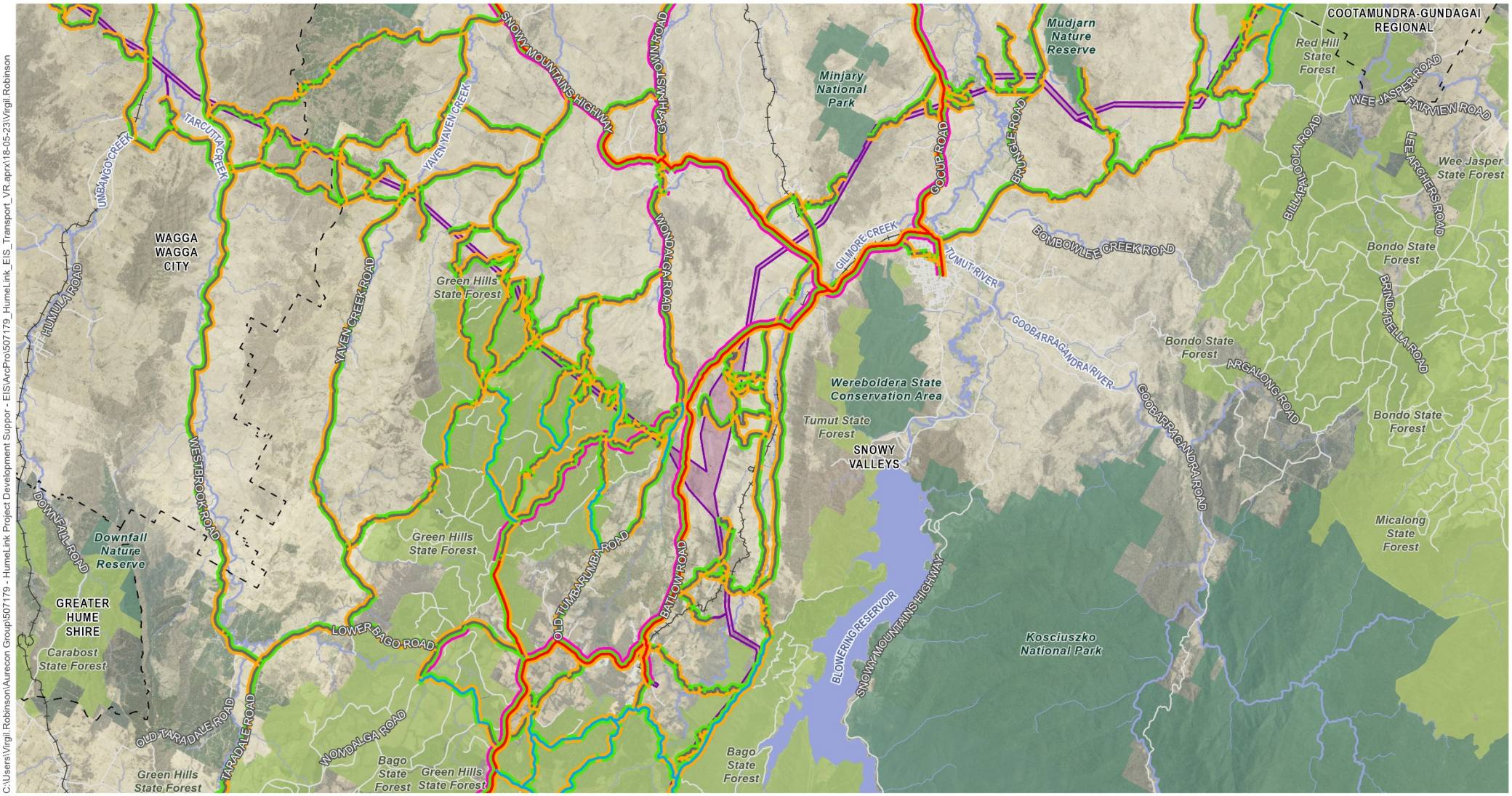
Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8 km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-3d: Location of TfNSW approved heavy vehicle route restriction



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

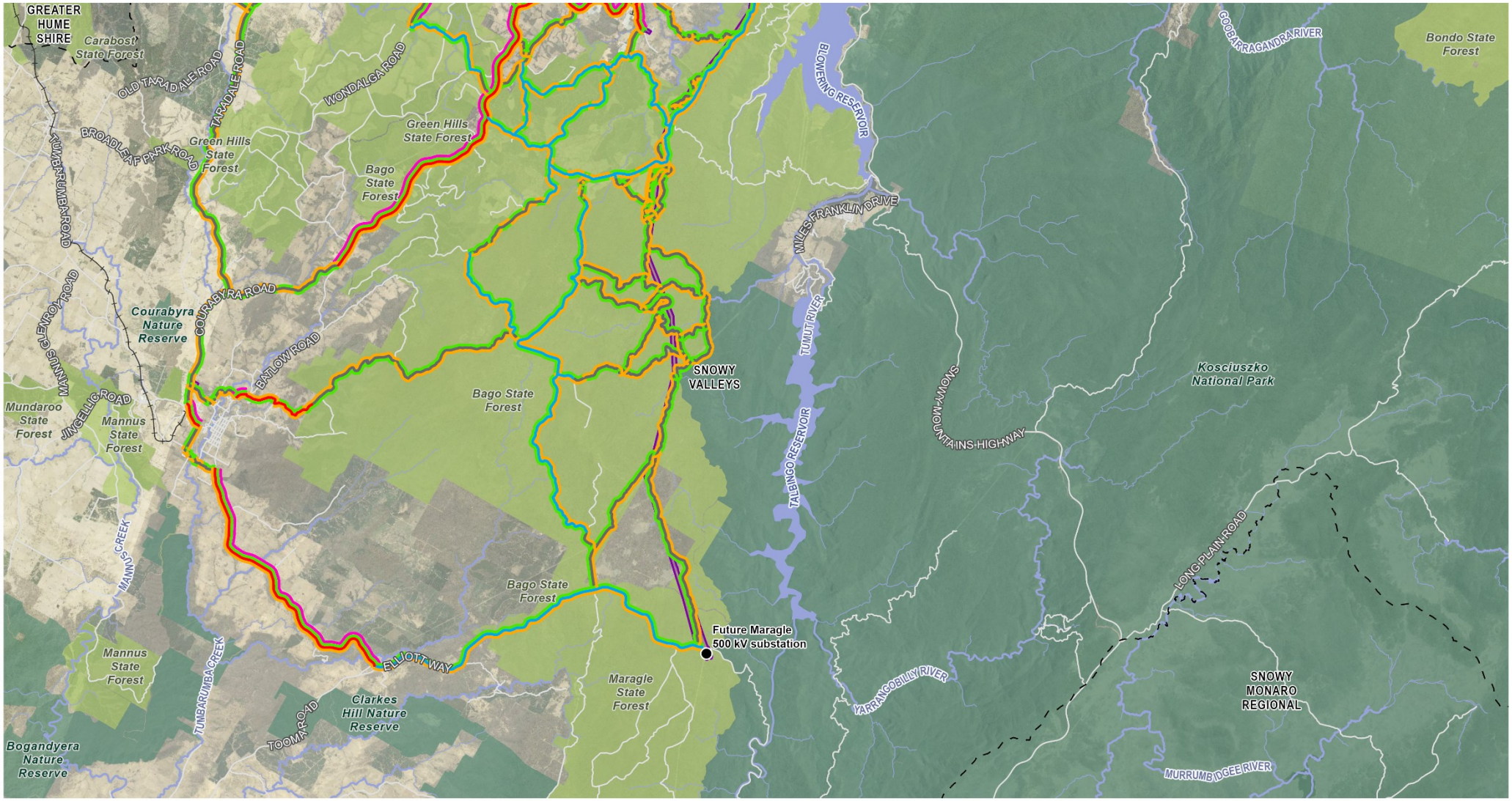
1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-3e: Location of TfNSW approved heavy vehicle route restriction



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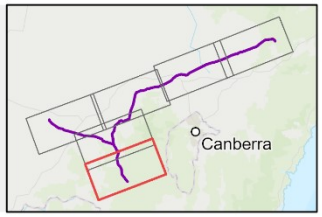
Project footprint
National park and reserve
State forest
Local Government Area
Watercourse
Railway
Traffic study area – access routes
Substation

Heavy Vehicle Route Restrictions
Restricted Access vehicle : 25/26 M B-double
Restricted Access vehicle : 25/26 M B-double with conditions

Road train : Type 1 A- double approved
Not approved

Access approval
Required

Oversize Over mass including 4.6 M Vehicles
Approved



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8km

Projection: GDA 1994 MGA Zone 55

Figure 5-3f: Location of TfNSW approved heavy vehicle route restriction

5.5 Road safety on routes

Figure 5-4 shows the recorded road crashes and casualty crashes between 2016 and 2020, for the road network within the traffic study area (TfNSW, 2022c).

A breakdown of crashes along the roads in the traffic study area is shown in Table 5-2 to Table 5-8. The details identify the severity of the crash and location of the crash.

The crash statistics for all LGAs within the traffic study area are as follows:

- Wagga Wagga City LGA recorded 130 crashes
- Snowy Valleys LGA recorded 151 crashes
- Cootamundra-Gundagai Regional LGA recorded 89 crashes
- Yass Valley LGA recorded 164 crashes
- Upper Lachlan Shire LGA recorded 124 crashes
- Goulburn-Mulwaree LGA recorded 106 crashes
- Hilltops LGA recorded two crashes.

Yass Valley LGA, with 164 recorded crashes on the access routes, has the highest number of crashes while Hilltops LGA, with two crashes recorded, has the lowest number of crashes.

Crash data is recorded at intersections and sections of road known as mid-block sections (sections of roads between two intersections). The highest number of intersection crashes were recorded in Wagga Wagga City LGA while the highest number of crashes recorded at two-way roads were recorded in Yass Valley LGA.

Table 5-2 Summary of crashes along routes within Wagga Wagga City LGA

Degree of crash	Number of crashes	Percentage
Fatal	3	2%
Serious injury	32	25%
Moderate injury	38	29%
Minor injury/other injury	6	5%
Non-casualty	51	39%
Location of crash		
Two-way	84	65%
Intersection	46	35%

Table 5-3 Summary of crashes along routes within Snowy Valleys LGA

Degree of crash	Number of crashes	Percentage
Fatal	8	5%
Serious injury	30	20%
Moderate injury	38	25%
Minor injury/other injury	16	11%
Non-casualty	59	39%
Location of crash		
Two-way	114	75%
Intersection	37	25%

Table 5-4 Summary of crashes along routes within Cootamundra-Gundagai Regional LGA

Degree of crash	Number of crashes	Percentage
Fatal	6	7%
Serious injury	26	29%
Moderate injury	13	15%
Minor injury/other injury	11	12%
Non-casualty	33	37%
Location of crash		
Two-way	77	87%
Intersection	12	13%

Table 5-5 Summary of crashes along routes within Yass Valley LGA

Degree of crash	Number of crashes	Percentage
Fatal	6	4%
Serious injury	11	7%
Moderate injury	59	36%
Minor injury/other injury	31	19%
Non-casualty	57	35%
Location of crash		
Two-way	125	76%
Intersection	39	24%

Table 5-6 Summary of crashes along routes within Upper Lachlan Shire LGA

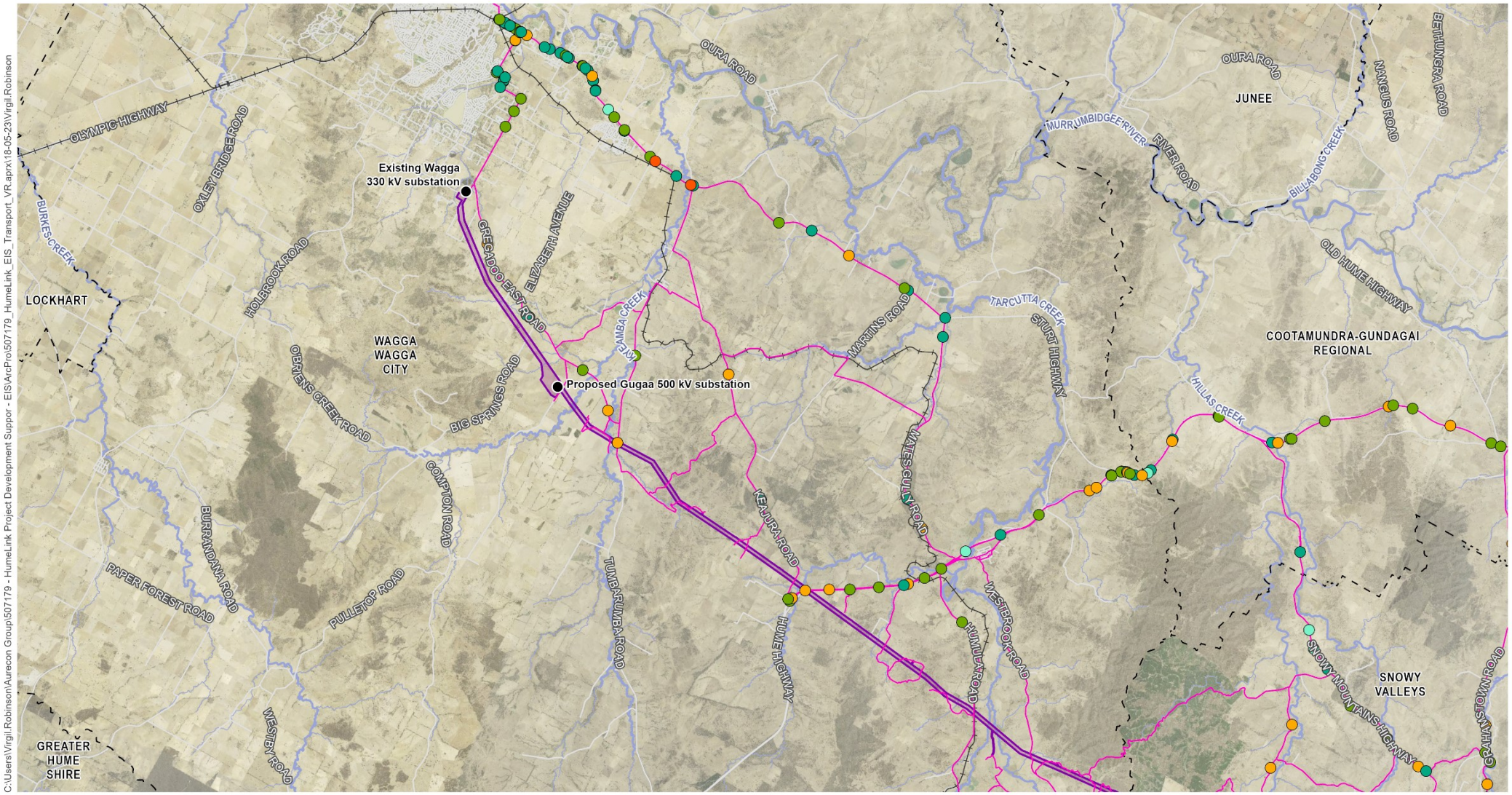
Degree of crash	Number of crashes	Percentage
Fatal	6	5%
Serious injury	25	20%
Moderate injury	49	40%
Minor injury/other injury	19	15%
Non-casualty	25	20%
Location of crash		
Two-way	113	91%
Intersection	11	9%

Table 5-7 Summary of crashes along routes within Goulburn-Mulwaree LGA

Degree of crash	Number of crashes	Percentage
Fatal	5	5%
Serious injury	18	17%
Moderate injury	49	46%
Minor injury/other injury	12	11%
Non-casualty	22	21%
Location of crash		
Two-way	63	59%
Intersection	43	41%

Table 5-8 Summary of crashes along routes within Hilltops LGA

Degree of crash	Number of crashes	Percentage
Fatal	0	0%
Serious injury	0	0%
Moderate injury	0	0%
Minor injury/other injury	0	0%
Non-casualty	2	100%
Location of crash		
Two-way	2	100%
Intersection	0	0%



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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0 4 8km

Projection: GDA 1994 MGA Zone 55

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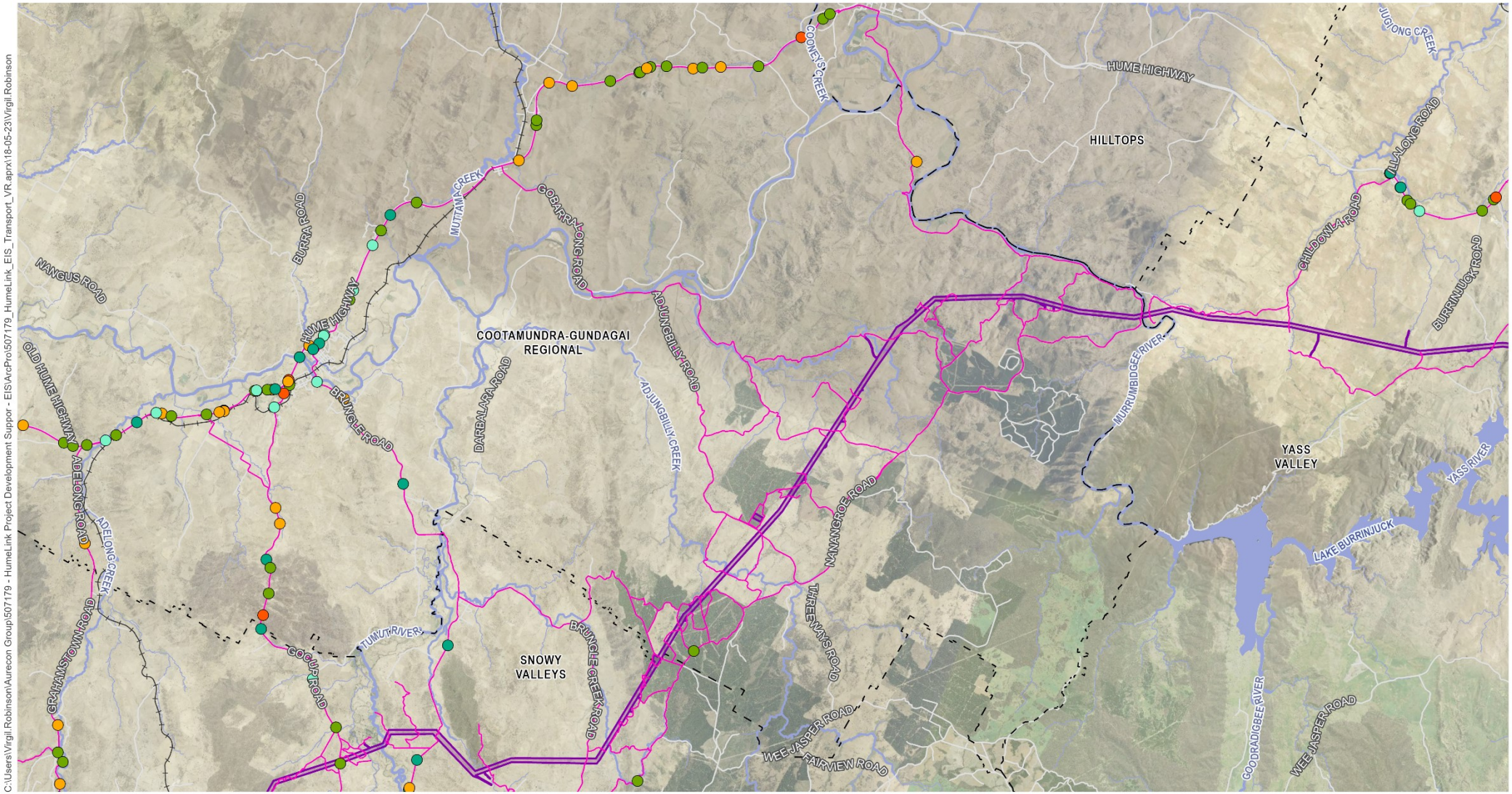
Figure 5-4a: Crash locations along road network providing access to project



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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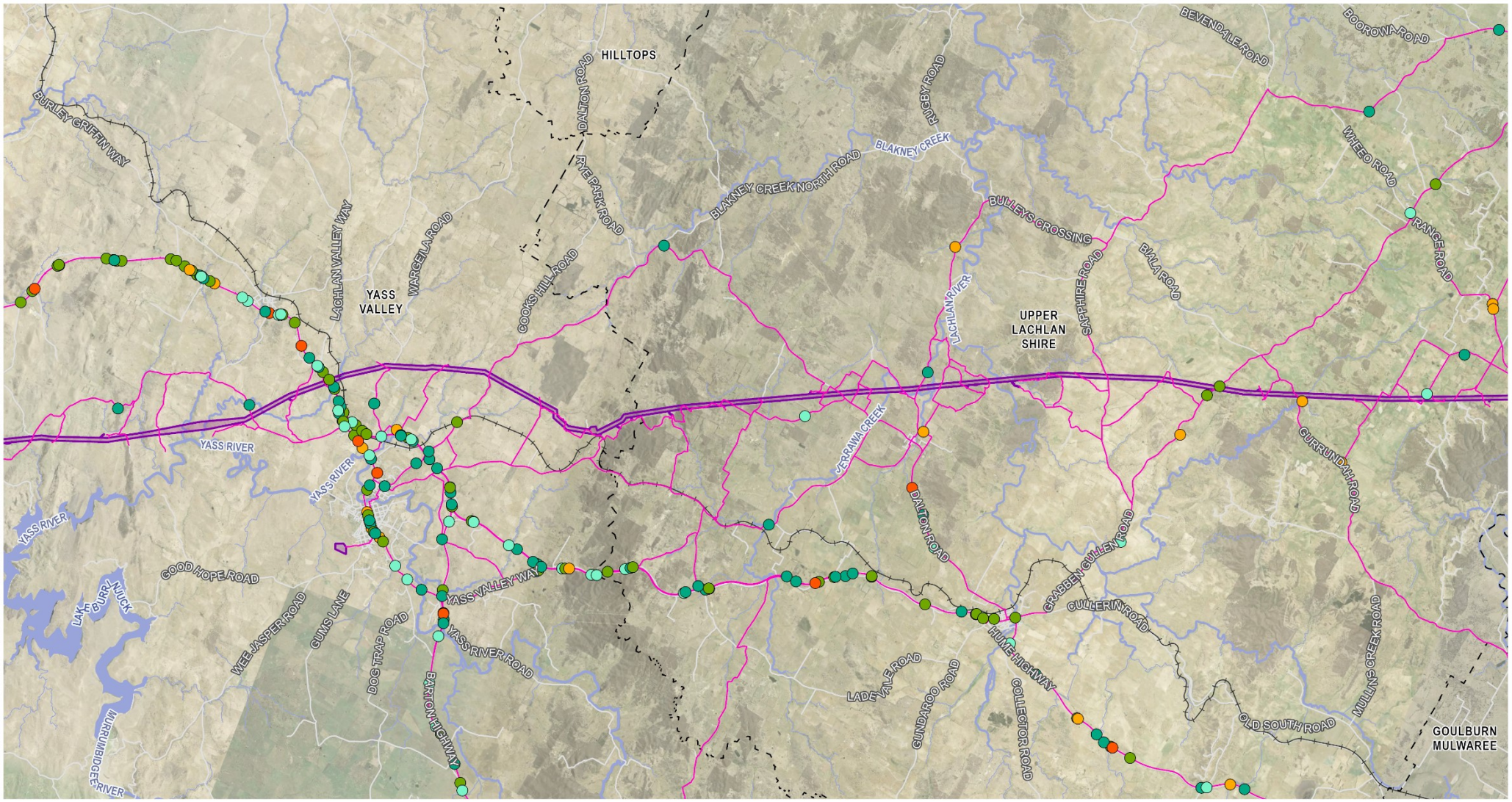
0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-4b: Crash locations along road network providing access to project



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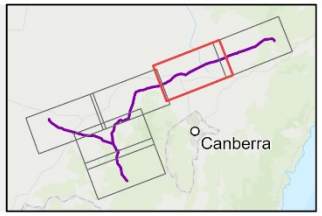
Project footprint
Local Government Area
Watercourse
Railway
Traffic study area – access routes

Crash locations

Fatal
Serious Injury
Moderate Injury
Minor/Other Injury
Non-casualty (towaway)



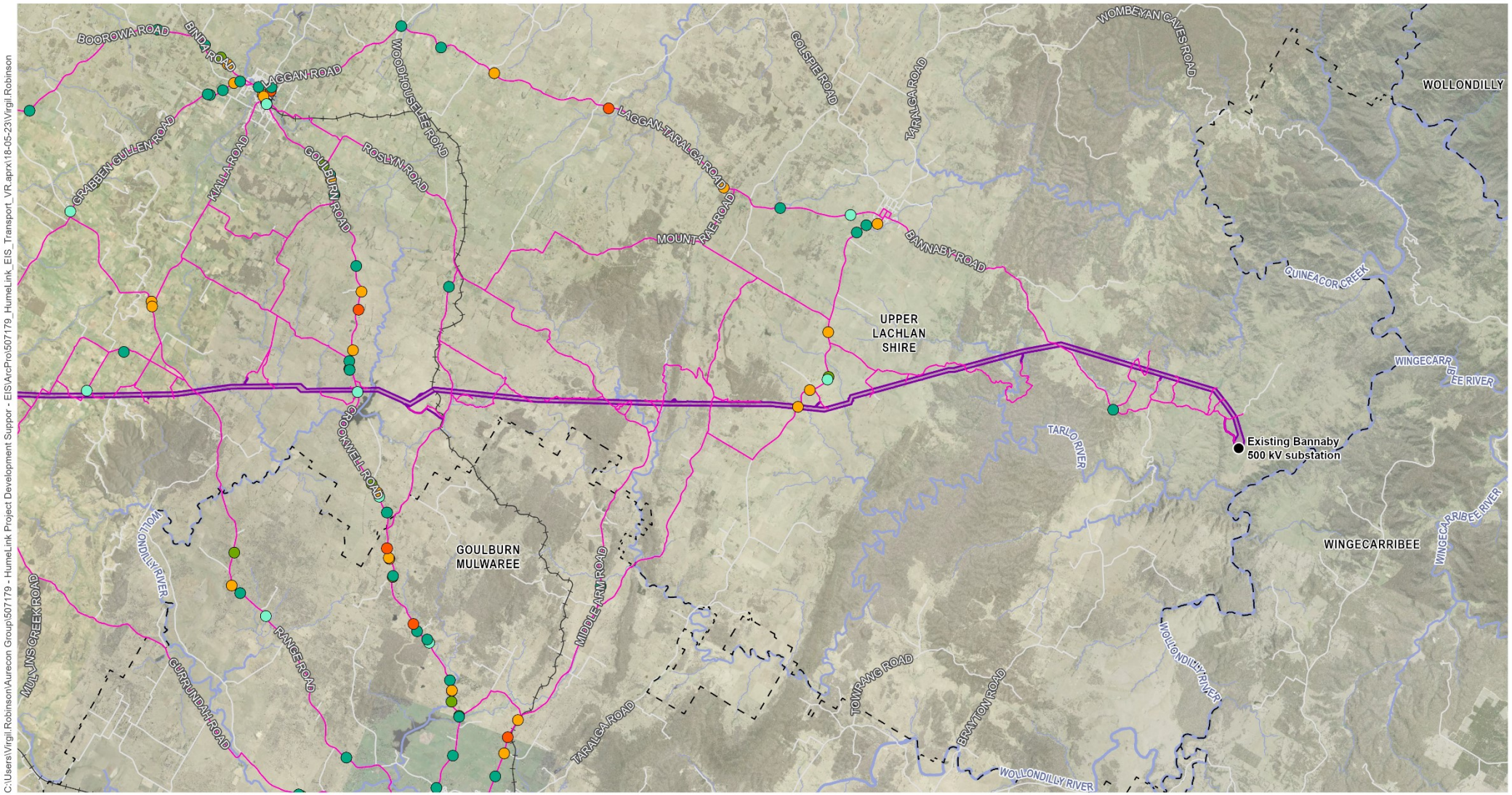
Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-4c: Crash locations along road network providing access to project



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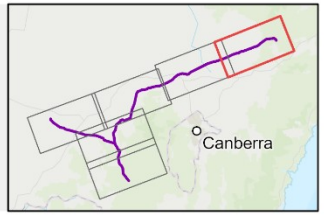
Project footprint
Local Government Area
Watercourse
Railway
Traffic study area – access routes
Substation

Crash locations

Fatal
Serious Injury
Moderate Injury
Minor/Other Injury
Non-casualty (towaway)



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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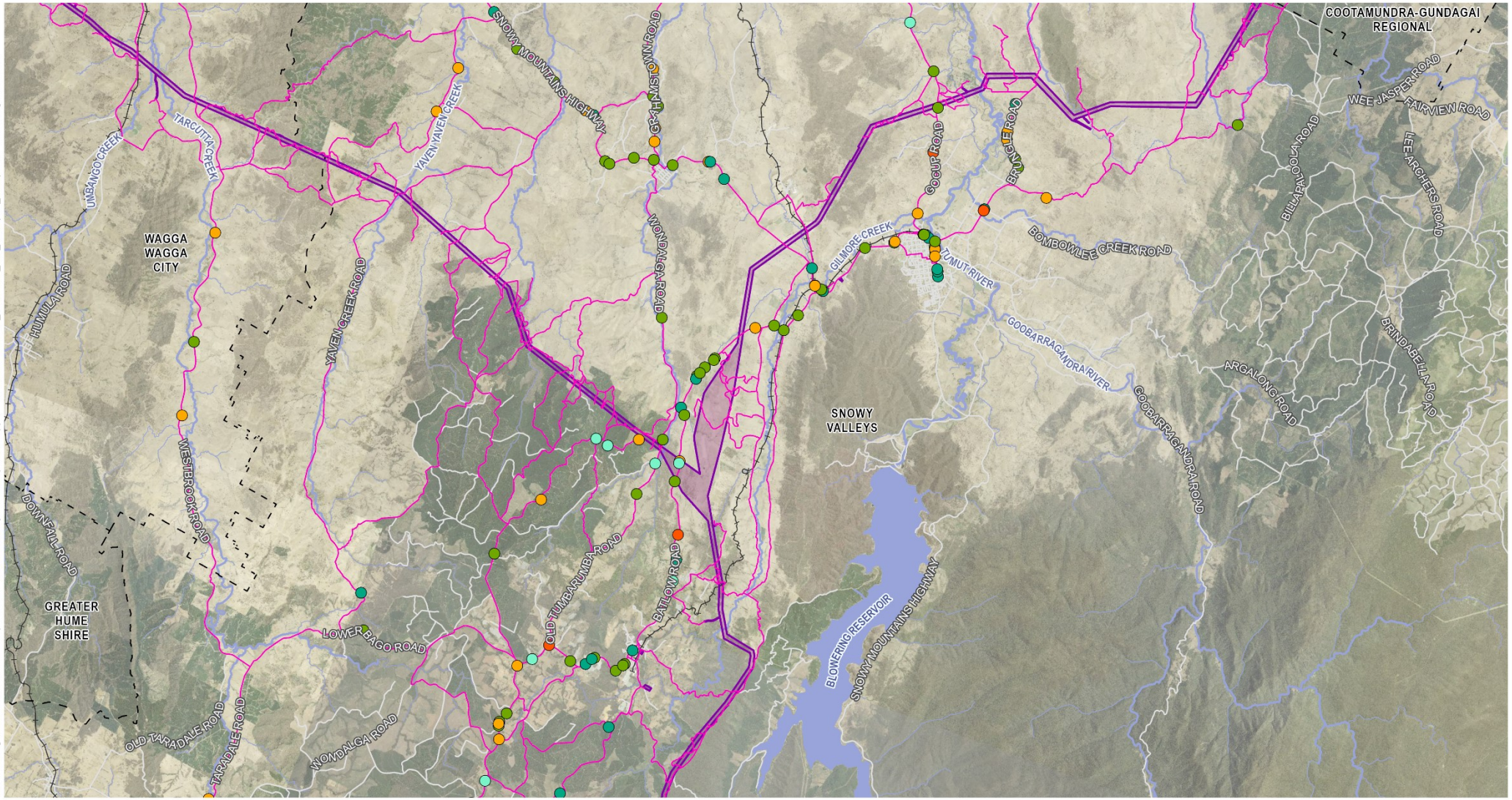
Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

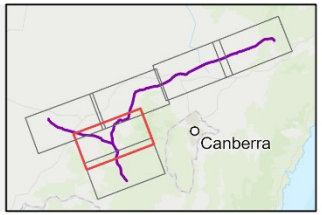
Figure 5-4d: Crash locations along road network providing access to project



Project footprint
Local Government Area
Watercourse
Railway
Traffic study area – access routes

Crash locations

Fatal
Serious Injury
Moderate Injury
Minor/Other Injury
Non-casualty (towaway)



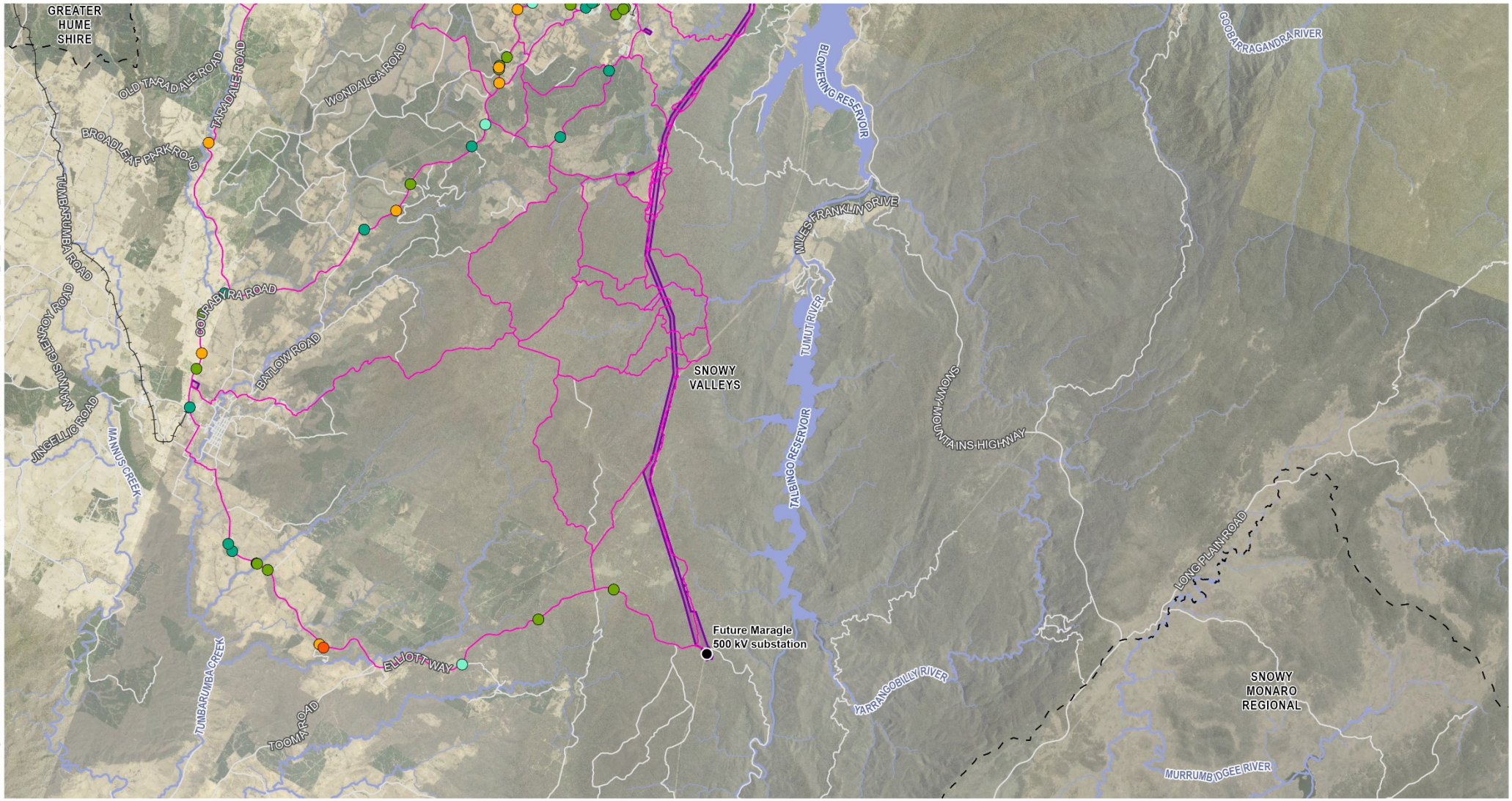
Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8 km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-4e: Crash locations along road network providing access to project



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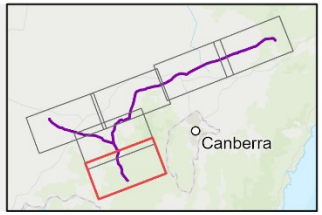
Project footprint
Local Government Area
Watercourse
Railway
Traffic study area – access routes
Substation

Crash locations

Fatal
Serious Injury
Moderate Injury
Minor/Other Injury
Non-casualty (towaway)



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

Figure 5-4f: Crash locations along road network providing access to project

5.6 Active transport

Active transport facilities include dedicated on-road or off-road infrastructure, which allow safe movement of pedestrians and cyclists. These can be segregated in the form of footpaths or dedicated pathways shared by pedestrians and cyclists.

Within the traffic study area, formal active transport facilities are generally only provided in towns. Wagga Wagga has an active travel plan under implementation in two stages for developing a cycling network to link outer suburbs to the town centre area. The cycling network in Wagga Wagga City LGA is expected to provide a safe and accessible option of travel to everyone in the community. The active transport plan of Wagga Wagga City LGA is shown in Figure 5-5. The access routes for the project include roads along some shared path links, including Kooringal Road on Kooringal Link and Kyeamba Avenue on Forest Hill Link.

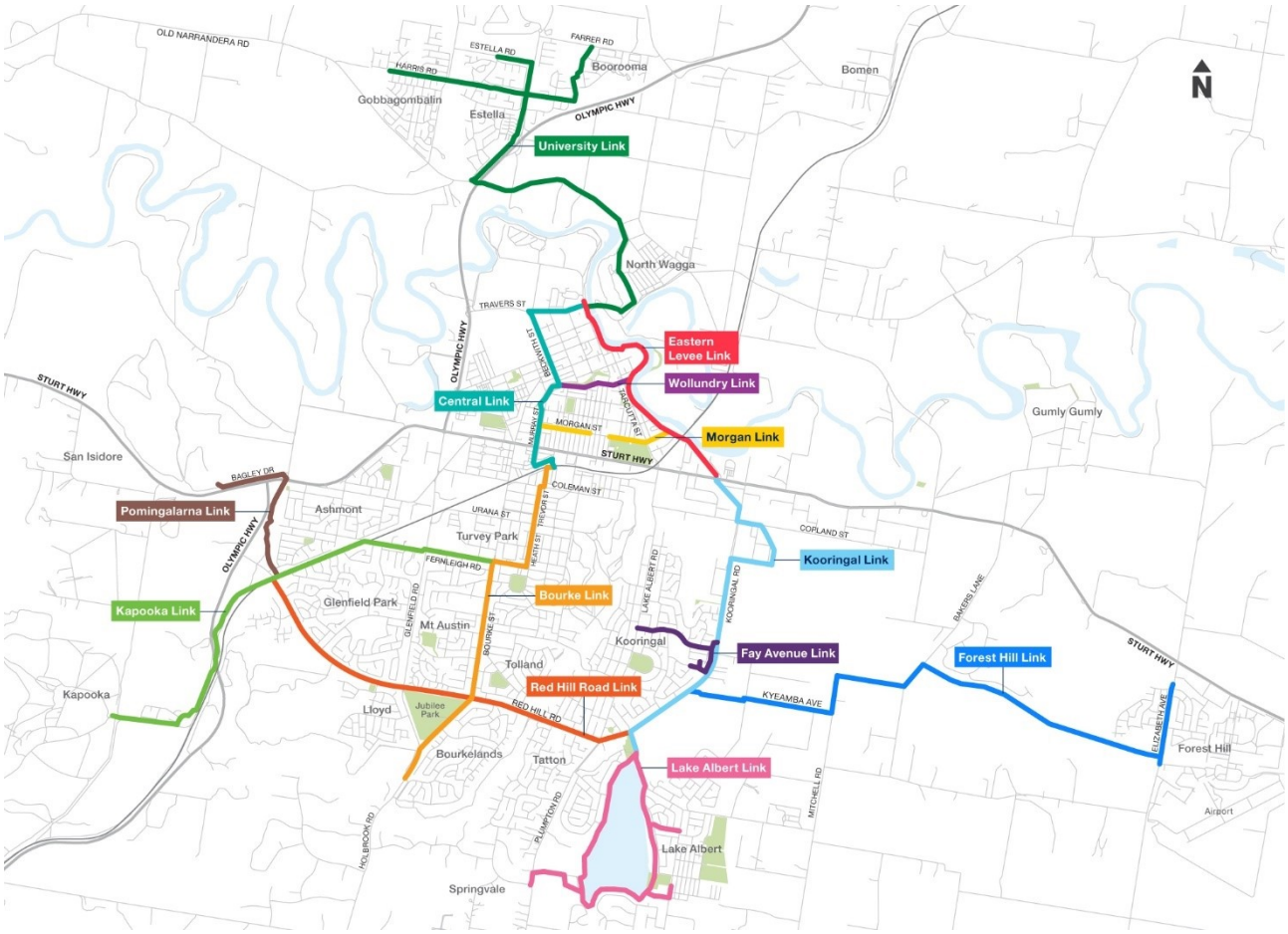


Figure 5-5 Active transport plan, Wagga Wagga

Source: Wagga Wagga Active Travel Plan (City of Wagga Wagga, 2022)

Active transport facilities in other towns with access to the project footprint as indicated on Cycleway Finder (TfNSW, 2022e) are shown in Table 5-9. Satellite imagery for some of the on-street cycling facilities indicated in Cycleway Finder (TfNSW, 2022e) suggest that these facilities are roads with wide shoulders. Roads outside these towns generally do not have active transport facilities, however, road shoulders are generally available on either side of the road.

Table 5-9 Roads in other towns with active transport facilities

Town	Road with active transport facility
Adelong	No road with active transport facility
Batlow	Reddy Street
Crookwell	Laggan Road
Dalton	No road with active transport facility
Goulburn	Hume Street
Goulburn	Clinton Street, Fitzroy Street
Gundagai	Middle Town Drive
Gundagai	Eagle Street
Gunning	No road with active transport facility
Murrumbateman	No road with active transport facility
Taralga	No road with active transport facility
Tarcutta	N/A
Tumbarumba	Batlow Road, Albury Street and Mate Street
Tumut	Fitzroy Street
Yass	Comour Street, Laidlaw Street

5.7 Public transport

5.7.1 Regional train and coach network

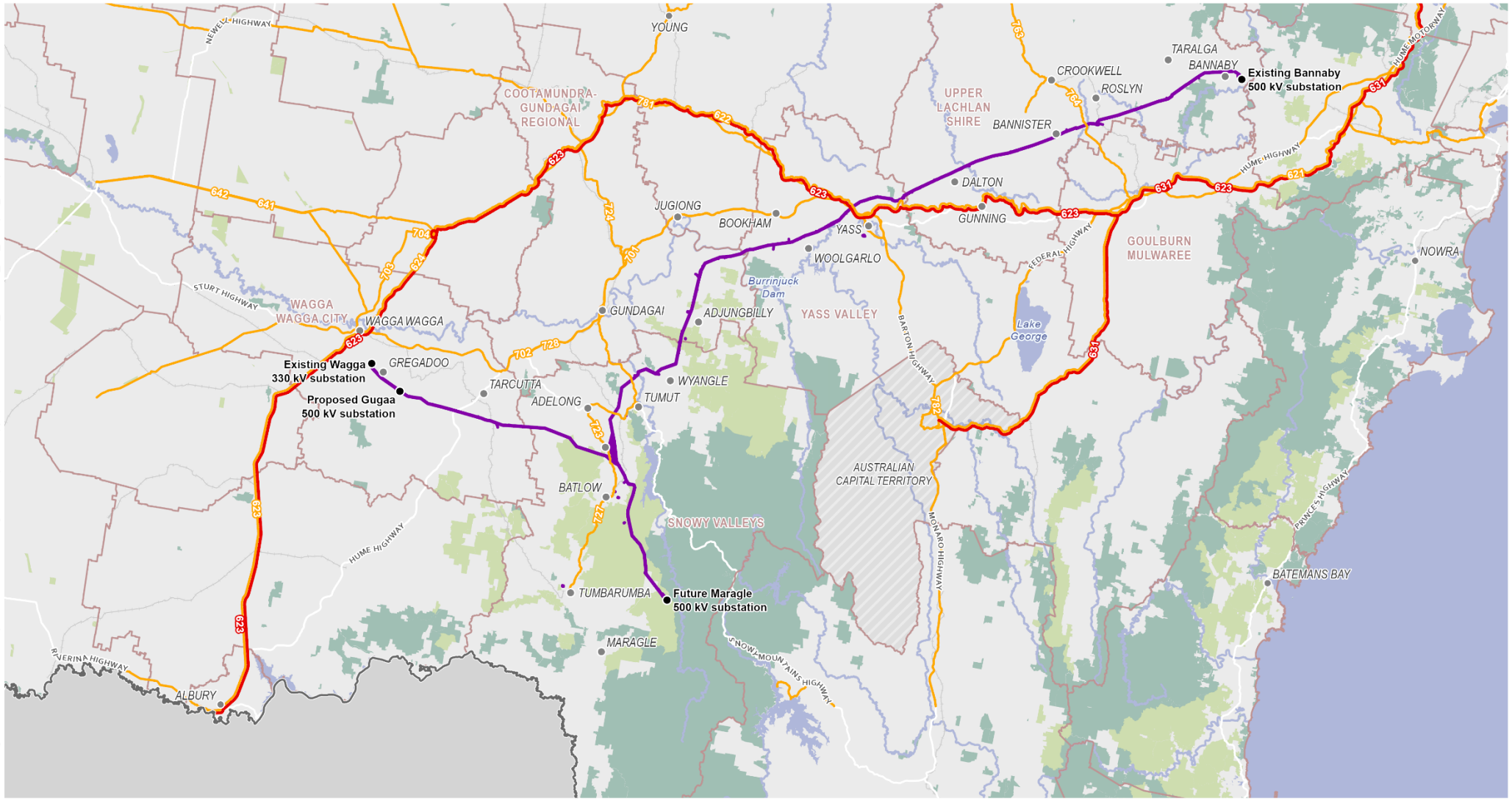
NSW TrainLink's publicly available website provides information on regional train and coach services within NSW and ACT (TfNSW, 2022d). According to the website, services operating within the traffic study area are generally scheduled once daily or several times a week. Figure 5-6 shows the regional rail and coach network while Table 5-10 shows the route and service frequency of services.

Table 5-10 Regional train and coach services within the traffic study area

Number	Route	Network and operator	Service frequency
621	Sydney to Melbourne	NSW TrainLink train service	Once daily
622	Melbourne to Sydney	NSW TrainLink train service	Once daily
623	Sydney to Melbourne	NSW TrainLink train service	Once daily
624	Melbourne to Sydney	NSW TrainLink train service	Once daily
641	Goulburn to Griffith	NSW TrainLink train service	Once Wednesday and Saturday
642	Griffith to Goulburn	NSW TrainLink train service	Once Thursday and Sunday
701	Queanbeyan to Wagga Wagga	NSW TrainLink coach service	Once on Monday and Friday
702	Wagga Wagga to Queanbeyan	NSW TrainLink coach service	Once on Monday and Friday
703	Queanbeyan to Wagga Wagga	NSW TrainLink coach service	Once on Tuesday, Thursday and Saturday.
704	Wagga Wagga to Queanbeyan	NSW TrainLink coach service	Once on Tuesday, Thursday and Saturday.
723	Cootamundra to Tumbarumba	NSW TrainLink coach service	Once on Tuesday, Thursday and Sunday.
724	Tumbarumba to Cootamundra	NSW TrainLink coach service	Once on Tuesday, Thursday and Sunday.
727	Wagga Wagga to Tumbarumba	NSW TrainLink coach service	Once on Monday, Wednesday and Friday.

Number	Route	Network and operator	Service frequency
728	Tumbarumba to Wagga Wagga	NSW TrainLink coach service	Once on Monday, Wednesday and Friday.
782	Cootamundra to Queanbeyan	NSW TrainLink coach service	Once daily.
781	Queanbeyan to Cootamundra.	NSW TrainLink coach service	Once daily.

Source: NSW TrainLink, Southern NSW network timetable (TfNSW, 2022d)



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

Figure 5-6: TfNSW regional train and coach network

5.7.2 Bus services

This section details the existing bus services within major towns operated by local private operators.

5.7.2.1 Wagga Wagga City LGA

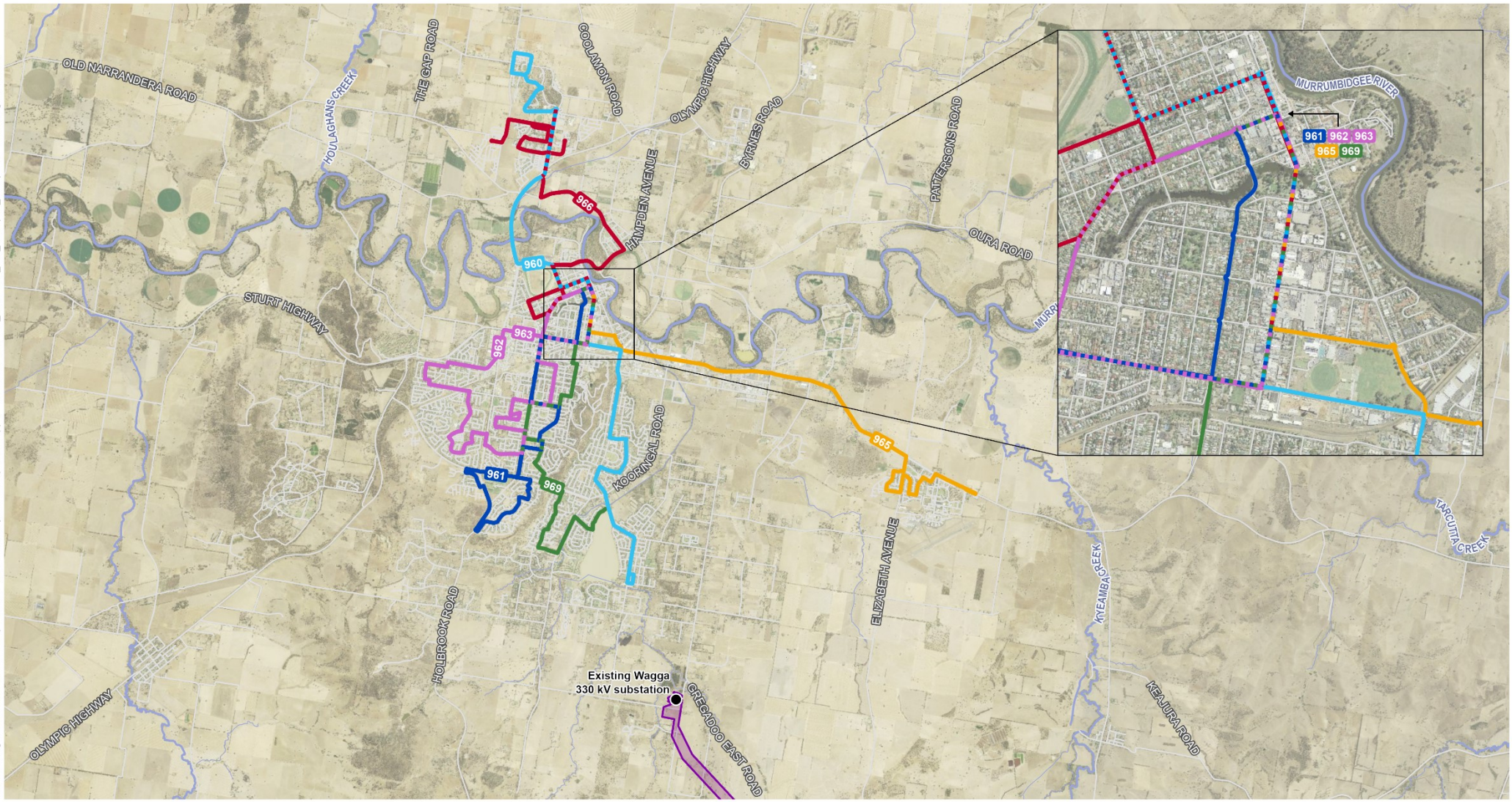
In Wagga Wagga City LGA, Busabout operates local and school bus services. Figure 5-7 shows the bus services network within Wagga Wagga with the roads anticipated for access to the project shown in red dash line. Details for the bus services are described in Table 5-11. School bus services are not included in Table 5-10 as details are not readily available, however, would be specifically considered as part of the CEMP.

Most bus routes operate in both directions while bus services on routes 962 and 963 operate in a loop. Typical operating hours of the bus services are 7am to 9pm. The routes to access the project include roads along some bus routes, including Hammond Avenue and Sturt Highway on bus route 965. Potential impacts to bus services outside of the major towns would be further considered as part of the CEMP for all LGAs.

Table 5-11 Bus services route information for Wagga Wagga City LGA

Route number	Route	Frequency
960	Lake Albert to Wagga Wagga, Estella and University	Hourly frequency. Operates daily typically from 7am to 9pm.
961	Wagga Wagga - Bourkelands - Wagga Wagga	Hourly frequency. Operates daily typically from 7.30am to 8.30pm.
962	Wagga Wagga - Glenfield Park - Wagga Wagga (anticlockwise loop)	Hourly frequency. Operates daily typically from 7.30am to 9pm.
963	Wagga Wagga - Glenfield Park - Wagga Wagga (clockwise loop)	Hourly frequency. Operates daily typically from 7.30am to 9pm.
965	Forest Hill to Wagga Wagga	Six services on Monday, Tuesday, and Wednesday and eight services on Thursday and Friday, typically operates from 9am to 8.30pm.
966	Wagga Wagga - Estella - Wagga Wagga	Nine services on Monday, Tuesday, and Wednesday and eleven services on Thursday and Friday, typically operates from 7am to 8pm
969	Tatton to Wagga Wagga	Hourly frequency. Operates daily typically from 8am to 8pm.

Source: Wagga Wagga network timetable (Busabout, 2022)



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

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Figure 5-7: Wagga Wagga bus routes

5.7.2.2 Yass Valley LGA

Bus services in Yass Valley LGA are operated by Transborder Express (Transborder 2022) with these services connecting Yass Valley to Canberra. Figure 5-8 shows the bus service network in Yass Valley with roads anticipated for access to project shown in red dash line. Details of bus services is described in Table 5-12. The routes to access the project include roads along the bus routes including Laidlaw Street, Comur Street, Yass Valley Way and Barton Highway.

Table 5-12 Bus services route information for Yass Valley LGA

Route number	Route	Frequency
842	Yass to Canberra Hospital via Murrumbateman, Canberra City (Civic), Reid, Russell, Barton and Woden.	Twice daily from Monday to Friday
843	Yass to Canberra City (Civic) via Murrumbateman, Hall and Belconnen.	Once daily from Monday to Friday

Source: Transborder Express timetable (Transborder 2022)

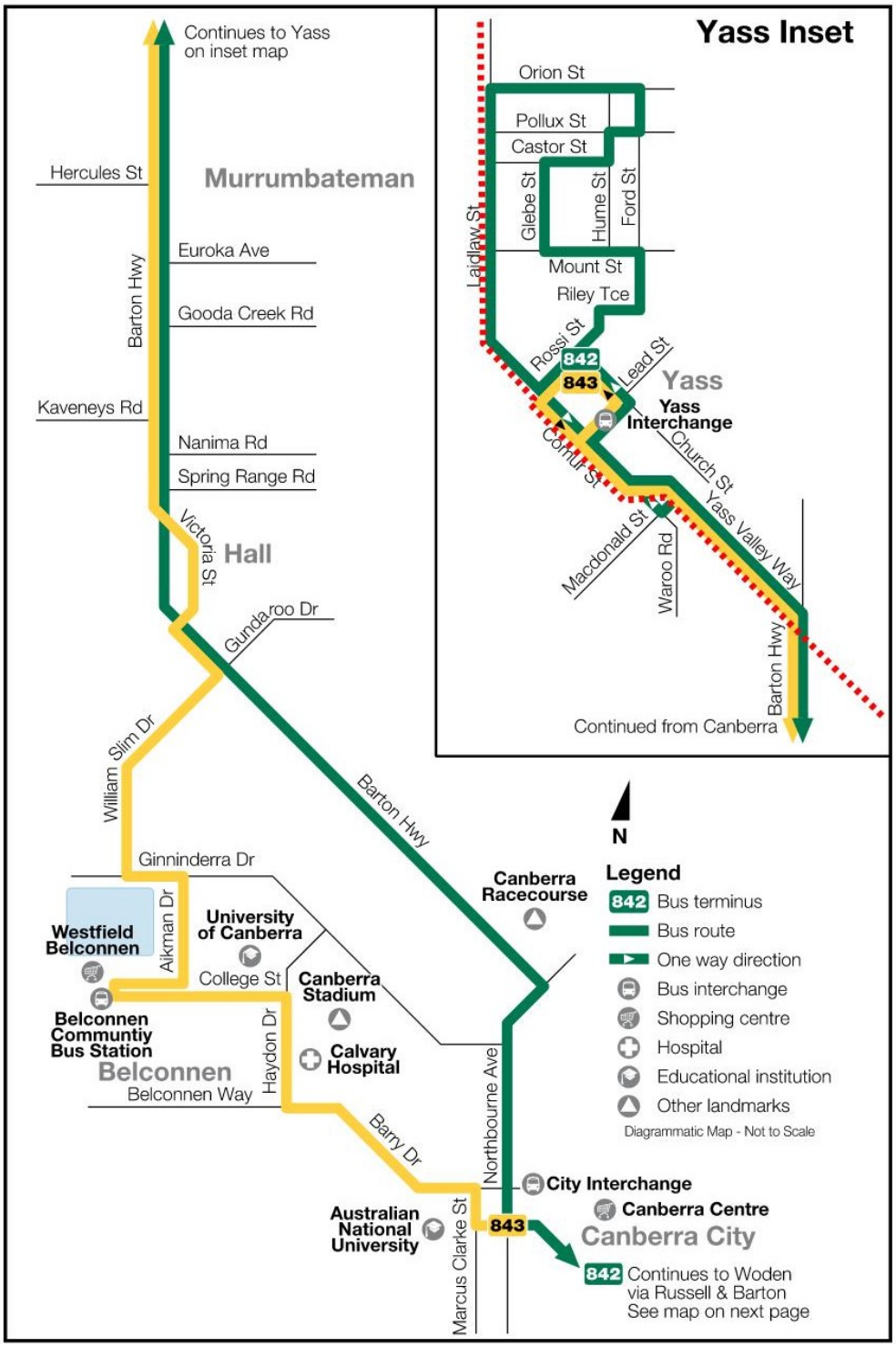


Figure 5-8 Existing bus services network in Yass Valley and access routes shown in red dash line

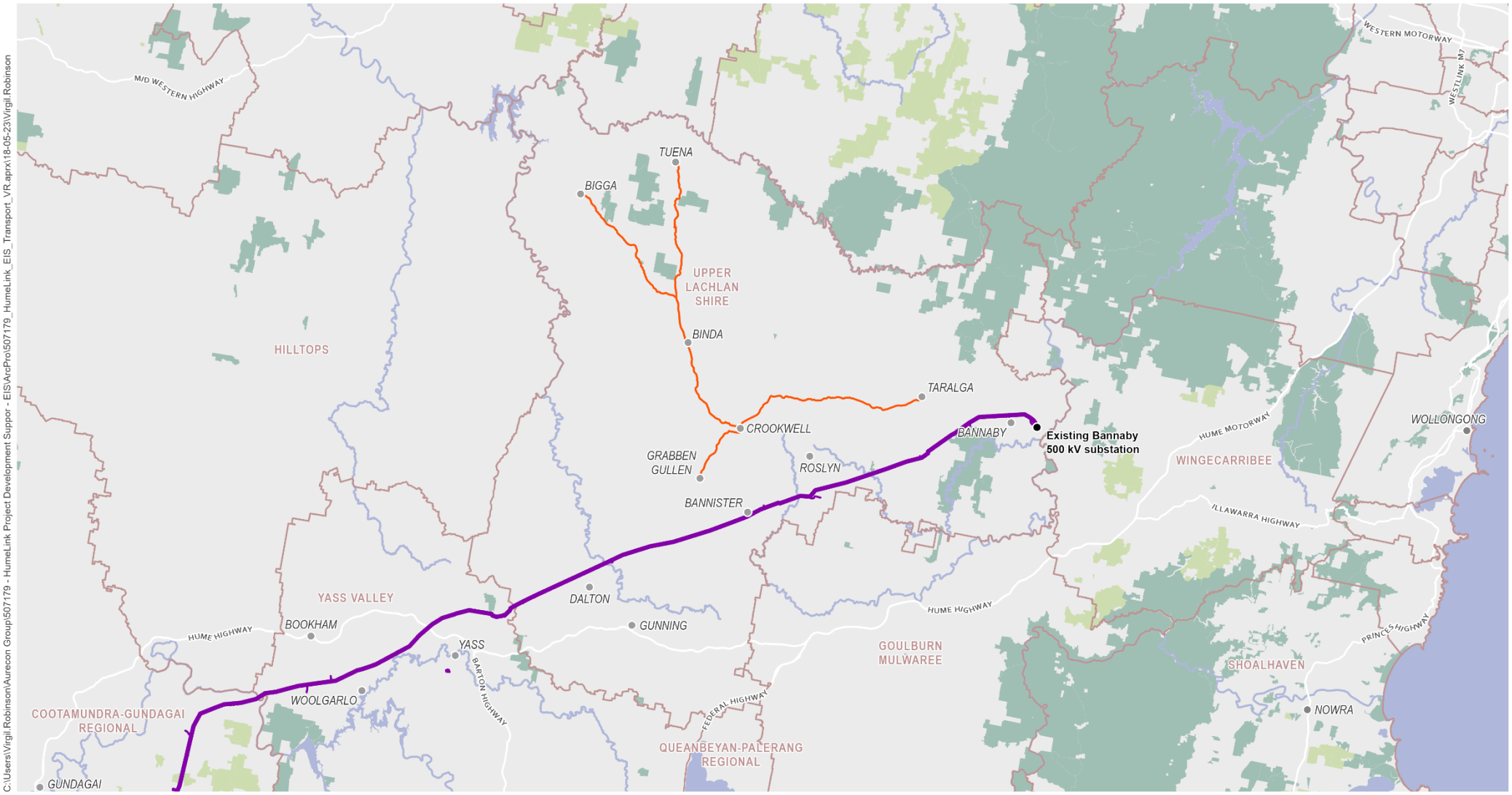
Source: Transborder Express timetable (Transborder 2022)

5.7.2.3 Upper Lachlan Shire LGA

In the Upper Lachlan Shire LGA, Valmar Community Transport provides transport services to people with disabilities and people who are transport disadvantaged (Upper Lachlan Shire Council, 2022). The transport services connect Crookwell to Bigga, Binda, Grabben Gullen, Tunea and Taralga. Table 5-13 outlines the bus/transport services run by Valmar Community Transport within Upper Lachlan Shire LGA. Figure 5-9 shows the community transport services network in Upper Lachlan Shire LGA.

Table 5-13 Bus services route information for Upper Lachlan Shire LGA

Route	Frequency
Tuena/ Binda- Crookwell	Weekly service on Tuesday
Taralga - Crookwell	Fortnightly service on Wednesday
Bigga/ Binda – Crookwell	Weekly on Thursday
Grabben – Gullen - Crookwell	Fortnightly service on Thursday



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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0 10 20 km

Projection: GDA 1994 MGA Zone 55

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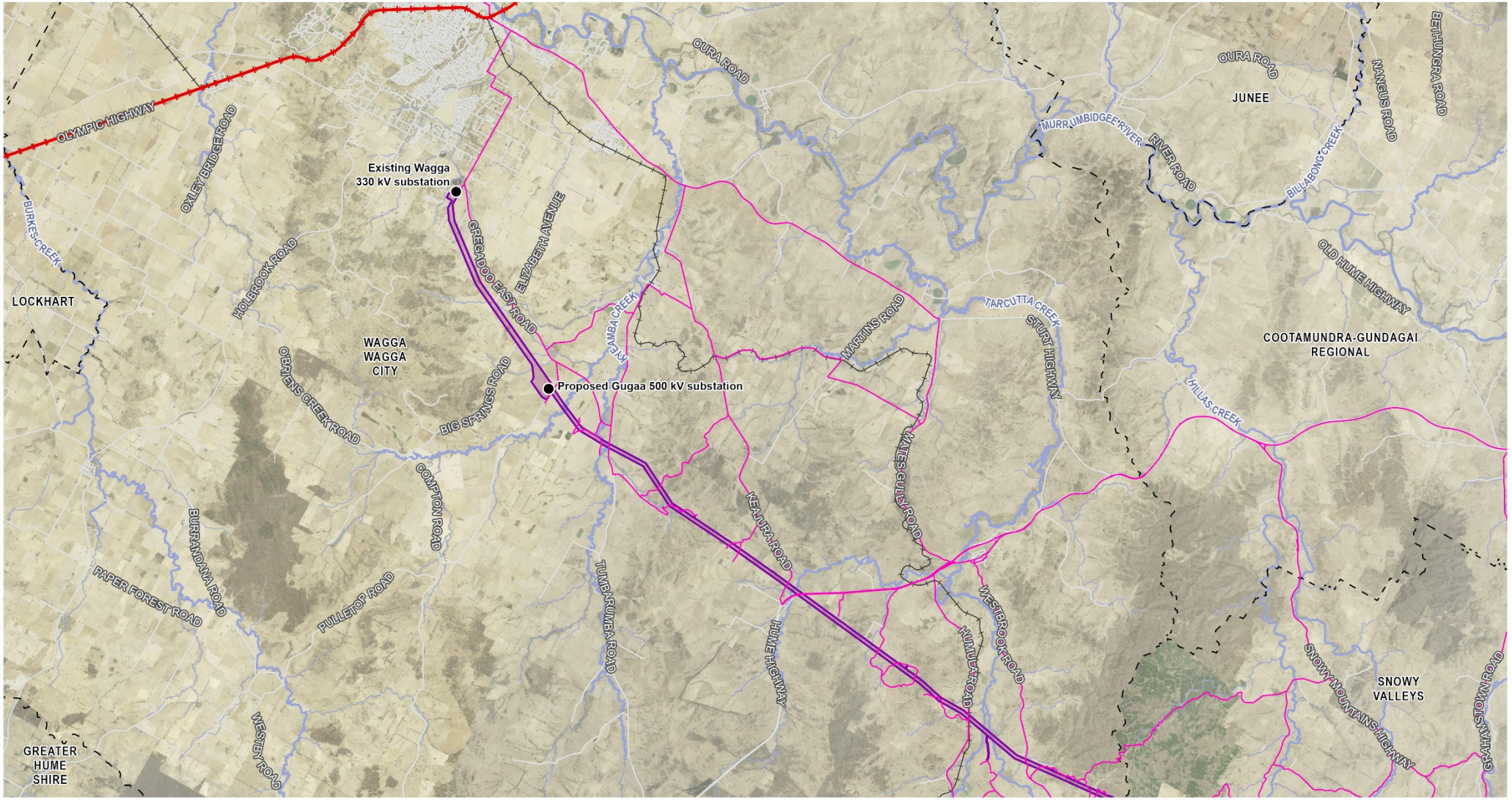
FIGURE 5-9: Valmar Community Transport bus routes

5.8 Rail network

The existing railway lines that cross the project footprint were identified using the NSW Public Level Crossing Finder (TfNSW, 2022g). The active Main Southern Railway line and disused railway lines that cross the project footprint are detailed below and shown in Figure 5-10:

- Main Southern Railway Line operated by Australian Rail Track Corporation (operational rail line), located in the project footprint north of the Hume Highway approximately seven kilometres north-west of Yass approximately 0.5 kilometres north of Derringullen Creek rest area on the Hume Highway (M-31)
- Wagga Wagga Tumbarumba Railway Line (non-operational rail line), located in the project footprint approximately nine kilometres south-east of Tarcutta
- Tumut Railway Line (non-operational) – located in the project footprint north of the Snowy Mountains Highway approximately two kilometres north-west of Gadara
- Kunama Railway Line (non-operational) –located in the project footprint approximately six kilometres north-east of Batlow
- Goulburn Crookwell Railway Line (non-operational rail line), approximately two kilometres north-west of Woodhouselee, near Woodhouselee Road.



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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

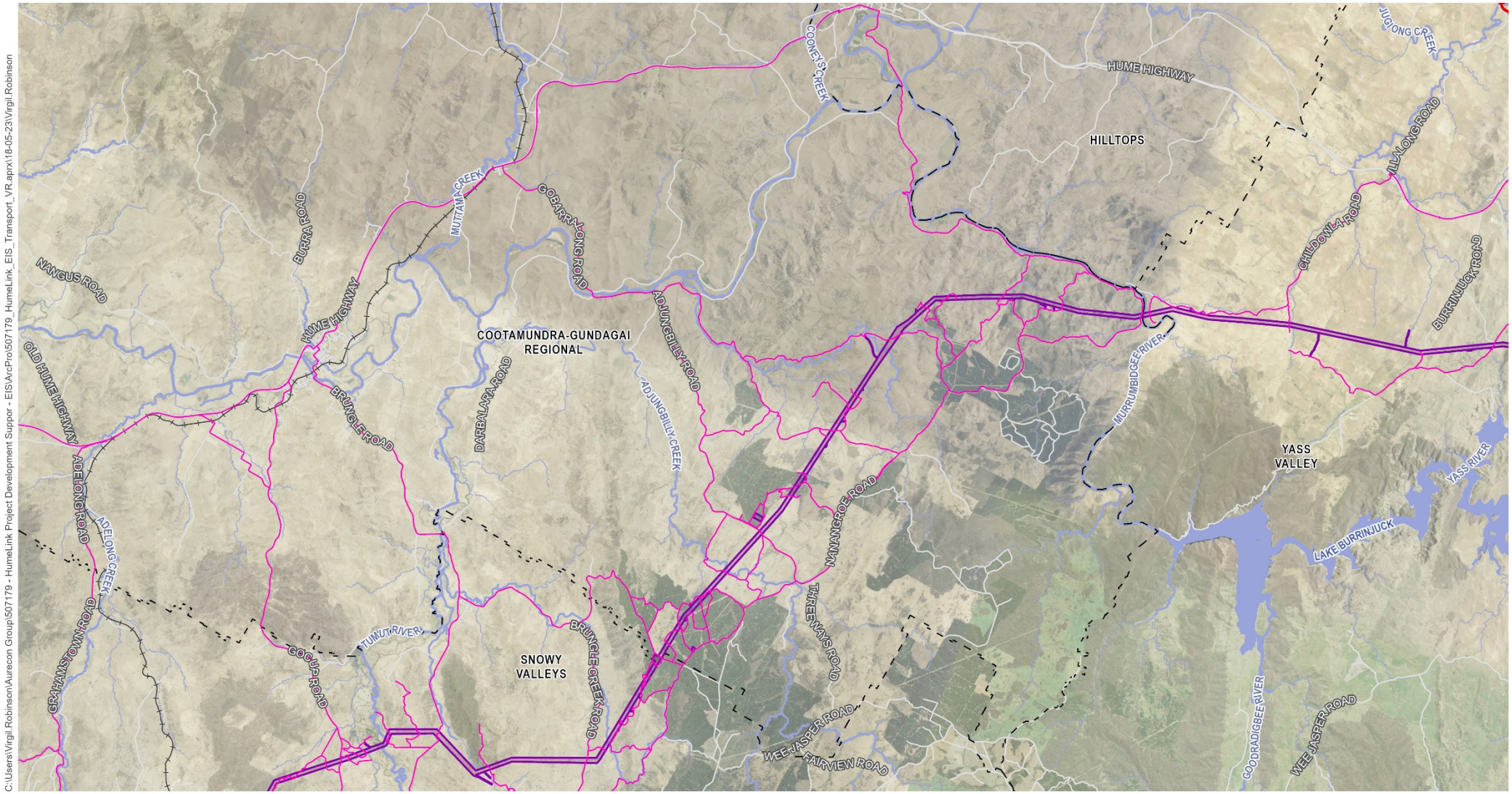
1:200,000

0 4 8 km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-10a: Operational rail line within study area



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

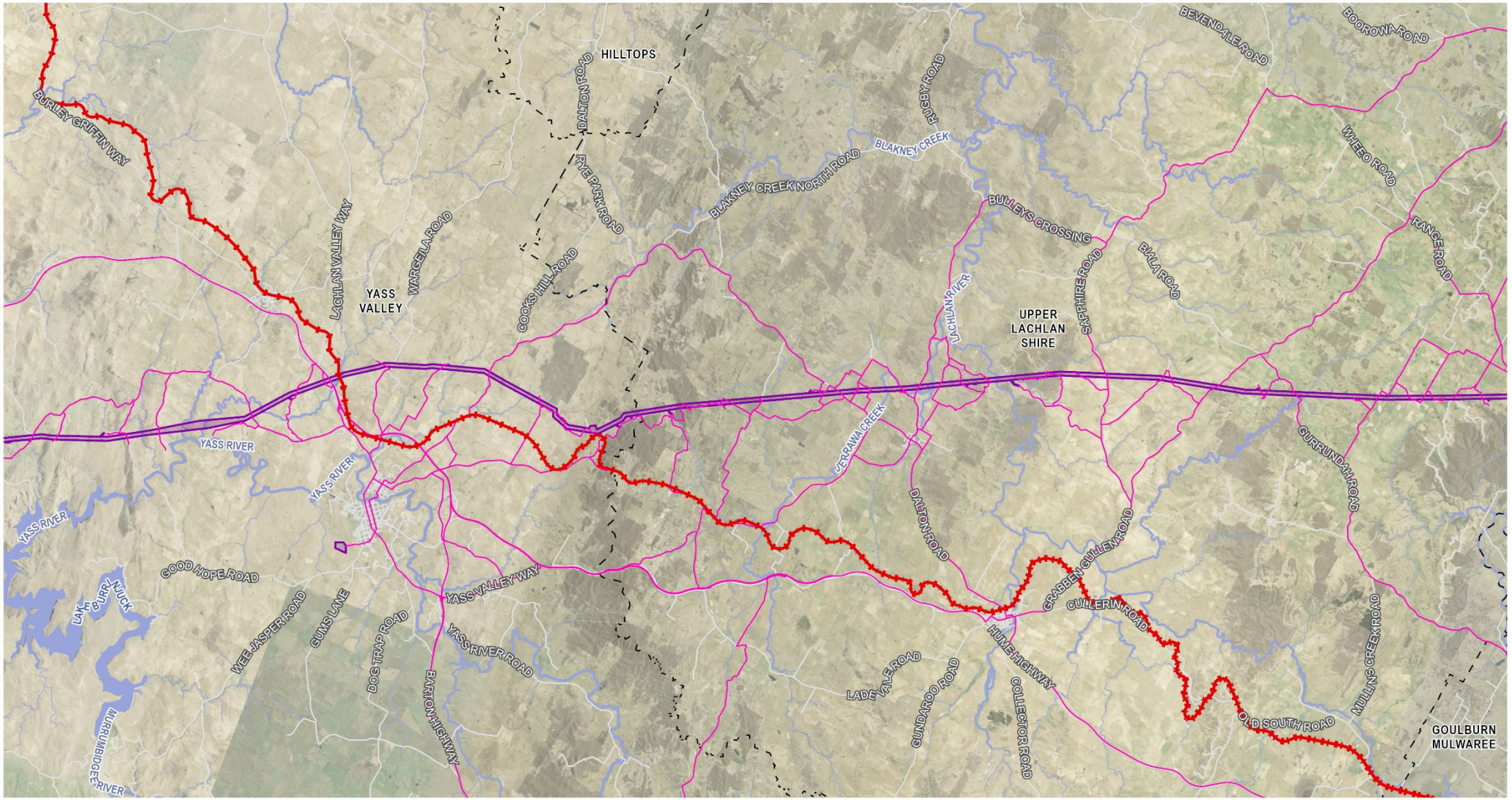
1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-10b: Operational rail line within study area



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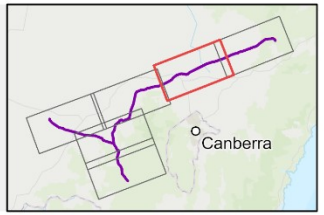
Project footprint
Local Government Area
Traffic study area – access routes
Main Southern Railway Line
Watercourse
Railway



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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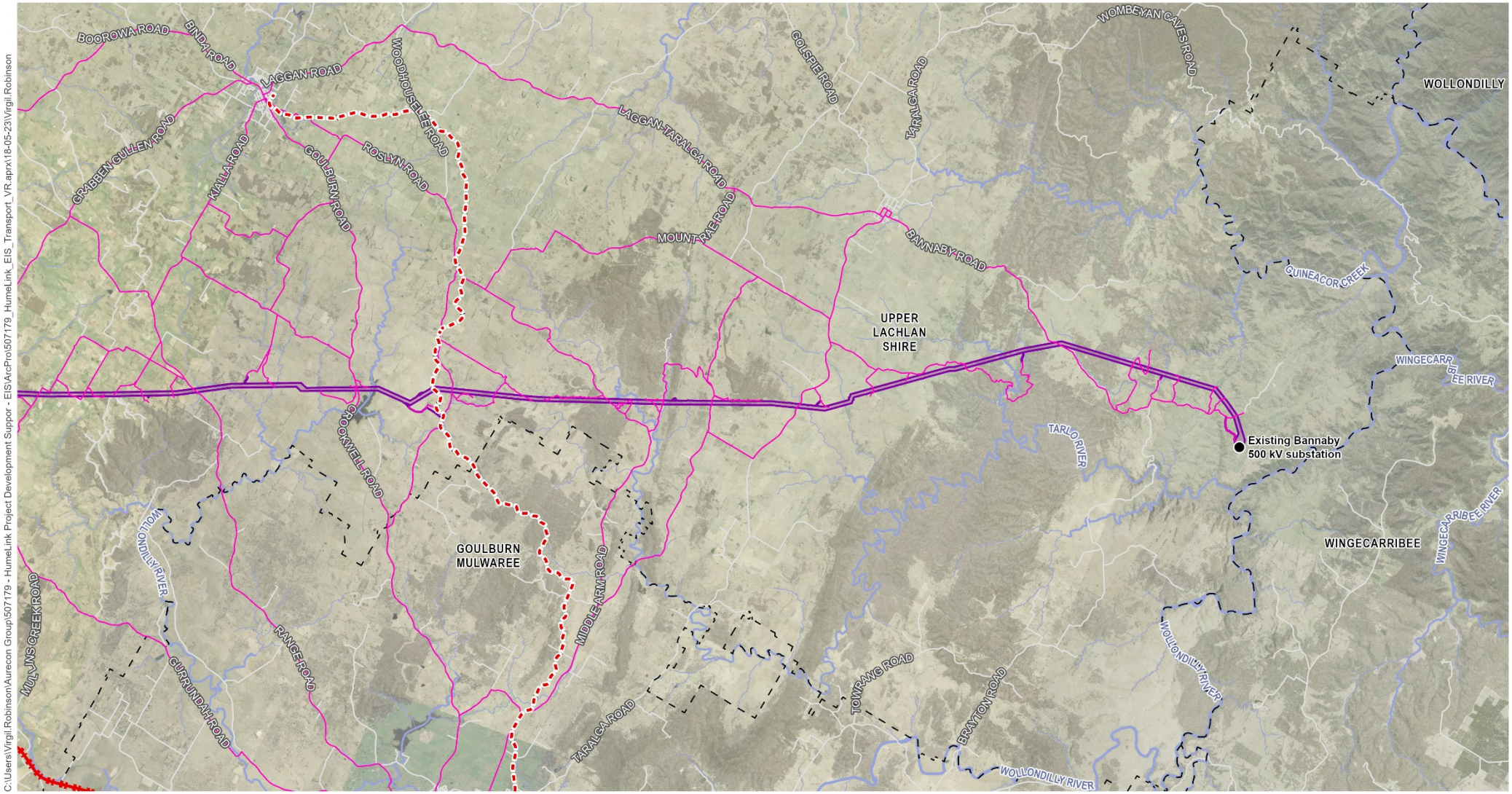
0 4 8 km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-10c: Operational rail line within study area



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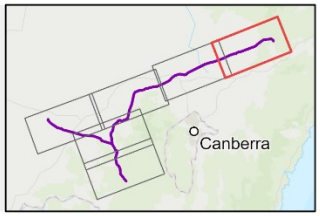
Project footprint
Local Government Area
Traffic study area – access routes
Disused rail lines
Main Southern Railway Line
Watercourse
Railway
Substation



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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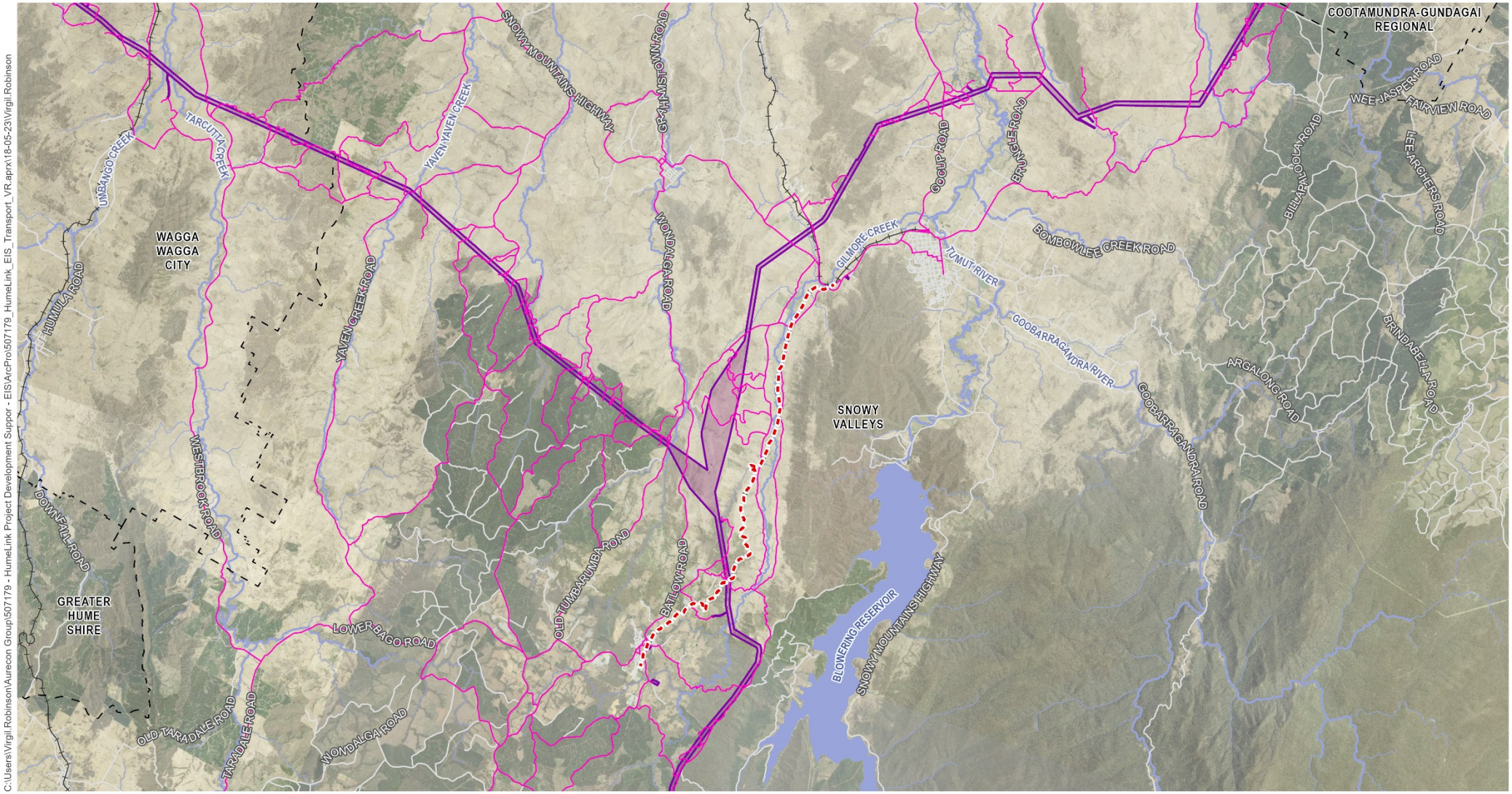
0 4 8 km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-10d: Operational rail line within study area



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-10e: Operational rail line within study area

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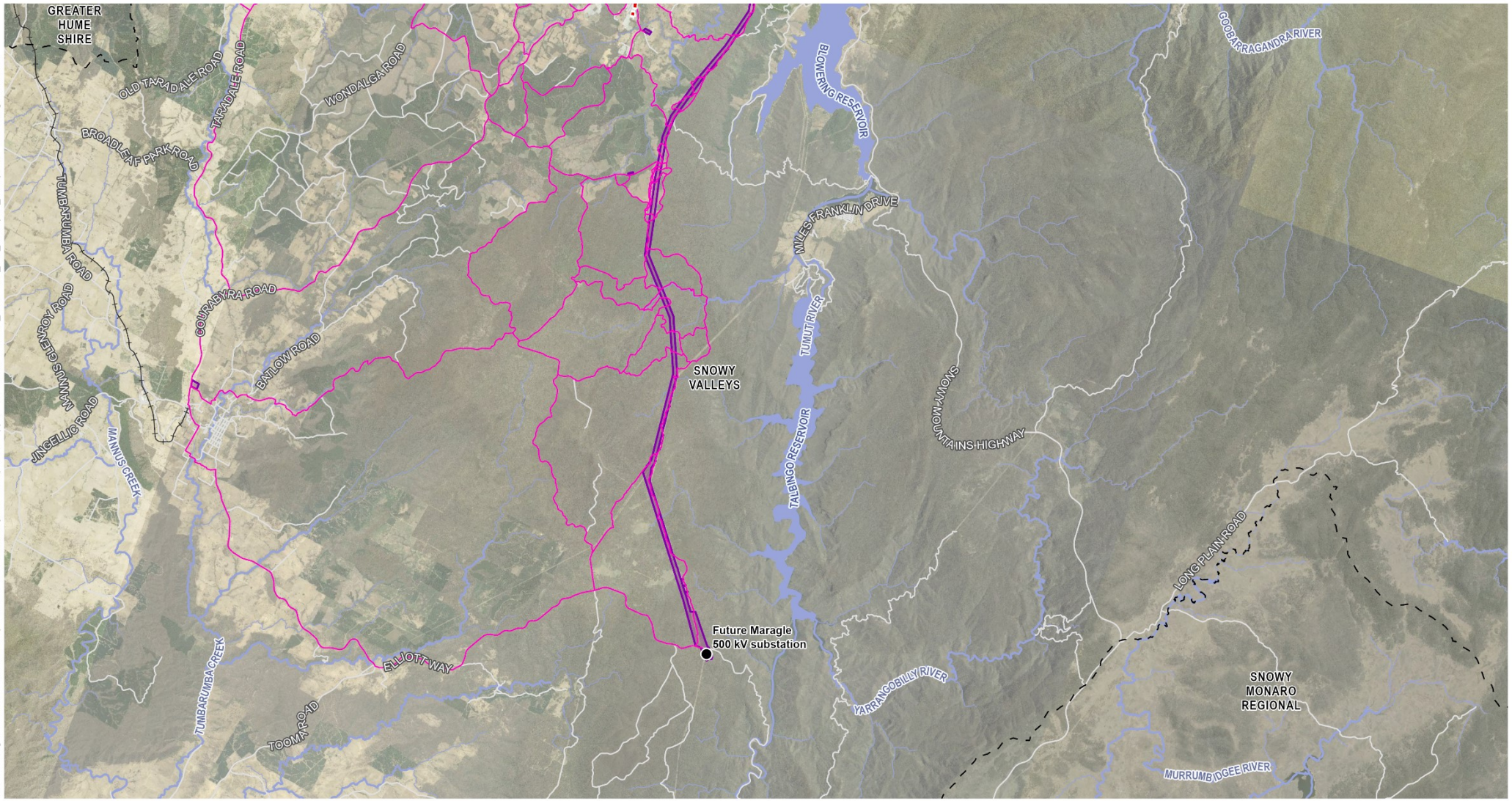

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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 5-10f: Operational rail line within study area

6 Construction impacts

During construction of the project, movements of construction vehicles would impact on the existing transport network. Indicative access routes connecting worker accommodation, transmission line structures and associated work sites, construction compounds and substations have been identified in Section 6.1.3. However, specific access would be confirmed for each transmission line structure during detailed design stage and for the purposes of this assessment representative locations have been considered in accordance with the methodology described in Chapter 4. This section of the report provides a summary of the indicative construction methodology and an assessment of transport impacts during construction, as required by the SEARs based on the methodology described in Chapter 4.

6.1 Construction approach

The project would generate light and heavy vehicle movements within the traffic study area. These vehicle movements would be associated with the delivery of construction materials and equipment, removal of waste and spoil, and the transportation of construction workers.

6.1.1 Construction workers

The number of construction workers would vary depending on the stage of construction and associated activities. During peak construction activities, the project is expected to employ around 1,200 full-time equivalent workers. Table 6-1 provides an overview of the anticipated number of construction workers for the key construction activities.

Table 6-1 Anticipated construction workers for the project

Construction activities	Anticipated construction workers (estimate)
Substation work	
Modification of existing Wagga 330 kV substation	■ up to 80 (monthly peak) ■ 270 total.
Construction of proposed Gugaa 500 kV substation	■ up to 190 (monthly peak) ■ 510 total.
Modification of existing Bannaby 500 kV substation	■ up to 110 (monthly peak) ■ 320 total.
Transmission line work	
Site establishment, environmental controls and vegetation clearing	■ 12 to 24.
Establishment of access points and tracks for construction of transmission line structures	■ 14 to 22.
Installation of structure foundations	■ 60 to 80.
Assembly and erection of structure	■ up to 100 (peak).
Stringing of conductors	■ up to 120 (peak).
Testing and commissioning	■ 30.
Administrative and management staff	■ 50 to 100.
Accommodation facility and laydown support staff	■ 20 to 50.

Notes:
- Monthly peak: This represents the estimated maximum monthly number of construction workers at any given month
- Total: This represents the estimated total number of construction workers.

6.1.2 Construction hours

As noted in Section 2.2.3, it is expected that construction activities would largely be undertaken during standard construction hours.

6.1.3 Construction compounds and access

The construction of the project would involve the establishment and use of construction compounds to support transmission line construction work. In addition, the Bannaby 500 kV substation compound (C12) would support the proposed work at the Bannaby 500 kV substation, the Gregadoo Road compound (C06) would support construction of the proposed Gugaa 500 kV substation and Wagga 330 kV substation compound (C01) would support proposed work at the Wagga 330 kV substation. These construction compounds would accommodate a range of facilities such as laydown areas, stockpiling areas, crushing/screening plant and vehicle and equipment storage. The Bannaby 500 kV substation compound (C12) is also likely to include a concrete batching plant. The final arrangement and activities to occur at each of the construction compound sites would be confirmed during detailed design.

Access to the construction compounds would be available from either existing roads or through temporary connection or new/upgraded access tracks, however exact access arrangements would be confirmed during detailed design. The location of construction compounds and indicative access arrangements is presented in Table 6-2. Permanent access arrangements are described in Chapter 7. No crashes have been recorded between 2016 and 2020 within 100 metres of all the proposed access points to the proposed construction compounds and the accommodation facility.

Table 6-2 Proposed access roads to construction compounds

Construction compound	Access arrangement
Wagga 330 kV substation compound (C01) Located adjacent the southern boundary fence of the existing Wagga 330 kV substation on the corner of Ashfords Road and Boiling Down Road, Gregadoo	Access to the construction compound would be via a temporary connection with Ashfords Road. Road improvement work would be required to facilitate access.
Snowy Mountains Highway compound (C02) Located east of the Snowy Mountains Highway adjacent the Tumut Resource Recovery Centre at Gilmore. The Gilmore timber mill is located opposite the site on the western side of the highway.	Access to the construction compound would be via a temporary connection with Snowy Mountains Highway about 380 m north of its intersection with Gilmore Mill Road. Road improvement work would be required to facilitate access.
Snubba Road compound (C03) Located along Snubba Road, Gilmore, about 6 km east of Batlow central business district (CBD).	Access to the construction compound would be via a temporary connection with Snubba Road. Road improvement work would be required to facilitate access.
Maragle 500 kV substation compound (C05) Located at the site of the future Maragle 500 kV substation at Nurenmerenmong, about 27 km west of Tumbarumba.	Access in and out would be via a temporary connection with Elliot Way. Road improvement work would be required to facilitate access.
Gregadoo Road compound (C06) Located on private property off Livingstone Gully Road, Gregadoo, about 20 km south-east of Wagga Wagga CBD.	Access in and out would be via temporary connection from Livingstone Gully Road. Road improvement work would be required to facilitate access. Access to this construction compound would facilitate access to the proposed Gugaa 500 kV substation.
Honeysuckle Road compound (C07) Located at the corner of Honeysuckle Road and Kileys Creek Road, Red Hill, about 20 km north-west of Tumut.	Access in and out would be via temporary connection from Honeysuckle Road. Road improvement work would be required to facilitate access.
Red Hill Road compound (C08) Located at the corner of Red Hill Road and Sawmill Creek Road, Adjungbilly about 22 km north-west of Tumut.	Access in and out would be via the existing property accesses off Sawmill Creek Road and/or the unnamed vehicular track east of Wee Jasper Road.
Adjungbilly Road compound (C09) Located off Adjungbilly Road, Adjungbilly, about 23 km east of Gundagai.	Access in and out would be via the existing Black Flat Forest area access from Adjungbilly Road.
Yass substation compound (C10) Located at the existing Yass substation at Perry Street, Yass.	Access in and out would be via the existing Perry Street access to the Yass substation.
Woodhouselee Road compound (C11) Located on private property off Woodhouselee Road, Woodhouselee.	Access in and out would be via the existing property access on Woodhouselee Road with an additional access track to be constructed to the site.

Construction compound	Access arrangement
Bannaby 500 kV substation compound (C12) Located at the Bannaby 500 kV substation at Hanworth Road, Bannaby.	The existing unsealed access road from Hanworth Road to the Bannaby 500 kV substation/ Bannaby substation 500 kV compound (C12) would be upgraded as part of the modification work. The upgrade work would mainly be limited to the existing access road formation and involve work to ensure the access road is suitable for heavy vehicles used in construction, eg grading and resurfacing work. The extent of the upgrade work would be confirmed during detailed design.
Memorial Avenue compound (C14) Located at the corner of Memorial Avenue and Mill Road, Tumut on a former Forestry Corporation of NSW depot site.	Access in and out would be via the existing property access at the corner of Memorial Avenue and Mill Road.
Bowmans Lane compound (C15) Located adjacent the Batlow waste depot along Keenans Road/Bowmans Lane, Batlow.	Access in and out would be via the existing property access on Keenans Road.
Snubba Road compound (C16) Located along Snubba Road, Batlow, about 9 km south of Batlow CBD.	Access in and out would be via a temporary connection with Snubba Road. Road improvement work would be required to facilitate access.
Tumbarumba Accommodation Facility (AC1) Located at the corner of Courabyra Road and Alfred Street, Tumbarumba, about 2 km north-west of the Tumbarumba CBD.	Access in and out would be via temporary connections with Courabyra Road and Alfred Street. Road improvement work would be required to facilitate access.

6.1.4 Construction of temporary and permanent access tracks

Safe access to transport construction machinery and material to each transmission line structure would be required during construction. Where safe access for such activities is not available, establishment of temporary access tracks would be required, which may be retained during operation of the project. These access tracks are expected to be traversable by a range of vehicles. The two broad groups of access tracks anticipated are as follows:

- *Un-improved access tracks*, where vehicles access the work site by using existing roads or tracks or driving on existing soil or ground surface with minimal or no prior preparation.
- *Constructed access tracks*, where there is no existing road or track, or where terrain conditions prevent continuous access along the transmission line easement. In these situations, suitable access tracks would be constructed outside the transmission line easement. All new access tracks would be around six metres wide and would generally follow the natural contour of the land as far as practicable to minimise the amount of cut and fill and soil disturbance. Access tracks would also include drainage control features such as table drains or cross banks to minimise erosion. The location of the access tracks would be agreed with the affected landowner and would be subject to separate use agreements, where required. Consideration for the potential erosion impacts for access tracks is considered by *Technical Report 12 - Surface Water and Groundwater Impact Assessment*. Construction of access tracks would be in accordance with design standards issued by Department of Land, Water and Conservation Guidelines for the Planning, Construction and Maintenance of Tracks (DLWC, 1994), Transgrid's Transmission Line Construction Manual and relevant Austroads guidelines.

If required, connection of these access tracks with the existing road network would be done per the provisions of *Guide to Road Design Part 4: Intersections and Crossings – General* (Austroads, 2020).

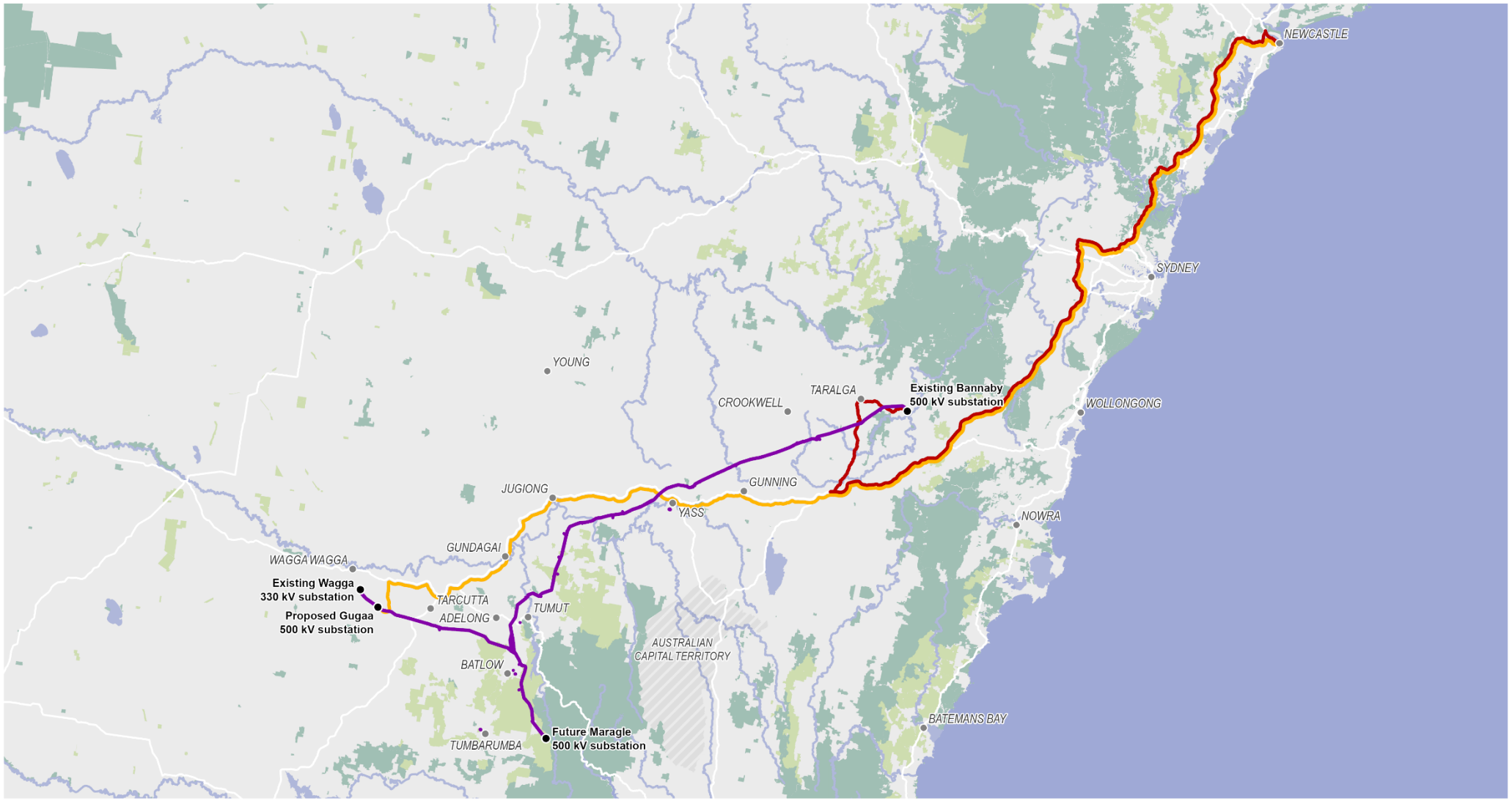
6.1.5 OSOM haul routes

As described in Section 4.1.1 two OSOM haul routes have been identified to transport OSOM components from Newcastle port to the existing Bannaby 500 kV substation site and to the proposed Gugaa 500 kV substation site. The routes have been identified and assessed by a third party (Rex J Andrews) with the reports outlining findings considered by this assessment.

The reports indicate that OSOM deliveries could be undertaken subject to various minor requirements including but not limited to:

- requirement of traffic management, spotter, assistance of police and pilot vehicles for pinch points
- approval to access the routes will be required from following:
  - NHVR – National Heavy Vehicle Regulator for access permits
  - TfNSW for accessing road bridge followed by assessment, approval of Traffic and Transport Management Plan (TTMP) and communication with road stakeholders
  - Local councils (Newcastle council, Goulburn Council, Upper Lachlan Shire Council, Wagga Wagga City council) for removal and replacement of road signs at pinch points, where required and TTMP
  - NSW police for police and pilot vehicles, if required
  - Ausgrid, Essential Energy, Telstra: To assess the height clearance of overhead utilities
  - CRN JHG (rail) and ARTC (Rail): to assess rail overbridges and crossings on route
- trailers to be raised to travel over a hump in the road (Selwyn Street onto Industrial Drive via George Street)
- restrictions on vehicles due to overhead structure (5.3 m maximum loaded height)
- construction of a suitable access road for the swept path of the largest load to the proposed Gugaa 500 kV substation.

The construction contractors will confirm the haulage route and would obtain the approvals that would need to be granted from relevant stakeholders. Figure 6-1 shows the location of the two most suitable OSOM haul routes considered in this assessment.

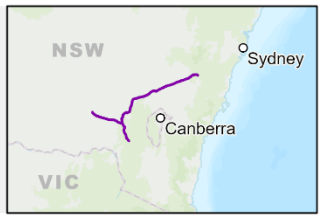


Project footprint
State forest
National park and reserve
Waterbody
Waterway

Major road
Substation

OSOM routes

Port of Newcastle to Bannaby 500 kV substation
Port of Newcastle to proposed Gugaa 500 kV substation



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

FIGURE 6-1: Indicative haulage routes for OSOM deliveries to the project footprint

6.2 Construction traffic generation and distribution

6.2.1 Traffic generation

Table 6-3 provides the overall estimated traffic movements generated by the project during construction for substations and transmission line work. Based on the preliminary construction program, up to 65 locations are estimated to be in use concurrently during construction of the transmission line structures, telecommunications hut, substations and construction compounds during the peak construction period. These active work sites would be distributed across the project footprint and accessed from various roads within the traffic study area.

Table 6-3 Indicative vehicle movement across the traffic study area during construction of substations and transmission link work

Activity	LVs		HVs	
	Typical daily movements	Maximum daily movements	Typical daily movements	Maximum daily movements
Wagga 330 kV substation	52	106	26	92
Gugaa 500 kV substation	86	190	36	102
Bannaby 500 kV substation	52	106	26	92
Transmission line work	346	656	99	155

Note:
Vehicle movements are each way (ie a HV / LV arriving and leaving a site, either within a day or separate days counts as two movements).Typical and maximum daily movements are based on the current program of work.
Vehicle movements associated with the connection to the future Maragle 500 kV substation and telecommunication huts are included in transmission line work.

Table 6-4 provides the overall estimated traffic movements generated by the project during construction for roads adjacent to the construction compounds and the worker accommodation facility.

Table 6-4 Indicative vehicle movement across the traffic study area during construction of construction compounds

Construction compound/ worker accommodation facility	Daily movement* z (vehicles per day in both direction of travel)				Peak hour movement* (vehicles per day in both direction of travel)			
	Typical construction		Construction peak		Typical construction		Construction peak	
	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles	Light vehicles	Heavy vehicles
Wagga 330 kV substation compound (C01)	60	70	120	140	12	14	24	28
Snowy Mountains Highway compound (C02)	120	50	240	100	24	10	48	20
Snubba Road compound (C03)	100	40	200	80	20	8	40	16
Maragle 500 kV substation compound (C05)	25	30	50	60	5	6	10	12
Gregadoo Road compound (C06)	100	105	200	210	20	21	40	42
Honeysuckle Road compound (C07)	25	30	50	60	5	6	10	12
Red Hill Road compound (C08)	30	35	60	70	6	7	12	14
Adjungbilly Road compound (C09)	35	40	70	80	7	8	14	16
Yass substation compound (C10)	10	65	20	130	2	13	4	26
Woodhouselee Road compound (C11)	60	40	120	80	12	8	24	16
Bannaby 500 kV substation compound (C12)	100	85	200	170	20	17	40	34
Memorial Avenue compound (C14)	5	45	10	90	1	9	2	18
Bowmans Lane compound (C15)	5	25	10	50	1	5	2	10
Snubba Road compound (C16)	100	40	200	80	20	8	40	16
Tumbarumba Accommodation Facility (AC1)	50	10	100	20	10	2	20	4

6.2.2 Traffic distribution

This section details the distribution of the construction traffic across all roads that are expected to provide access to the project. HV traffic would be distributed across work sites for the deliveries or disposal of construction material. LV traffic would originate from the proposed worker accommodation facility and towns close to the project footprint and would be distributed from these locations to active work sites and construction compounds.

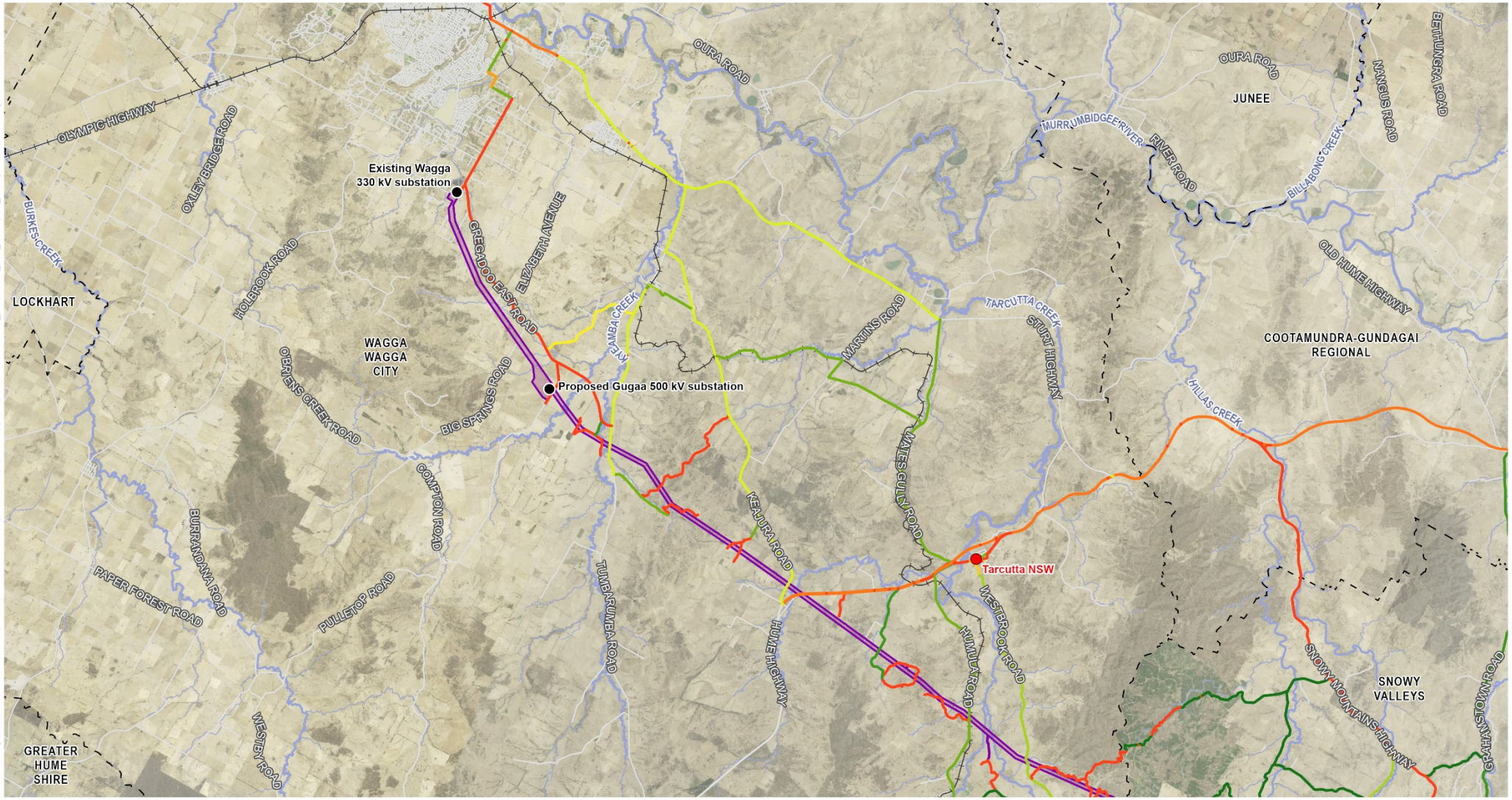
Roads adjacent to substation construction sites, existing substations and construction compounds are expected to experience higher volumes of HV traffic, due to the deliveries of materials to these locations for longer durations of the construction program than other work sites. These roads would also carry some LVs for workers travelling to and from construction compounds and across the project footprint.

Table 6-4 provides a summary of the expected daily movements on roads adjacent to the construction compounds for light and HVs. The daily movement includes traffic generated by:

- delivery of materials to and from construction compounds and delivery of materials from construction compounds to construction work sites
- daily movement of LVs trips include worker trips to construction compounds and construction work sites
- LV trips (workers) originating from accommodation locations (local towns and the proposed worker accommodation facility) to work sites directly and not construction compounds. These workers are not travelling to construction compounds destinations but rather directly to work sites, however the routes also use the roads adjacent to construction compound and traffic movements have been accordingly considered.

The number of vehicles travelling to and from any given construction compound would be determined by the number of active construction sites and the duration of construction activities supported from that site.

Figure 6-2 illustrates the distributed construction traffic on roads within the traffic study area. Overall, 90 per cent of the routes are expected to be used for a short duration of the overall construction program (ie would accommodate trips for up to six months), only 10 per cent of the routes would be used for the full duration.



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 6-2a: Road impact for construction traffic on roads providing access to project

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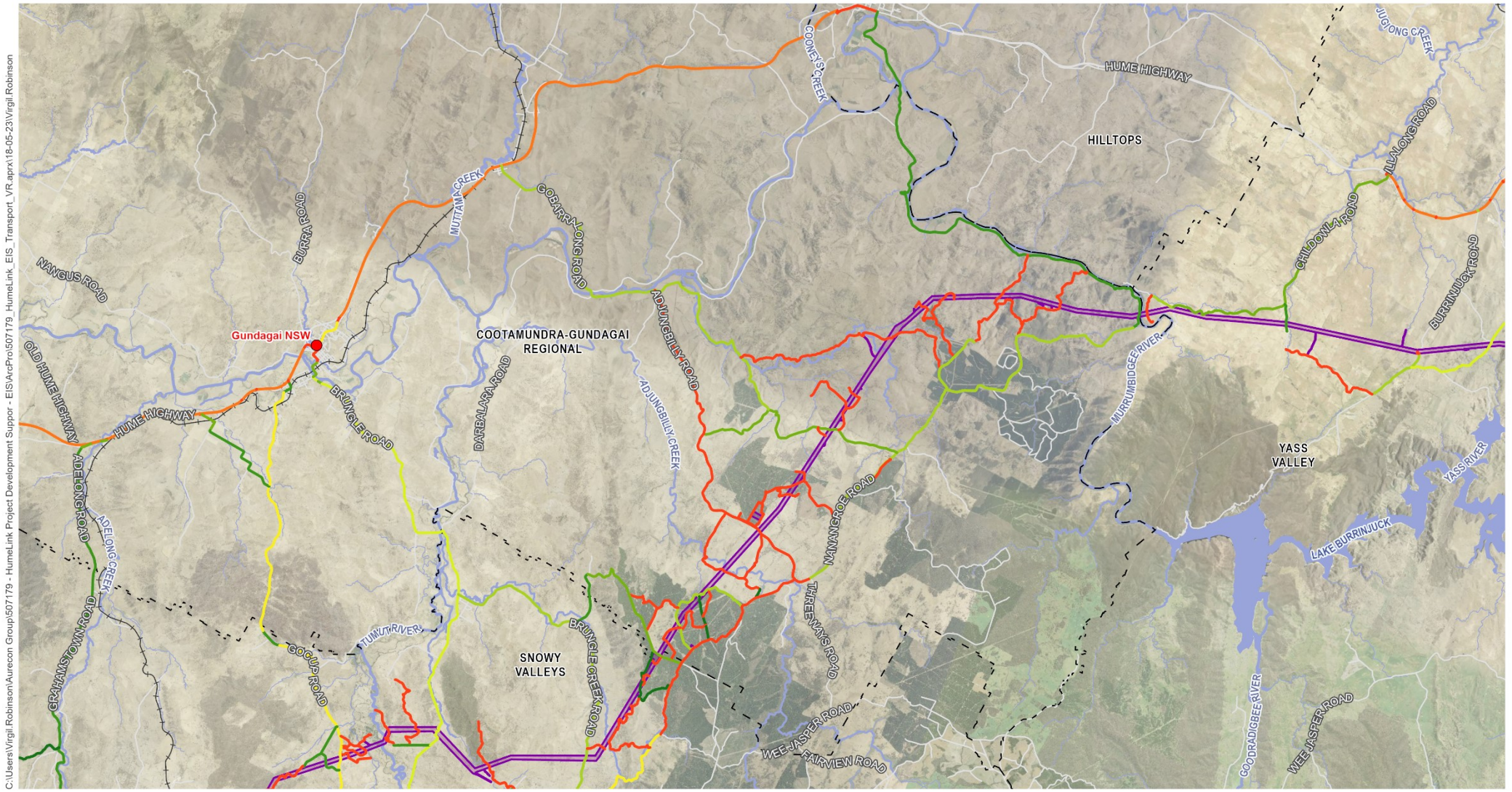

Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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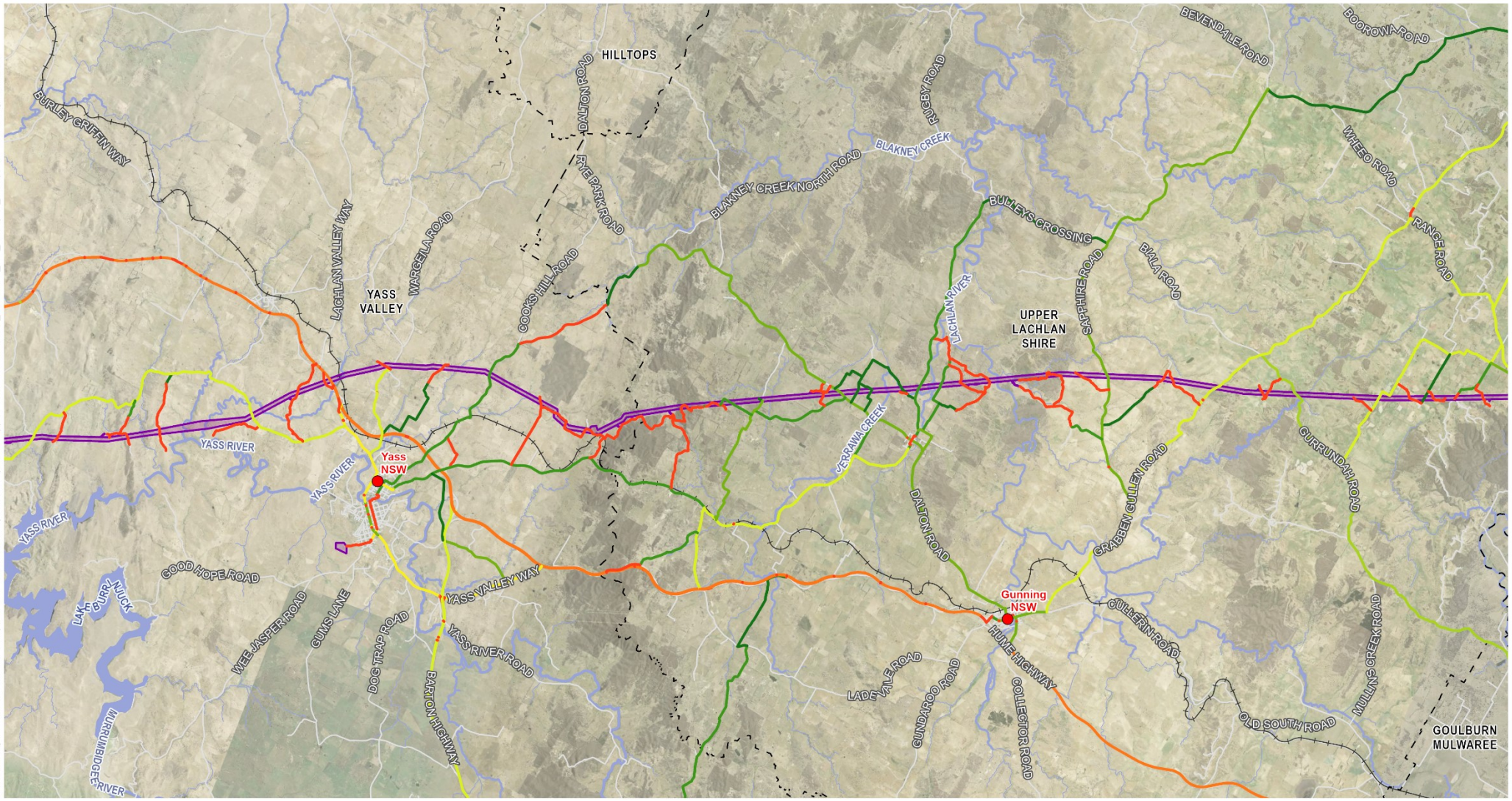
Projection: GDA 1994 MGA Zone 55

Figure 6-2b: Road impact for construction traffic on roads providing access to project



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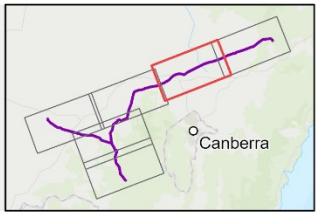
Project footprint
Local Government Area
Watercourse
Railway
Key accomodation location

Road impact
Most impact
Least impact



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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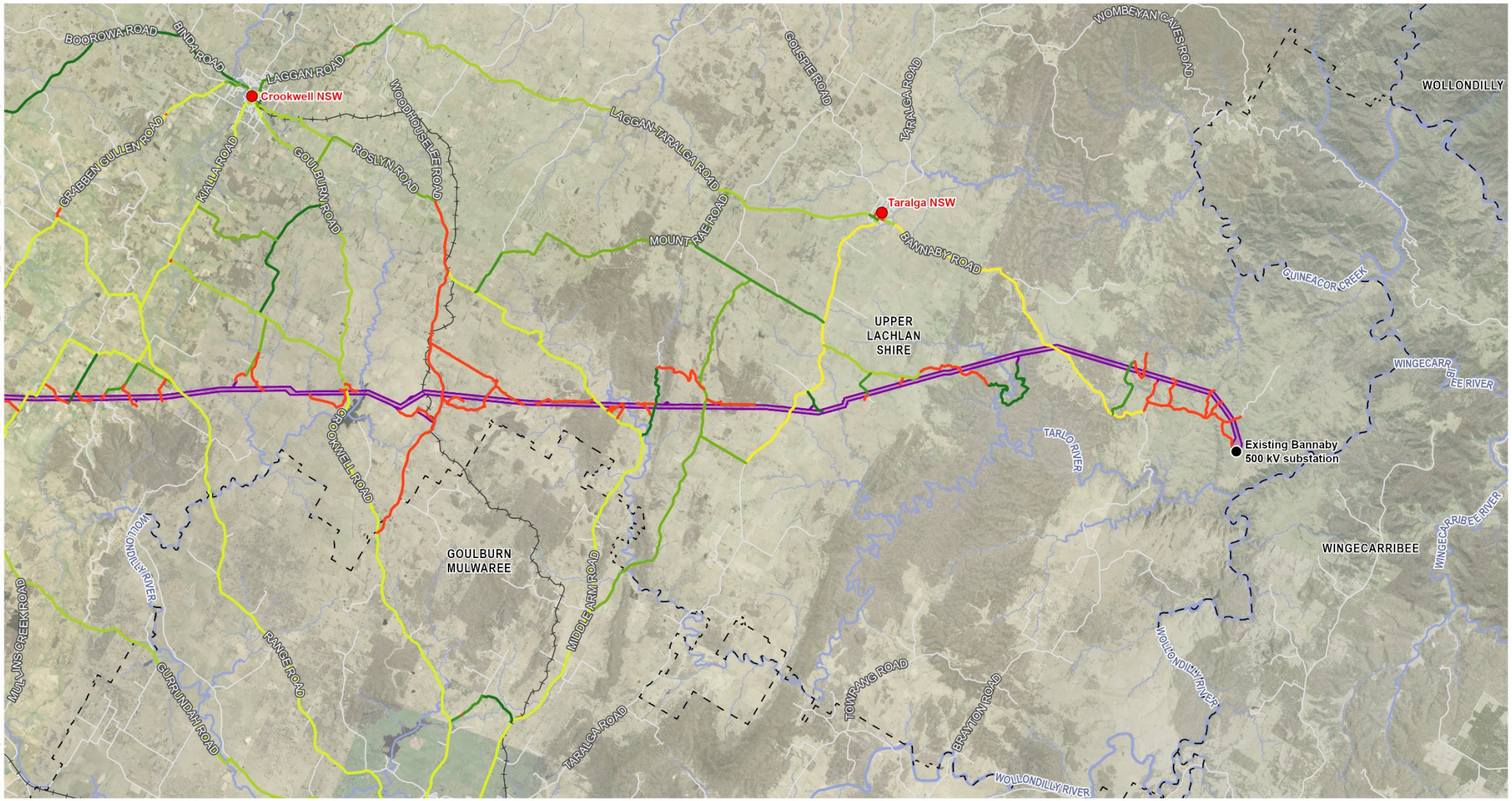
Projection: GDA 1994 MGA Zone 55

Figure 6-2c: Road impact for construction traffic on roads providing access to project



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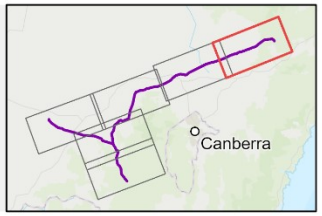
Project footprint
Local Government Area
Watercourse
Railway
Substation
Key accomodation location

Road impact
Most impact
Least impact



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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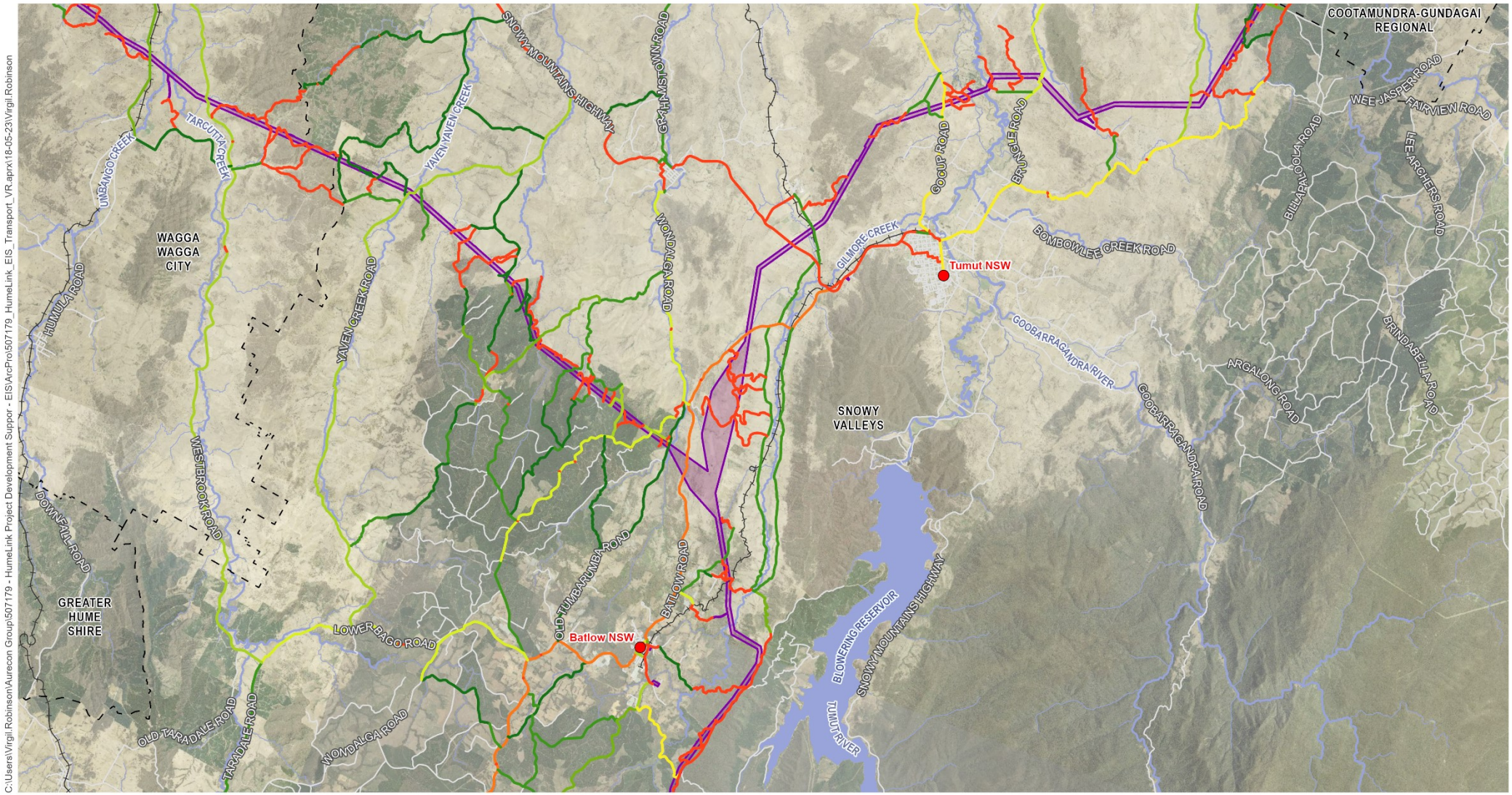
Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 6-2d: Road impact for construction traffic on roads providing access to project



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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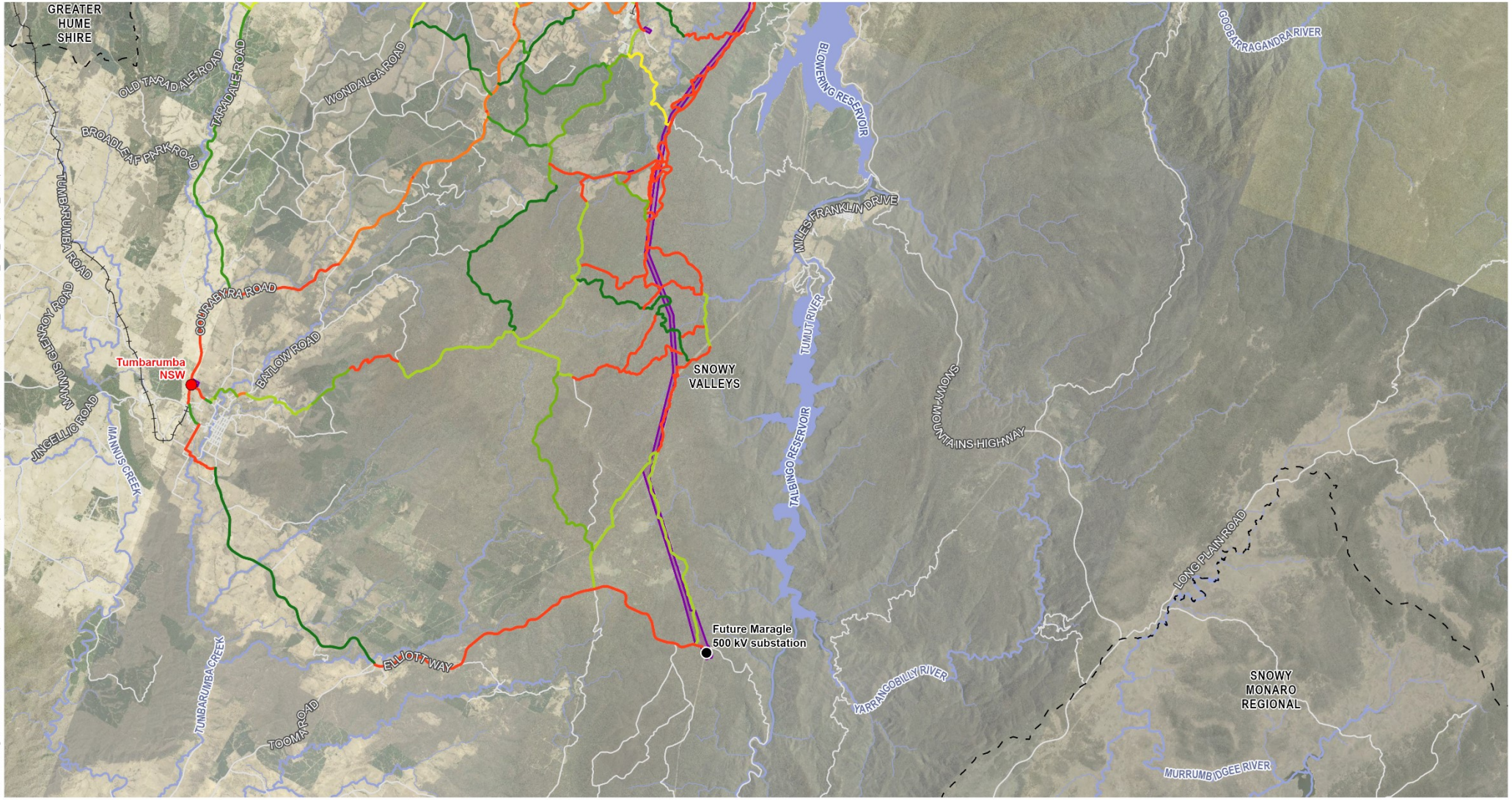
Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 6-2e: Road impact for construction traffic on roads providing access to project



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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 6-2f: Road impact for construction traffic on roads providing access to project

6.3 Construction impact assessment

6.3.1 Impact on road network

Construction impacts on the road network would include temporary increases in traffic movements on roads connecting work sites, for the duration of construction activities. These impacts would vary over the project program as various elements of the project are delivered sequentially. Works would not occur along the entire transmission line at one time but rather would be undertaken in a progressive manner along the line, with potential for several work fronts. The following sections discuss the impact of construction traffic on road network performance and road condition.

6.3.1.1 Road network performance

The traffic impact within the traffic study area during construction is likely to be more apparent on local roads, access tracks and at specific access locations within the project footprint. The comparison between the expected LoS during peak construction traffic and existing LoS is shown in Table 6-5 to Table 6-10. Figure 6-3 shows the LoS of roads with additional construction traffic.

During the construction peak for all activities (refer to Table 6-1) the peak hourly increase in total traffic on all roads providing access to the project would range between six to 82 vehicles per direction of travel and the median total increase in traffic on roads would be 22 vehicles per direction of travel. Five per cent of the time, the increase in total traffic would be above 40 vehicles per direction of travel. This is considered low.

The peak hourly increase in heavy vehicle traffic on all roads providing access to the project would range between two to 42 vehicles per direction of travel and the median increase in heavy vehicle traffic would be 12 vehicles per direction of travel. Five per cent of the time, the increase in heavy traffic would be above 18 vehicles per direction of travel. This is considered low.

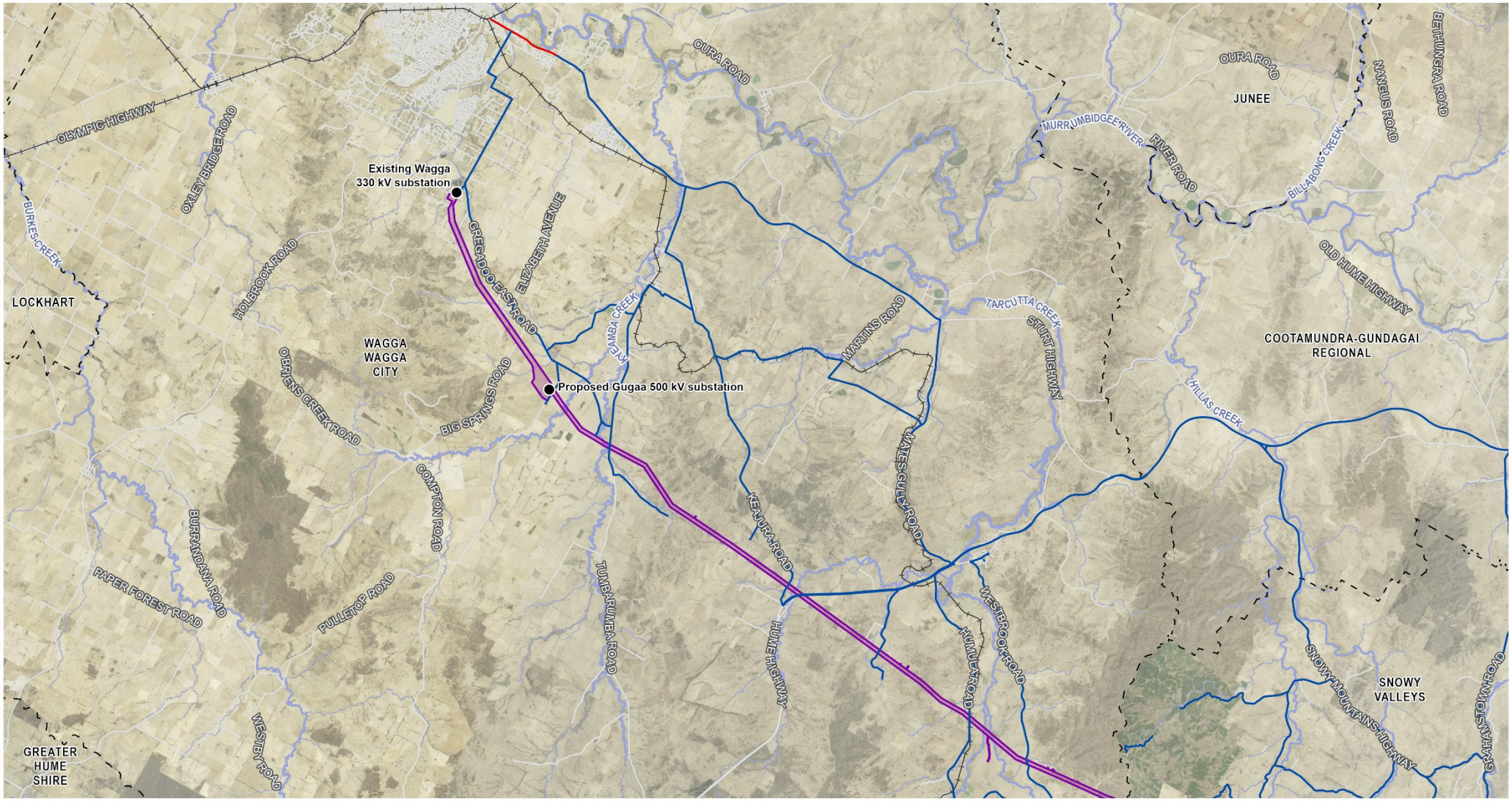
For 248 local roads, the peak hourly increase in total traffic on roads providing access to the project would range between six to 82 vehicles per direction of travel and the median total increase in traffic would be 16 vehicles per direction of travel. Five per cent of the time, the increase in total traffic would be above 36 vehicles per direction of travel. This is considered low.

In summary, the overall increase in construction traffic due to the project is considered relatively minor in light of the available capacity on roads.

With the additional construction traffic, there would be a minor increase in Volume Capacity Ratio (VCR) however there would be no change in LoS. Due to the quiet nature of the existing local environment owing to the low existing levels of traffic and the regional rural setting, the additional traffic would result in some noticeable change. However, with regards to road capacity, all roads would operate reasonably in free flow conditions. This demonstrates that the road network in the traffic study area would keep on operating at nearly the same level of network performance as per existing conditions.

The assessment indicates the expected impact of additional traffic on road network performance would be low. In particular, when considering the construction program and the distribution of construction and ancillary site locations over the full geographical extent of the project, the expected additional volume of construction traffic generated by the project on national, state and regional roads (taking into consideration the design capacity) is expected to be insignificant.

The delivery of materials to transmission line structures is anticipated to be via a combination of both road delivery and air delivery (ie by helicopter). The use of helicopters would be informed during detailed design, subject to various considerations including access, ground conditions and landing locations. In general, the use of helicopters would reduce the potential for impacts on the road network within the traffic study area. The flying paths and the landing platforms required to be in line with the Civil Aviation Safety Authority. For the purposes of this assessment, it has been assumed that all deliveries of materials would be via the road network.



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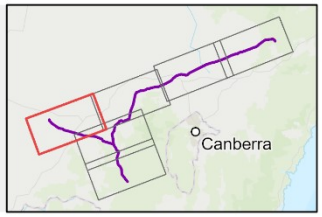
Project footprint
Local Government Area
Watercourse
Railway
Substation

Construction phase LOS
LoS A
LoS B



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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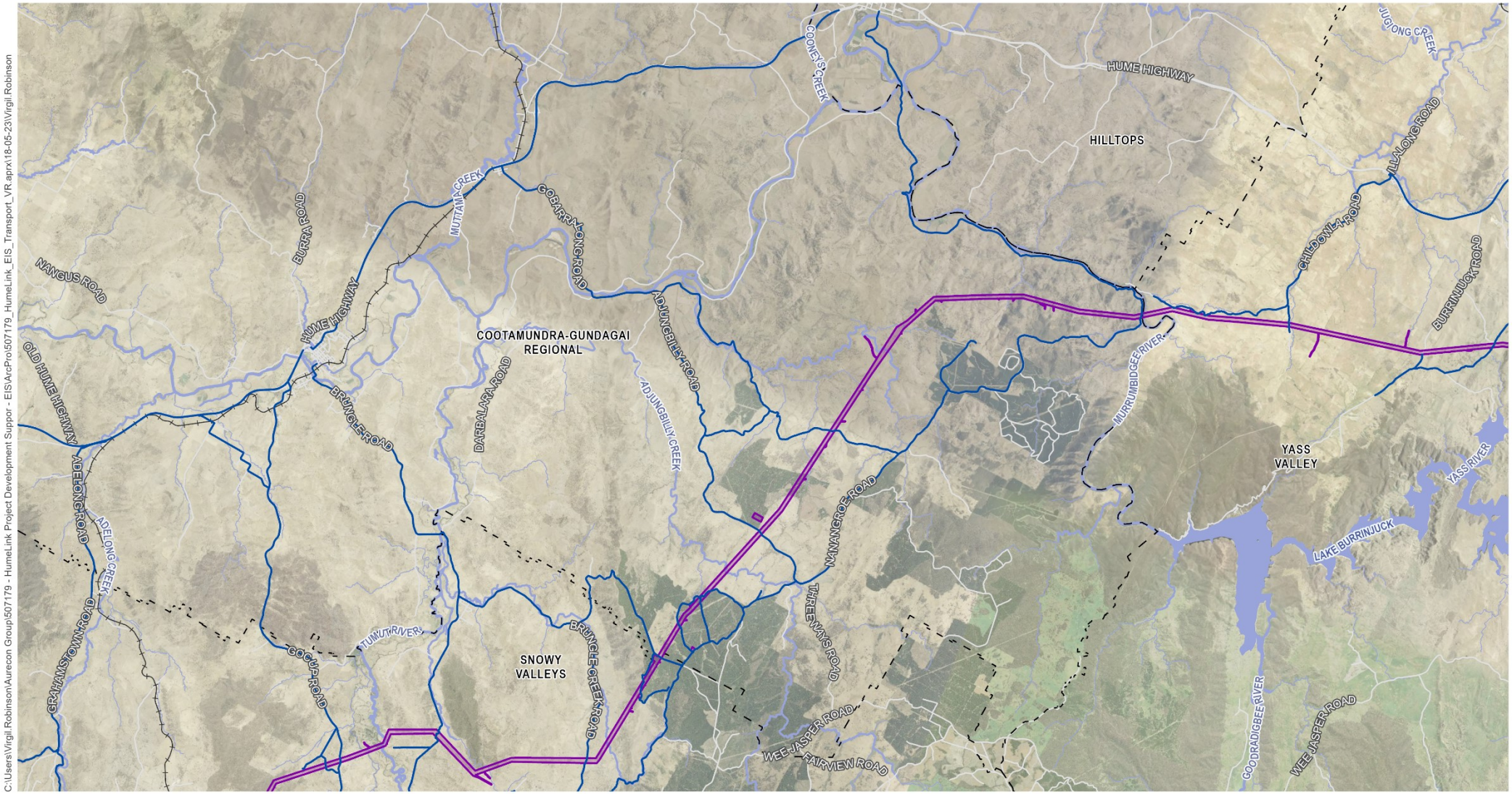
Projection: GDA 1994 MGA Zone 55

Figure 6-3a: Level of service with additional construction traffic on roads providing access to project



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Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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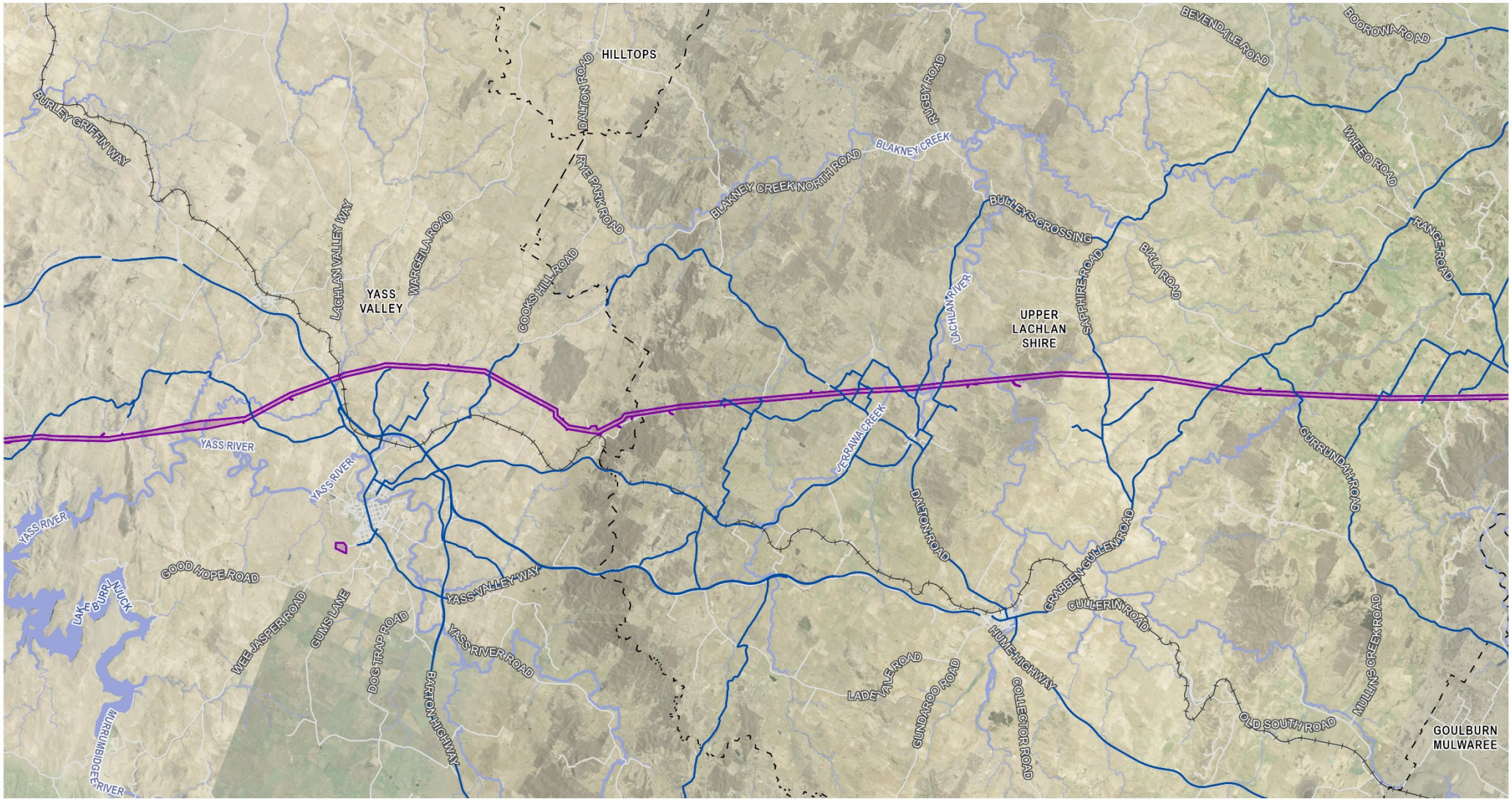
Projection: GDA 1994 MGA Zone 55

Figure 6-3b: Level of service with additional construction traffic on roads providing access to project



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Project footprint

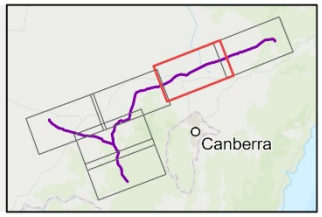
Local Government Area

Watercourse

Railway

Construction phase LOS

LoS A



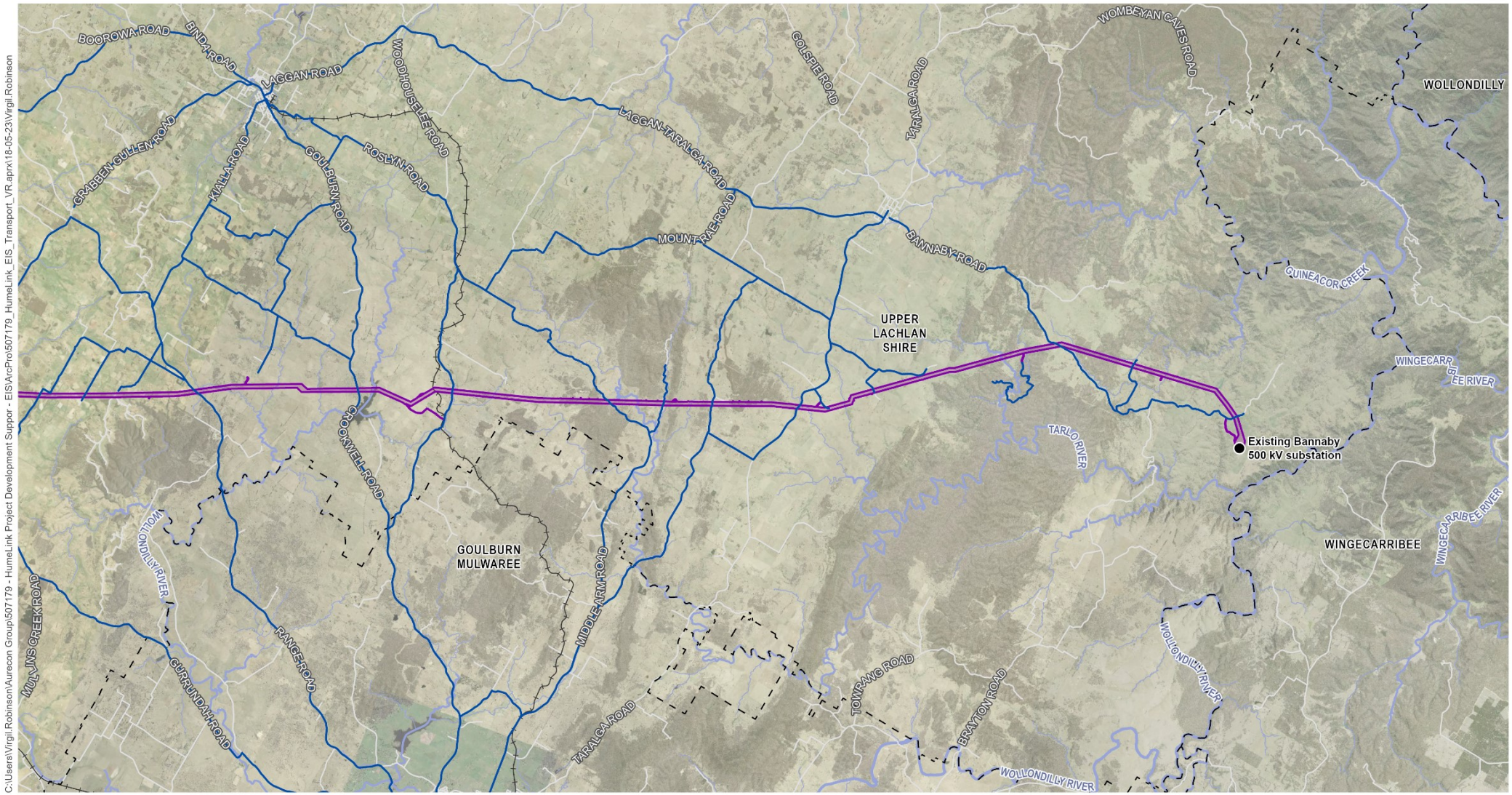
Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000

0 4 8km

Projection: GDA 1994 MGA Zone 55

Figure 6-3c: Level of service with additional construction traffic on roads providing access to project



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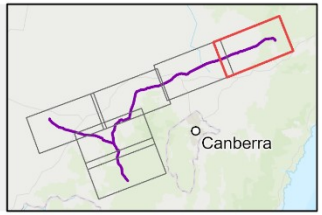
Project footprint
Local Government Area
Watercourse
Railway
Substation
Construction phase LOS
LoS A

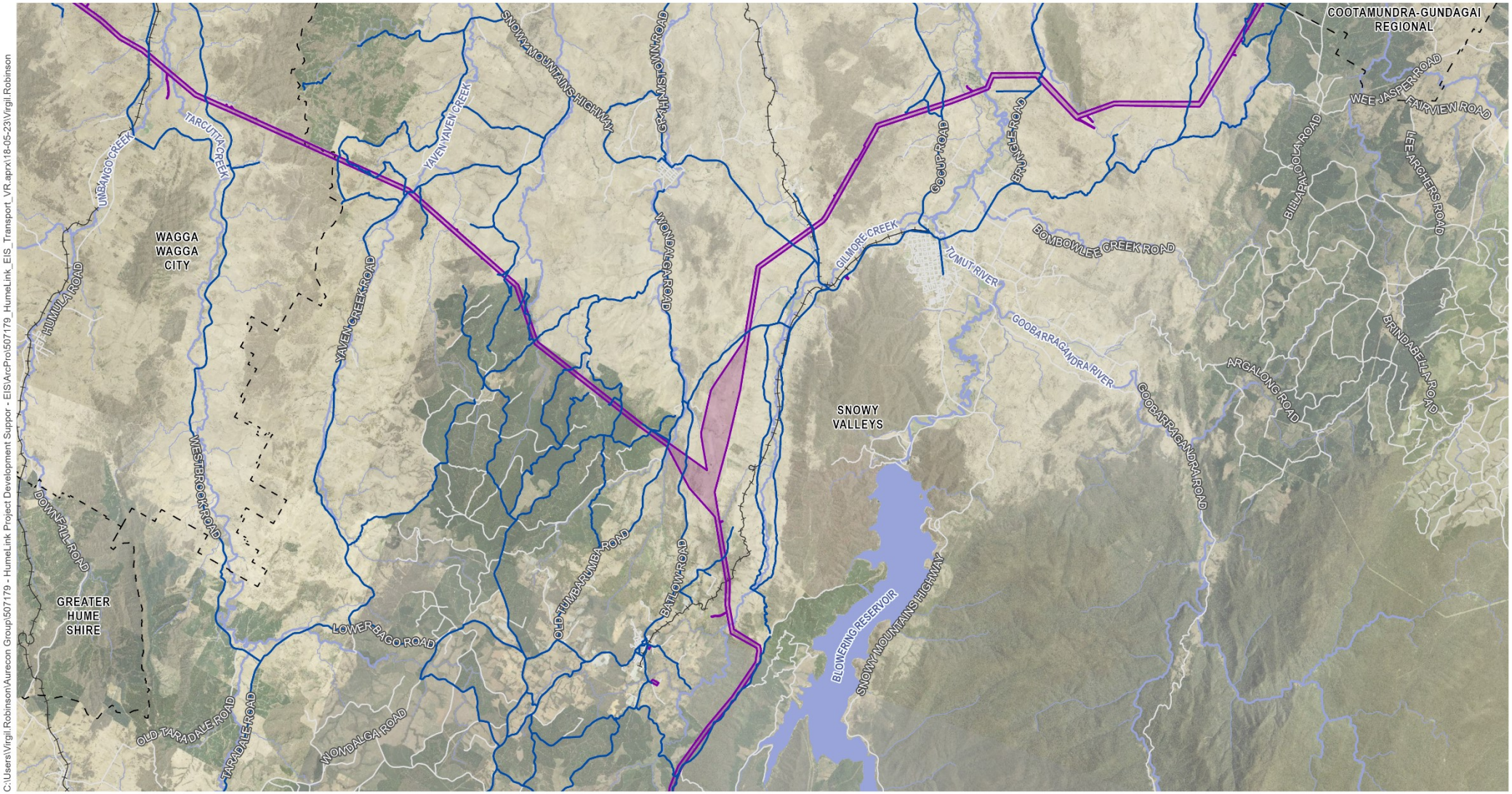


Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8 km

Projection: GDA 1994 MGA Zone 55

Figure 6-3d: Level of service with additional construction traffic on roads providing access to project

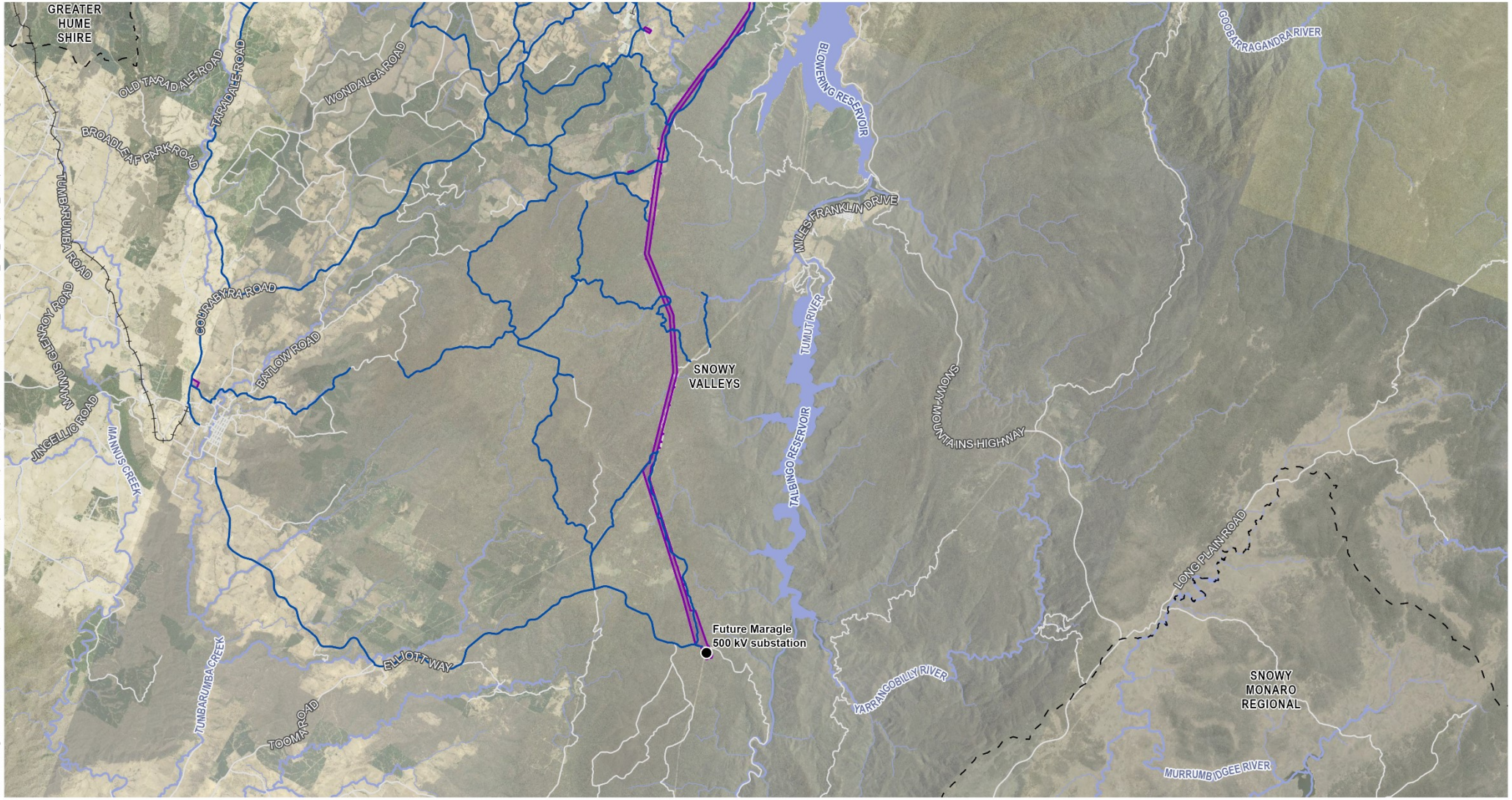


Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8km

Projection: GDA 1994 MGA Zone 55

Figure 6-3e: Level of service with additional construction traffic on roads providing access to project



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:200,000
0 4 8 km

Projection: GDA 1994 MGA Zone 55

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Figure 6-3f: Level of service with additional construction traffic on roads providing access to project

Table 6-5 Impact on road network performance for additional construction traffic, Wagga Wagga City LGA

Road name	NSW road network classification	Pavement type	Duration of impacts	Existing peak hour volume (vehicles per hour in one direction)	Existing Volume to capacity ratio	Existing LoS	Peak hourly increase LV (vehicles per hour in one direction)	Peak hourly increase HV (vehicles per hour in one direction)	Peak hourly traffic increase (vehicles per hour in one direction)	Total traffic (vehicles per hour in one direction)	Construction phase V/C ratio	Construction phase LOS (changes from existing LoS identified in bold)
Abbots Lane	Local road	Unsealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Angels Lane	Local road	Unsealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Ashfords Road	Local road	Sealed	Long term	30	0.03	LoS A	24	28	52	82	0.09	LoS A
Big Springs Road	Local road	Sealed	Short term	50	0.05	LoS A	16	12	28	78	0.08	LoS A
Burkinshaws Lane	Local road	Unsealed	Short term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Byes Lane	Local road	Unsealed	Short term	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Centenary Avenue	Local road	Sealed	Medium term	100	0.10	LoS A	30	16	46	146	0.15	LoS A
Comatawa Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Coreinbob Road	Local road	Unsealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Coreinbob Siding Road	Local road	Unsealed	Short term	30	0.03	LoS A	16	12	28	58	0.06	LoS A
Gregadoo East Road	Local road	Sealed	Long term	100	0.10	LoS A	40	42	82	182	0.18	LoS A
Gregadoo-Ladysmith Road	Local road	Sealed	Medium term	50	0.05	LoS A	20	16	36	86	0.09	LoS A
Hammond Avenue	State road	Sealed	Long term	910	0.33	LoS B	30	20	50	960	0.34	LoS B
Hume Highway (between Humula Road and Comatawa Road)	National road	Sealed	Long term	140	0.04	LoS A	30	20	50	190	0.05	LoS A
Humula Link Road	Local road	Sealed	Short term	50	0.05	LoS A	8	8	16	66	0.07	LoS A
Humula Road	Local road	Sealed	Short term	50	0.05	LoS A	16	12	28	78	0.08	LoS A
Ivydale Road	Local road	Unsealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Keajura Road	Local road	Sealed	Medium term	50	0.05	LoS A	16	16	32	82	0.08	LoS A
Kooringal Road	Local road	Sealed	Short term	100	0.10	LoS A	16	12	28	128	0.13	LoS A
Kyeamba Avenue	Local road	Sealed	Short term	50	0.06	LoS A	16	12	28	78	0.09	LoS A
Kyeamba Street	Local road	Sealed	Short term	50	0.05	LoS A	16	12	28	78	0.08	LoS A
Livingstone Gully Road	Local road	Unsealed	Long term	20	0.02	LoS A	40	42	82	102	0.11	LoS A
Mates Gully Road	Local road	Sealed	Short term	50	0.05	LoS A	16	12	28	78	0.08	LoS A
Mitchell Road	Local road	Sealed	Long term	100	0.11	LoS A	24	28	52	152	0.17	LoS A
Oberne-Umbango Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Stewarts Road	Local road	Unsealed	Short term	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Sturt Highway (east of Tumbarumba Road)	State road	Sealed	Medium term	160	0.09	LoS A	16	16	32	192	0.11	LoS A
Sturt Highway (east of RAAF BASE Wagga Wagga)	State road	Sealed	Medium term	210	0.12	LoS A	16	16	32	242	0.13	LoS A
Sturt Highway (west of Elizabeth Avenue)	State road	Sealed	Medium term	390	0.22	LoS A	16	16	32	422	0.23	LoS A
Sydney Street	Local road	Sealed	Short term	100	0.10	LoS A	16	12	28	128	0.13	LoS A
Trewalla Road	Local road	Unsealed	Short term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Tumbarumba Road	Regional road	Sealed	Medium term	50	0.05	LoS A	16	16	32	82	0.08	LoS A
Tywong Street	Local road	Sealed	Medium term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Vincent Road	Local road	Sealed	Long term	50	0.06	LoS A	20	16	36	86	0.10	LoS A
Westbrook Road	Local road	Sealed	Medium term	50	0.05	LoS A	16	12	28	78	0.08	LoS A

Table 6-6 Impact on road network performance for additional construction traffic, Snowy Valleys LGA

Road name	NSW road network classification	Pavement type	Duration of impacts	Existing peak hour volume (vehicles per hour in one direction)	Existing Volume to capacity ratio	Existing LOS Level of service	Peak hourly increase LV (vehicles per hour in one direction)	Peak hourly increase HV (vehicles per hour in one direction)	Peak hourly traffic increase (vehicles per hour in one direction)	Total traffic (vehicles per hour in one direction)	Construction phase V/C ratio	Construction phase LOS (changes from existing LoS identified in bold)
Adelong Road	State road	Sealed	Short term	280	0.20	LoS A	8	8	16	296	0.21	LoS A
Albury Street	State road	Sealed	Short term	100	0.07	LoS A	8	8	16	116	0.08	LoS A
Alfred Street	Local road	Unsealed	Long term	20	0.02	LoS A	20	4	24	44	0.05	LoS A
Ash Creek Road	Local road	Unsealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Back Creek Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Back Kunama Road	Local road	Unsealed	Short term	30	0.03	LoS A	4	2	6	36	0.04	LoS A
Back Nacki Creek Road	Local road	Unsealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Back Sandy Gully Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Bago Creek Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Bago Forest Way	Local road	Unsealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Barneys Highway	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Bartoman Street	Local road	Sealed	Medium term	50	0.05	LoS A	16	12	28	78	0.08	LoS A
Batlow Road (between Snowy Mountains Highway and East Gilmore Road)	State road	Sealed	Long term	70	0.04	LoS A	30	20	50	120	0.07	LoS A
Batlow Road (south of Herrings Road)	State road	Sealed	Long term	50	0.03	LoS A	30	20	50	100	0.06	LoS A
BB Feeder Road	Local road	Unsealed	Medium term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Black Boot Road	Local road	Unsealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Bogong Street	Local road	Sealed	Short term	20	0.01	LoS A	16	12	28	48	0.03	LoS A
Booths Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Browns Forest Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Browns Road	Local road	Unsealed	Short term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Brungle Creek Link Road	Local road	Unsealed	Short term	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Brungle Creek Road	Local road	Unsealed	Medium term	30	0.03	LoS A	16	12	28	58	0.06	LoS A
Brungle Road	Local road	Sealed	Medium term	50	0.05	LoS A	16	16	32	82	0.08	LoS A
Buddong Road	Local road	Unsealed	Medium term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Bullongra Road	Local road	Unsealed	Medium term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Central Logging Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Cockatoo Road	Local road	Unsealed	Short term	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Courabyra Road	Local road	Sealed	Long term	50	0.05	LoS A	20	4	24	74	0.07	LoS A
Dog Tree Road	Local road	Unsealed	Short term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Dunns Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
East Bago Powerline Road	Local road	Unsealed	Medium term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
East Gilmore Road	Local road	Sealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Ellerslie Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Ellerslie Woolshed Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Elliott Way	Regional road	Sealed	Long term	50	0.04	LoS A	10	12	22	72	0.05	LoS A
Fitzroy Street	State road	Sealed	Medium term	200	0.14	LoS A	20	16	36	236	0.17	LoS A
Forest Road	Local road	Sealed	Medium term	50	0.05	LoS A	16	12	28	78	0.08	LoS A
Forsters Road	Local road	Sealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A

Road name	NSW road network classification	Pavement type	Duration of impacts	Existing peak hour volume (vehicles per hour in one direction)	Existing Volume to capacity ratio	Existing LOS Level of service	Peak hourly increase LV (vehicles per hour in one direction)	Peak hourly increase HV (vehicles per hour in one direction)	Peak hourly traffic increase (vehicles per hour in one direction)	Total traffic (vehicles per hour in one direction)	Construction phase V/C ratio	Construction phase LOS (changes from existing LoS identified in bold)
Gadara Lane	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Gadara Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Gocup Road (West Of Tumut)	State road	Sealed	Medium term	70	0.04	LoS A	20	16	36	106	0.06	LoS A
Grahamstown Road	Local road	Sealed	Short term	30	0.02	LoS A	8	8	16	46	0.03	LoS A
Green Hills Access Road	Local road	Sealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Green Hills Forest Way	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Greenhills Road	Local road	Sealed	Short term	50	0.05	LoS A	4	2	6	56	0.06	LoS A
Herrings Road	Local road	Unsealed	Medium term	10	0.01	LoS A	16	16	32	42	0.05	LoS A
Honeysuckle Road	Local road	Unsealed	Short term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Hugel Trail	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Hurdle Creek Trail	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Hydes Old Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Inglis Street	State road	Sealed	Short term	100	0.07	LoS A	8	8	16	116	0.08	LoS A
Keenans Road	Local road	Sealed	Long term	10	0.01	LoS A	2	10	12	22	0.02	LoS A
Kileys Creek Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Kileys Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Kopsens Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Kunama Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Kurrajong Avenue	Local road	Sealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Lower Bago Road	Local road	Sealed	Medium term	50	0.05	LoS A	16	16	32	82	0.08	LoS A
Mate Street	Local road	Sealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Meadow Creek Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Memorial Avenue	Local road	Sealed	Long term	30	0.03	LoS A	2	18	20	50	0.06	LoS A
Mill Road	Local road	Sealed	Long term	30	0.03	LoS A	2	18	20	50	0.06	LoS A
Millers Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Minjary Street	State road	Sealed	Short term	50	0.04	LoS A	8	8	16	66	0.05	LoS A
Monterey Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Mount Hugel Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Mount Pleasant Creek Trail	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Murrays Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Nellis Street	Local road	Sealed	Medium term	50	0.06	LoS A	16	12	28	78	0.09	LoS A
New Maragle Road	Local road	Unsealed	Short term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Northern Boundary Road	Local road	Unsealed	Medium term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Nursery Access Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Oberne Ellerslie Trail	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Old Tumbarumba Road	Local road	Sealed	Short term	30	0.03	LoS A	4	2	6	36	0.04	LoS A
Old Western Boundary Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
One Tree Hill Trail	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Palmer Street	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A

Road name	NSW road network classification	Pavement type	Duration of impacts	Existing peak hour volume (vehicles per hour in one direction)	Existing Volume to capacity ratio	Existing LOS Level of service	Peak hourly increase LV (vehicles per hour in one direction)	Peak hourly increase HV (vehicles per hour in one direction)	Peak hourly traffic increase (vehicles per hour in one direction)	Total traffic (vehicles per hour in one direction)	Construction phase V/C ratio	Construction phase LOS (changes from existing LoS identified in bold)
Park Avenue	Local road	Sealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Perkins Road	Local road	Unsealed	Medium term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Pierces Boundary Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Pioneer Street	Local road	Sealed	Short term	30	0.03	LoS A	8	8	16	46	0.05	LoS A
Pound Creek Road	Local road	Sealed	Medium term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Pound Creek Upper Road	Local road	Unsealed	Medium term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Powerline Road	Local road	Unsealed	Medium term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Powerline Trail	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Prickle Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Quartz Street	Local road	Sealed	Short term	30	0.03	LoS A	8	8	16	46	0.05	LoS A
Red Hill Road	Local road	Unsealed	Long term	20	0.02	LoS A	12	14	26	46	0.05	LoS A
Reedy Street	State road	Sealed	Medium term	100	0.07	LoS A	16	16	32	132	0.09	LoS A
Right Arm Creek Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Roches Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Rocky Gully Road	Local road	Unsealed	Short term	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Running Waters Road	Local road	Unsealed	Short term	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Selwyn Street (Adelong)	Regional road	Sealed	Short term	20	0.01	LoS A	8	8	16	36	0.03	LoS A
Selwyn Street (Batlow)	Local road	Sealed	Short term	30	0.03	LoS A	16	12	28	58	0.06	LoS A
Sharpes Creek Feeder Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Sharps Creek Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Sharps Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Shedleys Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Sixty Five Feeder Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Snowy Mountains Highway (west of Batlow Road)	State road	Sealed	Long term	130	0.07	LoS A	48	20	68	198	0.11	LoS A
Snubba Road	Local road	Unsealed	Long term	20	0.02	LoS A	40	16	56	76	0.08	LoS A
Spyglass Trail	Local road	Unsealed	Short term	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Stewarts Road	Local road	Sealed	Short term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Stockmans Creek Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Stud Horse Feeder Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Sturgess Trail	Local road	Unsealed	Short term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Taradale Road	Local road	Sealed	Short term	50	0.05	LoS A	8	8	16	66	0.07	LoS A
Tooma Road	Regional road	Sealed	Short term	70	0.05	LoS A	4	2	6	76	0.05	LoS A
Townsend Street	Local road	Sealed	Medium term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Tumut Street	State road	Sealed	Short term	130	0.09	LoS A	8	8	16	146	0.10	LoS A
Travers Street	Local road	Sealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Webbs Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Wee Jasper Road (north of Tumut)	Regional road	Sealed	Medium term	70	0.05	LoS A	20	16	36	106	0.08	LoS A
West Branch Feeder	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
West Gilmore Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A

Road name	NSW road network classification	Pavement type	Duration of impacts	Existing peak hour volume (vehicles per hour in one direction)	Existing Volume to capacity ratio	Existing LOS Level of service	Peak hourly increase LV (vehicles per hour in one direction)	Peak hourly increase HV (vehicles per hour in one direction)	Peak hourly traffic increase (vehicles per hour in one direction)	Total traffic (vehicles per hour in one direction)	Construction phase V/C ratio	Construction phase LOS (changes from existing LoS identified in bold)
Westbrook Road	Local road	Sealed	Short term	30	0.03	LoS A	16	12	28	58	0.06	LoS A
Westwood Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Wilsons Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Wiltys Road	Local road	Unsealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Wondalga Road	Regional road	Sealed	Medium term	30	0.02	LoS A	16	16	32	62	0.04	LoS A
Yarrawonga Road	Local road	Unsealed	Short term	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Yaven Creek Road	Local road	Sealed	Medium term	30	0.03	LoS A	16	12	28	58	0.06	LoS A
Yellowin Access Road	Local road	Sealed	Medium term	20	0.02	LoS A	20	16	36	56	0.06	LoS A
Yellowin Road	Local road	Sealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A

Table 6-7 Impact on road network performance for additional construction traffic, Cootamundra-Gundagai Regional LGA

Road name	NSW road network classification	Pavement type	Duration of Impacts	Existing peak hour volume (vehicles per hour in one direction)	Existing Volume to capacity ratio	Existing LOS Level of service	Peak hourly increase LV (vehicles per hour in one direction)	Peak hourly increase HV (vehicles per hour in one direction)	Peak hourly traffic increase (vehicles per hour in one direction)	Total traffic (vehicles per hour in one direction)	Construction phase V/C ratio	Construction phase LOS (Changes from existing LoS identified in bold)
Adelong Road	Local road	Sealed	Short term	20	0.01	LoS A	16	12	28	48	0.03	LoS A
Adjungbilly Road	Local road	Sealed	Long term	20	0.02	LoS A	14	16	30	50	0.05	LoS A
Brungle Creek Link Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Brungle Road	Local road	Sealed	Medium term	50	0.05	LoS A	16	12	28	78	0.08	LoS A
Bundarbo Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Eagle Street	State road	Sealed	Short term	70	0.05	LoS A	8	8	16	86	0.06	LoS A
Edwardstown Road	Local road	Sealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Fernhill Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Fullers Lane	Local road	Unsealed	Short term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Gobarralong Road	Local road	Sealed	Medium term	30	0.03	LoS A	16	12	28	58	0.06	LoS A
Gocup Road (south of South Gundagai)	State road	Sealed	Short term	60	0.03	LoS A	8	8	16	76	0.04	LoS A
Hume Highway (north of Coolac)	National road	Sealed	Long term	360	0.10	LoS A	20	16	36	396	0.11	LoS A
Hume Highway (east of Snowy Mountains Highway)	National road	Sealed	Long term	230	0.06	LoS A	20	16	36	266	0.07	LoS A
Hume Highway (west of South Gundagai)	National road	Sealed	Long term	230	0.06	LoS A	20	16	36	266	0.07	LoS A
Honeysuckle Road	Local road	Unsealed	Long term	20	0.02	LoS A	10	12	22	42	0.05	LoS A
Hopewood Road	Local road	Sealed	Medium term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Maryvale Road	Local road	Unsealed	Medium term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Middle Street	Local road	Sealed	Short term	50	0.06	LoS A	8	8	16	66	0.07	LoS A
Middleton Drive	Local road	Sealed	Short term	50	0.05	LoS A	16	12	28	78	0.08	LoS A
Nanangroe Road	Local road	Unsealed	Medium term	30	0.03	LoS A	16	12	28	58	0.06	LoS A
Parsons Creek Road	Local road	Unsealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Red Hill Road	Local road	Unsealed	Long term	20	0.02	LoS A	12	14	26	46	0.05	LoS A
Red Strip Road	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Rileys Flat Road	Local road	Sealed	Short term	50	0.06	LoS A	16	12	28	78	0.09	LoS A
Sawmill Creek Road	Local road	Unsealed	Medium term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Sheridan Street	Local road	Sealed	Short term	70	0.08	LoS A	8	8	16	86	0.10	LoS A
Snowball Road	Local road	Sealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Snowy Mountains Highway (east of Hume Highway)	State road	Sealed	Short term	60	0.07	LoS A	16	12	28	88	0.10	LoS A
Stockdale Road	Local road	Unsealed	Medium term	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Tumblong Road	Local road	Sealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
West Street	Regional road	Sealed	Medium term	50	0.04	LoS A	20	16	36	86	0.06	LoS A

Table 6-8 Impact on road network performance for additional construction traffic Yass Valley LGA

Road name	NSW road network classification	Pavement type	Duration of impacts	Existing peak hour volume (vehicles per hour in one direction)	Existing Volume to capacity ratio	Existing LOS Level of service	Peak hourly increase LV (vehicles per hour in one direction)	Peak hourly increase HV (vehicles per hour in one direction)	Peak hourly traffic increase (vehicles per hour in one direction)	Total traffic (vehicles per hour in one direction)	Construction phase V/C ratio	Construction phase LOS (changes from existing LoS identified in bold)
Black Range Road	Local road	Sealed	Medium term	30	0.03	LoS A	16	16	32	62	0.07	LoS A
Burrinjuck Road	Regional road	Sealed	Medium term	30	0.02	LoS A	16	12	28	58	0.04	LoS A
Barton Highway	State road	Sealed	Medium term	400	0.11	LoS A	16	16	32	432	0.12	LoS A
Childowla Road	Local road	Sealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Comur Street	Regional road	Sealed	Short term	350	0.25	LoS A	16	12	28	378	0.27	LoS A
Cooks Hill Road	Local road	Sealed	Short term	30	0.03	LoS A	8	8	16	46	0.05	LoS A
Elms Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Fagan Drive	Local road	Sealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Fairy Hole Road	Local road	Unsealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Grand Junction Road	Local road	Sealed	Medium term	100	0.11	LoS A	20	16	36	136	0.15	LoS A
Greenwood Road	Local road	Sealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Hardwicke Lane	Local road	Unsealed	Short term	30	0.03	LoS A	4	2	6	36	0.04	LoS A
Hillview Drive	Local road	Sealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Hovell Street	Local road	Sealed	Medium term	50	0.06	LoS A	16	12	28	78	0.09	LoS A
Hume Highway (between Yass Valley Way and Lachlan Valley Way)	State road	Sealed	Long term	550	0.15	LoS A	30	20	50	600	0.17	LoS A
Hume Highway (between Burley Griffin Way and Burrinjuck Road)	State road	Sealed	Long term	340	0.09	LoS A	30	20	50	390	0.11	LoS A
Hume Highway (between Yass Valley Way and Barton Highway)	State road	Sealed	Long term	290	0.08	LoS A	30	20	50	340	0.09	LoS A
Hume Street	Local road	Sealed	Short term	50	0.06	LoS A	8	8	16	66	0.07	LoS A
Laidlaw Street	Regional road	Sealed	Medium term	350	0.25	LoS A	20	16	36	386	0.28	LoS A
Lucernvale Road	Local road	Unsealed	Short term	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Mcintosh Lane	Local road	Unsealed	Short term	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Orion Street	Local road	Sealed	Short term	50	0.06	LoS A	8	8	16	66	0.07	LoS A
Perry Street	Local road	Sealed	Long term	30	0.03	LoS A	4	26	30	60	0.07	LoS A
Pollux Street	Local road	Sealed	Medium term	50	0.06	LoS A	20	16	36	86	0.10	LoS A
Talmo Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Turtons Road	Local road	Unsealed	Short term	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Wargeila Road	Local road	Sealed	Medium term	30	0.03	LoS A	16	16	32	62	0.06	LoS A
Warroo Road	Local road	Sealed	Medium term	100	0.11	LoS A	16	16	32	132	0.15	LoS A
Yass Valley Way (west of Barton Highway)	Regional road	Sealed	Medium term	320	0.23	LoS A	20	16	36	356	0.25	LoS A

Table 6-9 Impact on road network performance for additional construction traffic, Upper Lachlan Shire LGA

Road name	NSW road network classification	Pavement type	Duration of impacts	Anticipated Duration of Impacts	Existing peak hour volume (vehicles per hour in one direction)	Existing Volume to capacity ratio	Existing LOS Level of service	Peak hourly increase LV (vehicles per hour in one direction)	Peak hourly increase HV (vehicles per hour in one direction)	Peak hourly traffic increase (vehicles per hour in one direction)	Total traffic (vehicles per hour in one direction)	Construction phase V/C ratio	Construction phase LOS (changes from existing LoS identified in bold)
Adavale Road	Local road	Unsealed	Short term	9	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Alton Hill Road	Local road	Unsealed	Short term	9	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Back Arm Road	Local road	Unsealed	Short term	10	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Bannaby Road	Local road	Sealed	Medium term	5	20	0.02	LoS A	20	16	36	56	0.06	LoS A
Bannister Lane	Local road	Unsealed	Medium term	6	10	0.01	LoS A	16	16	32	42	0.05	LoS A
Binda Road	Regional road	Sealed	Short term	10	50	0.04	LoS A	4	2	6	56	0.04	LoS A
Blakney Creek South Road	Local road	Sealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Boorowa Road	Regional road	Sealed	Short term	10	40	0.03	LoS A	4	2	6	46	0.03	LoS A
Brooklands Street	Regional road	Sealed	Short term	9	30	0.02	LoS A	8	8	16	46	0.03	LoS A
Bulleys Crossing	Local road	Unsealed	Short term	10	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Bunnaby Street	Regional road	Sealed	Short term	9	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Butcher Road	Local road	Unsealed	Short term	9	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Carnells Lane	Local road	Unsealed	Short term	9	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Carrabungla Road	Local road	Unsealed	Short term	9	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Carrington Street	State road	Sealed	Short term	9	50	0.04	LoS A	8	8	16	66	0.05	LoS A
Chapel Street	Local road	Sealed	Short term	9	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Clancys Road	Local road	Unsealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Collector Road	Regional road	Sealed	Short term	8	30	0.02	LoS A	16	12	28	58	0.04	LoS A
Colyer Street	Local road	Sealed	Medium term	7	50	0.06	LoS A	16	12	28	78	0.09	LoS A
Coolalie Road	Local road	Unsealed	Short term	9	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Crookwell Road	State road	Sealed	Medium term	6	100	0.06	LoS A	16	16	32	132	0.07	LoS A
Cullerin Road	Regional road	Sealed	Short term	8	30	0.02	LoS A	16	12	28	58	0.04	LoS A
Dalton Road (south of Dalton)	Regional road	Sealed	Short term	8	20	0.01	LoS A	16	12	28	48	0.03	LoS A
Dalton Road (west of Gunning)	Regional road	Sealed	Short term	8	20	0.01	LoS A	16	12	28	48	0.03	LoS A
Dawes Road	Local road	Unsealed	Short term	9	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Dawsons Creek Road	Local road	Unsealed	Short term	8	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Dowlings Road	Local road	Unsealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Elms Road	Local road	Unsealed	Short term	10	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Felled Timber Road	Local road	Unsealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Flacknell Creek Road	Local road	Unsealed	Short term	8	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Gorham Road	Local road	Unsealed	Short term	8	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Goulburn Road	State road	Sealed	Medium term	7	100	0.06	LoS A	16	12	28	128	0.07	LoS A
Goulburn Street	State road	Sealed	Medium term	6	90	0.06	LoS A	16	16	32	122	0.09	LoS A
Grabben Gullen Road (north of Cullerin Road)	Regional road	Sealed	Medium term	6	20	0.01	LoS A	16	16	32	52	0.04	LoS A
Greendale Road	Local road	Unsealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Gundaroo Street	Regional road	Sealed	Short term	8	30	0.02	LoS A	16	12	28	58	0.04	LoS A
Gunning Street	Regional road	Sealed	Short term	8	30	0.02	LoS A	16	12	28	58	0.04	LoS A
Gurrundah Road	Local road	Sealed	Medium term	7	30	0.03	LoS A	16	12	28	58	0.06	LoS A

Road name	NSW road network classification	Pavement type	Duration of impacts	Anticipated Duration of Impacts	Existing peak hour volume (vehicles per hour in one direction)	Existing Volume to capacity ratio	Existing LOS Level of service	Peak hourly increase LV (vehicles per hour in one direction)	Peak hourly increase HV (vehicles per hour in one direction)	Peak hourly traffic increase (vehicles per hour in one direction)	Total traffic (vehicles per hour in one direction)	Construction phase V/C ratio	Construction phase LOS (changes from existing LoS identified in **bold**)
Hanworth Road	Local road	Sealed	Long term	1	20	0.02	LoS A	40	34	74	94	0.10	LoS A
Harley Road	Local road	Unsealed	Medium term	7	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Hawthornes Tree Road	Local road	Sealed	Short term	10	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Hillcrest Road	Local road	Unsealed	Medium term	7	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Hillgrove Road	Local road	Unsealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Howards Road	Local road	Unsealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Hume Highway (south of Gunning)	State road	Sealed	Medium term	6	300	0.17	LoS A	16	16	32	332	0.18	LoS A
Hume Street	Regional road	Sealed	Short term	8	50	0.06	LoS A	16	12	28	78	0.09	LoS A
Jerrawa Road	Local road	Sealed	Medium term	6	20	0.02	LoS A	16	16	32	52	0.06	LoS A
Kerrawarry Creek Trail	Local road	Unsealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Kialla Road	Local road	Sealed	Medium term	6	20	0.02	LoS A	16	16	32	52	0.06	LoS A
Lade Vale Road	Local road	Unsealed	Short term	10	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Laggan Road	Regional road	Sealed	Short term	9	40	0.03	LoS A	8	8	16	56	0.04	LoS A
Laggan-Taralga Road	Regional road	Unsealed	Medium term	7	50	0.04	LoS A	16	12	28	78	0.06	LoS A
Loop Road	Local road	Unsealed	Short term	8	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Lower Greendale Road	Local road	Unsealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Menzies Lane	Local road	Unsealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Middle Arm Road	Local road	Sealed	Medium term	6	50	0.05	LoS A	16	16	32	82	0.08	LoS A
Mount Rae Road	Local road	Unsealed	Short term	8	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Northcott Street	Regional road	Sealed	Short term	8	30	0.02	LoS A	16	12	28	58	0.04	LoS A
Offleys Lane	Local road	Unsealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Orchard Street	Regional road	Sealed	Medium term	7	50	0.04	LoS A	16	12	28	78	0.06	LoS A
Parsons Lane	Local road	Sealed	Short term	8	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Pejar Road	Local road	Unsealed	Medium term	7	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Prices Lane	Local road	Unsealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Range Road	Local road	Sealed	Medium term	6	50	0.05	LoS A	16	16	32	82	0.08	LoS A
Rhyanna Road	Local road	Unsealed	Short term	8	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Robertson Lane	Local road	Sealed	Short term	8	30	0.03	LoS A	16	12	28	58	0.06	LoS A
Roslyn Road	Local road	Sealed	Short term	8	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Rugby Road	Local road	Sealed	Short term	9	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Rye Park Road	Regional road	Sealed	Short term	8	30	0.02	LoS A	16	12	28	58	0.04	LoS A
Saleyards Road	Local road	Sealed	Short term	9	50	0.06	LoS A	8	8	16	66	0.07	LoS A
Sapphire Road	Local road	Sealed	Short term	8	20	0.02	LoS A	16	12	28	48	0.05	LoS A
Sheldricks Lane	Local road	Unsealed	Short term	9	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Soldiers Settlement Road South	Local road	Unsealed	Short term	9	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Spicers Lane	Local road	Unsealed	Short term	9	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Spring Street	Local road	Sealed	Medium term	6	50	0.06	LoS A	16	16	32	82	0.09	LoS A
Stink Pot Road	Local road	Unsealed	Short term	9	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Storriers Lane	Local road	Unsealed	Short term	9	10	0.01	LoS A	8	8	16	26	0.03	LoS A

Road name	NSW road network classification	Pavement type	Duration of impacts	Anticipated Duration of Impacts	Existing peak hour volume (vehicles per hour in one direction)	Existing Volume to capacity ratio	Existing LOS Level of service	Peak hourly increase LV (vehicles per hour in one direction)	Peak hourly increase HV (vehicles per hour in one direction)	Peak hourly traffic increase (vehicles per hour in one direction)	Total traffic (vehicles per hour in one direction)	Construction phase V/C ratio	Construction phase LOS (changes from existing LoS identified in bold)
Strathaird Lane	Local road	Sealed	Short term	9	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Taralga Road	Regional road	Sealed	Medium term	5	50	0.04	LoS A	20	16	36	86	0.06	LoS A
Tarlo Number 1 Trail	Local road	Unsealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Third Creek Road	Local road	Unsealed	Short term	10	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Veterans Road	Local road	Sealed	Short term	10	10	0.01	LoS A	4	2	6	16	0.02	LoS A
Walkoms Lane	Local road	Unsealed	Short term	8	10	0.01	LoS A	16	12	28	38	0.04	LoS A
Walsh Street	Local road	Sealed	Medium term	7	30	0.03	LoS A	16	12	28	58	0.06	LoS A
Walshs Road	Local road	Unsealed	Short term	9	10	0.01	LoS A	8	8	16	26	0.03	LoS A
Warrataw Street	Regional road	Sealed	Short term	8	30	0.02	LoS A	16	12	28	58	0.04	LoS A
Wheeo Road	Local road	Sealed	Short term	10	30	0.03	LoS A	4	2	6	36	0.04	LoS A
Willis Street	Regional road	Sealed	Short term	8	30	0.02	LoS A	16	12	28	58	0.04	LoS A
Woodhouselee Road	Local road	Sealed	Long term	1	30	0.03	LoS A	24	16	40	70	0.07	LoS A
Yass Street	Regional road	Sealed	Short term	8	50	0.04	LoS A	16	12	28	78	0.06	LoS A

Table 6-10 Impact on road network performance for additional construction traffic, Goulburn-Mulwaree LGA

Road name	NSW road network classification	Pavement type	Duration of impacts	Existing peak hour volume (vehicles per hour in one direction)	Existing Volume to capacity ratio	Existing LOS Level of service	Peak hourly increase LV (vehicles per hour in one direction)	Peak hourly increase HV (vehicles per hour in one direction)	Peak hourly traffic increase (vehicles per hour in one direction)	Total traffic (vehicles per hour in one direction)	Construction phase V/C ratio	Construction phase LOS (changes from existing LoS identified in bold)
Clinton Street	Local road	Sealed	Short term	150	0.17	LoS A	8	8	16	166	0.18	LoS A
Cowper Street	State road	Sealed	Short term	300	0.21	LoS A	8	8	16	316	0.23	LoS A
Crookwell Road (north of Sooley Creek)	State road	Sealed	Short term	120	0.09	LoS A	8	8	16	136	0.10	LoS A
Fitzroy Street	State road	Sealed	Short term	150	0.11	LoS A	8	8	16	166	0.12	LoS A
Goldsmith Street	State road	Sealed	Short term	150	0.11	LoS A	8	8	16	166	0.12	LoS A
Gurrundah Road	Local road	Sealed	Short term	40	0.04	LoS A	8	8	16	56	0.06	LoS A
Hume Highway (west of Federal Highway)	State road	Sealed	Short term	280	0.08	LoS A	8	8	16	296	0.08	LoS A
Hume Street	State road	Sealed	Short term	340	0.12	LoS A	8	8	16	356	0.13	LoS A
Marble Hill Road	Local road	Sealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Middle Arm Road	Local road	Sealed	Short term	100	0.10	LoS A	8	8	16	116	0.12	LoS A
Norwood Road	Local road	Sealed	Short term	20	0.02	LoS A	4	2	6	26	0.03	LoS A
Range Road	Local road	Sealed	Short term	50	0.05	LoS A	8	8	16	66	0.07	LoS A
Wheeo Road	Local road	Sealed	Short term	50	0.05	LoS A	8	8	16	66	0.07	LoS A

Table 6-11 Impact on road network performance for additional construction traffic, Hilltops LGA

Road name	NSW road network classification	Pavement type	Duration of Impacts	Existing peak hour volume (vehicles per hour in one direction)	Existing Volume to capacity ratio	Existing LOS Level of service	Peak hourly increase LV (vehicles per hour in one direction)	Peak hourly increase HV (vehicles per hour in one direction)	Peak hourly traffic increase (vehicles per hour in one direction)	Total traffic (vehicles per hour in one direction)	Construction phase V/C ratio	Construction phase LOS (changes from existing LoS identified in bold)
Bundarbo Road	Local road	Unsealed	Short term	20	0.02	LoS A	8	8	16	36	0.04	LoS A
Hume Highway	National road	Sealed	Long term	230	0.06	LoS A	20	16	36	266	0.07	LoS A

6.3.1.2 Road condition

Road condition generally deteriorates over time due to pavement fatigue, with heavy vehicle movements resulting in more noticeable pavement fatigue compared to LVs.

The 95th percentile increase in peak hourly heavy vehicle traffic on sealed roads comprising access routes would be 20 vehicles per direction of travel and the 95th percentile increase in peak hourly heavy vehicle traffic on unsealed road would be 12 vehicles per direction of travel. With such minor increases in heavy vehicle traffic, the impact on road conditions is expected to be low and would generally depend on the existing road condition and applicable load restrictions.

Impacts are most likely on the unsealed roads used to access construction compounds due to the volume of proposed HV traffic. These roads include:

- Snubba Road
- Livingstone Gully Road
- Honeysuckle Road
- Red Hill Road.

Condition assessments of the proposed local access roads, including dilapidation surveys prior to construction would be carried out on all local roads to record the existing road condition in consultation with the relevant roads authority. for the project. Engagement with the relevant road authorities and councils would be undertaken to monitor ongoing use of the roads during construction. In addition, at the completion of construction a road condition assessment would be undertaken to assess the damage to roads accessed by project related traffic. Damage caused by the project would be rectified in consultation with the relevant road authority.

6.3.2 Stringing of the transmission line across roads

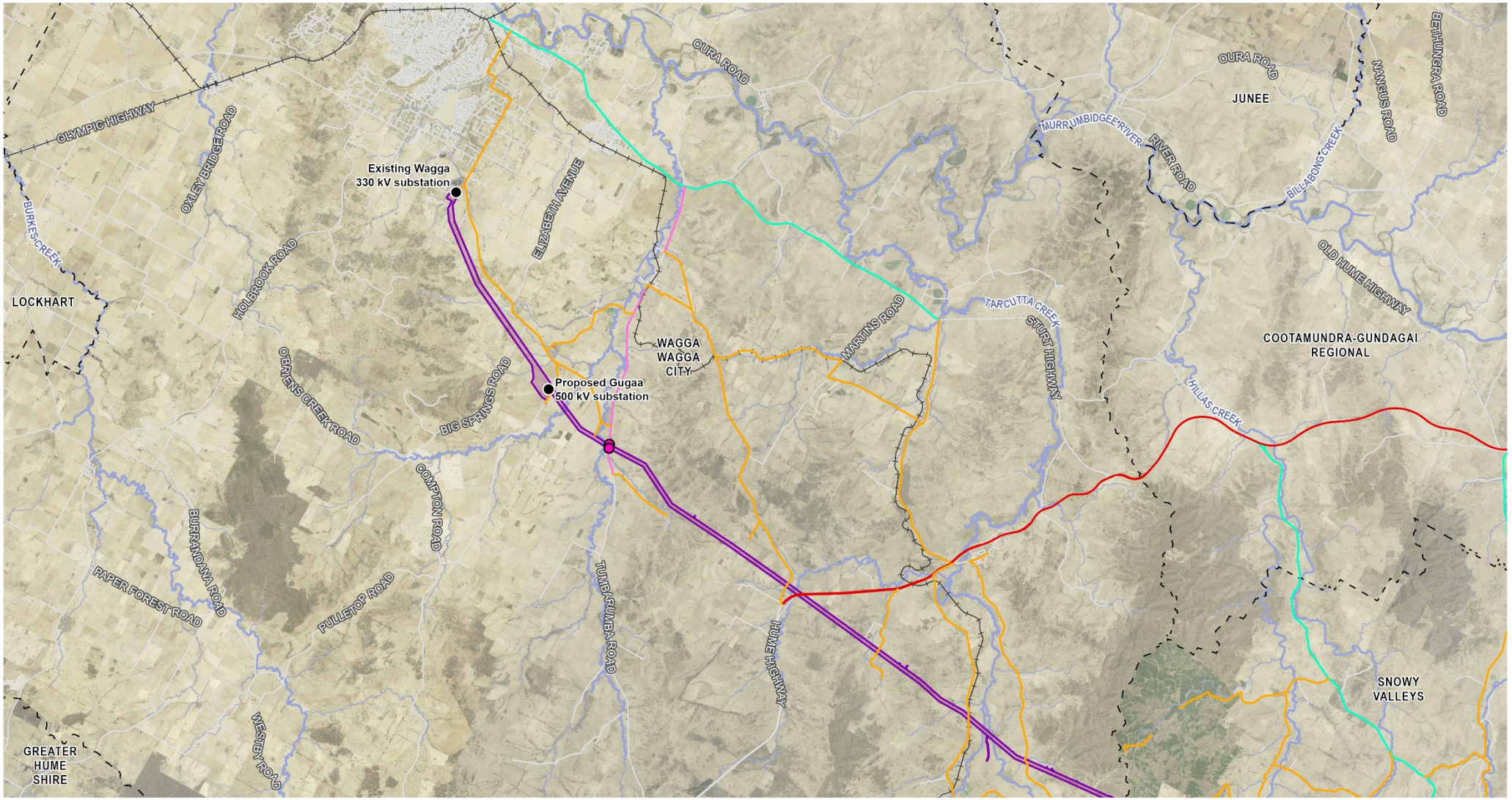
Stringing of transmission line would occur over roads where the transmission line crosses roads. Details where these crossings occur with classified roads are presented in Table 6-12 while Figure 6-4 shows the locations. Partial or full road closures would be required for stringing activities. Specific arrangements for closures would be confirmed during detailed design. Potential impact would include short-term increase in travel time and distance due to reduction in road capacity or speed restriction, or where detours would be required for full road closure.

Road Occupancy Licences would be sought for all temporary (partial or full) road closures where required. Any activity involving short-term partial or full road or lane closures would be assessed on a case-by-case basis and approval would be sought from the relevant road authority. Where full road closures are required, traffic would be provided with a detour route, potentially resulting in additional travel time. Any detour routes would be determined with relevant stakeholders including councils and the road authority and would be planned to minimise travel times for vehicles as far as possible.

Overhead stringing of conductors for new transmission lines across roads would be undertaken with short duration temporary road closure(s) (less than one hour estimated) and traffic control in place in accordance with approved traffic control plans. Work would be undertaken in accordance with approved plans and conducted in a way to minimise impacts on traffic, such as undertaking the work outside of standard construction hours where needed. Temporary safeguards such as traffic control would be in place during the stringing activities to prevent conductor(s) sagging whilst completing stringing activities over roads and creating a danger to the public.

Table 6-12 Classified roads impacted by overhead stringing

Road name	Road classification	Location of interaction with transmission line
Tumbarumba Road	Regional road	Approximately 1 km south of Gregadoo East Road and Tumbarumba Road
Snowy Mountains Highway	State road	Approximately 3 km west of Gilmore
Gocup Road	State road	Approximately 8 km north-west of Tumut
Rye Park Road	Regional road	Approximately 5 km west of Dalton
Hume Highway	National road	Approximately 9 km south-west of Tarcutta and approximately 1.5 km north-west of Derringullen Creek rest area on Hume Highway
Grabben Gullen Road	Regional road	Approximately 3 km south-west of Grabben Gullen Road and Gurrundah Road intersection
Crookwell Goulburn Road	Regional road	West of Pejar Dam
Taralga Road	Regional road	Approximately 1 km north of Chatsbury
Burrinjuck Road	Regional road	Approximately 1 km north of Burrinjuck Road and Black Range Road intersection
Batlow Road	State road	Approximately 1.5 km south of Wondalga and 1 kilometre south of Windowie



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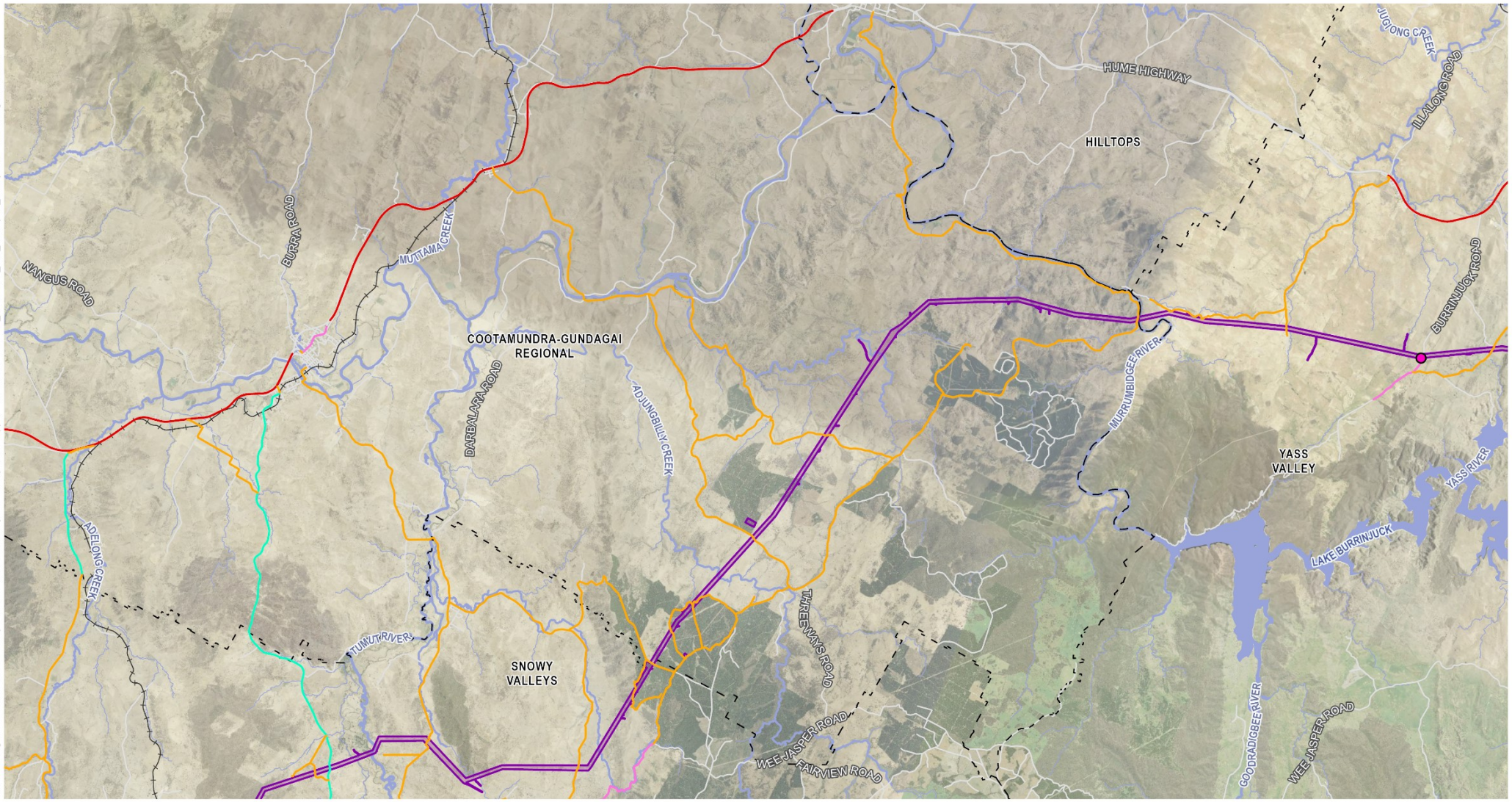
Projection: GDA 1994 MGA Zone 55

Figure 6-4a: Location of interaction of project footprint with classified roads



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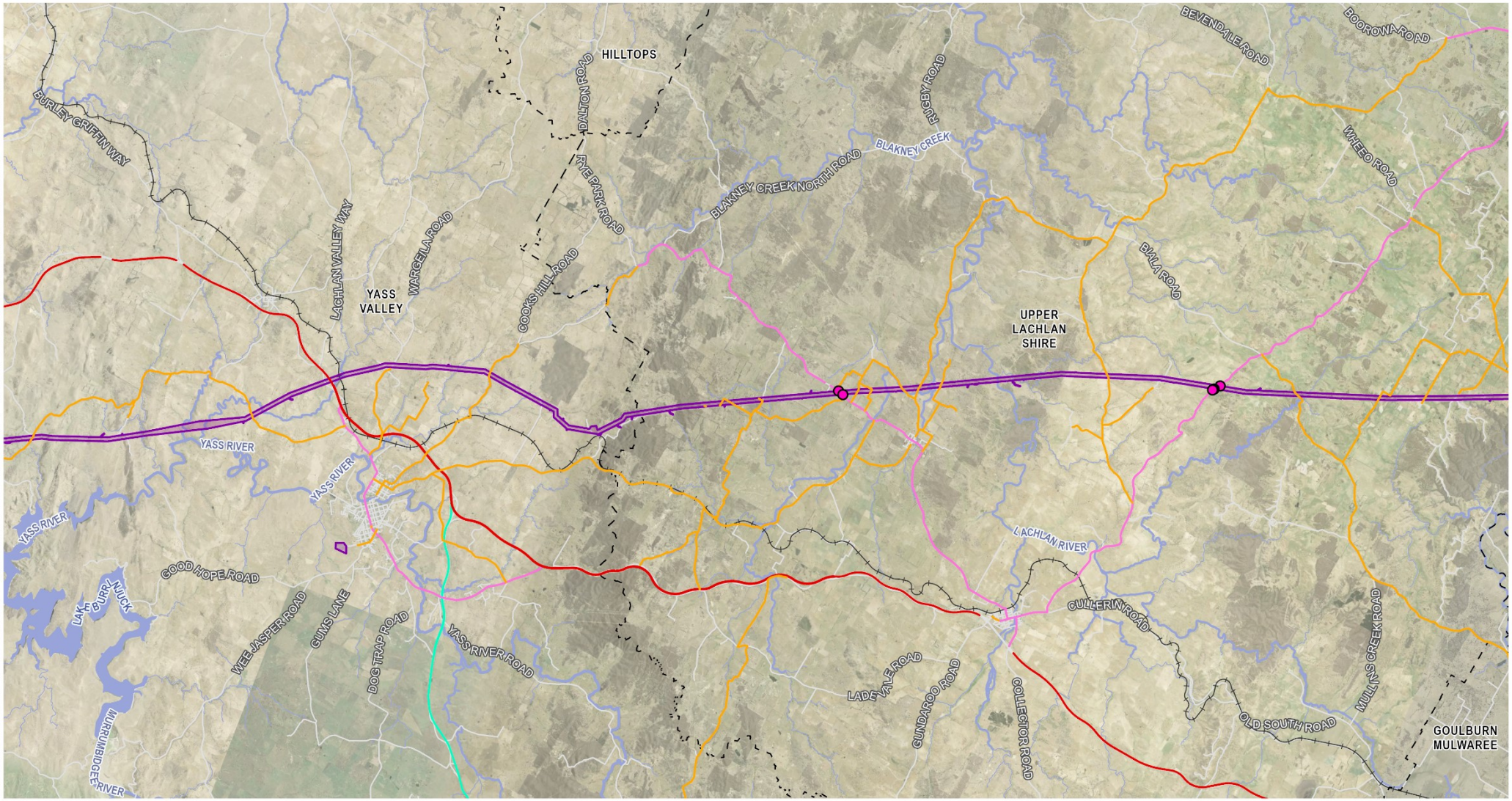
Projection: GDA 1994 MGA Zone 55

Figure 6-4b: Location of interaction of project footprint with classified roads



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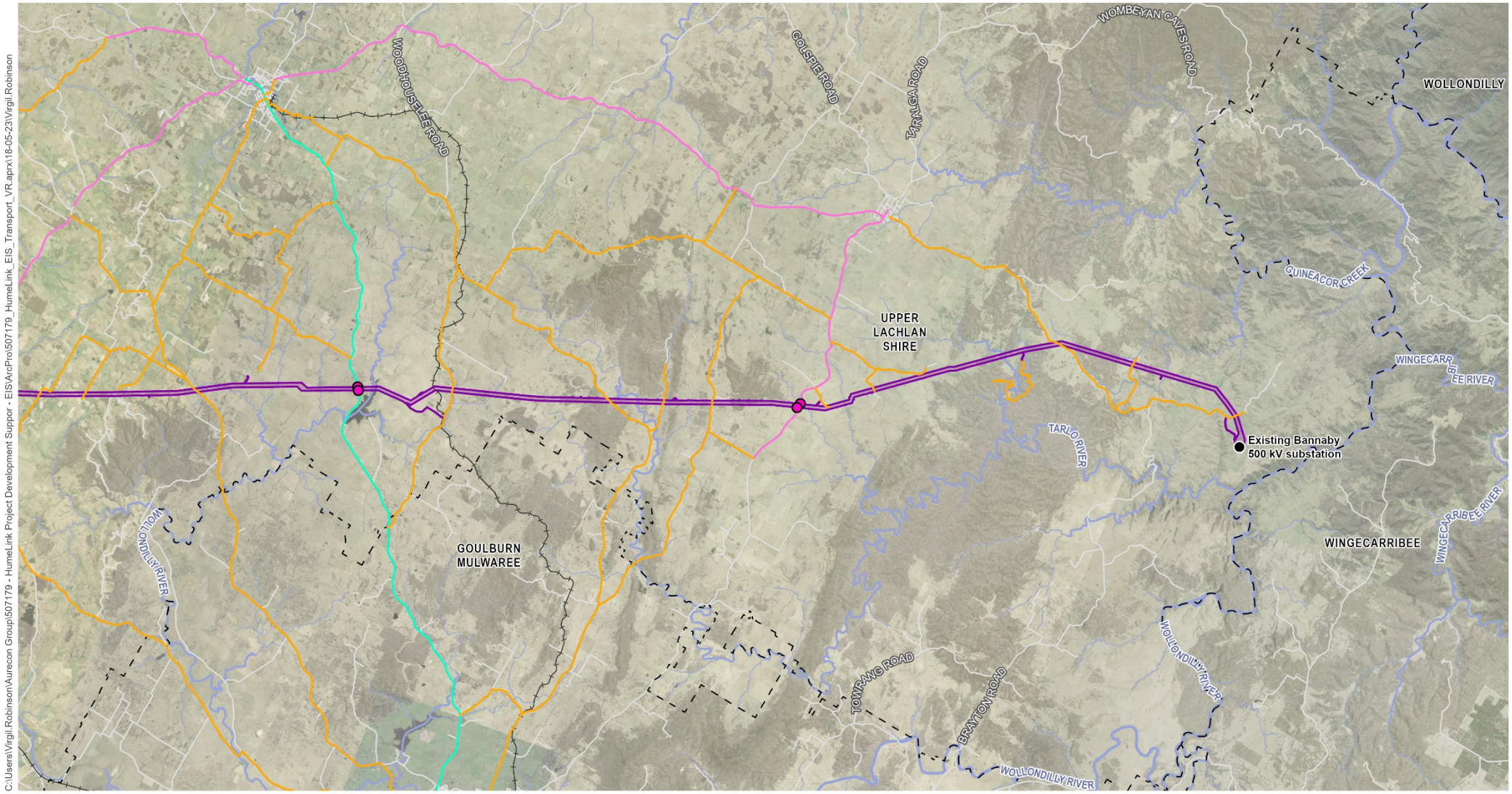
0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 6-4c: Location of interaction of project footprint with classified roads



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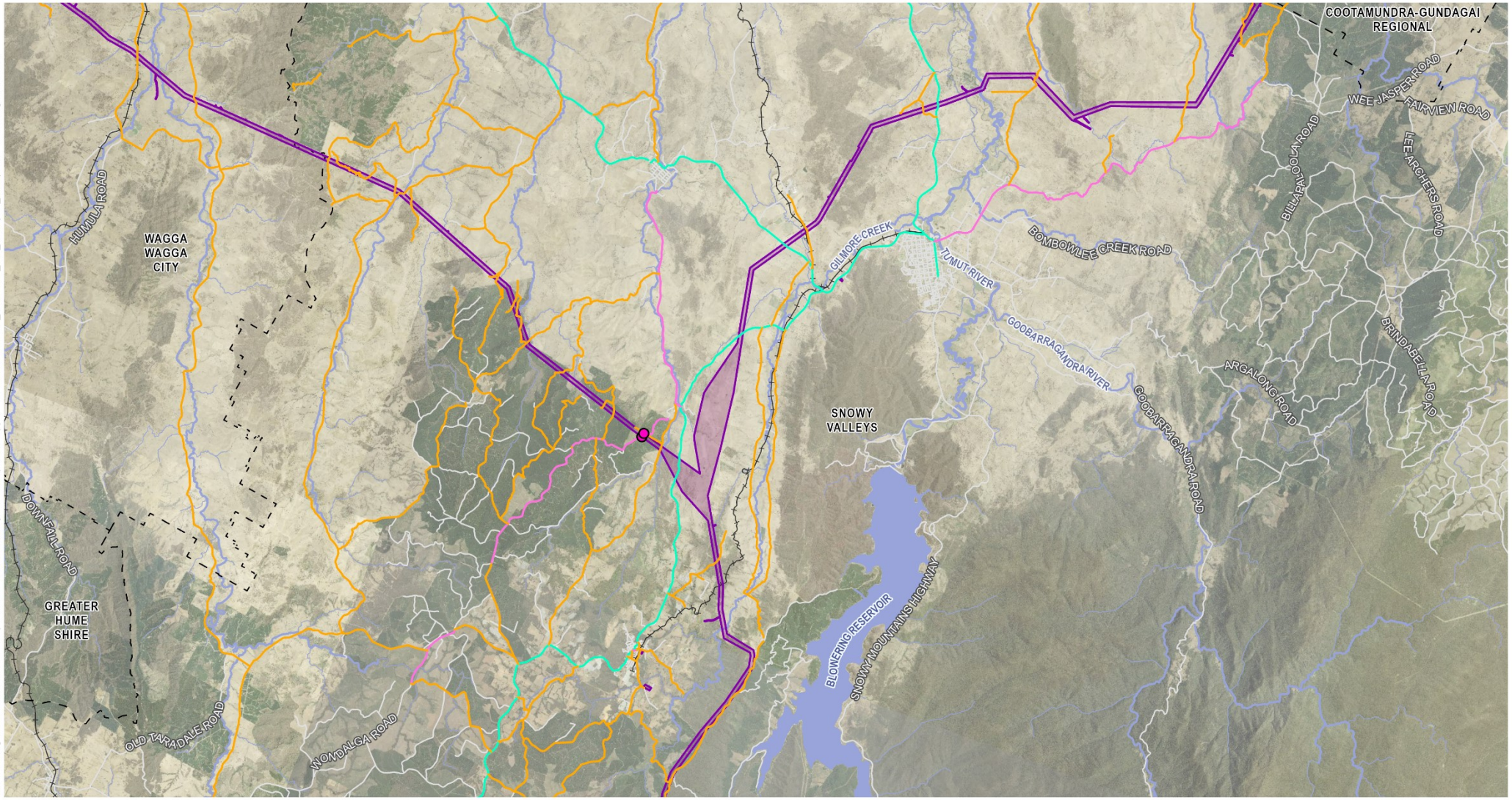
0 4 8km

Projection: GDA 1994 MGA Zone 55

HumeLink **Traffic and Transport Impact**

Figure 6-4d: Location of interaction of project footprint with classified roads



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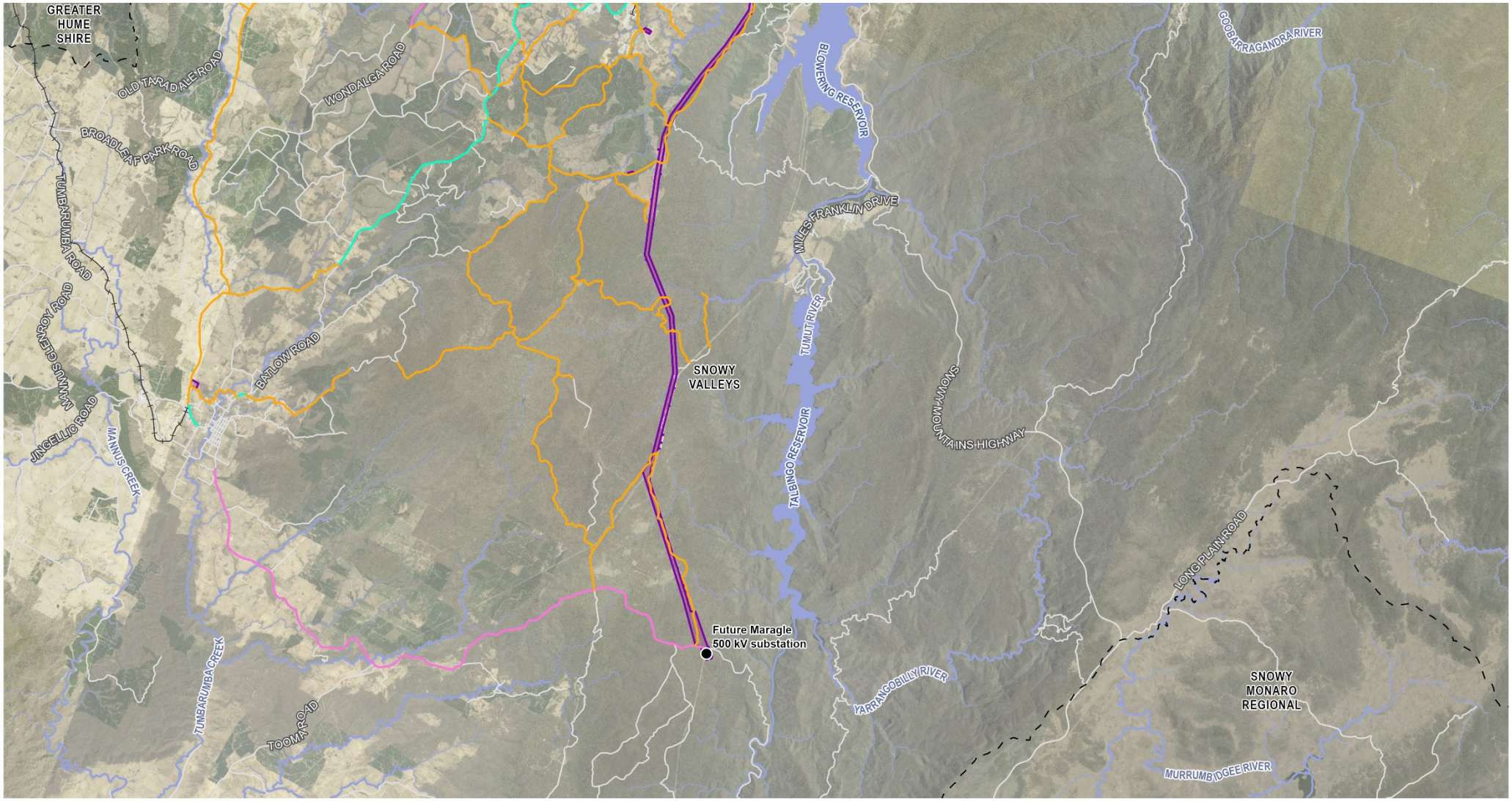
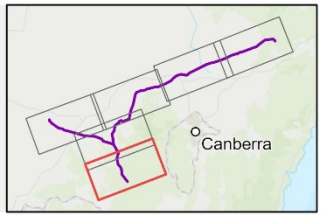
Projection: GDA 1994 MGA Zone 55

Figure 6-4e: Location of interaction of project footprint with classified roads



Project footprint
Local Government Area
Local road
National road
Regional road
State road
Watercourse
Railway
Substation



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0 4 8km

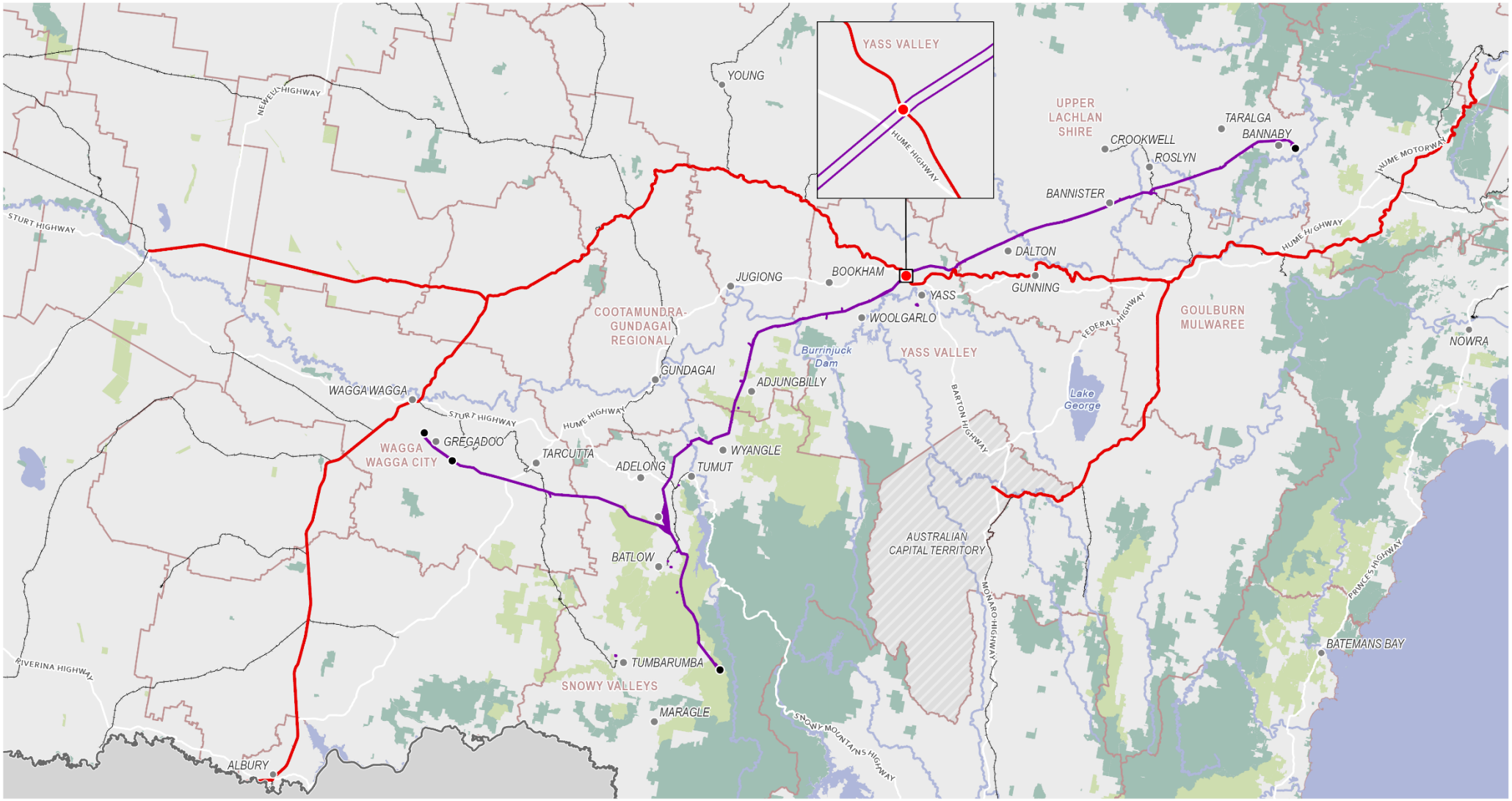
Projection: GDA 1994 MGA Zone 55

Figure 6-4f: Location of interaction of project footprint with classified roads

6.3.3 Impact on rail network

Construction of the project would not have any impact on rail network operations as the construction traffic would use the existing road network and approved railway crossings for access.

The stringing of transmission lines across railway lines would be required at isolated locations as shown in Figure 6-5 . Stringing activities at these locations would be undertaken during rail possessions (periods during which railway lines are not in use) with no disruptions to operations on the rail network, and no impacts anticipated. Activities would be undertaken in accordance with railway line owners' or operators' requirements. In the case of the stringing over the Main Southern Railway Line, this would be in accordance with the Australian Rail Track Corporation's requirements.



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Projection: GDA 1994 MGA Zone 55

FIGURE 6-5: Intersection of project footprint at rail line

6.3.4 Impact on road safety

There are numerous factors that contribute to crashes, including road design, road condition, weather, speed, driver's fatigue, vehicle malfunction, driver's experience and behaviour.

The additional traffic associated with the construction is unlikely to impact the road network performance as discussed in Section 6.3.1.1. All roads with additional construction traffic would continue to operate at the same LoS and free flow conditions or reasonably free flow conditions would prevail. As the traffic flow conditions on the road network are unchanged during construction, it is considered unlikely that there would be sudden changes in speed or increased vehicle overtaking/lane changing and is therefore unlikely to result in an increase in crashes.

Where construction activities are likely to impact on the existing operational conditions of a road (ie. during full or partial road closures), temporary traffic management measures would be required to address the risk of accidents.

A review of crashes within 100 metres from access point to each construction compound and the worker accommodation facility in Section 6.1.3 found no crash recorded between 2016 and 2020. Construction of new access points and access tracks to construction compounds, the proposed Gugaa 500 kV substation and the worker accommodation facility would be designed in accordance with Austroads guidelines.

6.3.5 Impacts on active transport

Within the traffic study area, active transport provisions such as footpaths exist in urban environments only (refer to Section 5.6). The potential for the interaction of active transport users with construction traffic would be isolated to towns. The impact on such roads is expected to be negligible, considering the low volume of additional construction traffic and presence of off-road active transport facilities which separate active transport users from vehicles.

Outside towns, traffic associated with construction activities is expected to be mainly in the vicinity of transmission lines and substation work, where no active transport provisions exist. The impact of construction traffic is therefore expected to have no impact on active transport at these locations.

6.3.6 Impact on public transport

Bus services form the major public transport services in the traffic study area. As construction traffic is not anticipated to adversely impact on the road network performance, bus services are not expected to experience delays.

Short duration temporary road closures (less than one hour estimated) are anticipated primarily for stringing of transmission lines at limited road locations and where there are new access points onto public roads.

Activities would be assessed on a case-by-case basis while seeking road occupancy approval from the relevant stakeholders with work undertaken in accordance with approved plans and conducted in a way to minimise impacts on traffic and access. This may include planning these activities outside of peak traffic periods. Overall impact to public transport would be negligible.

6.3.7 Impact on access to property

Access to properties for residents (including for emergency vehicle access and egress) would be maintained throughout construction. In some limited circumstances, short-term restrictions for a particular property may need to be imposed with prior consultation with the affected party. There are expected to be minimal impacts to property access due to the rural nature of the project, however, some properties along the proposed transmission line may be affected for short periods. This would be mitigated through establishing a communication process with landowners, keeping them informed of construction staging and work schedule.

7 Operational impacts

During operation, there is limited potential for traffic and transport impacts associated with anticipated routine maintenance. Access to the existing and proposed substations would be as per existing access arrangements, or via the proposed access routes as listed in Table 6-2. In the case of the transmission lines, access would largely relate to inspection and maintenance activities, which would be infrequent and would not result in significant vehicle movements. Access to the transmission lines would be via existing access tracks or those constructed specifically for the project.

A detailed assessment of state roads used during operation was not undertaken due to the anticipated negligible number of vehicles required, in comparison to existing traffic volumes, the design capacity of state roads and the large geographical area of the project.

7.1 Operation and maintenance activities

The substations and transmission lines would be inspected by Transgrid operational staff and contractors on a regular basis, with other operational activities occurring in the event of an emergency (as required). Likely maintenance activities would include:

- regular inspection (ground and aerial) and maintenance of electrical equipment and transmission line structures
- general building maintenance
- vegetation trimming, landscaping and maintenance of asset protection zone
- fire detection system inspection and maintenance
- fence repair
- stormwater and drainage infrastructure maintenance.

7.1.1 Substation operation and maintenance

During operation, the substations would not accommodate full-time staff or contractors. Maintenance at these substation sites would typically include ad hoc attendance (typically one to two times a month) of one or two switching operators to undertake planned and unplanned switching of equipment. It is expected that these activities would only require LVs and/or small to medium plant (depending on the work required).

Additional maintenance activities at the substation sites would typically include (but not limited to):

- Routine substation infrastructure inspection (such as transformers and other electrical plant and equipment) throughout the year by around two to three personnel.
- Routine substation maintenance of equipment, property and switchyard areas on a scheduled basis. This would typically be monthly and undertaken by around three to five maintenance personnel.
- Ad hoc fault and emergency work for repair of any damaged infrastructure (eg through a weather event or other failure of infrastructure) would occur as required. The amount of maintenance and/or crew required to access for repair of any damaged infrastructure would depend on the extent of repairs required.

During operation, it is anticipated that access to the substations would be as follows:

- The proposed Gugaa 500 kV substation would be via a new access road established from Livingstone Gully Road (refer to Figure 7-1).
- The Wagga 330 kV substation would be accessed via the existing access road from Ashfords Road (refer to Figure 7-2).
- The Bannaby 500 kV substation would be accessed via the existing access road from Hanworth Road that would be upgraded as part of the project (refer to Figure 7-3).
- The future Maragle 500 kV substation would be accessed via the future access road from Elliott Way to be constructed by Snowy 2.0 Transmission Connection Project (refer to Figure 7-4).

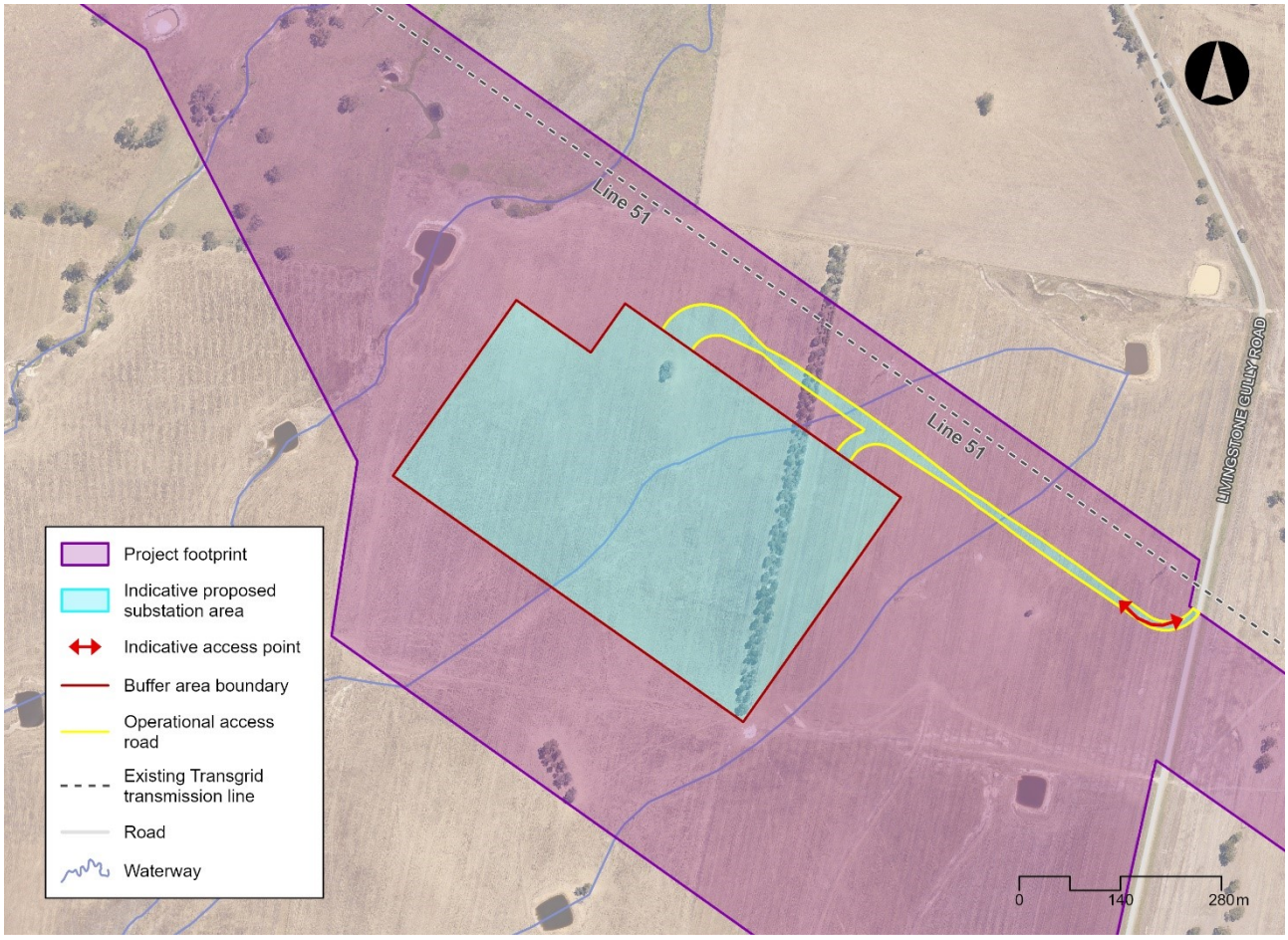


Figure 7-1 Indicative layout of proposed Gugaa 500 kV substation (subject to detailed design) showing location of operational access road

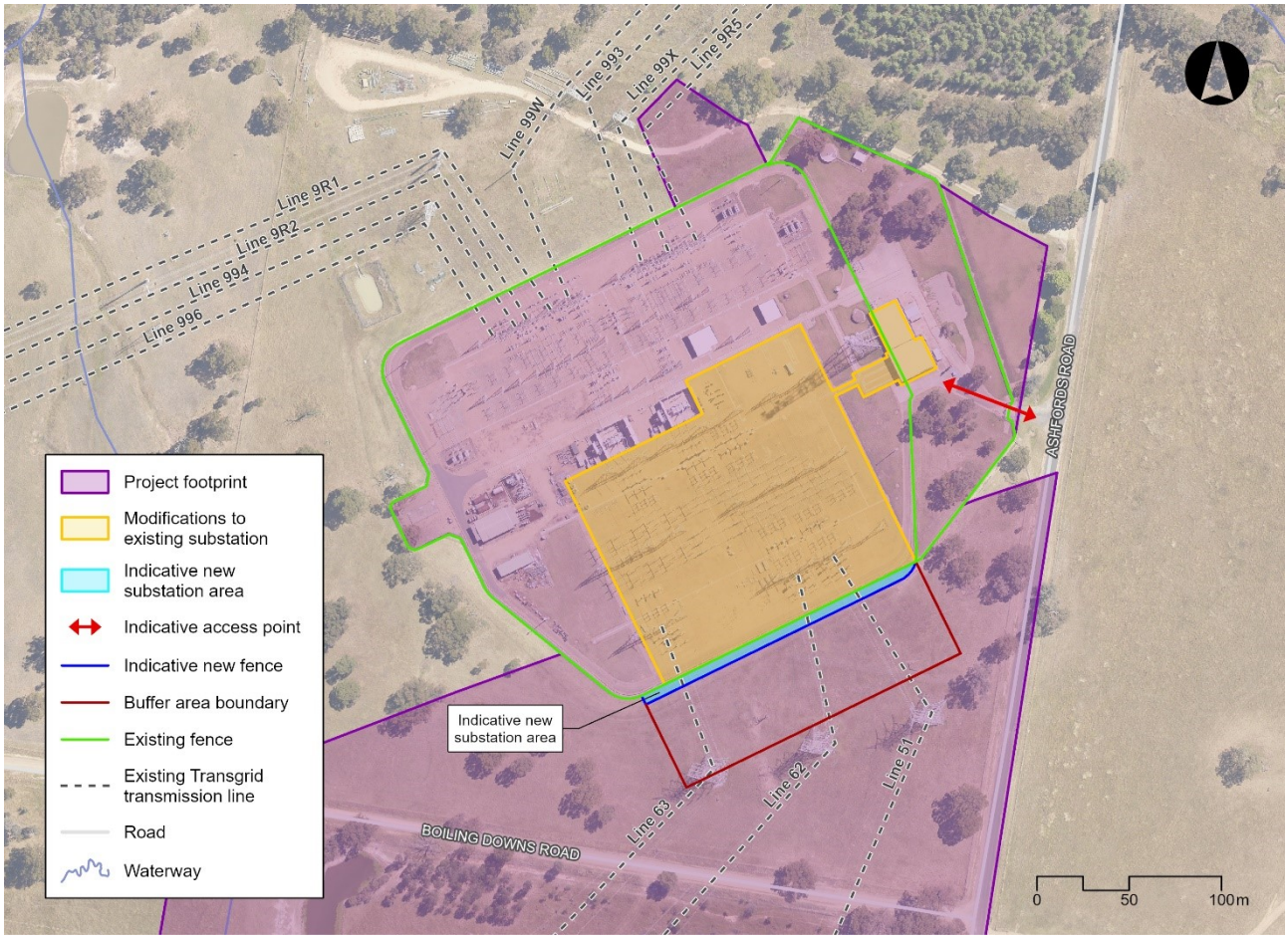


Figure 7-2 Indicative layout of modified Wagga 330 kV substation (subject to detailed design) showing location of the existing access from Ashfords Road

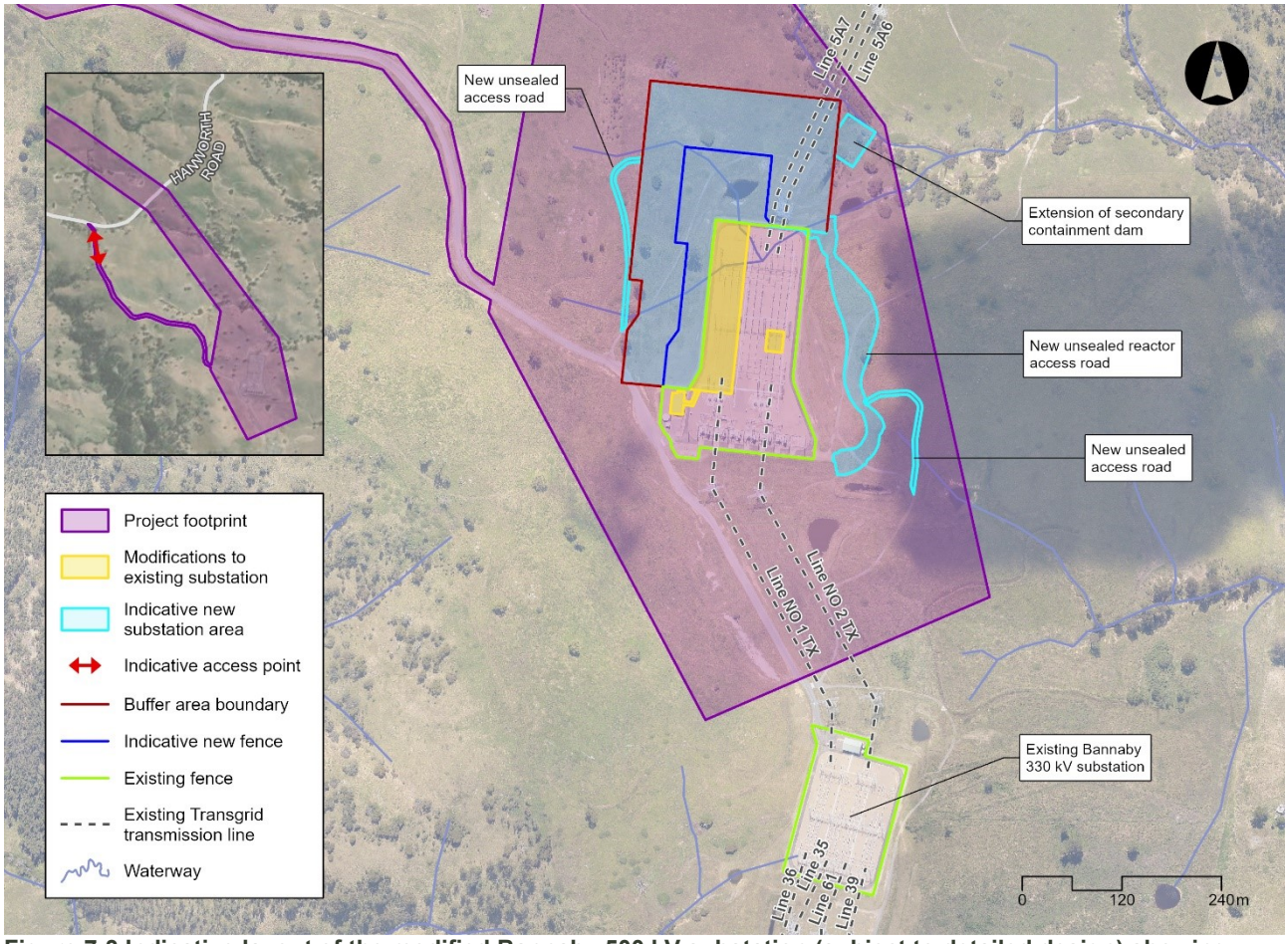


Figure 7-3 Indicative layout of the modified Bannaby 500 kV substation (subject to detailed design) showing location of the existing access road from Hanworth Road that would be upgraded as part of the project

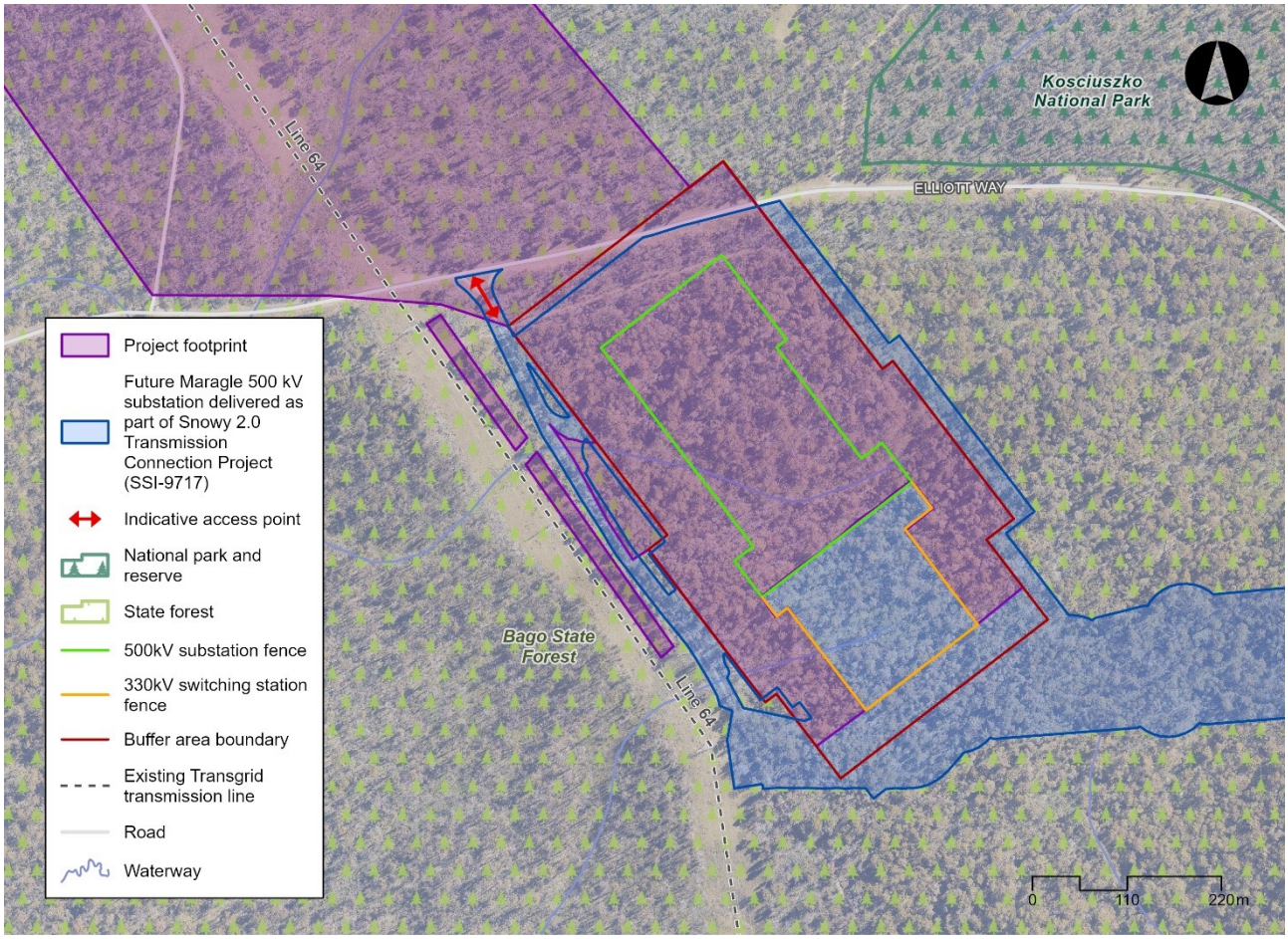


Figure 7-4 Indicative layout of the future Maragle 500 kV substation (subject to detailed design) showing location of the future access road from Elliot Way to be constructed by Snowy 2.0 Transmission Connection Project

7.1.2 Transmission line operation and maintenance

Regular maintenance activities would be required for the transmission lines during its operation. Likely maintenance activities for transmission lines structures would include:

- An annual fly over (aerial inspection) as part of seasonal bushfire prevention surveys.
- Routine infrastructure inspections. This would typically involve two to three maintenance workers driving a light vehicle from public roads to the easement utilising access tracks, then along the easement inspecting each transmission line structure in turn. Structures would be inspected both from the ground and by maintenance workers climbing the structure on a six-yearly cycle.
- Reactive transmission line maintenance in response to unexpected issues identified during routine inspections. This would typically involve maintenance workers using light vehicles, an elevated work platform and a medium sized truck to rectify any defects found from routine inspections. Generally, this would occur within the same maintenance cycles as the routine infrastructure inspection.
- Ad hoc fault and emergency fly over(s) to assess infrastructure condition should an unplanned outage occur (eg through a weather event or other failure of infrastructure). This maintenance would occur as required. The amount of maintenance and/or crew required for repair of any damaged infrastructure would depend on the extent of repairs required.
- Vegetation management within the transmission line easement and hazard tree zone.

7.2 Operation traffic generation and distribution

7.2.1 Maintenance workers

During operation, the proposed Gugaa 500 kV substation would not accommodate full-time staff or contractors. Maintenance at the new substation would typically include routine and ad hoc attendance (typically one to two times a month) of one to five workers to undertake planned and unplanned maintenance activities. It is expected that these activities would only require light vehicles and/or small to medium plant (depending on the work required). The modification of the Wagga 330 kV substation and Bannaby 500 kV substation would not change the existing operational or maintenance requirements that currently occur for this infrastructure.

The management of vegetation at transmission line structures and within the easement would occur on a cyclic basis, which would be determined by vegetation response and growth rate. Based on Transgrid's existing transmission assets in the local region, the cyclic management period is expected to be four to six years. Ad-hoc vegetation maintenance would be carried out as required along operational access tracks. This would typically involve slashing of any vegetation regrowth within the shoulders and/or management of trees, which encroach the access track corridor and prevent safe vehicle passage.

7.2.2 Maintenance traffic generation and distribution

Traffic movements for substation inspection and maintenance would generally involve movement of workers by LVs only. Movements for transmission line inspection and maintenance would generally require LVs and a single heavy vehicle.

Considering a worst-case scenario of routine maintenance and inspection occurring simultaneously at substations, a maximum of four LV trips are anticipated for eight workers at each substation with vehicle occupancy of two workers per vehicle. A total of 16 LV trips are anticipated for four substations during operation. This would result in 32 movements throughout the day over the traffic study area. However only eight movements throughout the day would be expected on the road adjacent to any given substation location and all substations are located far from each other.

For transmission line maintenance and inspection, five LV trips are anticipated for ten workers with vehicle occupancy of two workers per vehicle and one heavy vehicle trip.

For the telecommunications hut, trips would be carried out around once a year for routine maintenance. This excludes defect rectifications which could occur on an as-required basis.

Project vehicle movements during operation are not expected to generate large amounts of vehicular traffic. Any traffic which is likely to be limited to a few vehicles would occur infrequently and be short-term in nature.

7.3 Operational impact assessment

7.3.1 Impact on road network

Operational traffic impacts on the road network include:

- Temporary increases in traffic movements at inspection/maintenance locations for the duration of the activities. These impacts vary, however they would be expected to be negligible and most likely imperceptible to the general transport users due to the low number of trips generated. Maintenance activities along the transmission line would be experienced at isolated locations at any given time
- Impacts association with the ongoing maintenance of new access tracks and roads developed during construction, particularly where these new assets connect with the existing public road networks.

Therefore, based on a qualitative assessment the risk of traffic and access impacts from operational traffic at sensitive receivers is considered minimal. These impacts are detailed below in terms of road network performance, road condition and new access points.

7.3.1.1 Road network performance

Based on the proposed operation and maintenance activities and their frequencies detailed in Section 7.1, the traffic generated for operation and maintenance activities in Section 7.2 is insignificant. As such, operation of the project would have negligible impact on road network performance.

7.3.1.2 Road condition

The low volumes of light and HVs for operation and maintenance activities are anticipated to have negligible impact on road condition. As a proportion of road volume capacity available, and in terms of the current high level of service for the road network within the traffic study area, the additional vehicles generated by the operation of the project would represent no perceptible change.

7.3.2 Impact on rail network

During operation, maintenance activities near the rail network would be limited to inspections of transmission line structures and managing localised network disruptions. During these events, work would be undertaken in consultation with rail authorities, by appropriately authorised personnel and within the required clearances from existing rail lines.

7.3.3 Impact on road safety

The low volume of traffic associated with operation and maintenance activities is relatively low and expected to have minimal impact on the existing road networks safety.

7.3.4 Impact on active transport

Within the traffic study area, active transport provisions such as footpaths exist in urban environments only. The traffic for operation and maintenance activities is expected mainly in the vicinity of transmission lines and substations, where no active transport provisions exist.

The increase in traffic due to operation of project is expected to have negligible impact on active transport.

7.3.5 Impacts on public transport

The low traffic generated for operation of the project combined with the infrequent nature of the traffic movements would have limited interaction with public transport services. Operational traffic is anticipated to have a negligible impact on public transport.

7.3.6 Impacts to property access

Access to properties would be maintained at all times over the course of operational and maintenance activities.

8 Cumulative impacts

Assessing cumulative impacts involves the consideration of the proposed impact in the context of traffic and transport. The assessment of cumulative impacts also considers projects that are currently under development, or at the planning state that may also influence the assessment of this project's potential impacts. Cumulative impacts can potentially arise from the interaction of the construction and operation activities of the project and other future projects nearby.

The cumulative impact assessment was prepared in accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPE, 2022). Projects with the potential for cumulative impacts with the project were identified through a review of publicly available information and environmental impact assessments from the following databases in March 2023:

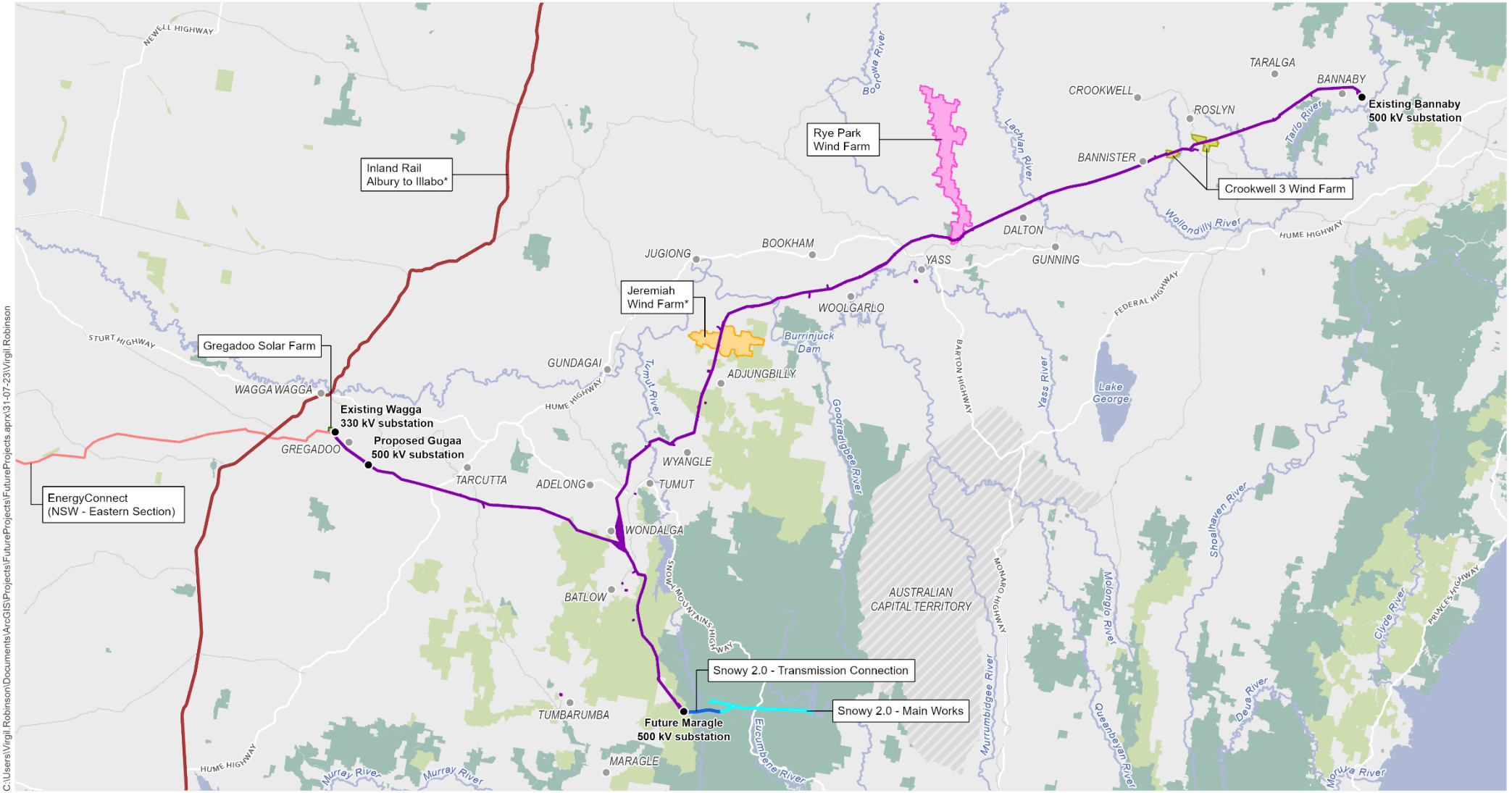
- DPE's Major Projects register
- NSW Government's Southern Regional Planning Panel project register
- NSW Independent Planning Commission project register
- EPBC Act Public Portal
- Transport for NSW Projects Map.

Searches were limited to the LGAs of Wagga Wagga City, Snowy Valleys, Yass Valley, Cootamundra-Gundagai Regional Upper Lachlan Shire, Goulburn-Mulwaree, and Hilltops.

Based on the above searches, the following projects are to be considered in the cumulative impact assessment for each of the key matters:

- EnergyConnect (NSW – Eastern Section)
- Gregadoo Solar Farm
- Jeremiah Wind Farm
- Rye Park Wind Farm
- Victoria to NSW Interconnector West (VNI West)
- Snowy 2.0 - Transmission Connection
- Snowy 2.0 - Main Works
- Inland Rail – Albury to Illabo
- Crookwell 3 Wind Farm.

Figure 8-1 shows the location of relevant future projects with respect to HumeLink's project footprint.



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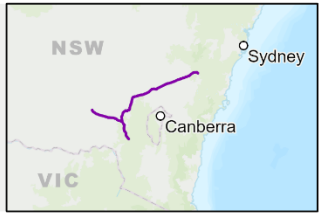
Project footprint
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway
Substation

Relevant future projects

Crookwell 3 Wind Farm
EnergyConnect (NSW - Eastern Section)
Gregadoo Solar Farm
Inland Rail Albury to Illabo*
Jeremiah Wind Farm*
Rye Park Wind Farm
Snowy 2.0 - Main Works
Snowy 2.0 - Transmission Connection

*Note: Subject to approval



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

HumeLink **Soil and Contamination**

FIGURE 8-1: Relevant future projects

Table 8-1 Summary of cumulative impact identified

Relevant project	Details	Distance/interface	Cumulative impacts
EnergyConnect (NSW - Eastern Section)	The EnergyConnect (NSW – Eastern Section) project includes a new transmission line connecting the existing Buronga substation and existing Wagga 330 kV substation, and construction of the new Dinawan 330 kV substation (170 km west of Wagga Wagga). The new transmission line comprises: ■ 375 km of new 330 kV double-circuit transmission line and associated infrastructure between the Buronga substation and the proposed Dinawan 500 kV substation ■ 162 km of new 500 kV double-circuit transmission line (operated at 330 kV) and associated infrastructure between the proposed Dinawan 500 kV substation and the existing Wagga 330 kV substation ■ Connection of the proposed transmission lines to the proposed Dinawan 330 kV substation. Construction of the project would commence in early-2023. The construction of the transmission lines and substation facilities would take around 30 months. The upgraded Wagga 330 kV substation and new Dinawan 330 kV substation are expected to be operational by late-2024. Site decommissioning and remediation would extend around six months beyond the commissioning (operational) phase, with estimated completion in mid-2025.	HumeLink and EnergyConnect (NSW – Eastern Section) both require upgrades of the existing Wagga 330 kV substation	The EnergyConnect (NSW – Eastern Section) project is expected to be operational by late 2024, however site decommissioning and remediation work would extend to early 2025. Construction of HumeLink is expected start in mid-2024. As the construction traffic related to both projects is expected to use roads in the vicinity of overlapping worksites some cumulative impacts are anticipated. However, by the time construction on HumeLink commences, it is expected that most of the work for EnergyConnect at Wagga Wagga would have been completed considering the scheduled operation of project in late 2024. Only minor traffic related to site decommissioning and remediation work and maintenance during operation is anticipated which would have minimal to no cumulative impact.
Gregadoo Solar Farm	The Gregadoo Solar Farm would be located about 13 km south-east of Wagga Wagga, adjacent to the Wagga 330 kV substation. The project is proposed to comprise construction, operation and decommissioning of a maximum 47 MW solar farm and associated infrastructure. The EIS for the project was approved in 2021. Construction is expected to commence in 2023 with nine months of construction period. The project is expected to be operational early 2024.	The road network adjacent to the existing Wagga 330 kV substation would be used by both the projects. Gregadoo Solar Farm is proposed to connect to existing Wagga 330 kV substation on the northern side of substation.	This project is not expected to result in cumulative impacts with HumeLink, given the construction phase of the project is anticipated to finish before commencement of HumeLink construction work. During operation, Gregadoo Solar Farm project is anticipated to generate insignificant traffic, therefore negligible cumulative impacts are anticipated.

Relevant project	Details	Distance/interface	Cumulative impacts
Jeremiah Wind Farm	The proposed Jeremiah Wind Farm is located approximately 29 km east of Gundagai in the Adjungbilly area. The project proposes a 65 turbine wind farm with a maximum tip height of 300 m, battery energy storage system and associated ancillary infrastructure. An EIS is in preparation. Project approval is anticipated in 2023 with construction expecting to take 24-30 months.	HumeLink transmission lines would pass through the Jeremiah Wind Farm development area	The construction period of the Jeremiah Wind farm coincides with the HumeLink project. Due to the nature of the wind farm construction, the majority of its construction traffic is expected to be concentrated locally, in the vicinity of the wind farm. Considering the geographical extent of the HumeLink project, cumulative transport impacts are anticipated to be locally concentrated in the Adjungbilly area. Adjungbilly Road, Nanangroe Road, Parsons Creek Road, Red Hill Road, Maryvale Road or other similar roads in overlapping area are expected to be used by both the projects. Given the substantial residual capacity available on these roads, should the peak construction work of both projects coincide, the traffic impacts are considered manageable within the existing road network capacity.
Rye Park Wind Farm	The Rye Park Wind Farm is located to the west of Rye Park, to the north-west of Yass and south-east of Boorowa. The modified project includes a maximum of 80 wind turbines with a maximum tip height of 200 m. The project also includes construction of associated infrastructure (substations, operation and maintenance facilities) and upgrades to local roads. The EIS was approved in 2017, modification 1 was approved in 2021 and modification 2 is in preparation in 2022. Construction commenced in December 2021 with commissioning scheduled for June 2023.	HumeLink transmission lines would pass through the southern end of the wind farm project boundary at Bango (near Bango Nature Reserve).	This project is a not expected to have a major impact given the construction phase of the project is anticipated to finish before commencement of the HumeLink construction work. During operation, Rye Wind farm project is anticipated to generate low traffic volumes, which would not result in any cumulative impacts during the operation of HumeLink.
Victoria to NSW Interconnector West	The Victoria to NSW Interconnector West (VNI West) project involves targeted interconnector expansion between Victoria and NSW to address transmission network limitations and improve supply reliability. VNI West is still in scoping and market modelling phase to assess the technical and economic viability of expanding transmission interconnector capacity between Victoria and NSW. One of the options for connection of VNI could be at Wagga 330 kV substation Construction of project is anticipated in late 2026 with indicative completion by 2028.	In anticipation of scope for VNI project, HumeLink and VNI project could potentially interface along Wagga 330 kV substation and the proposed Gugaa 500 kV substation.	This project is not expected to result in cumulative impacts with HumeLink as the construction of this project is expected to start after the commissioning of HumeLink project. Further, HumeLink's traffic volume associated with operation and maintenance activities are negligible and would not result in any cumulative impacts.

Relevant project	Details	Distance/interface	Cumulative impacts
Snowy 2.0 - Transmission Connection	The Snowy 2.0 – Transmission Connection project involves a new transmission connection between the proposed Snowy 2.0 pumped hydro and generation project to the existing high voltage transmission network. This includes construction of a new substation in Bago State Forest (future Maragle 500 kV substation), new access tracks and upgrade of existing access tracks and ancillary work to support construction. An EIS has been exhibited. Construction expected to begin in late 2023 with expected completion by end of 2025.	HumeLink to connect to the future Maragle 500 kV substation being constructed as part of the Snowy 2.0 – Transmission Connection project	HumeLink would connect to the future Maragle 500 kV substation being constructed as part of the Snowy 2.0 - Transmission Connection project. The nature of this project is similar to HumeLink. At Bago State Forest there is an overlap in worksite. By the time construction on HumeLink commences, it is expected that most of the work for Snowy 2.0 - Transmission Connection at Bago State Forest would have been completed considering the scheduled completion date of project in 2026. Transgrid is the proponent for both Snowy 2.0 - Transmission Connection and HumeLink. As such construction schedules for both projects would be coordinated to minimise cumulative transport impacts.
Snowy 2.0 - Main Works	The Snowy 2.0 – Main Works project includes an underground pumped hydro power station and ancillary infrastructure. The main work at Talbingo Reservoir site include excavated rock placement, portal construction and tunnelling, access roads and ancillary facilities for emplacement activities and tunnelling support. Construction began in October 2020 with expected completion by 2026.	Talbingo Reservoir site is approximately 5 km east of the HumeLink project footprint.	The construction period of Snowy 2.0 – Main Works coincides with the HumeLink project. Due to nature of Snowy 2.0 – Main Works majority of projects' construction traffic is expected to be concentrated locally in the Bago State Forest near Talbingo Reservoir. The roads providing access to HumeLink project footprint have significant substantial residual capacity. The cumulative impact of Snowy 2.0 – Main Works and HumeLink would be manageable within the existing road network capacity.
Inland Rail – Albury to Illabo	Upgrade 185 km of rail track from Albury to Illabo which passes through Wagga Wagga. Construction is proposed to commence in early 2024 and is expected to take about 16 months.	Roughly 9 km north-west of existing Wagga 330 kV substation.	This project is not expected to result in cumulative impacts with HumeLink as the construction of this rail track would only interact with HumeLink generated traffic around Wagga Wagga. The increase in HumeLink's traffic volumes around Wagga Wagga are expected to be low and would not result in any cumulative impacts.
Crookwell 3 – Wind Farm	16 wind turbines up to 157 m in height, connected to the grid via the 330 kV transmission line. Detailed design and pre-construction activities are being carried out with main construction work expected to take about 18 months once commenced.	Project site is within the project footprint.	This project is not expected to result in cumulative impacts with HumeLink as the construction is likely to finish before the start of construction for HumeLink. Irrespective, if there is a slight overlap in construction, the increase in HumeLink's traffic volumes around Crookwell are expected to be low and would not result in any cumulative impacts.

9 Management of impacts

9.1 Overview of approach

This chapter lists out the mitigation measures to be implemented to minimise the impacts related to construction and operation traffic and transport of the project.

A Traffic and Transport Management Plan would be prepared prior to construction to mitigate and manage the impacts associated with the construction work. The plan will be guided by *Traffic Control at Work Sites version 6.1-Technical Manual* (Transport for NSW, 2022). The plan will also detail how potential project-related traffic and access impacts during construction would be minimised and managed. This plan will be prepared in consultation with the local councils and Transport for NSW. This plan will be implemented prior to and during construction and will include consideration and potential coordination with relevant nearby projects with potential for cumulative impacts to plan transport related activities to minimise the impacts on traffic where possible.

All relevant permits and licences, including those required for drivers (such as Forest Operators Licence), are required prior to construction.

9.2 Avoidance and minimisation of impacts

Traffic impacts during construction of the project would be managed primarily through the establishment of regular communications with the relevant road/rail authorities, landowners, community, contractors of other projects and project stakeholders, regarding the planned movements of project construction traffic in relation to staging of work.

Considering the geographical extent and the nature of the project, an increase in construction traffic movement for most of the roads is expected to be low and distributed over a large network.

During operation, consultation with relevant stakeholders such as road authorities, relevant councils and community affected would be the main avenue for management of impacts. However, the traffic impacts during operation are anticipated to be negligible, as detailed in Chapter 7.

9.3 Summary of mitigation measures

The traffic and transport impact mitigation measures and the suggested timing of developing the mitigation is provided in Table 9-1.

Table 9-1 Summary of mitigation measures

Impact	Mitigation measures	Timing	Relevant location
Road safety – design	Access tracks, access connections and road upgrades required to facilitate the movement of project related traffic will be designed according to relevant Austroads guides.	Detailed design	Access tracks and roads
Impact to road network during OSOM deliveries	Prior to commencement of transportation activities, the validity of the previously undertaken haulage route studies will confirmed in consideration of final haulage route conditions and applicable route restrictions for the period during which transportation of such components is planned.	Detailed design	Transportation route
General construction impacts	Traffic controls will be aligned with *Traffic Control at Work Sites – Technical Manual Version 6.1* (TfNSW, 2022). Traffic controls will be confirmed in consultation with the relevant road authority.	Detailed design and construction	All locations
Road maintenance	Prior to construction, road dilapidation surveys will be carried out for all local roads to be used during construction. The surveys will assess the current condition of the road surface. At the completion of project construction, a subsequent road condition assessment will be prepared to assess the damage to roads accessed by project related traffic. Damage caused by the project will be rectified in consultation with the relevant road authority.	Detailed design and construction	Access routes
Impact on rail operation	All project activities in rail corridors will be undertaken in accordance with the permission granted by the appropriate rail authority. Stringing of transmission line over rail tracks will be scheduled during rail maintenance periods or in a duration which permits sufficient gap between scheduled freight or passenger services to undertake the work.	Construction and operation	All locations
Temporary lane/road closure	Road closures will be undertaken with the approval of the appropriate road authority and under the relevant road occupancy licence to be obtained prior to construction. Where feasible, road closures will be planned outside of the traffic peak to minimise the impact on the road network.	Construction	All locations
Road safety – driver related	A Code of Conduct applicable to all construction workers will be developed and implemented which will define acceptable driver behaviour. The purpose of the Code of Conduct is to promote road safety and ensure that the impacts of construction-related vehicle movements on local roads and the local community are minimised. The Code of Conduct will be developed as part of a wider suite of documents under work health and safety requirements.	Construction	Roads providing access to project
Community and stakeholder consultation	Community and stakeholder communication strategies will be established and implemented to notify the affected communities, visitors, emergency services and relevant road and rail authorities in advance of any disruptions to traffic, anticipated delays, disruptions to property access and changes to travel routes. The strategies will be developed including details on communication channels, frequency of communication and response measures in relaying information to the community and stakeholders.	Detailed design and construction	All locations

10 Conclusion

This report assesses the traffic and transport impacts associated with construction and operation of the HumeLink project. The report addresses the SEARs in relation to traffic and transport related impacts on the road and rail network performance, road safety, impact on active transport and public transport. The report also outlines measures to maintain and minimise the impacts of road and rail transport.

10.1 Construction traffic impact

Construction of the project would generate additional traffic on the existing road network within the traffic study area. Due to low existing levels of traffic on the local road network within the traffic study area, the additional project traffic during construction would result in a perceptible change. From a road capacity point of view, all roads would operate reasonably in free flow conditions.

Some of the roads are expected to have additional traffic over the full duration of project construction, however most of the roads are expected to be used for a much shorter duration.

The road network in the traffic study area is expected to maintain performance at LoS A or B as per the existing conditions.

A review of crashes on roads within 100 metres of the anticipated access routes to the construction compounds identified no crashes between 2016 and 2020. The design of the access points and roads tie-ins would be developed in accordance with the Austroads Guide to Road Design, TfNSW and the relevant LGA's guidelines to minimise the likelihood of crashes and other road safety concerns.

Construction traffic would not have any impact on rail network operation as vehicles would use the existing road network and approved railway crossings. All stringing activities for the transmission lines across railway lines would be undertaken during planned rail possessions and would be undertaken in accordance with the railway line owners' or operators' requirements to avoid any impact to rail operations.

The impact of construction traffic on active transport would be confined to urban areas where active transport infrastructure is provided and utilised. However, these impacts would be negligible due to the low volumes of additional construction traffic and the separation of active transport users from vehicles.

Bus services form the major public transport services in the traffic study area. As construction traffic is not anticipated to adversely impact road network performance, bus services are not expected to experience delays.

Access to properties is expected to be mostly maintained throughout the duration of the construction. Where short-term temporary restrictions to property access is required, it would be undertaken in consultation with property owners in accordance with the relevant property management plans.

10.2 Operation traffic impact

The traffic generated during operation of the project would be relatively low. The low volume of operational traffic would have a negligible impact on the road network including road network performance, road safety and road condition.

The traffic to be generated during operation and maintenance activities would be around the transmission lines and substations, where no active transport provisions exist, thus no impact on active transport is expected.

The low volumes of traffic generated during operation would have little to no interaction with public transport services resulting in negligible impact on public transport.

Access to properties would be maintained throughout operation in consultation with landowners.

10.3 Cumulative impacts

The cumulative impact assessment of traffic and transport impacts assessed the potential for an increase in impact during construction and operation of HumeLink in conjunction with other relevant future projects. Given the substantial residual capacity available on the road network within the study area, the cumulative impacts are largely considered manageable and would be accommodated by the existing road network capacity.

10.4 Mitigation measures

With the implementation of the traffic mitigation and management measures during each phase of the project the impact of construction and operational traffic of the project is expected to be low.

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Attachments

Attachment A
Regional road network within traffic study area

Road name	Pavement type	Lane counts	Speed limit	Pedestrian/ cyclist provision
Binda Road	Sealed	2	80/ 100 km/h	Sealed shoulders
Boorowa Road	Sealed	2	100 km/h	Unsealed Shoulders
Brooklands Street	Sealed	2	50 km/h	Road reserve
Bunnaby Street	Sealed	Unmarked	50 km/h	Road reserve
Burrinjuck Road	Sealed	Unmarked	60/ 80 km/h	Unsealed shoulders
Collector Road	Sealed	2	100 km/h (50 km/h near towns)	Unsealed shoulders
Dalton Road	Sealed	2	100 km/h (50 km/h near towns)	Unsealed shoulders
Grabben Gullen Road	Sealed	2	100 km/h (50 km/h near towns)	Unsealed shoulders
Gundaroo Road	Sealed	2	100 km/h	Sealed shoulders
Gundaroo Street	Sealed	2	50 km/h	Unsealed shoulder
Gunning Street	Sealed	2	50 km/h	Road reserve
Hume Street	Sealed	2	50 km/h	Sealed shoulders
Laggan Road	Sealed	2	100 km/h (50 km/h near towns)	Unsealed shoulders
Laggan – Taralga Road	Sealed/ Unsealed	2	100 km/h	Unsealed shoulders
Laidlaw Street	Sealed	2	50 km/h	Footpaths
Northcott Street	Sealed	2	50 km/h	Road reserve
Orchard Street	Sealed	Unmarked	50 km/h	Road reserve
Rye Park Road	Sealed	2	100 km/h (50 km/h near towns)	Unsealed shoulders
Selwyn Street	Sealed	2	50 km/h	Unsealed shoulders
Taralga Road	Sealed	2	100 km/h (50 km/h near towns)	Unsealed shoulders
Tooma Road	Sealed	2	100 km/h	Unsealed shoulders
Tumbarumba Road	Sealed	2	100 km/h (50 km/h near towns)	Unsealed shoulders
Tumut Street	Sealed	2	50 km/h	Road reserve
Warrataw Street	Sealed	2	50 km/h	Road reserve
Wee Jasper Road (including Grand Junction Road)	Sealed	2	100 km/h (50 km/h near towns)	Sealed shoulders
West Street	Sealed	2	50 km/h	Road reserve
Willis Street	Sealed	2	50 km/h	Road reserve
Wondalga Road	Sealed	2	100 km/h (50 km/h near towns)	Unsealed shoulders
Woodhouselee Road	Sealed	Unmarked	100 km/h	Unsealed shoulders
Yass Street	Sealed	2	50 km/h	Footpaths

Road name	Pavement type	Lane counts	Speed limit	Pedestrian/ cyclist provision
Yass Valley Way	Sealed	2	80/ 100 km/h (50 km/h in towns)	Sealed shoulders/ Road reserve

Attachment B

Local road network within traffic study area

Road name	Pavement type	Lane counts
Abbots Lane	Unsealed	2
Adavale Road	Unsealed	1
Adelong Road	Sealed	2
Adjungbilly Road	Sealed	2
Alfred Street	Unsealed	2
Alton Hill Road	Unsealed	1
Angels Lane	Unsealed	1
Ash Creek Road	Unsealed	1
Ashfords Road	Sealed	2
Back Arm Road	Unsealed	1
Back Creek Road	Unsealed	1
Back Kunama Road	Unsealed	1
Back Nacki Creek Road	Unsealed	1
Back Sandy Gully Road	Unsealed	1
Bago Creek Road	Unsealed	2
Bago Forest Way	Unsealed	1
Bango Lane	Unsealed	1
Bannaby Road	Sealed	2
Bannister Lane	Unsealed	2
Barneys Highway	Unsealed	1
Bartoman Street	Sealed	2
Bb Feeder Road	Unsealed	1
Big Springs Road	Sealed	2
Black Boot Road	Unsealed	1
Black Range Road	Unsealed	2
Blakney Creek Road South	Sealed	2
Blakney Creek South Road	Sealed	2
Bogong Street	Sealed	2
Booths Road	Unsealed	1
Browns Forest Road	Unsealed	1
Browns Road	Unsealed	1
Brungle Creek Link Road	Unsealed	1
Brungle Creek Road	Unsealed	2
Brungle Road	Sealed	2
Buddong Road	Unsealed	1
Buggali Road	Unsealed	1
Bulleys Crossing	Unsealed	2
Bullongra Road	Unsealed	1
Bundarbo Road	Unsealed	1

Road name	Pavement type	Lane counts
Burkinshaws Lane	Unsealed	1
Bushs Road	Unsealed	1
Butcher Road	Unsealed	1
Byes Lane	Unsealed	1
Carnells Lane	Unsealed	2
Carrabungla Road	Unsealed	2
Centenary Avenue	Sealed	2
Central Logging Road	Unsealed	1
Chapel Street	Sealed	1
Childowla Road	Sealed	2
Clancys Road	Unsealed	1
Clinton Street	Sealed	2
Cockatoo Road	Unsealed	1
Colyer Street	Sealed	2
Comatawa Road	Unsealed	1
Cooks Hill Road	Sealed	2
Coolalie Road	Unsealed	2
Coreinbob Road	Unsealed	2
Coreinbob Siding Road	Unsealed	2
Courabyra Road	Sealed	2
Dawes Road	Unsealed	2
Dawsons Creek Road	Unsealed	1
Days Road	Unsealed	1
Dog Tree Road	Unsealed	1
Dowlings Road	Unsealed	1
Dunns Road	Unsealed	1
East Bago Powerline Road	Unsealed	1
East Gilmore Road	Sealed	2
Edwardstown Road	Sealed	1
Ellerslie Road	Unsealed	1
Ellerslie Woolshed Road	Unsealed	1
Elms Road	Unsealed	2
Fagan Drive	Sealed	2
Fairy Hole Road	Unsealed	1
Felled Timber Road	Unsealed	1
Fernhill Road	Unsealed	1
Flacknell Creek Road	Unsealed	2
Forest Road	Sealed	1
Forsters Road	Sealed	1
Fullers Lane	Unsealed	1
Gadara Lane	Unsealed	2
Gadara Road	Unsealed	2
Gobarralong Road	Sealed	2

Road name	Pavement type	Lane counts
Gorham Road	Unsealed	2
Grahamstown Road	Sealed	2
Grand Junction Road	Sealed	2
Green Hills Access Road	Sealed	2
Green Hills Forest Way	Unsealed	2
Greendale Road	Unsealed	1
Greenhills Road	Sealed	2
Greenwood Road	Sealed	2
Gregadoo East Road	Sealed	2
Gregadoo-Ladysmith Road	Sealed	1
Gurrundah Road	Sealed	2
Hanworth Road	Sealed	2
Hardwicke Lane	Unsealed	2
Harley Road	Unsealed	1
Hawthornes Tree Road	Sealed	2
Herrings Road	Unsealed	1
Hillcrest Road	Unsealed	1
Hillgrove Road	Unsealed	2
Hillview Drive	Sealed	2
Honeysuckle Road	Unsealed	1
Hopewood Road	Sealed	1
Hovell Street	Sealed	2
Howards Road	Unsealed	1
Hugel Trail	Unsealed	1
Hume Street	Sealed	2
Humula Link Road	Sealed	2
Humula Road	Sealed	2
Hurdle Creek Trail	Unsealed	1
Hydes Old Road	Unsealed	1
Ivydale Road	Unsealed	1
Jerrawa Road	Sealed	2
Keajura Road	Sealed	2
Keenans Road	Sealed	2
Kerrawarry Creek Trail	Unsealed	1
Kialla Road	Sealed	2
Kileys Creek Road	Unsealed	1
Kileys Road	Unsealed	1
Kooringal Road	Sealed	2
Kopsens Road	Unsealed	1
Kunama Road	Unsealed	1
Kurrajong Avenue	Sealed	2
Kyeamba Avenue	Sealed	2
Kyeamba Street	Sealed	2

Road name	Pavement type	Lane counts
Lade Vale Road	Unsealed	2
Livingstone Gully Road	Unsealed	2
Loop Road	Unsealed	2
Lower Bago Road	Sealed	2
Lower Greendale Road	Unsealed	1
Lucernvale Road	Unsealed	1
Marble Hill Road	Sealed	2
Maryvale Road	Unsealed	1
Mate Street	Sealed	2
Mates Gully Road	Sealed	2
Mcintosh Lane	Unsealed	1
Meadow Creek Road	Unsealed	1
Memorial Avenue	Sealed	2
Menzies Lane	Unsealed	1
Middle Arm Road	Sealed	2
Middle Street	Sealed	2
Middleton Drive	Sealed	2
Mill Road	Sealed	2
Millers Road	Unsealed	1
Mitchell Road	Sealed	2
Monterey Road	Unsealed	2
Mount Hugel Road	Unsealed	1
Mount Pleasant Creek Trail	Unsealed	1
Mount Rae Road	Unsealed	1
Murrays Road	Unsealed	1
Nanangroe Road	Unsealed	1
Nellis Street	Sealed	2
New Maragle Road	Unsealed	1
Northern Boundary Road	Unsealed	1
Norwood Road	Sealed	2
Nursery Access Road	Unsealed	1
Oberne Ellerslie Trail	Unsealed	1
Oberne-Umbango Road	Unsealed	2
Offleys Lane	Unsealed	1
Old Tumbarumba Road	Sealed	2
Old Western Boundary Road	Unsealed	1
One Tree Hill Trail	Unsealed	1
Orion Street	Sealed	2
Palmer Street	Unsealed	1
Park Avenue	Sealed	2
Parsons Creek Road	Unsealed	1
Parsons Lane	Sealed	2
Pejar Road	Unsealed	2

Road name	Pavement type	Lane counts
Perkins Road	Unsealed	1
Perry Street	Sealed	2
Pierces Boundary Road	Unsealed	1
Pioneer Street	Sealed	2
Pollux Street	Sealed	2
Pound Creek Road	Sealed	2
Pound Creek Upper Road	Unsealed	1
Powerline Road	Unsealed	1
Powerline Trail	Unsealed	1
Prices Lane	Unsealed	2
Prickle Road	Unsealed	1
Quartz Street	Sealed	2
Range Road	Sealed	2
Red Hill Road	Unsealed	2
Red Strip Road	Unsealed	1
Rhyanna Road	Sealed	2
Right Arm Creek Road	Unsealed	1
Rileys Flat Road	Sealed	1
Robertson Lane	Sealed	1
Roches Road	Unsealed	1
Rocky Gully Road	Unsealed	1
Roslyn Road	Sealed	2
Rugby Road	Sealed	2
Running Waters Road	Unsealed	1
Saleyards Road	Sealed	2
Sapphire Road	Sealed	2
Sawmill Creek Road	Unsealed	1
Sharpes Creek Feeder Road	Unsealed	1
Sharps Creek Road	Unsealed	1
Sharps Road	Unsealed	1
Shedleys Road	Unsealed	1
Sheldricks Lane	Unsealed	1
Sheridan Street	Sealed	2
Sixty Five Feeder Road	Unsealed	1
Snowball Road	Sealed	1
Snubba Road	Unsealed	2
Soldiers Settlement Road South	Unsealed	1
Spicers Lane	Unsealed	2
Spring Street	Sealed	2
Spyglass Trail	Unsealed	1
Stewarts Road	Sealed	1
Stink Pot Road	Unsealed	1
Stockdale Road	Unsealed	1

Road name	Pavement type	Lane counts
Stockmans Creek Road	Unsealed	1
Storriers Lane	Unsealed	1
Strathaird Lane	Sealed	2
Stud Horse Feeder Road	Unsealed	1
Sturgess Trail	Unsealed	1
Sydney Street	Sealed	2
Talmo Road	Unsealed	1
Taradale Road	Sealed	2
Tarlo Number 1 Trail	Unsealed	1
Third Creek Road	Unsealed	2
Townsend Street	Sealed	2
Travers Street	Sealed	2
Trewalla Road	Unsealed	1
Tumblong Road	Sealed	2
Turtons Road	Unsealed	1
Tywong Street	Sealed	2
Veterans Road	Sealed	2
Vincent Road	Sealed	2
Walkoms Lane	Unsealed	1
Walsh Street	Sealed	2
Walshs Road	Unsealed	2
Wargeila Road	Sealed	2
Warroo Road	Sealed	2
Webbs Road	Unsealed	1
West Branch Feeder	Unsealed	1
West Gilmore Road	Unsealed	2
Westbrook Road	Sealed	2
Westwood Road	Unsealed	1
Wheeo Road	Sealed	2
Wilsons Road	Unsealed	1
Wiltys Road	Unsealed	1
Woodhouselee Road	Sealed	2
Yarrawonga Road	Unsealed	1
Yaven Creek Road	Sealed	2
Yellowin Access Road	Sealed	2
Yellowin Road	Sealed	1

Attachment C

Peak traffic volumes on access routes within traffic study area

Road name and location	Traffic count availability	NSW Road Network Classification	Pavement type	Estimated peak hour volume (vehicles per hour per direction)
Wagga Wagga City LGA				
Abbots Lane	No – Estimated	Local road	Unsealed	20
Angels Lane	No – Estimated	Local road	Unsealed	20
Ashfords Road	No – Estimated	Local road	Sealed	30
Big Springs Road	No – Estimated	Local road	Sealed	50
Burkinshaws Lane	No – Estimated	Local road	Unsealed	10
Byes Lane	No – Estimated	Local road	Unsealed	10
Centenary Avenue	No – Estimated	Local road	Sealed	100
Comatawa Road	No – Estimated	Local road	Unsealed	20
Coreinbob Road	No – Estimated	Local road	Unsealed	20
Coreinbob Siding Road	No – Estimated	Local road	Unsealed	30
Gregadoo East Road	No – Estimated	Local road	Sealed	100
Gregadoo-Ladysmith Road	No – Estimated	Local road	Sealed	50
Hammond Avenue	Yes – TfNSW Traffic Counter, Station ID – 95486	State road	Sealed	910
Hume Highway (between Humula Road and Comatawa Road)	Yes – TfNSW Traffic Counter, Station ID – 95423	National road	Sealed	140
Humula Link Road	No – Estimated	Local road	Sealed	50
Humula Road	No – Estimated	Local road	Sealed	50
Ivydale Road	No – Estimated	Local road	Unsealed	20
Keajura Road	No – Estimated	Local road	Sealed	50
Kooringal Road	No – Estimated	Local road	Sealed	100
Kyeamba Avenue	No – Estimated	Local road	Sealed	50
Kyeamba Street	No – Estimated	Local road	Sealed	50
Livingstone Gully Road	No – Estimated	Local road	Unsealed	20
Mates Gully Road	No – Estimated	Local road	Sealed	50
Mitchell Road	No – Estimated	Local road	Sealed	100
Oberne-Umbango Road	No – Estimated	Local road	Unsealed	20
Stewarts Road	No – Estimated	Local road	Unsealed	10
Sturt Highway (east of Tumbarumba Road)	Yes – TfNSW Traffic Counter, Station ID – 95001	State road	Sealed	160
Sturt Highway (east of RAAF BASE Wagga Wagga)	Yes – TfNSW Traffic Counter, Station ID – 95060	State road	Sealed	210
Sturt Highway(west of Elizabeth Avenue)	Yes – TfNSW Traffic Counter, Station ID – 95174	State road	Sealed	390
Sydney Street	No – Estimated	Local road	Sealed	100
Trewalla Road	No – Estimated	Local road	Unsealed	10

Road name and location	Traffic count availability	NSW Road Network Classification	Pavement type	Estimated peak hour volume (vehicles per hour per direction)
Tumbarumba Road	Yes – TfNSW Traffic Counter, Station ID – 95271	Regional road	Sealed	50
Tywong Street	No – Estimated	Local road	Sealed	20
Vincent Road	No – Estimated	Local road	Sealed	50
Westbrook Road	No – Estimated	Local road	Sealed	50
Snowy Valleys LGA				
Adelong Road	Yes – TfNSW Traffic Counter, Station ID – 95532	State road	Sealed	280
Albury Street	No – Estimated	State road	Sealed	100
Alfred Street	No – Estimated	Local road	Unsealed	20
Ash Creek Road	No – Estimated	Local road	Unsealed	20
Back Creek Road	No – Estimated	Local road	Unsealed	20
Back Kunama Road	No – Estimated	Local road	Unsealed	30
Back Nacki Creek Road	No – Estimated	Local road	Unsealed	20
Back Sandy Gully Road	No – Estimated	Local road	Unsealed	20
Bago Creek Road	No – Estimated	Local road	Unsealed	20
Bago Forest Way	No – Estimated	Local road	Unsealed	20
Barneys Highway	No – Estimated	Local road	Unsealed	10
Bartoman Street	No – Estimated	Local road	Sealed	50
Batlow Road (between Snowy Mountains Highway and East Gilmore Road)	Yes – TfNSW Traffic Counter, Station ID – 95107	State road	Sealed	70
Batlow Road (south of Herrings Road)	Yes – TfNSW Traffic Counter, Station ID – 95191	State road	Sealed	50
BB Feeder Road	No – Estimated	Local road	Unsealed	20
Black Boot Road	No – Estimated	Local road	Unsealed	20
Bogong Street	No – Estimated	Local road	Sealed	20
Booths Road	No – Estimated	Local road	Unsealed	20
Browns Forest Road	No – Estimated	Local road	Unsealed	20
Browns Road	No – Estimated	Local road	Unsealed	10
Brungle Creek Link Road	No – Estimated	Local road	Unsealed	10
Brungle Creek Road	No – Estimated	Local road	Unsealed	30
Brungle Road	No – Estimated	Local road	Sealed	50
Buddong Road	No – Estimated	Local road	Unsealed	10
Bullongra Road	No – Estimated	Local road	Unsealed	20
Central Logging Road	No – Estimated	Local road	Unsealed	20
Cockatoo Road	No – Estimated	Local road	Unsealed	10
Courabyra Road	No – Estimated	Local road	Sealed	50
Dog Tree Road	No – Estimated	Local road	Unsealed	10
Dunns Road	No – Estimated	Local road	Unsealed	20
East Bago Powerline Road	No – Estimated	Local road	Unsealed	10
East Gilmore Road	No – Estimated	Local road	Sealed	20
Ellerslie Road	No – Estimated	Local road	Unsealed	20

Road name and location	Traffic count availability	NSW Road Network Classification	Pavement type	Estimated peak hour volume (vehicles per hour per direction)
Ellerslie Woolshed Road	No – Estimated	Local road	Unsealed	20
Elliott Way	No – Estimated	Regional road	Sealed	50
Fitzroy Street	No – Estimated	State road	Sealed	200
Forest Road	No – Estimated	Local road	Sealed	50
Forsters Road	No – Estimated	Local road	Sealed	20
Gadara Lane	No – Estimated	Local road	Unsealed	20
Gadara Road	No – Estimated	Local road	Unsealed	20
Gocup Road (west Of Tumut)	Yes – TfNSW Traffic Counter, Station ID – 95186	State road	Sealed	70
Grahamstown Road	Yes – TfNSW Traffic Counter, Station ID – 95188	Local road	Sealed	30
Green Hills Access Road	No – Estimated	Local road	Sealed	20
Green Hills Forest Way	No – Estimated	Local road	Unsealed	20
Greenhills Road	No – Estimated	Local road	Sealed	50
Herrings Road	No – Estimated	Local road	Unsealed	10
Honeysuckle Road	No – Estimated	Local road	Unsealed	10
Hugel Trail	No – Estimated	Local road	Unsealed	10
Hurdle Creek Trail	No – Estimated	Local road	Unsealed	10
Hydes Old Road	No – Estimated	Local road	Unsealed	10
Inglis Street	No – Estimated	State road	Sealed	100
Keenans Road	No – Estimated	Local road	Sealed	10
Kileys Creek Road	No – Estimated	Local road	Unsealed	10
Kileys Road	No – Estimated	Local road	Unsealed	10
Kopsens Road	No – Estimated	Local road	Unsealed	20
Kunama Road	No – Estimated	Local road	Unsealed	20
Kurrajong Avenue	No – Estimated	Local road	Sealed	20
Lower Bago Road	No – Estimated	Local road	Sealed	50
Mate Street	No – Estimated	Local road	Sealed	20
Meadow Creek Road	No – Estimated	Local road	Unsealed	20
Memorial Avenue	No – Estimated	Local road	Sealed	30
Mill Road	No – Estimated	Local road	Sealed	30
Millers Road	No – Estimated	Local road	Unsealed	10
Minjary Street	No – Estimated	State road	Sealed	50
Monterey Road	No – Estimated	Local road	Unsealed	20
Mount Hugel Road	No – Estimated	Local road	Unsealed	10
Mount Pleasant Creek Trail	No – Estimated	Local road	Unsealed	10
Murrays Road	No – Estimated	Local road	Unsealed	10
Nellis Street	No – Estimated	Local road	Sealed	50
New Maragle Road	No – Estimated	Local road	Unsealed	10
Northern Boundary Road	No – Estimated	Local road	Unsealed	20
Nursery Access Road	No – Estimated	Local road	Unsealed	20

Road name and location	Traffic count availability	NSW Road Network Classification	Pavement type	Estimated peak hour volume (vehicles per hour per direction)
Oberne Ellerslie Trail	No – Estimated	Local road	Unsealed	10
Old Tumbarumba Road	No – Estimated	Local road	Sealed	30
Old Western Boundary Road	No – Estimated	Local road	Unsealed	20
One Tree Hill Trail	No – Estimated	Local road	Unsealed	10
Palmer Street	No – Estimated	Local road	Unsealed	20
Park Avenue	No – Estimated	Local road	Sealed	20
Perkins Road	No – Estimated	Local road	Unsealed	20
Pierces Boundary Road	No – Estimated	Local road	Unsealed	20
Pioneer Street	No – Estimated	Local road	Sealed	30
Pound Creek Road	No – Estimated	Local road	Sealed	20
Pound Creek Upper Road	No – Estimated	Local road	Unsealed	10
Powerline Road	No – Estimated	Local road	Unsealed	10
Powerline Trail	No – Estimated	Local road	Unsealed	10
Prickle Road	No – Estimated	Local road	Unsealed	10
Quartz Street	No – Estimated	Local road	Sealed	30
Red Hill Road	No – Estimated	Local road	Unsealed	20
Reedy Street	No – Estimated	State road	Sealed	100
Right Arm Creek Road	No – Estimated	Local road	Unsealed	20
Roches Road	No – Estimated	Local road	Unsealed	10
Rocky Gully Road	No – Estimated	Local road	Unsealed	10
Running Waters Road	No – Estimated	Local road	Unsealed	10
Selwyn Street (Adelong)	Yes – TfNSW Traffic Counter, Station ID – 95651	Regional road	Sealed	20
Selwyn Street (Batlow)	No – Estimated	Local road	Sealed	30
Sharpes Creek Feeder Road	No – Estimated	Local road	Unsealed	20
Sharps Creek Road	No – Estimated	Local road	Unsealed	20
Sharps Road	No – Estimated	Local road	Unsealed	10
Shedleys Road	No – Estimated	Local road	Unsealed	10
Sixty Five Feeder Road	No – Estimated	Local road	Unsealed	10
Snowy Mountains Highway (west of Batlow Road)	Yes – TfNSW Traffic Counter, Station ID – 95108	State road	Sealed	130
Snubba Road	No – Estimated	Local road	Unsealed	20
Spyglass Trail	No – Estimated	Local road	Unsealed	10
Stewarts Road	No – Estimated	Local road	Sealed	10
Stockmans Creek Road	No – Estimated	Local road	Unsealed	10
Stud Horse Feeder Road	No – Estimated	Local road	Unsealed	20
Sturgess Trail	No – Estimated	Local road	Unsealed	10
Taradale Road	No – Estimated	Local road	Sealed	50
Tooma Road	No – Estimated	Regional road	Sealed	70
Townsend Street	No – Estimated	Local road	Sealed	10
Tumut Street	Yes – TfNSW Traffic Counter, Station ID – 95660	State road	Sealed	130

Road name and location	Traffic count availability	NSW Road Network Classification	Pavement type	Estimated peak hour volume (vehicles per hour per direction)
Travers Street	No – Estimated	Local road	Sealed	20
Webbs Road	No – Estimated	Local road	Unsealed	
Wee Jasper Road (north of Tumut)	Yes – TfNSW Traffic Counter, Station ID – 95539	Regional road	Sealed	70
West Branch Feeder	No – Estimated	Local road	Unsealed	20
West Gilmore Road	No – Estimated	Local road	Unsealed	20
Westbrook Road	No – Estimated	Local road	Sealed	30
Westwood Road	No – Estimated	Local road	Unsealed	20
Wilsons Road	No – Estimated	Local road	Unsealed	20
Wiltys Road	No – Estimated	Local road	Unsealed	20
Wondalga Road	Yes – TfNSW Traffic Counter, Station ID – 95190	Regional road	Sealed	30
Yarrawonga Road	No – Estimated	Local road	Unsealed	10
Yaven Creek Road	No – Estimated	Local road	Sealed	30
Yellowin Access Road	No – Estimated	Local road	Sealed	20
Yellowin Road	No – Estimated	Local road	Sealed	20
Cootamundra-Gundagai Regional LGA				
Adelong Road	Yes – TfNSW Traffic Counter, Station ID – 95478	Local road	Sealed	20
Adjungbilly Road	No – Estimated	Local road	Sealed	20
Brungle Creek Link Road	No – Estimated	Local road	Unsealed	20
Brungle Road	No – Estimated	Local road	Sealed	50
Bundarbo Road	No – Estimated	Local road	Unsealed	20
Eagle Street	No – Estimated	State road	Sealed	70
Edwardstown Road	No – Estimated	Local road	Sealed	20
Fernhill Road	No – Estimated	Local road	Unsealed	10
Fullers Lane	No – Estimated	Local road	Unsealed	10
Gobarralong Road	No – Estimated	Local road	Sealed	30
Gocup Road (south of South Gundagai)	Yes – TfNSW Traffic Counter, Station ID – 94176	State road	Sealed	60
Hume Highway (north of Coolac)	Yes – TfNSW Traffic Counter, Station ID – 6136	National road	Sealed	360
Hume Highway (east of Snowy Mountains Highway)	Yes – TfNSW Traffic Counter, Station ID – 94058	National road	Sealed	230
Hume Highway (west of South Gundagai)	Yes – TfNSW Traffic Counter, Station ID – 94324	National road	Sealed	230
Honeysuckle Road	No – Estimated	Local road	Unsealed	20
Hopewood Road	No – Estimated	Local road	Sealed	20
Maryvale Road	No – Estimated	Local road	Unsealed	10
Middle Street	No – Estimated	Local road	Sealed	50
Middleton Drive	No – Estimated	Local road	Sealed	50
Nanangroe Road	No – Estimated	Local road	Unsealed	30
Parsons Creek Road	No – Estimated	Local road	Unsealed	20

Road name and location	Traffic count availability	NSW Road Network Classification	Pavement type	Estimated peak hour volume (vehicles per hour per direction)
Red Hill Road	No – Estimated	Local road	Unsealed	20
Red Strip Road	No – Estimated	Local road	Unsealed	10
Rileys Flat Road	No – Estimated	Local road	Sealed	50
Sawmill Creek Road	No – Estimated	Local road	Unsealed	10
Sheridan Street	No – Estimated	Local road	Sealed	70
Snowball Road	No – Estimated	Local road	Sealed	20
Snowy Mountains Highway (east of Hume Highway)	Yes – TfNSW Traffic Counter, Station ID – 94061	State road	Sealed	60
Stockdale Road	No – Estimated	Local road	Unsealed	10
Tumblong Road	No – Estimated	Local road	Sealed	20
West Street	No – Estimated	Regional road	Sealed	50
Yass Valley LGA				
Black Range Road	No – Estimated	Local road	Sealed	30
Burrinjuck Road	No – Estimated	Regional road	Sealed	30
Barton Highway	No – Estimated	State road	Sealed	400
Chilowla Road	No – Estimated	Local road	Sealed	20
Comur Street	No – Estimated	Regional road	Sealed	350
Cooks Hill Road	No – Estimated	Local road	Sealed	30
Elms Road	No – Estimated	Local road	Unsealed	20
Fagan Drive	No – Estimated	Local road	Sealed	20
Fairy Hole Road	No – Estimated	Local road	Unsealed	20
Grand Junction Road	No – Estimated	Local road	Sealed	100
Greenwood Road	No – Estimated	Local road	Sealed	20
Hardwicke Lane	No – Estimated	Local road	Unsealed	30
Hillview Drive	No – Estimated	Local road	Sealed	20
Hovell Street	No – Estimated	Local road	Sealed	50
Hume Highway (between Yass Valley Way and Lachlan Valley Way)	Yes – TfNSW Traffic Counter, Station ID – 6135-PR	State road	Sealed	550
Hume Highway (between Burley Griffin Way and Burrinjuck Road)	Yes – TfNSW Traffic Counter, Station ID – HHW005	State road	Sealed	340
Hume Highway (between Yass Valley Way and Barton Highway)	Yes – TfNSW Traffic Counter, Station ID – HHW006	State road	Sealed	290
Hume Street	No – Estimated	Local road	Sealed	50
Laidlaw Street	Yes – TfNSW Traffic Counter, Station ID – 94361	Regional road	Sealed	350
Lucernvale Road	No – Estimated	Local road	Unsealed	20
Mcintosh Lane	No – Estimated	Local road	Unsealed	10
Orion Street	No – Estimated	Local road	Sealed	50
Perry Street	No – Estimated	Local road	Sealed	30
Pollux Street	No – Estimated	Local road	Sealed	50
Talmo Road	No – Estimated	Local road	Unsealed	20

Road name and location	Traffic count availability	NSW Road Network Classification	Pavement type	Estimated peak hour volume (vehicles per hour per direction)
Turtons Road	No – Estimated	Local road	Unsealed	10
Wargeila Road	No – Estimated	Local road	Sealed	30
Warroo Road	No – Estimated	Local road	Sealed	100
Yass Valley Way (west of Barton Highway)	Yes – TfNSW Traffic Counter, Station ID – 94024	Regional road	Sealed	320
Upper Lachlan Shire LGA				
Adavale Road	No – Estimated	Local road	Unsealed	10
Alton Hill Road	No – Estimated	Local road	Unsealed	10
Back Arm Road	No – Estimated	Local road	Unsealed	20
Bannaby Road	No – Estimated	Local road	Sealed	20
Bannister Lane	No – Estimated	Local road	Unsealed	10
Binda Road	No – Estimated	Regional road	Sealed	50
Blakney Creek South Road	No – Estimated	Local road	Sealed	10
Boorowa Road	Yes – TfNSW Traffic Counter, Station ID – 94234	Regional road	Sealed	40
Brooklands Street	No – Estimated	Regional road	Sealed	30
Bulleys Crossing	No – Estimated	Local road	Unsealed	20
Bunnaby Street	No – Estimated	Regional road	Sealed	20
Butcher Road	No – Estimated	Local road	Unsealed	10
Carnells Lane	No – Estimated	Local road	Unsealed	10
Carrabungla Road	No – Estimated	Local road	Unsealed	10
Carrington Street	No – Estimated	State road	Sealed	50
Chapel Street	No – Estimated	Local road	Sealed	20
Clancys Road	No – Estimated	Local road	Unsealed	10
Collector Road	Yes – TfNSW Traffic Counter, Station ID – 94499	Regional road	Sealed	30
Colyer Street	No – Estimated	Local road	Sealed	50
Coolalie Road	No – Estimated	Local road	Unsealed	20
Crookwell Road	No – Estimated	State road	Sealed	100
Cullerin Road	No – Estimated	Regional road	Sealed	30
Dalton Road (south of Dalton)	Yes – TfNSW Traffic Counter, Station ID – 94245	Regional road	Sealed	20
Dalton Road (west of Gunning)	Yes – TfNSW Traffic Counter, Station ID – 94501	Regional road	Sealed	20
Dawes Road	No – Estimated	Local road	Unsealed	10
Dawsons Creek Road	No – Estimated	Local road	Unsealed	10
Dowlings Road	No – Estimated	Local road	Unsealed	10
Elms Road	No – Estimated	Local road	Unsealed	20
Felled Timber Road	No – Estimated	Local road	Unsealed	10
Flacknell Creek Road	No – Estimated	Local road	Unsealed	10
Gorham Road	No – Estimated	Local road	Unsealed	10
Goulburn Road	No – Estimated	State road	Sealed	100

Road name and location	Traffic count availability	NSW Road Network Classification	Pavement type	Estimated peak hour volume (vehicles per hour per direction)
Goulburn Street	Yes – TfNSW Traffic Counter, Station ID – 94296	State road	Sealed	90
Grabben Gullen Road (north of Cullerin Road)	Yes – TfNSW Traffic Counter, Station ID – 94170	Regional road	Sealed	20
Greendale Road	No – Estimated	Local road	Unsealed	10
Gundaroo Street	No – Estimated	Regional road	Sealed	30
Gunning Street	No – Estimated	Regional road	Sealed	30
Gurrundah Road	No – Estimated	Local road	Sealed	30
Hanworth Road	No – Estimated	Local road	Sealed	20
Harley Road	No – Estimated	Local road	Unsealed	20
Hawthornes Tree Road	No – Estimated	Local road	Sealed	20
Hillcrest Road	No – Estimated	Local road	Unsealed	10
Hillgrove Road	No – Estimated	Local road	Unsealed	10
Howards Road	No – Estimated	Local road	Unsealed	10
Hume Highway (south of Gunning)	No – Estimated	State road	Sealed	300
Hume Street	No – Estimated	Regional road	Sealed	50
Jerrawa Road	No – Estimated	Local road	Sealed	20
Kerrawarry Creek Trail	No – Estimated	Local road	Unsealed	10
Kialla Road	No – Estimated	Local road	Sealed	20
Lade Vale Road	No – Estimated	Local road	Unsealed	20
Laggan Road	Yes – TfNSW Traffic Counter, Station ID – 94488	Regional road	Sealed	40
Laggan-Taralga Road	No – Estimated	Regional road	Unsealed	50
Loop Road	No – Estimated	Local road	Unsealed	20
Lower Greendale Road	No – Estimated	Local road	Unsealed	10
Menzies Lane	No – Estimated	Local road	Unsealed	10
Middle Arm Road	No – Estimated	Local road	Sealed	50
Mount Rae Road	No – Estimated	Local road	Unsealed	20
Northcott Street	No – Estimated	Regional road	Sealed	30
Offleys Lane	No – Estimated	Local road	Unsealed	10
Orchard Street	No – Estimated	Regional road	Sealed	50
Parsons Lane	No – Estimated	Local road	Sealed	20
Pejar Road	No – Estimated	Local road	Unsealed	10
Prices Lane	No – Estimated	Local road	Unsealed	10
Range Road	No – Estimated	Local road	Sealed	50
Rhyanna Road	No – Estimated	Local road	Unsealed	20
Robertson Lane	No – Estimated	Local road	Sealed	30
Roslyn Road	No – Estimated	Local road	Sealed	20
Rugby Road	No – Estimated	Local road	Sealed	20
Rye Park Road	No – Estimated	Regional road	Sealed	30
Saleyards Road	No – Estimated	Local road	Sealed	50

Road name and location	Traffic count availability	NSW Road Network Classification	Pavement type	Estimated peak hour volume (vehicles per hour per direction)
Sapphire Road	No – Estimated	Local road	Sealed	20
Sheldricks Lane	No – Estimated	Local road	Unsealed	10
Soldiers Settlement Road South	No – Estimated	Local road	Unsealed	10
Spicers Lane	No – Estimated	Local road	Unsealed	20
Spring Street	No – Estimated	Local road	Sealed	50
Stink Pot Road	No – Estimated	Local road	Unsealed	10
Storriers Lane	No – Estimated	Local road	Unsealed	10
Strathaird Lane	No – Estimated	Local road	Sealed	20
Taralga Road	No – Estimated	Regional road	Sealed	50
Tarlo Number 1 Trail	No – Estimated	Local road	Unsealed	10
Third Creek Road	No – Estimated	Local road	Unsealed	20
Veterans Road	No – Estimated	Local road	Sealed	10
Walkoms Lane	No – Estimated	Local road	Unsealed	10
Walsh Street	No – Estimated	Local road	Sealed	30
Walshs Road	No – Estimated	Local road	Unsealed	10
Warrataw Street	No – Estimated	Regional road	Sealed	30
Wheeo Road	No – Estimated	Local road	Sealed	30
Willis Street	Yes – TfNSW Traffic Counter, Station ID – 94290	Regional road	Sealed	30
Woodhouselee Road	No – Estimated	Local road	Sealed	30
Yass Street	No – Estimated	Regional road	Sealed	50
Goulburn-Mulwaree LGA				
Clinton Street	No – Estimated	Local road	Sealed	150
Cowper Street	No – Estimated	State road	Sealed	300
Crookwell Road (north of Sooley Creek)	Yes – TfNSW Traffic Counter, Station ID – 94390	State road	Sealed	120
Fitzroy Street	No – Estimated	State road	Sealed	150
Goldsmith Street	No – Estimated	State road	Sealed	150
Gurrundah Road	No – Estimated	Local road	Sealed	40
Hume Highway(west of Federal Highway)	Yes – TfNSW Traffic Counter, Station ID – 94047	State road	Sealed	280
Hume Street	Yes – TfNSW Traffic Counter, Station ID – 94130	State road	Sealed	340
Marble Hill Road	No – Estimated	Local road	Sealed	20
Middle Arm Road	No – Estimated	Local road	Sealed	100
Norwood Road	No – Estimated	Local road	Sealed	20
Range Road	No – Estimated	Local road	Sealed	50
Wheeo Road	No – Estimated	Local road	Sealed	50

Attachment D

Existing road network performance

Road name and LGA	Hierarchy	Existing peak hourly per direction Vph	No of Lanes	Design Capacity per Lane	Flow/ Capacity	LoS
Wagga Wagga City LGA						
Abbots Lane	Local	20	1	900	0.02	LoS A
Angels Lane	Local	20	1	900	0.02	LoS A
Ashfords Road	Local	30	1	900	0.03	LoS A
Big Springs Road	Collector	50	1	1000	0.05	LoS A
Burkinshaws Lane	Local	10	1	900	0.01	LoS A
Byes Lane	Local	10	1	900	0.01	LoS A
Centenary Avenue	Collector	100	1	1000	0.1	LoS A
Comatawa Road	Local	20	1	900	0.02	LoS A
Coreinbob Road	Local	20	1	900	0.02	LoS A
Coreinbob Siding Road	Collector	30	1	1000	0.03	LoS A
Gregadoo East Road	Collector	100	1	1000	0.1	LoS A
Gregadoo-Ladysmith Road	Collector	50	1	1000	0.05	LoS A
Hammond Avenue	Arterial	910	2	2800	0.33	LoS B
Hume Highway (between Humula Road and Comatawa Road)	Highway	140	2	3600	0.04	LoS A
Humula Link Road	Collector	50	1	1000	0.05	LoS A
Humula Road	Collector	50	1	1000	0.05	LoS A
Ivydale Road	Local	20	1	900	0.02	LoS A
Keajura Road	Collector	50	1	1000	0.05	LoS A
Kooringal Road	Collector	100	1	1000	0.1	LoS A
Kyeamba Avenue	Local	50	1	900	0.06	LoS A
Kyeamba Street	Collector	50	1	1000	0.05	LoS A
Livingstone Gully Road	Local	20	1	900	0.02	LoS A
Mates Gully Road	Collector	50	1	1000	0.05	LoS A
Mitchell Road	Local	100	1	900	0.11	LoS A
Oberne-Umbango Road	Collector	20	1	1000	0.02	LoS A
Stewarts Road	Local	10	1	900	0.01	LoS A
Sturt Highway (east of Tumbarumba Road)	Highway	160	1	1800	0.09	LoS A
Sturt Highway (east of RAAF BASE Wagga Wagga)	Highway	210	1	1800	0.12	LoS A
Sturt Highway(west of Elizabeth Avenue)	Highway	390	1	1800	0.22	LoS A
Sydney Street	Collector	100	1	1000	0.1	LoS A
Trewalla Road	Local	10	1	900	0.01	LoS A
Tumbarumba Road	Collector	50	1	1000	0.05	LoS A
Tywong Street	Local	20	1	900	0.02	LoS A
Vincent Road	Local	50	1	900	0.06	LoS A

Road name and LGA	Hierarchy	Existing peak hourly per direction Vph	No of Lanes	Design Capacity per Lane	Flow/ Capacity	LoS
Westbrook Road	Collector	50	1	1000	0.05	LoS A
Snowy Valleys LGA						
Adelong Road	Arterial	280	1	1400	0.2	LoS A
Albury Street	Arterial	100	1	1400	0.07	LoS A
Alfred Street	Local	20	1	900	0.02	LoS A
Ash Creek Road	Local	20	1	900	0.02	LoS A
Back Creek Road	Local	20	1	900	0.02	LoS A
Back Kunama Road	Collector	30	1	1000	0.03	LoS A
Back Nacki Creek Road	Local	20	1	900	0.02	LoS A
Back Sandy Gully Road	Local	20	1	900	0.02	LoS A
Bago Creek Road	Local	20	1	900	0.02	LoS A
Bago Forest Way	Local	20	1	900	0.02	LoS A
Barneys Highway	Local	10	1	900	0.01	LoS A
Bartoman Street	Collector	50	1	1000	0.05	LoS A
Batlow Road (between Snowy Mountains Highway and East Gilmore Road)	Highway	70	1	1800	0.04	LoS A
Batlow Road (south of Herrings Road)	Highway	50	1	1800	0.03	LoS A
BB Feeder Road	Local	20	1	900	0.02	LoS A
Black Boot Road	Local	20	1	900	0.02	LoS A
Bogong Street	Local	20	2	1800	0.01	LoS A
Booths Road	Local	20	1	900	0.02	LoS A
Browns Forest Road	Local	20	1	900	0.02	LoS A
Browns Road	Local	10	1	900	0.01	LoS A
Brungle Creek Link Road	Local	10	1	900	0.01	LoS A
Brungle Creek Road	Collector	30	1	1000	0.03	LoS A
Brungle Road	Collector	50	1	1000	0.05	LoS A
Buddong Road	Local	10	1	900	0.01	LoS A
Bullongra Road	Local	20	1	900	0.02	LoS A
Central Logging Road	Local	20	1	900	0.02	LoS A
Cockatoo Road	Local	10	1	900	0.01	LoS A
Courabyra Road	Collector	50	1	1000	0.05	LoS A
Dog Tree Road	Local	10	1	900	0.01	LoS A
Dunns Road	Local	20	1	900	0.02	LoS A
East Bago Powerline Road	Local	10	1	900	0.01	LoS A
East Gilmore Road	Local	20	1	900	0.02	LoS A
Ellerslie Road	Local	20	1	900	0.02	LoS A
Ellerslie Woolshed Road	Local	20	1	900	0.02	LoS A
Elliott Way	Arterial	50	1	1400	0.04	LoS A
Fitzroy Street	Arterial	200	1	1400	0.14	LoS A
Forest Road	Collector	50	1	1000	0.05	LoS A
Forsters Road	Local	20	1	900	0.02	LoS A

Road name and LGA	Hierarchy	Existing peak hourly per direction Vph	No of Lanes	Design Capacity per Lane	Flow/ Capacity	LoS
Gadara Lane	Local	20	1	900	0.02	LoS A
Gadara Road	Local	20	1	900	0.02	LoS A
Gocup Road (west of Tumut)	Highway	70	1	1800	0.04	LoS A
Grahamstown Road	Arterial	30	1	1400	0.02	LoS A
Green Hills Access Road	Local	20	1	900	0.02	LoS A
Green Hills Forest Way	Local	20	1	900	0.02	LoS A
Greenhills Road	Collector	50	1	1000	0.05	LoS A
Herrings Road	Local	10	1	900	0.01	LoS A
Honeysuckle Road	Local	10	1	900	0.01	LoS A
Hugel Trail	Local	10	1	900	0.01	LoS A
Hurdle Creek Trail	Local	10	1	900	0.01	LoS A
Hydes Old Road	Local	10	1	900	0.01	LoS A
Inglis Street	Arterial	100	1	1400	0.07	LoS A
Keenans Road	Local	10	1	900	0.01	LoS A
Kileys Creek Road	Local	10	1	900	0.01	LoS A
Kileys Road	Local	10	1	900	0.01	LoS A
Kopsens Road	Local	20	1	900	0.02	LoS A
Kunama Road	Local	20	1	900	0.02	LoS A
Kurrajong Avenue	Local	20	1	900	0.02	LoS A
Lower Bago Road	Collector	50	1	1000	0.05	LoS A
Mate Street	Local	20	1	900	0.02	LoS A
Meadow Creek Road	Local	20	1	900	0.02	LoS A
Memorial Avenue	Local	30	1	900	0.03	LoS A
Mill Road	Local	30	1	900	0.03	LoS A
Millers Road	Local	10	1	900	0.01	LoS A
Minjary Street	Arterial	50	1	1400	0.04	LoS A
Monterey Road	Local	20	1	900	0.02	LoS A
Mount Hugel Road	Local	10	1	900	0.01	LoS A
Mount Pleasant Creek Trail	Local	10	1	900	0.01	LoS A
Murrays Road	Local	10	1	900	0.01	LoS A
Nellis Street	Local	50	1	900	0.06	LoS A
New Maragle Road	Local	10	1	900	0.01	LoS A
Northern Boundary Road	Local	20	1	900	0.02	LoS A
Nursery Access Road	Local	20	1	900	0.02	LoS A
Oberne Ellerslie Trail	Local	10	1	900	0.01	LoS A
Old Tumbarumba Road	Collector	30	1	1000	0.03	LoS A
Old Western Boundary Road	Local	20	1	900	0.02	LoS A
One Tree Hill Trail	Local	10	1	900	0.01	LoS A
Palmer Street	Local	20	1	900	0.02	LoS A
Park Avenue	Local	20	1	900	0.02	LoS A
Perkins Road	Local	20	1	900	0.02	LoS A
Pierces Boundary Road	Local	20	1	900	0.02	LoS A

Road name and LGA	Hierarchy	Existing peak hourly per direction Vph	No of Lanes	Design Capacity per Lane	Flow/ Capacity	LoS
Pioneer Street	Local	30	1	900	0.03	LoS A
Pound Creek Road	Local	20	1	900	0.02	LoS A
Pound Creek Upper Road	Local	10	1	900	0.01	LoS A
Powerline Road	Local	10	1	900	0.01	LoS A
Powerline Trail	Local	10	1	900	0.01	LoS A
Prickle Road	Local	10	1	900	0.01	LoS A
Quartz Street	Collector	30	1	1000	0.03	LoS A
Red Hill Road	Local	20	1	900	0.02	LoS A
Reedy Street	Arterial	100	1	1400	0.07	LoS A
Right Arm Creek Road	Local	20	1	900	0.02	LoS A
Roches Road	Local	10	1	900	0.01	LoS A
Rocky Gully Road	Local	10	1	900	0.01	LoS A
Running Waters Road	Local	10	1	900	0.01	LoS A
Selwyn Street (Adelong)	Arterial	20	1	1400	0.01	LoS A
Selwyn Street (Batlow)	Local	30	1	900	0.03	LoS A
Sharpes Creek Feeder Road	Local	20	1	900	0.02	LoS A
Sharps Creek Road	Local	20	1	900	0.02	LoS A
Sharps Road	Local	10	1	900	0.01	LoS A
Shedleys Road	Local	10	1	900	0.01	LoS A
Sixty Five Feeder Road	Local	10	1	900	0.01	LoS A
Snowy Mountains Highway (west of Batlow Road)	Highway	130	1	1800	0.07	LoS A
Snubba Road	Local	20	1	900	0.02	LoS A
Spyglass Trail	Local	10	1	900	0.01	LoS A
Stewarts Road	Local	10	1	900	0.01	LoS A
Stockmans Creek Road	Local	10	1	900	0.01	LoS A
Stud Horse Feeder Road	Local	20	1	900	0.02	LoS A
Sturgess Trail	Local	10	1	900	0.01	LoS A
Taradale Road	Collector	50	1	1000	0.05	LoS A
Tooma Road	Arterial	70	1	1400	0.05	LoS A
Townsend Street	Local	10	1	900	0.01	LoS A
Tumut Street	Arterial	130	1	1400	0.09	LoS A
Travers Street	Local	20	1	900	0.02	LoS A
Webbs Road	Local	20	1	900	0.02	LoS A
Wee Jasper Road (north of Tumut)	Arterial	70	1	1400	0.05	LoS A
West Branch Feeder	Local	20	1	900	0.02	LoS A
West Gilmore Road	Local	20	1	900	0.02	LoS A
Westbrook Road	Collector	30	1	1000	0.03	LoS A
Westwood Road	Local	20	1	900	0.02	LoS A
Wilsons Road	Local	20	1	900	0.02	LoS A
Wiltys Road	Local	20	1	900	0.02	LoS A
Wondalga Road	Arterial	30	1	1400	0.02	LoS A

Road name and LGA	Hierarchy	Existing peak hourly per direction Vph	No of Lanes	Design Capacity per Lane	Flow/ Capacity	LoS
Yarrawonga Road	Local	10	1	900	0.01	LoS A
Yaven Creek Road	Collector	30	1	1000	0.03	LoS A
Yellowin Access Road	Local	20	1	900	0.02	LoS A
Yellowin Road	Local	20	1	900	0.02	LoS A
Cootamundra-Gundagai Regional LGA						
Adelong Road	Arterial	20	1	1400	0.01	LoS A
Adjungbilly Road	Collector	20	1	1000	0.02	LoS A
Brungle Creek Link Road	Local	20	1	900	0.02	LoS A
Brungle Road	Collector	50	1	1000	0.05	LoS A
Bundarbo Road	Local	20	1	900	0.02	LoS A
Eagle Street	Arterial	70	1	1400	0.05	LoS A
Edwardstown Road	Collector	20	1	1000	0.02	LoS A
Fernhill Road	Local	10	1	900	0.01	LoS A
Fullers Lane	Collector	10	1	1000	0.01	LoS A
Gobarralong Road	Collector	30	1	1000	0.03	LoS A
Gocup Road (south of South Gundagai)	Highway	60	1	1800	0.03	LoS A
Hume Highway (north of Coolac)	Highway	360	2	3600	0.1	LoS A
Hume Highway (east of Snowy Mountains Highway)	Highway	230	2	3600	0.06	LoS A
Hume Highway (west of South Gundagai)	Highway	230	2	3600	0.06	LoS A
Honeysuckle Road	Local	20	1	900	0.02	LoS A
Hopewood Road	Local	20	1	900	0.02	LoS A
Maryvale Road	Local	10	1	900	0.01	LoS A
Middle Street	Local	50	1	900	0.06	LoS A
Middleton Drive	Collector	50	1	1000	0.05	LoS A
Nanangroe Road	Collector	30	1	1000	0.03	LoS A
Parsons Creek Road	Local	20	1	900	0.02	LoS A
Red Hill Road	Local	20	1	900	0.02	LoS A
Red Strip Road	Local	10	1	900	0.01	LoS A
Rileys Flat Road	Local	50	1	900	0.06	LoS A
Sawmill Creek Road	Local	10	1	900	0.01	LoS A
Sheridan Street	Local	70	1	900	0.08	LoS A
Snowball Road	Collector	20	1	1000	0.02	LoS A
Snowy Mountains Highway (east of Hume Highway)	Local	60	1	900	0.07	LoS A
Stockdale Road	Local	10	1	900	0.01	LoS A
Tumblong Road	Collector	20	1	1000	0.02	LoS A
West Street	Arterial	50	1	1400	0.04	LoS A
Yass Valley LGA						
Black Range Road	Local	30	1	900	0.03	LoS A
Burrinjuck Road	Arterial	30	1	1400	0.02	LoS A

Road name and LGA	Hierarchy	Existing peak hourly per direction Vph	No of Lanes	Design Capacity per Lane	Flow/ Capacity	LoS
Barton Highway	Highway	400	2	3600	0.11	LoS A
Chilowla Road	Local	20	1	900	0.02	LoS A
Comur Street	Arterial	350	1	1400	0.25	LoS A
Cooks Hill Road	Local	30	1	900	0.03	LoS A
Elms Road	Local	20	1	900	0.02	LoS A
Fagan Drive	Local	20	1	900	0.02	LoS A
Fairy Hole Road	Local	20	1	900	0.02	LoS A
Grand Junction Road	Local	100	1	900	0.11	LoS A
Greenwood Road	Local	20	1	900	0.02	LoS A
Hardwicke Lane	Local	30	1	900	0.03	LoS A
Hillview Drive	Local	20	1	900	0.02	LoS A
Hovell Street	Local	50	1	900	0.06	LoS A
Hume Highway (between Yass Valley Way and Lachlan Valley Way)	Highway	550	2	3600	0.15	LoS A
Hume Highway (between Burley Griffin Way and Burrinjuck Road)	Highway	340	2	3600	0.09	LoS A
Hume Highway (between Yass Valley Way and Barton Highway)	Highway	290	2	3600	0.08	LoS A
Hume Street	Local	50	1	900	0.06	LoS A
Laidlaw Street	Arterial	350	1	1400	0.25	LoS A
Lucernvale Road	Local	20	1	900	0.02	LoS A
Mcintosh Lane	Local	10	1	900	0.01	LoS A
Orion Street	Local	50	1	900	0.06	LoS A
Perry Street	Local	30	1	900	0.03	LoS A
Pollux Street	Local	50	1	900	0.06	LoS A
Talmo Road	Local	20	1	900	0.02	LoS A
Turtons Road	Local	10	1	900	0.01	LoS A
Wargeila Road	Collector	30	1	1000	0.03	LoS A
Warroo Road	Local	100	1	900	0.11	LoS A
Yass Valley Way (west of Barton Highway)	Arterial	320	1	1400	0.23	LoS A
Upper Lachlan Shire LGA						
Adavale Road	Local	10	1	900	0.01	LoS A
Alton Hill Road	Local	10	1	900	0.01	LoS A
Back Arm Road	Local	20	1	900	0.02	LoS A
Bannaby Road	Local	20	1	900	0.02	LoS A
Bannister Lane	Local	10	1	900	0.01	LoS A
Binda Road	Arterial	50	1	1400	0.04	LoS A
Blakney Creek South Road	Local	10	1	900	0.01	LoS A
Boorowa Road	Arterial	40	1	1400	0.03	LoS A
Brooklands Street	Arterial	30	1	1400	0.02	LoS A
Bulleys Crossing	Local	20	1	900	0.02	LoS A

Road name and LGA	Hierarchy	Existing peak hourly per direction Vph	No of Lanes	Design Capacity per Lane	Flow/ Capacity	LoS
Bunnaby Street	Collector	20	1	1000	0.02	LoS A
Butcher Road	Local	10	1	900	0.01	LoS A
Carnells Lane	Local	10	1	900	0.01	LoS A
Carrabungla Road	Local	10	1	900	0.01	LoS A
Carrington Street	Arterial	50	1	1400	0.04	LoS A
Chapel Street	Local	20	1	900	0.02	LoS A
Clancys Road	Local	10	1	900	0.01	LoS A
Collector Road	Arterial	30	1	1400	0.02	LoS A
Colyer Street	Local	50	1	900	0.06	LoS A
Coolalie Road	Local	20	1	900	0.02	LoS A
Crookwell Road	Highway	100	1	1800	0.06	LoS A
Cullerin Road	Arterial	30	1	1400	0.02	LoS A
Dalton Road (south of Dalton)	Arterial	20	1	1400	0.01	LoS A
Dalton Road (west of Gunning)	Arterial	20	1	1400	0.01	LoS A
Dawes Road	Local	10	1	900	0.01	LoS A
Dawsons Creek Road	Local	10	1	900	0.01	LoS A
Dowlings Road	Local	10	1	900	0.01	LoS A
Elms Road	Local	20	1	900	0.02	LoS A
Felled Timber Road	Local	10	1	900	0.01	LoS A
Flacknell Creek Road	Local	10	1	900	0.01	LoS A
Gorham Road	Local	10	1	900	0.01	LoS A
Goulburn Road	Highway	100	1	1800	0.06	LoS A
Goulburn Street	Arterial	90	1	1400	0.06	LoS A
Grabben Gullen Road (north of Cullerin Road)	Arterial	20	1	1400	0.01	LoS A
Greendale Road	Local	10	1	900	0.01	LoS A
Gundaroo Street	Arterial	30	1	1400	0.02	LoS A
Gunning Street	Arterial	30	1	1400	0.02	LoS A
Gurrundah Road	Local	30	1	900	0.03	LoS A
Hanworth Road	Local	20	1	900	0.02	LoS A
Harley Road	Local	20	1	900	0.02	LoS A
Hawthornes Tree Road	Local	20	1	900	0.02	LoS A
Hillcrest Road	Local	10	1	900	0.01	LoS A
Hillgrove Road	Local	10	1	900	0.01	LoS A
Howards Road	Local	10	1	900	0.01	LoS A
Hume Highway (south of Gunning)	Highway	300	1	1800	0.17	LoS A
Hume Street	Local	50	1	900	0.06	LoS A
Jerrawa Road	Local	20	1	900	0.02	LoS A
Kerrawarry Creek Trail	Local	10	1	900	0.01	LoS A
Kialla Road	Local	20	1	900	0.02	LoS A
Lade Vale Road	Local	20	1	900	0.02	LoS A
Laggan Road	Arterial	40	1	1400	0.03	LoS A

Road name and LGA	Hierarchy	Existing peak hourly per direction Vph	No of Lanes	Design Capacity per Lane	Flow/ Capacity	LoS
Laggan-Taralga Road	Arterial	50	1	1400	0.04	LoS A
Loop Road	Local	20	1	900	0.02	LoS A
Lower Greendale Road	Local	10	1	900	0.01	LoS A
Menzies Lane	Local	10	1	900	0.01	LoS A
Middle Arm Road	Collector	50	1	1000	0.05	LoS A
Mount Rae Road	Local	20	1	900	0.02	LoS A
Northcott Street	Arterial	30	1	1400	0.02	LoS A
Offleys Lane	Local	10	1	900	0.01	LoS A
Orchard Street	Arterial	50	1	1400	0.04	LoS A
Parsons Lane	Local	20	1	900	0.02	LoS A
Pejar Road	Local	10	1	900	0.01	LoS A
Prices Lane	Local	10	1	900	0.01	LoS A
Range Road	Collector	50	1	1000	0.05	LoS A
Rhyanna Road	Local	20	1	900	0.02	LoS A
Robertson Lane	Local	30	1	900	0.03	LoS A
Roslyn Road	Local	20	1	900	0.02	LoS A
Rugby Road	Local	20	1	900	0.02	LoS A
Rye Park Road	Arterial	30	1	1400	0.02	LoS A
Saleyards Road	Local	50	1	900	0.06	LoS A
Sapphire Road	Collector	20	1	1000	0.02	LoS A
Sheldricks Lane	Local	10	1	900	0.01	LoS A
Soldiers Settlement Road South	Local	10	1	900	0.01	LoS A
Spicers Lane	Local	20	1	900	0.02	LoS A
Spring Street	Local	50	1	900	0.06	LoS A
Stink Pot Road	Local	10	1	900	0.01	LoS A
Storriers Lane	Local	10	1	900	0.01	LoS A
Strathaird Lane	Local	20	1	900	0.02	LoS A
Taralga Road	Arterial	50	1	1400	0.04	LoS A
Tarlo Number 1 Trail	Local	10	1	900	0.01	LoS A
Third Creek Road	Local	20	1	900	0.02	LoS A
Veterans Road	Local	10	1	900	0.01	LoS A
Walkoms Lane	Local	10	1	900	0.01	LoS A
Walsh Street	Collector	30	1	1000	0.03	LoS A
Walshs Road	Local	10	1	900	0.01	LoS A
Warrataw Street	Arterial	30	1	1400	0.02	LoS A
Wheeo Road	Collector	30	1	1000	0.03	LoS A
Willis Street	Arterial	30	1	1400	0.02	LoS A
Woodhouselee Road	Collector	30	1	1000	0.03	LoS A
Yass Street	Arterial	50	1	1400	0.04	LoS A
Goulburn-Mulwaree LGA						
Clinton Street	Local	150	1	900	0.17	LoS A
Cowper Street	Arterial	300	1	1400	0.21	LoS A

Road name and LGA	Hierarchy	Existing peak hourly per direction Vph	No of Lanes	Design Capacity per Lane	Flow/ Capacity	LoS
Crookwell Road (north of Sooley Creek)	Arterial	120	1	1400	0.09	LoS A
Fitzroy Street	Arterial	150	1	1400	0.11	LoS A
Goldsmith Street	Arterial	150	1	1400	0.11	LoS A
Gurrundah Road	Collector	40	1	1000	0.04	LoS A
Hume Highway (west of Federal Highway)	Highway	280	2	3600	0.08	LoS A
Hume Street	Arterial	340	2	2800	0.12	LoS A
Marble Hill Road	Local	20	1	900	0.02	LoS A
Middle Arm Road	Collector	100	1	1000	0.1	LoS A
Norwood Road	Local	20	1	900	0.02	LoS A
Range Road	Collector	50	1	1000	0.05	LoS A
Wheeo Road	Collector	50	1	1000	0.05	LoS A

Attachment E

Heavy vehicle road network restriction

Road name	Functional hierarchy	Restricted Access vehicle: 25/26 m B-double approved	Road train: Type 1 A- double approved	OSOM including 4.6 m Vehicles approved
Wagga Wagga City LGA				
Abbots Lane	Local road	No	No	No
Angels Lane	Local road	No	No	No
Ashfords Road	Local road	No	No	No
Big Springs Road	Local road	No	No	No
Burkinshaws Lane	Local road	No	No	No
Byes Lane	Local road	No	No	No
Centenary Avenue	Local road	No	No	No
Comatawa Road	Local road	No	No	No
Coreinbob Road	Local road	No	No	No
Coreinbob Siding Road	Local road	No	No	No
Gregadoo East Road	Local road	No	No	No
Gregadoo-Ladysmith Road	Local road	No	No	No
Hammond Avenue	State road	Yes	No	Yes
Hume Highway (between Humula Road and Comatawa Road)	National road	Yes	No	Yes
Humula Link Road	Local road	Yes	No	Yes
Humula Road	Local road	No	No	No
Ivydale Road	Local road	No	No	No
Keajura Road	Local road	No	No	No
Kooringal Road	Local road	Travel only permitted in the event of a declared emergency	No	No
Kyeamba Avenue	Local road	Yes	No	No
Kyeamba Street	Local road	Yes	No	Yes
Livingstone Gully Road	Local road	Yes	No	Yes
Mates Gully Road	Local road	No	No	No
Mitchell Road	Local road	Yes	No	No
Oberne-Umbango Road	Local road	No	No	No
Stewarts Road	Local road	No	No	No
Sturt Highway (east of Tumbarumba Road)	State road	Yes	No	Yes
Sturt Highway (east of RAAF BASE Wagga Wagga)	State road	Yes	No	Yes
Sturt Highway(west of Elizabeth Avenue)	State road	Yes	No	Yes
Sydney Street	Local road	Yes	No	Yes
Trewalla Road	Local road	No	No	No
Tumbarumba Road	Regional road	Yes	No	Yes

Road name	Functional hierarchy	Restricted Access vehicle: 25/26 m B-double approved	Road train: Type 1 A- double approved	OSOM including 4.6 m Vehicles approved
Tywong Street	Local road	No	No	No
Vincent Road	Local road	No	No	No
Westbrook Road	Local road	No	No	No
Snowy Valleys LGA				
Adelong Road	State road	Yes	No	Yes
Albury Street	State road	Yes	No	Yes
Alfred Street	Local road	No	No	No
Ash Creek Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Back Creek Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Back Kunama Road	Local road	No	No	No
Back Nacki Creek Road	Local road	No	No	No
Back Sandy Gully Road	Local road	No	No	No
Bago Creek Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Bago Forest Way	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Barneys Highway	Local road	No	No	No
Bartoman Street	Local road	No	No	No
Batlow Road (between Snowy Mountains Highway and East Gilmore Road)	State road	Yes	No	Yes
Batlow Road (south of Herrings Road)	State road	Yes	No	Yes
BB Feeder Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Black Boot Road	Local road	No	No	No
Bogong Street	Local road	No	No	No
Booths Road	Local road	No	No	No
Browns Forest Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Browns Road	Local road	No	No	No
Brungle Creek Link Road	Local road	No	No	No

Road name	Functional hierarchy	Restricted Access vehicle: 25/26 m B-double approved	Road train: Type 1 A- double approved	OSOM including 4.6 m Vehicles approved
Brungle Creek Road	Local road	No	No	No
Brungle Road	Local road	No	No	No
Buddong Road	Local road	No	No	No
Bullongra Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Central Logging Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Cockatoo Road	Local road	No	No	No
Courabyra Road	Local road	No	No	No
Dog Tree Road	Local road	No	No	No
Dunns Road	Local road	No	No	No
East Bago Powerline Road	Local road	No	No	No
East Gilmore Road	Local road	No	No	No
Ellerslie Road	Local road	No	No	No
Ellerslie Woolshed Road	Local road	No	No	No
Elliott Way	Regional road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Fitzroy Street	State road	Yes	No	Yes
Forest Road	Local road	No	No	No
Forsters Road	Local road	No	No	No
Gadara Lane	Local road	No	No	No
Gadara Road	Local road	No	No	No
Gocup Road (west of Tumut)	State road	Yes	No	Yes
Grahamstown Road	Local road	No	No	Yes
Green Hills Access Road	Local road	yes	No	No
Green Hills Forest Way	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Greenhills Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Herrings Road	Local road	No	No	No
Honeysuckle Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Hugel Trail	Local road	No	No	No

Road name	Functional hierarchy	Restricted Access vehicle: 25/26 m B-double approved	Road train: Type 1 A- double approved	OSOM including 4.6 m Vehicles approved
Hurdle Creek Trail	Local road	No	No	No
Hydes Old Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Inglis Street	State road	yes	No	yes
Keenans Road	Local road	No	No	No
Kileys Creek Road	Local road	No	No	No
Kileys Road	Local road	No	No	No
Kopsens Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Kunama Road	Local road	No	No	No
Kurrajong Avenue	Local road	Yes	No	No
Lower Bago Road	Local road	No	No	No
Mate Street	Local road	No	No	No
Meadow Creek Road	Local road	No	No	No
Memorial Avenue	Local road	No	No	No
Mill Road	Local road	Yes	No	Yes
Millers Road	Local road	No	No	No
Minjary Street	State road	Yes	No	Yes
Monterey Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Mount Hugel Road	Local road	No	No	No
Mount Pleasant Creek Trail	Local road	No	No	No
Murrays Road	Local road	No	No	No
Nellis Street	Local road	No	No	No
New Maragle Road	Local road	No	No	No
Northern Boundary Road	Local road	No	No	No
Nursery Access Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Oberne Ellerslie Trail	Local road	No	No	No
Old Tumbarumba Road	Local road	No	No	No
Old Western Boundary Road	Local road	No	No	No
One Tree Hill Trail	Local road	No	No	No
Palmer Street	Local road	No	No	No
Park Avenue	Local road	No	No	No
Perkins Road	Local road	No	No	No

Road name	Functional hierarchy	Restricted Access vehicle: 25/26 m B-double approved	Road train: Type 1 A- double approved	OSOM including 4.6 m Vehicles approved
Pierces Boundary Road	Local road	No	No	No
Pioneer Street	Local road	No	No	No
Pound Creek Road	Local road	Yes	No	No
Pound Creek Upper Road	Local road	Yes	No	No
Powerline Road	Local road	No	No	No
Powerline Trail	Local road	No	No	No
Prickle Road	Local road	No	No	No
Quartz Street	Local road	Yes	No	Yes
Red Hill Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Reedy Street	State road	No	No	Yes
Right Arm Creek Road	Local road	No	No	No
Roches Road	Local road	No	No	No
Rocky Gully Road	Local road	No	No	No
Running Waters Road	Local road	No	No	No
Selwyn Street (Adelong)	Regional road	No	No	yes
Selwyn Street (Batlow)	Local road	No	No	No
Sharpes Creek Feeder Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Sharps Creek Road	Local road	No	No	No
Sharps Road	Local road	No	No	No
Shedleys Road	Local road	No	No	No
Sixty Five Feeder Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Snowy Mountains Highway (west of Batlow Road)	State road	Yes	No	Yes
Snubba Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Spyglass Trail	Local road	No	No	No
Stewarts Road	Local road	No	No	No
Stockmans Creek Road	Local road	No	No	No
Stud Horse Feeder Road	Local road	No	No	No
Sturgess Trail	Local road	No	No	No
Taradale Road	Local road	No	No	No
Tooma Road	Regional road	Yes	No	Yes
Townsend Street	Local road	No	No	No

Road name	Functional hierarchy	Restricted Access vehicle: 25/26 m B-double approved	Road train: Type 1 A- double approved	OSOM including 4.6 m Vehicles approved
Tumut Street	State road	Yes	No	Yes
Travers Street	Local road	No	No	No
Webbs Road	Local road	No	No	No
Wee Jasper Road (north of Tumut)	Regional road	No	No	No
West Branch Feeder	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
West Gilmore Road	Local road	No	No	No
Westbrook Road	Local road	No	No	No
Westwood Road	Local road	No	No	No
Wilsons Road	Local road	No	No	No
Wiltys Road	Local road	No	No	No
Wondalga Road	Regional road	No	No	Yes
Yarrawonga Road	Local road	No	No	No
Yaven Creek Road	Local road	No	No	No
Yellowin Access Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Yellowin Road	Local road	No	No	No
Cootamundra-Gundagai Regional LGA				
Adelong Road	Local road	No	No	Yes
Adjungbilly Road	Local road	Yes	No	Yes
Brungle Creek Link Road	Local road	No	No	No
Brungle Road	Local road	No	No	Yes
Bundarbo Road	Local road	No	No	Yes
Eagle Street	State road	No	No	No
Edwardstown Road	Local road	No	No	Yes
Fernhill Road	Local road	No	No	Yes
Fullers Lane	Local road	No	No	Yes
Gobarralong Road	Local road	Yes	No	Yes
Gocup Road (south of South Gundagai)	State road	Yes	No	Yes
Hume Highway (north of Coolac)	National road	Yes	No	Yes
Hume Highway (east of Snowy Mountains Highway)	National road	Yes	No	Yes
Hume Highway (west of South Gundagai)	National road	Yes	No	yes
Honeysuckle Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No

Road name	Functional hierarchy	Restricted Access vehicle: 25/26 m B-double approved	Road train: Type 1 A- double approved	OSOM including 4.6 m Vehicles approved
Hopewood Road	Local road	No	No	yes
Maryvale Road	Local road	Yes	No	yes
Middle Street	Local road	No	No	No
Middleton Drive	Local road	No	No	No
Nanangroe Road	Local road	Yes	No	Yes
Parsons Creek Road	Local road	No	No	Yes
Red Hill Road	Local road	All drivers are required to hold a current Forest Operators License and follow Contractor Haulage Operations Plans.	No	No
Red Strip Road	Local road	No	No	No
Rileys Flat Road	Local road	No	No	No
Sawmill Creek Road	Local road	No	No	No
Sheridan Street	Local road	No	No	No
Snowball Road	Local road	No	No	Yes
Snowy Mountains Highway (East of Hume Highway)	State road	Yes	No	Yes
Stockdale Road	Local road	No	No	Yes
Tumblong Road	Local road	Yes	No	Yes
West Street	Regional road	Yes	No	Yes
Yass Valley LGA				
Black Range Road	Local road	No	No	No
Burrinjuck Road	Regional road	No	No	No
Barton Highway	State road	Yes	No	Yes
Childowla Road	Local road	No	No	No
Comur Street	Regional road	Yes Permanent gazettal for incident management under Traffic Control when a section of the Hume Highway is closed between HW15 Barton Highway and Yass Valley Way (Western Exit), Yass Service Centre, Yass.	No	No
Cooks Hill Road	Local road	No	No	No
Elms Road	Local road	No	No	No
Fagan Drive	Local road	No	No	No
Fairy Hole Road	Local road	No	No	No
Grand Junction Road	Local road	Yes	No	No
Greenwood Road	Local road	No	No	No
Hardwicke Lane	Local road	No	No	No
Hillview Drive	Local road	No	No	No
Hovell Street	Local road	No	No	No
Hume Highway (between Yass Valley Way and Lachlan Valley Way)	State road	Yes	No	Yes

Road name	Functional hierarchy	Restricted Access vehicle: 25/26 m B-double approved	Road train: Type 1 A- double approved	OSOM including 4.6 m Vehicles approved
Hume Highway (between Burley Griffin Way and Burrinjuck Road)	State road	Yes	No	Yes
Hume Highway (between Yass Valley Way and Barton Highway)	State road	Yes	No	Yes
Hume Street	Local road	No	No	No
Laidlaw Street	Regional road	Yes Permanent gazettal for incident management under Traffic Control when a section of the Hume Highway is closed between HW15 Barton Highway and Yass Valley Way (Western Exit), Yass Service Centre, Yass.	No	No
Lucernvale Road	Local road	No	No	No
Mcintosh Lane	Local road	No	No	No
Orion Street	Local road	No	No	No
Perry Street	Local road	No	No	No
Pollux Street	Local road	No	No	No
Talmo Road	Local road	No	No	No
Turtons Road	Local road	No	No	No
Wargeila Road	Local road	No	No	No
Warroo Road	Local road	No	No	No
Yass Valley Way (west of Barton Highway)	Regional road	Yes	No	Yes
Upper Lachlan Shire LGA				
Adavale Road	Local road	No	No	No
Alton Hill Road	Local road	No	No	No
Back Arm Road	Local road	No	No	No
Bannaby Road	Local road	No	No	No
Bannister Lane	Local road	No	No	No
Binda Road	Regional road	Yes	No	Yes
Blakney Creek South Road	Local road	No	No	No
Boorowa Road	Regional road	Yes	No	Yes
Brooklands Street	Regional road	Yes	No	Yes
Bulleys Crossing	Local road	No	No	No
Bunnaby Street	Regional road	No	No	No
Butcher Road	Local road	No	No	No
Carnells Lane	Local road	No	No	No
Carrabungla Road	Local road	No	No	No
Carrington Street	State road	Yes	No	Yes
Chapel Street	Local road	No	No	No
Clancys Road	Local road	No	No	No
Collector Road	Regional road	yes	No	No
Colyer Street	Local road	No	No	No

Road name	Functional hierarchy	Restricted Access vehicle: 25/26 m B-double approved	Road train: Type 1 A- double approved	OSOM including 4.6 m Vehicles approved
Coolalie Road	Local road	No	No	No
Crookwell Road	State road	Yes	No	Yes
Cullerin Road	Regional road	Yes	No	Yes
Dalton Road (south of Dalton)	Regional road	No	No	Yes
Dalton Road (west of Gunning)	Regional road	No	No	Yes
Dawes Road	Local road	No	No	No
Dawsons Creek Road	Local road	No	No	No
Dowlings Road	Local road	No	No	No
Elms Road	Local road	No	No	No
Felled Timber Road	Local road	No	No	No
Flacknell Creek Road	Local road	No	No	No
Gorham Road	Local road	No	No	No
Goulburn Road	State road	Yes	No	Yes
Goulburn Street	State road	Yes	No	Yes
Grabben Gullen Road (north of Cullerin Road)	Regional road	Yes	No	Yes
Greendale Road	Local road	No	No	No
Gundaroo Street	Regional road	Yes	No	No
Gunning Street	Regional road	No	No	Yes
Gurrundah Road	Local road	No	No	No
Hanworth Road	Local road	No	No	No
Harley Road	Local road	No	No	No
Hawthornes Tree Road	Local road	No	No	No
Hillcrest Road	Local road	No	No	No
Hillgrove Road	Local road	No	No	No
Howards Road	Local road	No	No	No
Hume Highway (south of Gunning)	State road	Yes	No	Yes
Hume Street	Regional road	Yes	No	Yes
Jerrawa Road	Local road	No	No	No
Kerrawarry Creek Trail	Local road	No	No	No
Kialla Road	Local road	No	No	No
Lade Vale Road	Local road	No	No	No
Laggan Road	Regional road	No	No	No
Laggan-Taralga Road	Regional road	No	No	No
Loop Road	Local road	No	No	No
Lower Greendale Road	Local road	No	No	No
Menzies Lane	Local road	No	No	No
Middle Arm Road	Local road	No	No	No
Mount Rae Road	Local road	No	No	No
Northcott Street	Regional road	Yes	No	Yes

Road name	Functional hierarchy	Restricted Access vehicle: 25/26 m B-double approved	Road train: Type 1 A- double approved	OSOM including 4.6 m Vehicles approved
Offleys Lane	Local road	No	No	No
Orchard Street	Regional road	No	No	No
Parsons Lane	Local road	No	No	No
Pejar Road	Local road	No	No	No
Prices Lane	Local road	No	No	No
Range Road	Local road	No	No	No
Rhyanna Road	Local road	No	No	No
Robertson Lane	Local road	No	No	No
Roslyn Road	Local road	No	No	No
Rugby Road	Local road	No	No	No
Rye Park Road	Regional road	No	No	Yes
Saleyards Road	Local road	No	No	No
Sapphire Road	Local road	No	No	No
Sheldricks Lane	Local road	No	No	No
Soldiers Settlement Road South	Local road	No	No	No
Spicers Lane	Local road	No	No	No
Spring Street	Local road	No	No	No
Stink Pot Road	Local road	No	No	No
Storriers Lane	Local road	No	No	No
Strathaird Lane	Local road	No	No	No
Taralga Road	Regional road	No	No	No
Tarlo Number 1 Trail	Local road	No	No	No
Third Creek Road	Local road	No	No	No
Veterans Road	Local road	No	No	No
Walkoms Lane	Local road	No	No	No
Walsh Street	Local road	No	No	No
Walshs Road	Local road	No	No	No
Warrataw Street	Regional road	No	No	Yes
Wheeo Road	Local road	No	No	No
Willis Street	Regional road	Yes	No	Yes
Woodhouselee Road	Local road	No	No	No
Yass Street	Regional road	Yes	No	Yes
Goulburn-Mulwaree LGA				
Clinton Street	Local road	Yes	No	Yes
Cowper Street	State road	Yes	No	Yes
Crookwell Road (north of Sooley Creek)	State road	Yes	No	Yes
Fitzroy Street	State road	Yes	No	Yes
Goldsmith Street	State road	No	No	No
Gurrundah Road	Local road	No	No	Yes
Hume Highway (west of Federal Highway)	State road	Yes	No	Yes

Road name	Functional hierarchy	Restricted Access vehicle: 25/26 m B-double approved	Road train: Type 1 A- double approved	OSOM including 4.6 m Vehicles approved
Hume Street	State road	Yes	No	Yes
Marble Hill Road	Local road	No	No	No
Middle Arm Road	Local road	No	No	No
Norwood Road	Local road	No	No	No
Range Road	Local road	No	No	Yes
Wheeo Road	Local road	No	No	Yes

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